



Govt. of Maharashtra

PRIMARY HEALTH CENTER

MANUAL

**Directorate of Health Services,
Maharashtra, Mumbai**



MESSAGE

Maharashtra enjoys the reputation of being one of the most progressive and well-administered State in the country. The Public Health Department continuously strives to improve the health indicators by improving and strengthening the delivery of health care both curative and preventive. The Government is keen and firm on ensuring accessible health services to the most remote areas in the state and also ensures that these services are of appropriate standards.

Recently with the launch of the National Rural Health Mission this resolve of the Government of Maharashtra has further strengthened. Various reforms have been undertaken to achieve an accessible, affordable and acceptable health system in Maharashtra. The Primary Health Centre manual is one such action by the Public Health Department to enable the Medical Officer Primary Health Centre execute their tasks better.

I congratulate the Public Health Department, Government of Maharashtra on the preparation of this Primary Health Centre manual. I am glad that this manual is updated after long time since its first publication in 1971. We should not undermine the dynamic nature of the health system and continue to update and revise this manual.

I assure that this manual reaches every Primary Health Centre in Maharashtra and I am very optimistic that the Medical Officers working at Primary Health Centre will use this manual effectively.

A handwritten signature in black ink, appearing to read 'Vimaltai Mundada'.

Dr. Vimaltai Mundada
Hon. Health Minister,
Government of Maharashtra



MESSAGE

I greatly appreciate the efforts taken by the Public Health Department, Government of Maharashtra in coming up with this revised Primary Health Centre manual. The primary Health Centre is a very important level of service delivery in the rural areas. It forms the pillars of the health system catering to the most vulnerable population. The crucial role of the Medical Officer Primary Health Centre should not be undermined. It is important that their knowledge about various national health programmes and services to be delivered at the primary level needs to be updated regularly. The Public Health Department has first published the Primary Health Centre manual in 1971 & there was a need to update & publish its revise edition.

The National Rural Health Mission too has greatly emphasised the importance of the Primary Health Centres. Considering the need to regularly update the knowledge of the Medical Officers and the importance given by the National Rural Health Mission on Primary Health Centres, it is most appropriate that this manual is published and circulated to all Primary Health Centres in Maharashtra.

I am certain that this manual will be significantly useful to the Medical Officers Primary Health Centre in their efforts to deliver health services of desired standards.

Ranjit Kamble
Hon. Health Minister for State
Government of Maharashtra

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SECTION - I

SCOPE AND OBJECTIVES OF PRIMARY HEALTH C E N T E R

1. EVOLUTION OF PRIMARY HEALTH CENTER

The concept of providing medical aid and other essential health services through the medium of Rural Health Centers dates back to 1931 when the European Conference on Rural Hygiene convened by the League of Nations Health Organization at Geneva with participation of 25 countries, recommended provision of rural health services through the agency of Rural Health Centers. To begin with, Rockefeller Foundation established 7 model Health Units in different parts of India between 1931 to 1939. One of these is located at Sirur (District Pune) which now is being utilized as rural field practice area for B J Medical College, Pune.

The idea of developing Primary Health Center as the focal point for providing comprehensive, curative and preventive health services in rural areas of India was presented in a concrete form by the Health Survey and Development Committee (Bhore Committee) in 1946. The Committee recommended establishment of a network of Primary Health Centers and Secondary Health Centers in rural areas to bring medical aid and minimum essential health services within the easy reach of rural people. However, establishment of wide network of Primary Health Centers in the entire country came only with the recommendations of Balwantrai Mehta Committee. On the committee's recommendations, Community Development Program was launched on 2nd October 1952 in 55 project areas. Primary Health Centers were part of efforts in all-round development of rural areas through this program.

The Central Council of Health fully endorsed in 1953 the principle of integrated development of community life and accepted the provision of one Primary Health Center per Development Block (for 80,000 to 1,20,000 population) to provide promotive, preventive and curative services by professional and para-professional health personnel.

After Bhore Committee, various important committees were appointed and the recommendations of these committees were landmarks in the evolution of primary health centers. These are:

- Mudaliar Committee (1962): The Committee insisted to strengthen the existing PHCs before establishing new centers and recommended strengthening of sub divisional and district hospitals.
- Chadha Committee (1963): The Committee recommended that "vigilance" operations under NMEP should be taken up by general health services and recommended one Basic Health Worker for every 10000 population who would carry out monthly home visits for collection of vital statistics and FP services, in addition to malaria vigilance.
- Mukerji Committee (1965): Reviewing the strategy for Family Planning, the Committee recommended integration

of maternal and child health services with Family Planning Programme with separate staff for FP. Basic health workers were to be utilized for purposes other than FP.

- Jungalwalla Committee (1967): Recommended unified approach for all the problems instead of a truncated approach for different problems. Medical care of sick and conventional public health programmes were recommended to be kept under a single administrator.
- Kartar Singh Committee (1972): The Committee recommended the concept of Multi Purpose Worker. One health worker (F) for 10,000 population would be responsible for FP and MCH activities, medical care, and health and nutrition education. One health worker (M) expected to cover 6,000 to 7,000 population would be concerned with malaria, smallpox, FP, immunization, environmental sanitation, nutrition education, communicable diseases and health education activities. The Committee's recommendations changed the unipurpose cadres to a common cadre of Multipurpose Workers (male and female) and Health Assistants (male and female) to provide for all health programmes.
- Srivastava Committee (1975): The Committee stressed utilization of para-professional resources available in the community who would provide simple promotive, preventive and curative care. The committee also stressed the creation of bands of para professional and semi professional health workers from within the community itself.
- Rural Health scheme (1977): Accepting the basic recommendation of Srivastava committee, rural health scheme was launched and the training of community health workers was started in 77-78. Steps were taken towards reorientation of medical education and reorientation training of multipurpose workers.
- Report of working group (1981) towards Health For All by 2000 AD: The group evolved specific indices and targets to be achieved by 2000 AD.

National Health Policy 1983 has ratified the norms of one Primary Health Center for every 30000 population and one sub centre for every 5000 population in plain area and 20000 and 3000 for tribal and hilly area respectively.

New PHCs are now being provided under the Minimum Needs Programme and the Regional Imbalance Scheme.

1. National Health Policy

Policy is the system which provides the logical frame & rationality of decision making for the achievement of intended objectives. Policy states priorities & guides resource allocation.

First National Health policy was formulated in 1983 & after that it was revised in 2002.

1.1. Goals to be achieved as per National Health Policy

2003:	Enactment of legislation for regulating minimum standard in clinical establishments/medical institutions
2005:	- Eradicate Poliomyelitis & Yaws - Eliminate Leprosy - Establish an integrated system of surveillance, National Health Accounts & health Statistics - Increase state sector health spending from 5.5% to 7% of the budget
2007:	Achieve 0 level growth of HIV/AIDS
2010:	- Eliminate Kala Azar - Reduce mortality by 50% on account of TB, malaria & other vector/water borne diseases - Reduce prevalence of blindness to 0.5% - Reduce IMR to 30/1000 & MMR to 100/1 lakh live births - Increase utilization of public health facilities from current level of <20% to > 75% - Increase health expenditure by Government from current 0.9% to 2% of GDP - Increase share of central grants to constitute at least 25% of total health spending - Further increase of state sector health spending to 8%
2015:	Eliminate Lymphatic Filariasis

1.2. Objectives

NHP-2002 has set out new policy framework for the accelerated achievement of public health goals. The objectives are as below:

- To achieve an acceptable standard of good health amongst the general population of the country.
- To increase the access to the decentralized public health system by establishing new health infrastructure in deficient areas, & by upgrading of our citizens, the Government of India has launched the infrastructure in the existing institutions.
- To ensure more equitable access to health services across the social & geographical expanse of the country.
- To strengthen the capacity of the public health administration at the state level to render effective service delivery.
- To enhance the contribution of the private sector in providing health services for the population group which can afford to pay for the services.
- To rationalize use of drugs within the allopathic system
- To increase access to tried & tested systems of traditional medicine.

1.3. Financial resources

- Increase health sector expenditure from 5.2% as at present to 6% of GDP with the government contribution increasing from 0.9% as at present to 2% by 2010.
- Increase health sector expenditure by states from 5.5% to 7% of their budget by 2005 & further to 8% by 2010.

1.4. Equity

Out of total public health spending, increase sectoral outlay

as under

- Primary: 55%
- Secondary: 35%
- Tertiary: 10%

2. National Rural Health Mission (NRHM)

Recognising the importance of health in the process of economic & social development & improving the quality of life of our citizens, the Government of India has launched the National Rural Health Mission during January 2005.

2.1. The goal of the Mission

The goal of the mission is to improve the availability & access to quality health care by people, especially for those residing in rural areas, the poor, women & children.

2.2. Strategy

The NRHM is basically a strategy for integrating ongoing vertical programmes of health & family welfare and addressing issues related to the determinants of health like sanitation, nutrition & safe drinking water.

NRHM subsumes key national programmes namely

- Reproductive & Child Health phase II
- National Diseases Control programmes like RNTCP, NLEP
- Integrated Disease Surveillance Programme
- Mainstreaming of Ayurveda, Yoga, Unani, Siddha & Homeopathy (AYUSH)

2.3. The activities under the NRHM

- At the state level, the State Health Mission is formed & chairman of this mission is Hon. Chief Minister.
- Similar mission is being formed at each district level headed by Chairman Zilla Parishad.
- For 30 bedded hospitals norms for services,

instruments/equipments, staff, drugs etc have been developed as Indian Public Health Standards (IPHS) in order to improve the quality of health care delivery.

4. Formation of Hospital Management Committees for monitoring of functioning at hospital level.
5. Strengthening of immunization programme
6. Organising mobile medical services at district level.
7. Organising Health Camp at Anganwadi level on a fixed day in a month for providing assured services to women & children.
8. Strengthening institutional deliveries under Janani Suraksha Yojana.
9. Increase accountability of health staff & system to Panchayat Raj Institutions (PRI).
10. Untied fund of Rs. 10,000 per sub center will be provided for improving service delivery.

Details for each district will be provided by each district from time to time.

2.4. Janani Suraksha Yojana

Under NRHM as per the Central Government guidelines, Janani Suraksha Yojana has been started.

2.4.1. Objectives of the scheme

1. To improve institutional deliveries of antenatal mothers especially BPL women.
2. To reduce maternal & infant deaths.

2.4.2. Eligibility criteria

- Antenatal mother should be from rural area & BPL family & have BPL card. If BPL card is not available, certificate of Tahasildar or Talathi or Grampanchayat is essential.
- Age of the woman should be minimum 19 years at the time of ANC registration.
- The benefit will be given only up to 2 issues.

2.4.3. Benefits under the scheme

- When antenatal mother is registered before 16 weeks, Rs. 100/.
- For three regular antenatal check ups, at each follow up visit Rs. 100/
- After delivery when she comes for postnatal check up, Rs. 100/.
- When the mother is hospital delivered, Rs. 200/ additional monetary benefit will be provided.
- If caesarean section delivery is required for such high risk mother & specialist is not available in government institution, services of private specialist is allowed to be availed. In such case Rs. 1500/ as a reimbursement is given to that private hospital.
- In case of referral, transportation cost will be paid from the District RCH society.

2.4.4. Implementation

- Register eligible antenatal mothers along with record

for BPL status at SC/PHC.

- Keep advance of Rs. 5000/ at the disposal of ANM.
- Information of the scheme should be given to the community. Help of AWW, pada volunteers, NGOs should be taken for this purpose.
- Information about the beneficiaries & benefit given to them should be displayed at appropriate places at village level.

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2. MEDICAL OFFICER AS A TEAM LEADER

Team and the Team Leader at PHC

Medical Officer is a part of the health team, which includes Health Assistants (HAs), Multi Purpose Workers (MPWs), Pharmacist, administrative staff and sub centers at satellite locations. The team consists of a group of people who share a common health goal and common objectives, as determined by community and programme needs. Each member contributes according to his or her competence and skills and in coordination with the others.

The health care team of your PHC is ultimately responsible to the people you serve, the community and users of your service. It is from these people and groups that you must seek direction. Observing, listening and learning, discussing and deciding, organizing, participating and informing are the foundations of the relationship between the community and your team.

The leader is not expected to make all the decisions or do all the work, but must encourage others and coordinate efforts of team members. Final responsibility for any endeavor rests with the leader. As health care providers, we adhere to the dictates of our profession and the expectations of the society. In our professional roles, we are acting not just as individuals but also as representatives of our profession. Thus it is extremely important to work within the limits of your training and ethics.

System and the situation

At times, systems and individuals can be overwhelmed. Some factors will go beyond your control, such as a shortage of supplies. The balance between advocating for improvement and driving yourself crazy with an inflexible problem can be difficult. Trying too hard to fix a problem can lead to frustration and eventually cynicism; too little effort will ensure that things will never change. Be realistic about what you can accomplish as an individual and as part of an organization. You did not create the situation, but you can speak the truth about it and work for improvement.

Working in leadership and management roles means you will be dealing with your colleagues and co-workers and be faced with many of their problems. You will have to deal with absenteeism, poor job performance and the results of illness and disease. These are problems that you did not create and may not be able to fix. Be clear about your expectations and put systems for reporting, evaluation and remedy in place. This will help to make expectations clear and avoid the problem of dealing

with things on a person-by-person basis.

As a team leader MO has following responsibilities

- Planning and monitoring of health programmes
- Provide basic curative services
- Organize and supervise preventive and promotive health related activities
- Develop a viable and functional referral system
- Supervise the sub-center functioning

Key points to note

- Leadership is part of your job
- Apply the skills of evaluation and planning to your work as a manager.
- Respect the knowledge and expertise of senior PHC staff.
- Every institution has a history and the legacy of what has happened and why things have worked or not worked and is held in memory of PHC staff.

Few tips to new leaders at the PHC

When assuming a new role or advanced leadership responsibilities, use your past experiences, but also begin your new role with a broader view and unbiased attitude. When you arrive in a new place or take on a new job or role at a familiar place, be alert to the physical and human resources and try to

learn as much as possible about the work and culture of the place.

Familiarize yourself with the people, PHC and its resources. Try to get an overview of the organizational and communication systems that are used (not just those that are supposed to be used, but what is really happening). Hear what people have to say. Try to understand what works well, where the problems lie and what the hopes of your co-workers are.

It will not be possible to understand everything at once or to fix all problems, but a full history and examination of the site provides the starting point for understanding and improvement. Any efforts to change practices or introduce new ones should include consultation with representatives of all interested parties. Any management plan needs to be worked out with the people involved and carried out as a partnership.

The pride people feel in their workplace and the services they offer is a valuable commodity and are the greatest resource of any health care facility.

Following lines of Lao-tse summarize the requirement of true leadership

*“A leader is best when people barely know he exists.
Not so good when people obey and acclaim him.
Worse when they despise him.
Fail to honor people, they fail to honor you.
But of a good leader, who talks little
When his work is done, his aim fulfilled,
The people will say, “We did this ourselves”.*

Lao-tse

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3. ESTABLISHMENT AND FUNCTIONING OF PRIMARY HEALTH CENTER

Primary Health Centers play a very vital role in the health care of rural population of our state and the country. These are expected to serve as centers for promotion of positive health, make people health conscious and ensure their full participation. Primary Health Center is a multipurpose unit which renders curative, preventive and promotive health care services to the people living in defined geographical area. It is an organization, which endeavors to provide basic health care to safeguard and promote the health of the community. With the democratic decentralisation, primary health centers are expected to fully involve local people and their leaders in planning and implementation of day to day health care rendered by the centers. A primary health center provides accommodation for out-door clinic, MCH/FP clinic, minor surgery room, small laboratory and a ward of 6 beds, 4 being reserved for maternity. PHC is known for offering its services as a health team. There are 1814 PHCs and 10427 Subcenters in the state by the end of 2005.

Health services have to be developed with local participation and in full coordination with elected leaders of the community. In view of this the Medical officer of the Primary Health Center should always inform local leaders about planning and development of health services in PHC area.

1. Establishment of PHC

Criteria of selection and location of Primary Health Center and Sub-Center laid down by Public Health Department are given below.

1.1. Primary Health Center

- There will be one PHC for 20,000 population in tribal, hilly area and for 30,000 populations in non-tribal and non-hilly area.
- Headquarter of Primary Health Center should be located in a place which is centrally situated place/village with good communication and adequate electricity, water-supply etc.
- Minimum population of HQ village should be 3000 in tribal and hilly area and 5000 in non-tribal plain area.
- Land required for construction of PHC should be obtained free of cost. If suitable centrally placed land is not available and if Zilla Parishad passes the resolution, PHC land can be purchased as per government procedure.

1.2. Sub-Center

- There will be one sub center for 3000 populations in tribal, hilly area and for 5000 populations in non-tribal and non-hilly area.
- Minimum population of sub center HQ should be 500 in tribal/hilly area and 1000 in non-tribal/non-hilly area.
- Headquarter of sub center should be located as far as possible in a place which is centrally situated with good communication and adequate electricity, water-supply etc.
- Land required for construction of SC should be obtained

Section -I : Scope and objective of Primary Health Center

free of cost. If centrally placed land is not available and if Zilla Parishad passes the resolution, SC land can be purchased as per government procedure.

The scheme of establishment of Primary Health Centers has been transferred to Zilla Parishad under Government Notification Co-operation and Rural Development Department No. TWS/1062-N, dated 1st May 1962 (the date from which Zilla Parishad got established). The Government takes decision of establishment of new PHCs and SCs and Zilla Parishad recommends the place. Once established, Zilla Parishad cannot shift PHC/SC from its present location. It can only be shifted with the permission of government, if Rural Hospital is established at that place.

2. Functions of PHC

Primary Health Center has following important functions:

- Provision of medical care.
- Control of communicable diseases.
- Plan & provide Reproductive and Child Health services.
- Family welfare services.
- School health services.
- Environmental sanitation.
- Health education/ Information Education Communication / Behavior Change Communication.
- Nutrition education Programme.
- Collection and maintenance of vital statistics.

3. Staffing pattern for PHC and Sub Center

Staffing pattern for the Primary Health Center and Sub Center has been revised as per the GR no. PHC-1097/286/No. 26/97/Health-4 Date 16 January 2003 and is now as follows -

Table 1: Staffing pattern at PHC & pay scale as per 5th pay commission recommendations

No.	Name of post	No. of sanctioned posts		Pay scale
		Non tribal area	Tribal area	
Technical posts				
1	Medical officer Class-II	2	1	Rs. 8,000 – 13,500
2	Medical officer Class-III	-	1	Rs.6,500-10,500
3	Health Assistant (Male)	1	1	Rs. 4,000 – 6,000
4	Health Assistant (Female)	1	1	Rs. 5,000 – 8,000
5	Auxiliary Nurse Midwife	1	1	Rs. 4,000 – 6,000
6	Laboratory Technician	-	1	Rs.5,000-8,000
7	Pharmacist	1	1	Rs. 4,500 – 7,000
Non Technical posts				
8	Junior Assistant	1	1	Rs. 3,050 – 4,500
9	Driver	1	1	Rs. 3,050 – 4,500
10	Sweeper	1	1	Rs. 2,550 -3,200
11	Lady attendant	1	1	Rs. 2,550 -3,200
12	Male attendant	3	3	Rs. 2,550 -3,200
	Total	13	14	

Pay scales and allowances of staff appointed in Primary Health Center are regulated by the Maharashtra Zilla Parishad

Rules (Pay Scales and Dearness Allowances), 1962, issued under Notification No. DSR-2462-V, dated 16th March 1963.

Table 2: Staffing pattern at sub center

No.	Name of post	No. of sanctioned posts	Pay scale
1	Auxiliary Nurse Midwife	1	Rs. 4,000 – 6,000
2	Multi Purpose Worker (Male)	1	Rs. 4,000 – 6,000
3	Part Time Lady Attendant	1	Rs 500

4. Part Time Lady Attendant (PTLA)

Medical officer should ensure that all ANMs are provided with a Part Time Lady Attendant. In case of vacancy of PTLA in PHC, submit proposal to DHO for appointment of new PTLA.

Guidelines for selection & recruitment are as per the GR Urban Development, Public Health & Housing Department, resolution number FPL 1062/56599-II, dated 10th January 1966

as given below -

- District Health Officer is authorized to appoint PTLA.
- Appointment should be made from amongst the literate ladies of age less than 45 years.
- MO should verify character of candidate. A certificate from Gram Panchayat should be obtained in this regard.

Section -I : Scope and objective of Primary Health Center

- Candidate should be physically fit and capable of carrying out her duties as attendant, such as carry kit, provide security to ANM etc.
- Candidate should be medically examined by Medical Officer i/c of PHC and certificate about physical fitness should be obtained.
- Written undertaking regarding temporary nature of services & one month's notice in case leaving the job should be taken.

MO PHC should prepare proposal of appointment of PTLA on the basis of above guidelines and submit to DHO. Appointment order of PTLA is issued by DHO.

5. Grants available for PHC

Table 4: Grants for various activities available at PHC

Purpose	Amount
PHC construction	Rs. 65,00,000 (one time)
Instruments and equipments	Rs. 1,00,000 (at the time of establishment)
Medicines*	Non tribal PHC: Rs. 60,000 and Tribal PHC: Rs. 80,000 per annum
Contingency	PHC with telephone : Rs. 8500 and PHC without telephone Rs. 5000 pa
POL	Rs. 6000/- per year
Vehicle maintenance	Rs. 4,000/- per year

*Medicine grant is kept at district level.

6. Grants available for sub center

Table 5: Grants for various activities available at sub center

SC construction	Rs. 3,00,000 (One time)
Instruments and equipments	Rs. 50,000 (at the time of establishment)
Medicines*	Rs. 6000/ annum
Contingency	Rs. 1500/annum

*Medicine grant is kept at district level.

A model list of medicines to be supplied to each Primary Health Center and Sub Center is given in the appendix.

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4. MONITORING PHC ACTIVITIES

Monitoring of various activities or records periodically is essential for ensuring smooth and efficient functioning of Primary Health Center. Frequency of monitoring may be daily, weekly, monthly, bi-annually or annually as per the need of Programme.

MO should prepare a register called as 'Monitoring

Activities Register'. This register should have sections for activities to be monitored daily, weekly, monthly, etc.

1. Daily monitoring activities

Write down activities to be monitored vertically (one below the other) and dates horizontally. After checking specific activity, tick mark if it has been completed and put cross mark if not completed in column of checking date.

Table 5: Format for daily monitoring of PHC activities : Month _____

Sr.	Activity	Dates					
		1	2	3	4	—	31
I	General						
1	Muster	√					
2	Movement register	√					
3	Late muster	√					
II	Pharmacist						
1	OPD register	√					
2	Daily tablet account register	×					
3	OPD cash book	×					
4	PBS of all fever cases	√					

Section -I : Scope and objective of Primary Health Center

III	Cold chain						
1	Temperature register	√					
2	ILR / Deep freezer	√					
3	Vaccine distribution register						
IV	Ward						
1	Emergency tray with all medicines						
2	Indoor case papers						
3	Indoor register						
4	Medicines given as per prescription and in time						
V	Autoclaving						
1	Signoloc register duly completed						
VI	Operation theater cleanliness						
VII	Labour room						
1	Delivery instruments autoclaved and kept ready						
2	Birth weight of newborns of delivered mothers recorded						
3	Delivery record and register updated						
VIII	General cleanliness						
1	In wards						
2	Outside PHC						
3	Toilets and bathrooms						
IX	Laboratory						
1	PBS of all fever cases taken						
2	Sputum for AFB of all chest symptomatics taken						
X	Junior assistant						
1	Cashbook						
2	Inward/Outward register						

2. Weekly monitoring

Table 2: Format for weekly monitoring of PHC activities

Sr.	Activity	Week number						
		1	2	3	4	5	—	52
1	Weekly disease surveillance report							
2	Work sheet of Jr. Assistant							
3	Compliance made to the letters received from district level By - HA Pharmacist Junior assistant							
4	Review performance of HA during last week.							

3. Monthly monitoring

Table 3: Format for monthly monitoring of PHC activities

Sr.	Activity	Apr	May	Jun	July	—	Mar
1	MIS reports						
2	Performance of critical indicators village wise, worker wise						
3	Cash book and cash verification						
4	Medicine stock book						
5	Medicine expiry register						
6	CL register and CL account						

4. Half yearly monitoring

Fix date for following activities and carry out the activity.

Table 4: Format for half yearly monitoring of PHC activities

Sr.	Activity	June	December
1	Dead stock check up		
2	Crediting earned leave, half pay leave of all workers		
3	Dead stock register		
4	Vaccine stock book		
5	RCH stock book		
6	Medicine stock book		
7	All other stock books		

5. Yearly monitoring

Following activities should be carried out once a year. It is better to fix month of April for this activity. Finish these activities during the month of April.

Table 5: Format for yearly monitoring of PHC activities: Year -

Sr.	Activity	Status
1	Service book of all workers	

6. Information to be submitted to higher offices

Besides MIS, lot of information is required by DHO for various reasons. Letters are sent by DHO for this information. Carefully read the daily *tapal*. If any information is required to be submitted to DHO, give this responsibility to one of the HQ

staff. Before preparation for the compliance, always discuss with the staff about how the information should be given. Remember that compliance should be made in stipulated time. Enter all such information required in following format in Monitoring Register.

Table 6: Monitoring of submission of information to higher offices

Sr	Information required	Reference number and date of letter	To whom the information should be submitted and	Person responsible to collect the information	Date of compilation	Date of dispatch	Remarks

5. MEETINGS

Medical Officer has to conduct PHC level meetings and participate in block and district level meetings. MO should do homework before and remain fully prepared for all meetings.

Effective PHC level meetings

Medical Officer has to conduct PHC staff meetings as team leader. Instructions given below should be followed for conducting PHC meetings.

- Have clear objectives and expected outcomes: Everybody should know what the meeting is about.
- Have an agenda or a plan of how things will proceed. Stick to schedule and end on time, proceed according to the agreed agenda.
- Role of MO is to conduct the meeting, review the performance, solve the problems of staff & not to voice his or her own opinions.
- Meeting should be conducted in a way that makes all participants feel welcome and comfortable.
- Sitting arrangement should be comfortable; meeting place should be neither too hot nor too cold and enough for all workers.
- Use names, encourage input and recognize the work and contribution of others.
- Give equal opportunity to everyone to express his or her views.

Feedback during meeting

- Feedback is most helpful if comments are constructive in nature. Suggest changes in a way that is encouraging rather than threatening.
- Feedback should be specific, timely, constructive and given in a respectful manner.
- Comments should be very specific and deal with a person's actions/omissions rather than expressing an opinion as a person.
- Comments are most helpful, when they are communicated independently in order to respect the privacy of staff and when staff are allowed to express their views on a matter.

1. PHC Management Information System (MIS) meeting

PHC MIS meeting is most important meeting for reporting and reviewing work done by field workers. Meeting should be conducted as follows:

1.1. General guidelines

- Date for monthly MIS meeting is fixed which is usually on last dates of the month.
- Meeting should start at 10.00 am and should continue up to 5 pm.
- Senior MO should hand over OPD/IPD to 2nd MO and remain present for meeting throughout the day. Second MO and pharmacist should join the meeting after OPD.
- Junior Assistant must be present in the meeting for whole day and should note down the minutes of the meeting.

- Start meeting by recording names of staff attending. This should be followed by reading minutes of the last meeting and review of compliance of activities agreed in last meeting.

1.2. Report submission

Two MIS report formats (MPW-Male reporting format and sub-center report format) are provided at sub-center level.

- MPW-Male should prepare his report and this should be added to sub-center format available with MPW (Female). Report of MPWs should be based on daily diary.
- Instructions should be given to all MPWs to prepare monthly MIS reports one day before the meeting and submit to concerned HA at 10 AM on the day of MIS meeting.

1.3. Scrutiny and analysis

- Sub-centers should be equally divided among available HAs. Scrutiny of reports of allotted sub-centers should be completed by concerned HAs within one hour.
- Information about progress of critical indicators should be immediately noted and analyzed by MO himself on separate register with the help of HAs which is helpful for detailed review.
- Analysis should indicate percentage of achievement against expected level of achievement and poor performing sub centers.

1.4. Review by MO

- Review of work done should
- Indicator wise, worker wise and village wise review should be carried out with the help of critical indicator performance register.
- Poor performing sub centers and villages should be identified. This will help to identify the high-risk areas, low performing pockets, least achieved indicators and workers with poor performance. Reasons for poor performance and support required should be discussed. Role of HA must be specified for problem solving and support.
- Depending on this analysis, planning for next month should be done. Supervise poor performing areas more closely and support with more resources like medicines, equipments, supervisory help etc for improving the performance.
- It is good practice to supervise low performing area by MO himself for improvement with specific laid down targets.

1.5. Capacity building

Discussion about important letters received in the month and Programme implementation guidelines should be carried out to update knowledge of HAs and MPWs.

- Continuing Medical Education: One technical topic should be discussed for at least 30 minutes during every monthly meeting. Topic should be of practical importance and of

relevance for the season (e.g. treatment of diarrheal diseases in June, malaria / fever outbreak in July, Dengue fever outbreak in summer season, etc.)

- Technical topic to be discussed in next meeting should be fixed at the end of technical discussion and all the staff should be instructed to come prepared. This will improve the quality of discussion.

1.6. Death audit

- During the monthly meeting, discuss all infant & maternal deaths that have taken place in reporting month.
- MO should investigate all infant and maternal deaths every month to understand ground realities and to highlight the deficiencies correctly during meeting.
- Death audit discussion should include details about the events leading to death, signs, symptoms, treatment received if any, probable cause of death, services received by the beneficiary and what could have been done at the level of MPW, HA and MO to prevent events leading to this death.
- Death audit is not a faultfinding mission. Discussion should be constructive and conducted in such a way that workers understand the mistakes at each stage with a view to prevent such deaths in future.

1.7. Problem solving

- Separate session of problem solving should be conducted at the end of monthly meeting. Junior Assistant must be present for this session.
- Majority of the problems of MPWs and HAs are related to minor administrative procedures like sanction of leave, increment, pending TA bills, arrears of salary and increments, supplies, etc.
- List out all the problems narrated by health staff. Classify the problems according to the level of action i.e. PHC level, Panchayat Samiti level and District level.
- Problems related to PHC must be solved before next meeting and appropriate correspondence should be started for problems related to higher level.
- Inform concerned staff about what efforts you are taking to solve their problems.
- Keep the record of problems and action taken by you. This will help to take review of action taken to solve the problems and also for further planning. Review in next weekly meeting till the problem is solved.
- Positive approach for problem solving by MO will improve efficiency of staff, minimize complaints & motivate them for better work.

2. PHC Weekly Meeting

PHC weekly meeting is basically to follow and assess the progress made regarding decisions taken during the last monthly meeting. All PHC headquarter staff should attend weekly meeting. Weekly meeting should preferably be carried out on Tuesday evening. However, the meeting day may be changed according to local convenience and instructions of DHO.

2.1. Following activities should be carried out during weekly meeting

- Review of progress of actions planned as per decision in monthly meeting
- Weekly disease surveillance situation, identification of problem areas and instructions for problem solving
- Problem solving: Progress of actions on personal problems put forward by the staff during monthly meeting
- Instruction to Junior Assistant to attend Panchayat Samiti or DHO office to solve the problems

3. ICDS sector meeting

Four out of six activities of ICDS are related to health sector and are implemented by PHC staff. Therefore, it is extremely important for Medical Officer to conduct ICDS meeting. ICDS meetings are scheduled during last week of every month. All the Anganwadi Workers (AWWs), Mukhya Sevikas, ANM and HA(F) must attend this meeting.

3.1. Role of PHC staff

- Tally the performance figures, reports of Anganwadi worker and MPW (F), especially immunization, ANC registration, etc.
- Check whether all births and deaths especially infants deaths reported by AWW are included in MPW(F) register and vice versa.
- Review the status of Gr-III and Gr-IV children in each Anganwadi. Prepare plan for their check up, home visit by ANM and referral if necessary.
- Plan Anganwadi visits of MO for next month.
- Discuss one important technical topic related to ICDS services during the meeting as continuing education.

4. Panchayat Samiti (PS) meeting

Panchayat Samiti meeting is held once in a month at Panchayat Samiti head quarter and Medical officer should attend the meeting.

4.1. Guidelines for PS meeting

- Panchayat Samiti meeting is held under ZP/PS Act. Carefully go through the agenda of meeting and prepare meeting notes on the basis of agenda. Make three more copies. Give copies of meeting notes and brief the Chairman Panchayat Samiti, Block Development Officer (BDO) and Taluka Health Officer about agenda and important issues related to your PHC before meeting.
- Brief BDO and Chairman Panchayat Samiti about difficulties encountered when working at PHC, difficulties in achieving the targets and support required by PS before meeting.
- Prepare a note on progress of your PHC in all National Health Programmes against expected level of achievements. Also mention action taken on important issues raised during last meeting in the note.
- Always be seated in meeting hall before meeting starts. Request the chairman for permission to talk before

explaining any issue to house.

- When any question is asked, answer the question on the basis of actual facts. Never give wrong information to house. Answer the questions sincerely, to the point and politely.
- Never leave the meeting hall before the meeting is officially declared as over by the Chairman.

5. District level MO meeting

District level MO meeting is the most important meeting of the month. In this meeting important discussion points include, review of work done during last month, planning for next month and solutions to important problems expected during Programme implementation.

5.1. Guidelines for preparation of the meeting

- Keep one register exclusively for District level meetings and always carry the same register to DHO meeting without fail.
- Always be on time. Start earlier to reach meeting place within given time.
- Preparation of meeting should be completed at least one day before you start for meeting. Never leave preparation for eleventh hour.
- Read carefully agenda of the meeting. Prepare required meeting note yourself with the help of staff. Arrange meeting file according to the sequence given in the agenda.
- Go through your notes of last meeting, PHC activity monitoring register and minutes of last meeting to check whether any action or information called for is not submitted by you. If so, then finish the activity on priority and prepare the information/report for submission to DHO.
- Carefully go through all MIS reports of last month. Note down the areas where your PHC is lagging behind and reasons for the same. Discuss with the HAs about how the activities can be improved, prepare plan for improvement.
- Your meeting preparation should be such that you should be able to answer all the questions asked regarding PHC performance without referring the reports.
- Prepare plan for next month and keep copy of the plan, mention difficulties in implementing the plan and support required from DHO if any.
- Be physically and mentally present in the meeting. If you are asked any question, answer briefly and clearly.
- Never give wrong answer. Giving wrong, incorrect and insufficient information and not preparing for meeting are most important and common reasons for lengthy meetings.
- Note down all the points discussed during the meeting and action expected.
- Listen with full concentration, understand important points discussed during the meeting, and get them clarified at once or after meeting if you have not understood. Implementing any event/Programme without clear understanding may create confusion among PHC staff and may affect your credibility.

- After coming back to PHC, conduct weekly meeting of that week immediately on next working day, inform staff about decisions taken during the meeting and discuss plan to implement these decisions. Also give specific responsibility to one HA for submission of any information/report required by higher authorities and enter in PHC activity monitoring register. Follow up the activity daily till the information is submitted.

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6. MAPS, CHARTS AND GRAPHS TO BE EXHIBITED AT PHC

Maps, charts and graphs give visual impression about the salient features of progress of your PHC to the observer. Thus they quickly catch the eyes and imagination of the viewer. Medical Officer should take personal interest in preparing and exhibiting the charts and graphs in the Primary Health Center. They should use their own imagination and aesthetic sense to make charts and graphs colorful, attractive and informative.

Following is the minimum essential list of the standard maps, charts and graphs that should be exhibited in the Primary Health Center. Few important maps, charts and graphs should be displayed in MO room and remaining in suitable places like HA room, pharmacist room, office and verandah.

1. Maps, charts and graphs to be displayed in MO room

1.1. Maps

- Map of taluka showing PHC along with the roads
- Map of PHC showing location of Primary Health Center, sub-centers, all villages, private hospitals, dispensaries (Govt., Zilla Parishad and voluntary organizations) with standard signs for individual category.
- If PHC is selected for Survey of Causes of Death (Rural) scheme, then village selected for the scheme, areas allotted to the workers, supervisors.
- Map of PHC showing cases of vaccine preventable diseases year wise.

1.2. Charts and graphs

- Total staff with designation, headquarter (including MO and peripheral staff).
- Village wise population, MCP sessions.
- Fixed tour programme of MPW, HA, MO.
- Birth Rate, Death Rate, Infant Mortality rate of last five years.
- Performance of sterilization, contraceptives, fully immunized children, ANC registration and checkup, fully protected antenatal mothers, new case detection and regularity of treatment for tuberculosis, cataract performance, malaria positive cases and any other key indicator of important national health programmes.
- New case detection of Leprosy (MB, PB), number of child

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- cases, cases under treatment, release from treatment, and number of cases with deformity.
- Performance under PPI & IPPI from 1995 (Year of starting PPI) - Number of children in 0 – 5 years age group, number of children given OPV in booths and at home during IPPI.
- Number of epidemics that took place in last five years (disease, place, attacks, deaths, etc.)
- Village wise water sources, number of water samples collected, number of contaminated samples each year for last five years and month wise for current year.
- Number of TCL samples collected village wise, number of TCL samples with less than 20% chlorine each year for last five years and month wise for current year.
- Graph of annual figures of institutional, domiciliary deliveries.
- Average clinic attendance in MCP sessions by months for the current year.
- Proportion of LBW babies.
- Active, passive surveillance – Year wise total fever cases, number of blood smears collected, number of blood smears examined, positive cases for vivax, falciparum & mixed infection and radical treatment given.
- Month wise statement showing above-mentioned details for the current year.
- Total number of school children examined every year, number found with morbidity/disability, and disease wise pattern detected.

2. Maps, charts and graphs at other suitable places

3. Other charts to be displayed at PHC

No.	Place	Charts to be displayed
1.	MO room	Treatment charts:
		a. Diagnosis and management of dehydration
		b. Classification of ARI and management
		c. Dog bite classification and treatment
		d. Categorization under RNTCP and management
		e. Classification of leprosy cases and management age wise
		f. Age wise presumptive and radical treatment of malaria.
		g. Treatment of cerebral malaria
2.	Sterilization room	a. Procedure of autoclaving
3.	MCP clinic	a. Immunization schedule
4.	OT	a. Area of OT and dose of formalin, KMnO_4 required for fumigation
5.	HA (M)	a. Method of calculation of volume of water for round, square well, tank
		b. Dose of TCL & method of chlorination of water, OT test
		c. Preparation of mother solution
6.	HA (F)	a. Board showing stock of vaccines, number of frozen ice packs ready every day.
		b. Plan for shifting of vaccine in case of cold chain failure
		c. Method of defrosting ILR.
7.	Compounder	Essential/epidemic medicines stock

4. Some tips about preparation of maps-charts

- Use standard size drawing paper for maps, charts, etc. Suitable size recommended is 22"x15" (58 cm X 40 cm).
- Fix up suitable scale for various charts after studying the maximum and minimum figures.
- Bar diagram may be drawn with water color or by pasting strips of glazed colored paper cut to the required size of the bar.
- Indicate absolute figures in the box drawn below the bar diagram.
- For indicating number of cases of VPDs use small bindis of various colors, use different color for every disease.
- Charts and diagrams should be maintained up-to-date. Give the responsibility of preparing and updating charts to HA (M).
- The Maps, charts, and graphs should preferably be put up in frames with a plastic sheet covering in front. Suitable frames could be prepared with arrangements at the back for easy removal and replacement of charts.

5. PHC Master-book

All the information related to your PHC should be collected together and entered in Master-book. This book is very much helpful to give information of PHC in brief and to the point when any guest visits PHC. Master book should be of A-4 size document file with sufficient plastic folders in which the

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information can be inserted. Sequence of information should be maintained uniformly as follows -

- Name of PHC, year of establishment
- Map of district showing all blocks and your PHC
- Map of PHC showing all the villages, sub centers along with population (different color for each subcenter), approach roads , places of public health importance, rivers, dams, etc
- List of PHC advisory committee members and dates of meetings held
- List of PHC staff with designation, date of joining the service, date of joining the PHC, etc.
- All vital indicators of PHC e.g. birth rate, death rate, IMR, MMR, etc.
- Aanganwadis, dais, schools, ashram schools, grampanchayats in PHC area.
- Village wise water sources.
- List of facilities available at PHC
- Information of various surveys carried out in PHC.
- Tables and graphs of achievements of important MIS indicators of last five years
- List of hatcheries and breeding places along with code numbers
- Important activities/events in last year along with photographs if available
- **Any** other relevant information

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SECTION -II

PHC ADMINISTRATION

1. POWERS OF MEDICAL OFFICER

Professional competence in health field has been traditionally identified with technical capabilities. However this needs to be supplemented by equally good managerial skills for effective functioning of PHC. Variable managerial skills are required for everyone working in health services, depending on level in hierarchy.

Primary Health Center is one administrative unit. As Medical Officer is designated as head of office, he/she has to take decisions on all administrative matters of PHC. Junior Assistant is posted to assist Medical Officer in administrative matters. To discharge duty as head of office efficiently, MO must know powers and responsibilities, various civil services rules related to leave, penalty, pension, etc. and financial aspects relevant to PHC functioning.

Important administrative matters at the level of Primary Health Center include:

- Powers delegated to PHC Medical Officer
- Types of Leave
- Service book
- Confidential Reports (CR)
- Penalties and punishment
- Financial aspects
- Records and registers
- Inventories & movable property, consumables, equipments etc.

1. Powers delegated to Medical Officer PHC

Primary Health Center functions under administrative control of Zilla Parishad. All the administrative powers in Zilla Parishad are vested to Chief Executive Officer (CEO) of Zilla Parishad. CEO delegates some of these powers, essential for day-to-day administration to Medical Officer. Powers delegation may not be similar for all Zilla Parishads. However list given below indicates powers delegated to MO in majority of districts.

1.1. Administrative powers

- To approve monthly diary and advance tour program (ATP) of PHC staff.
- To grant casual leave to staff working in PHC.
- To certify all entries in service book i.e. maintenance of service record of staff.
- Disciplinary actions (minor penalties) like censure, withholding of promotion, recovery from the pay- whole or part of loss caused to government due to negligence or breach of orders and withholding increments of pay, etc.
- Recommendation of major penalties to CEO/DHO.
- To classify records as per government guidelines regarding period of preservation and destroy them when period specified for preservation is over.

- To write Confidential Report of Group-B and Group-C staff and to record report of working of Group-D staff in a prescribed format and submit to DHO.

1.2. Financial powers

- To grant earned leave up to 90 days.
- To grant annual increment.
- To grant transfer TA and festival advance.
- To grant refundable GPF advance.
- Condemnation of articles not exceeding the cost of Rs. 250 after depreciation.
- Repair of vehicle within financial powers after getting written report from driver
- Pay fixation after promotion, time scale promotion and issue of guidelines when new pay commission is declared, getting options.

1.3. Powers related to health and sanitation

Medical officer has following powers related to health and sanitation for establishments located within PHC jurisdiction.

- To enter any building for inspection from health point of view.
- To enter and examine buildings with problem of communicable diseases.
- Inspection of hotels, cinema halls and other public places from health point of view.
- Inspection of poultries, pigeries, goat farms or any similar establishment from health point of view.
- To give notice to unhygienic buildings.
- To advice Taluka Magistrate about declaration of area as epidemic prone or with ongoing epidemic under Epidemic Control Act.
- To conduct sanitary survey of all villages under PHC jurisdiction.
- To monitor chlorination of water, cleanliness of & around water sources

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2. LEAVE

(Maharashtra Civil Services (Leave) Rules 1981)

Leave means written sanction from leave sanctioning authority to remain absent from duty & it cannot be claimed as a right. MO PHC must know various kinds of leave and sanctioning procedure. Maximum amount of continuous leave permissible to a government servant should not exceed 5 years but ground for such leave should be convincing & acceptable by CEO ZP.

1. Guidelines for sanctioning leave (Rule-12)

- Leave is not the right of the employee but it is discretion of leave sanctioning authority who may sanction or refuse leave. (Rule 10 of MCSR leave Rules)
- Leave applied should be at credit of incumbent.
- Sanction of leave should not hamper PHC functioning.
- There should be specific mention regarding who should look after duties during leave period so that work of PHC will not suffer.
- MO can recall employee from leave if there is emergency or work of PHC is suffering.
- MO PHC must know address of employee during leave period.

2. Important aspects of leave

2.1. Commutation of one kind of leave into another (Rule-14): Authority who can grant leave may commute retrospectively leave of one kind into another kind which was due and admissible to government servant at the time when leave was granted, but employee can not claim such commutation as a matter of right. Commutation should be made at the request of government servant.

2.2. Combination of leave (Rule-15): Any kind of leave may be granted in combination with or in continuation of other kind of leave. However casual leave shall not be combined with any kind of leave.

2.3. Grant of leave & leave salary payment to a transferred government servant (Rule-30)

- When a government servant is already on leave, which is sanctioned by competent authority and is transferred to another office where he has to join on expiry of leave, then leave sanction and payment of leave salary will be responsibility of office from where he/she is transferred.
- If government servant applies for extension of leave in continuation of leave already granted to him by office from which he is transferred, issue of formal orders sanctioning extension of leave & payment of leave salary shall devolve on
 - § Office where he has to report for duty, if transfer of government & ZP servant to such office is to take effect from date of expiry of original spell of leave.
 - OR
 - § Office from where he is transferred if his transfer is to take effect from date of expiry of extension of leave applied for.
 - § When leave is applied during transit period from one department to another, leave will be sanctioned by office where he has to report for duty.

2.4. Casual Leave

Casual leave is not considered as kind of leave. It is an excuse for absence from duty. It is intended to meet special circumstances for which provision cannot be made by exact rules. Total casual leave admissible to a government servant during a calendar year is 8 days. However, this should normally be

sanctioned proportionate to calendar year period. Some government servants may exhaust casual leave in first few months of year and request for short earned leave. Such practice should be discouraged.

2.4.1. Criteria

- Account of leave starts from 1st January of every year and ends on 31st December of that year. Total casual leave admissible in one year is eight days. Unconsumed casual leaves lapse at end of year and cannot be carried forward to next calendar year.
- Not more than 7 days CL can be enjoyed at a time to be extended to 8 days in exceptional circumstances.
- Total period of CL and holidays enjoyed in conjunction at a time should not exceed 7 days. Only in exceptional circumstances CL can be extended to 8 days, if it is due.
- Any number of holidays and or Sundays are permitted to be prefixed /suffixed so also holiday or series of holidays are permitted to interpose between period of CL. However total period of CL and holidays, enjoyed in continuation at one time should not ordinarily exceed 7 days & 10 days in exceptional circumstances.

3. Kinds of leave**3.1. Earned leave (MCSR (Leave) Rules -1981) Rule-50**

- Thirty days Earned leave is admissible for one calendar year. Fifteen days of earned leave is added to the account of government servant on 1st January and fifteen days on 1st July of every year.
- Account of earned leave is maintained in service book. A separate page has been provided in service book for earned leave account.
- Unused earned leave gets credited to earned leave account. Maximum limit of earned leave at a credit of government servant is up to 300 days.
- When public servant is asked to join duties immediately without availing joining time in his transfer order, unexpired portion of joining time in days is to be credited to earned leave account.
- Encashment of earned leave at credit is permissible on or after the date of retirement (Maximum EL 300 days).

3.1.1. Calculation of earned leave (rule - 51)

- Leave at a rate of 2 ½ days for each completed calendar month of service, which the public servant is likely to render in half year of calendar year in which he is appointed.
- Credit at above rate should be accorded in case of resignation/retirement/removal/ dismissal/death for every completed calendar month up to the end of calendar month in which instance occurred.

3.2. Half pay leave (Rule-60)

- Half pay leave of 20 days is admissible in respect of each completed year of service. For each half year on 1st January and 1st July 10 days leave is added to account of half pay leave.

- Account of half pay leave is maintained in service book on separate page.
- Half pay leave can get accumulated without any upper limit at the rate of 5/3 days for each completed month of service up to date of retirement/removal/dismissal/death.

3.3. Commuted leave (Rule no. 61)

- Commuted leave is always granted on medical ground.
- Commuted leave not exceeding half the amount of half pay leave due may be granted on medical grounds. If government servant avails 20 days commuted leave; 40 days half pay leave is debited to half pay leave account.
- Commuted leave up to a maximum 90 days may be allowed during entire service without production of medical certificate

3.4. Leave not due (Rule – 62)

- Only permanent employee can be granted this type of leave.
- It is advance sanction of half pay leave when there is no other kind of leave at the credit of the government servant.
- Leave not due during entire service period shall be limited to maximum 360 days, out of which not more than 90 days at a time and 180 days in all may be on medical certificate.
- Leave not due shall be debited against half pay leave a government servant may earn subsequently, e.g. if a government servant avails leave not due for 40 days then it will take 2 years to get it debited against half pay leave.

3.5. Extra ordinary leave (Rule-63)

Granted in following special circumstances

- When no other leave is admissible
- When other leave is admissible but government servant has applied in writing for grant of extra ordinary leave

3.5.1. Limits for extra-ordinary leave (Rule-63)

Limit for extra-ordinary leave is 3 months. Limits can be extended up to twenty-four months in following circumstances in any one occasion -

- Six months when government servant has completed 3 years continuous service and illness is certified by Civil Surgeon or Superintendent of Government Hospital
- Twelve months when government servant has completed 5 years service and illness is certified by Civil Surgeon or Superintendent of Government Hospital
- Twelve months when government servant has completed 1 year service and is undergoing treatment for cancer or mental illness.
- Eighteen months when government servant has completed 1 year continuous service and is undergoing treatment for pulmonary TB, pleurisy of TB origin and leprosy.
- Twenty-four months for prosecuting studies.

3.6. Grant of leave on Medical ground (Rule-40) –Medical leave/commuted leave

3.6.1. Grant of medical leave to Group-A/B government servant by competent authority

- If a leave with extension up to 2 months, certificate in form 3 from authorized medical attendant or Medical Officer of equal status is needed.
- If leave is more than 2 months, ask to appear before medical board.

3.6.2. Grant of Medical Leave to Group-C ZP government servant by competent authority

- Application of leave accompanied by certificate of authorized medical attendant or a registered medical practitioner defining nature and probable duration.
- In case of doubt, authority competent to grant leave can secure second medical opinion by Civil Surgeon to have medical examination.

3.6.3. Grant of leave to Group-D ZP government servants on medical grounds

- In support of application on medical grounds from government class IV servant, competent authority to grant leave may accept certificate, as it may deem sufficient.

3.6.4. Important aspects of medical leave

- If a government servant repeatedly applies for leave on medical ground, attention of medical board should be drawn, may be referred to medical board & if medical board opines that, he is no fit to continue / to carry out duties prescribed for the post, he should be asked for invalid retirement.
- If non-gazetted government/ZP servant has applied for 3 days leave on medical ground, exemption from submitting medical certificate may be given however such a leave should not be debited against leave other than commuted leave.

4. Leave salary (Rule no. 70)

- Earned leave: Leave salary equal to pay drawn in month immediately before proceeding on earned leave is admissible.
- Half pay leave: Half amount of pay drawn in month immediately before leave is admissible
- Commuted leave: Leave salary equal to pay drawn in month immediately before proceeding on leave is admissible.
- Extra ordinary leave: No leave salary is permissible. But House Rent Allowance (HRA) & City Compensatory Allowance (CCA) are admissible. However HRA etc. is permissible after ascertaining expenditure incurred by government servant during leave period.

5. Powers to grant leave and leave record

- Medical Officer is competent to sanction all kinds of leave to non-gazetted government ZP servant up to 120 days except special disability leave and study leave.
- Leave application extending leave beyond 120 days should be submitted to DHO with clear remarks about leave to

be sanctioned or rejected.

- **Junior Assistant** should keep leave record of all PHC staff. He should enter leave in service book and leave salary must be drawn in next month without delay.
- MO must verify leave entry in service book while signing pay bill of leave period.

6. Special kinds of leave

Special kinds of leave are not debited to leave account, however a note in service book is required to be taken with due attestation.

6.1. Maternity leave for government servant (Rule-74)

- On date of application female servant in permanent employment having 2 or less living children, is entitled for 90 days maternity leave & during such a period of leave, salary equal to pay drawn immediately before proceeding on leave will be paid.
- A lady government / ZP servant not in permanent employment who has put up at least one year continuous service but less than two years service is also entitled for 90 days maternity leave & leave salary equal to half the pay drawn immediately before proceeding on leave.
- Female government/ZP servant who has put up in two or more years continuous service will get leave salary equal to pay drawn before proceeding on leave. .
- If lady government servant demands for leave beyond maternity leave period, leave can be sanctioned for total period of one-year in continuation with maternity leave, it can be granted without asking to produce medical certificate. Earned leave or commuted leave should be deducted as per applicant's request.
- In case of abortion / MTP, 45 days leave irrespective of number of issues is admissible. However certificate from medical authority registered under MTP Act is necessary.
- Lady government servant who adopts a child is entitled for leave up to 1 year or till child completes his/her 1-year, whichever is earlier. Women who have 2 living issues on date of application are not entitled to this leave.

6.2. Special casual leave

- 6.2.1. A government servant whose wife is undergoing tubectomy operation for first time or re-surgery in case of failure is entitled for 7 days special leave.
- 6.2.2. Special casual leave of maximum 14 days or as certified by CS is permissible for anti rabies treatment. However it should be certified by Civil Surgeon or authorized medical attendant.

6.3. Special disability leave (Rule 75)

If a government servant gets injured and disabled, because of risk of his work or by somebody else, special disability leave up to maximum 24 months can be granted.

6.4. Special leave for tuberculosis, cancer, leprosy (Rule79)

After 3 years continuous service, one-year full pay leave is admissible on submission of medical certificate for above-

mentioned reasons. If not cured, half pay leave and afterwards as per medical board certification extra ordinary leave is admissible. However total leave should not exceed 3 years.

6.5. Study leave (Rule 80)

For 12 months and maximum up to 24 months is permissible. Such cases will not come across Panchayat Samiti level.

7. Action that can be taken against government servant who remains absent without permission

- Refusal of CL if it is believed that it is asked for without adequate ground.
- Treatment of absence as leave without pay when a person has remained absent without obtaining prior permission. He should be asked in writing reasons why he remained absent without permission & after getting his explanation, if leave sanctioning authority is not satisfied, absence without permission can be treated as LWP.
- Refusal of earned leave for short period of a day or two, to a person who has exhausted his CL by taking it on flimsy pretext.

8. Compensatory holidays

- Compensatory holidays should not be accumulated for more than 3 days and should not be allowed to be carried forward to next calendar year.
- Compensatory holidays can be prefixed or suffixed or both to leave due and or holidays.
- It is permissible to only group C& D staff.

9. Transit period after transfer

- Transit period of seven days including Sundays & holidays is permissible in case of administrative transfer from one place to another for preparation.
- In addition to this, journey period of one day is admissible, if transfer is in same district or adjoining border districts and two days in any other district when there is no common boundary. Sunday does not count as day for purpose of calculating days of actual journey but a holiday shall be included there in.
- When journey days fall on Sunday, journey day is extended by one day.
- For request transfer only journey period is allowed.

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3. SERVICE BOOK

Service book is history of service of government servant from date of appointment, till date of retirement. All incidences in service like pay scale, increment, promotions, penalties, leave account, transfer, joining time availed etc. of government servant are recorded in Service Book. It should be opened after joining service for all government servants appointed for more than

one year.

All columns in service book should be filled in carefully after verifying original documents. Proof of caste/reservation category and date of birth should be personally verified by Medical Officer before entry in service book. PHC MO has responsibility of maintaining service book of all staff of PHC.

1. Entries in service book MCSR (General conditions of service) Rule 1981 (Rule-37)

- Every step in official life of government servant, promotions of all kinds, increments, transfers, leave availed should be recorded in service book. In addition to this, rewards/ praise & punishment should also be mentioned.
- Leave account should be maintained and regularly updated.
- Punishments such as reduction to lower post, removal, dismissal should be entered in service book with reasons.
- Entry of house building advance, motor cycle advance etc. should be taken on last page.
- Each entry should be duly verified with departmental orders, pay bills, leave account and attested by head of office.
- GPF account number should also be noted in service book.

1.1. Date of birth (Rule-38)

- Date of birth should be verified by documentary evidence and nature of document relied should be mentioned i.e. school leaving certificate, SSC certificate, certified extract of birth by Gram Panchayat, corporation, municipality etc.
- If year is known but exact date is not known, 1st July and if year, month known but exact date is not known, 16th of month is treated as date of birth.
- When approximate age is also not known, age given by appearance as per medical certificate by Civil Surgeon or authorized medical attendant should be noted. Incumbent should be assumed to have completed age as certified by MO on date of certificate & his date of birth deduced accordingly.
- No alteration in entry of age should be done by MO PHC for any reason without approval of District Health Officer.
- No alterations in birth date are allowed after a period of 5 years from date of entry.

2. Important aspects about service book

- Fingerprints of government servant who is unable to sign should be recorded in service book.
- Service books should be shown to government servant every year and his signature having inspected service book should be obtained.
- After transfer from one office to another, enter nature and reason for transfer in service book and forward to office by RPAD where government servant is transferred. Service book should not be handed over to concerned government servant in any circumstances.
- Service book should be verified in month of May every year by MO and certified that, entries have been verified

up to end of preceding financial year from pay bills, acquaintance rolls and other records. Similarly entries on first page should be attested every five years.

- Service book should not be returned to government servant on retirement, resignation or discharge from service. Service Book should be preserved for 5 years after death or retirement of government servant.

2.1. Duplicate copy of service book to government servant -

Every government servant should be given duplicate copy of service book free of charge. In month of February of every year entries should be confirmed and made as per original copy of service book and head of office should sign all entries. Government servant should check whether entries made are correct and are attested by head of office and ensure that subsequent entries are also made in duplicate service book.

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4. CONFIDENTIAL REPORTS

Medical officer at PHC has to initiate Confidential Reports (CR) of all group-B and C government servants working in PHC. For group-D government servants, work performance report should be recorded and submitted to DHO.

1. General guidelines

The CR should be written as per guidelines issued vide GAD resolution no. CFR-1295/PRA-KRA-36/95 dt. 1.2.96

- Confidential Reports are written for period 1 April to 31 March of each year.
- For all Group-B and C staff working at PHC, MO is reporting officer and DHO is reviewing officer (except for Jr. Clerk and driver in some districts).
- MO should initiate CR of all Group B and C government servants from PHC and submit to DHO before 30 April.
- CR should be hand written in Marathi.
- In case of temporary government servant, if service period is more than 3 months and if s/he is likely to continue then CR should be written.
- If government servant has worked at more than one post during year then, CR should be written for all those periods that are more than 3 months.
- Reports should be written objectively, in clear and specific words without any ambiguity.
- When writing CR of backward class servants ensure that no injustice is made.
- Maintain a register at PHC in which information like serial number, name of worker, period for which CR is written should be entered. Last column should be for signature of receiving person of DHO office.
- In some districts, CR of Junior assistant, driver and performance report of Group-D employees need to be submitted to Dy. CEO (GAD).

2. How to write Confidential Reports

- These reports should be written in a prescribed form B.
- Form B has five parts. Part 1 which has to be completed before writing CR. It includes name, designation of employee, period of writing CR, etc. and that has to be completed by Jr. Assistant. Part 2 indicates guidelines for filling self assessment form, in part 3 there is prescribed format for self assessment, part 4 is for reporting officer estimating general ability and character, part 5 is for reviewing officer.
- Self-assessment form should be submitted by all Group B&C staff of PHC to MO before 15 April. Self-assessment should be written on place provided in form.
- When writing CR, MO should consider self-assessment given by worker and it should be mentioned that, self-assessment was considered while writing CR.
- MO should maintain "Ephemeral Roll" for all workers at PHC. In Ephemeral Roll all incidences (outstanding or bad performances) during year of each worker are noted by giving details as and when they occur. This should be referred to while writing CR.
- For each aspect to be assessed alternatives are given on CR form and MO has to encircle most appropriate alternative. However for point number 3, 9, 10, 11 and 18 there are no alternatives given and MO has to write report in clear words.
- While writing adverse remarks regarding integrity and character, MO should be very careful. Unless there is strong evidence, adverse remarks regarding integrity and character should not be entered in CR. If MO has some doubts, then do not write anything in column. Separate report should be attached and higher officer will take action regarding this.
- In a column on general assessment write outstanding performance, admirable performance and also if any punishment has been given or bad qualities of that staff.
- Grading given at end should correlate with grading given for each aspect in CR.
- At end MO should sign and write name and designation with date.

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5. PENALTY AND PUNISHMENT

Important aspects related to penalty and punishment described below are based on Maharashtra Civil Services (Conduct Discipline & Appeal) Rules 1979 and relevant government resolutions. Information is simplified for benefit of MO and staff of PHC. For details, original rules and government resolutions should be referred.

Penalties are classified as minor and major penalties. There should be sufficient reason to impose penalty on any government

servant. Laid down procedure should be strictly followed for imposing penalty. Medical Officer PHC must know types of penalties, procedure to be adopted and authorities who can impose these penalties.

1. Types of penalties (Rule 5 - Discipline and Appeal Rules)

1.1. Minor penalties

- Censure
- Withholding of promotion
- Recovery from pay- Whole or part of loss caused to government due to negligence or breach of orders.
- Withholding increments and pay
- Reduction in lower stage in time scale of pay for a specified period without effecting further increments.
- Reduction in lower stage in time scale of pay for a specified period with effecting further increments.
- Reduction to lower scale of pay, grade, post or service.

1.2. Major penalties

- **Compulsory** retirement
- Removal from service, which shall not be a disqualification for future employment under government.
- Dismissal from service, which shall ordinarily be a disqualification for future employment under government.

2. Disciplinary Authorities (Rule 6 - Discipline and Appeal Rules)

- Appointing authority may impose any of the penalties specified in Rule – 5 (Major or Minor) upon member of Group – C and D services.
- Head of office shall exercise power of imposing minor penalties on member of Group C and D category services.
- Medical officer is head of office for PHC staff, therefore, after going through laid down procedure can impose minor penalties when there is sufficient cause.

2.1. Procedure for imposing penalties

2.1.1. Procedure for imposing minor penalties (Rule 10 of Discipline & Appeal Rules)

- After noticing misconduct or misbehavior of government servant, if MO PHC is of opinion that there is sufficient reason to believe that government servant may be guilty then Medical Officer may start inquiry against that person.
- Inform government /ZP servant in writing of reason of misconduct or misbehavior and proposal to take action against him/her.
- Give reasonable opportunity to government servant for making such representation as he may wish to make against proposal.
- Record of proceedings of inquiry should include:
 - § A copy of intimation to government / ZP servant about proposal to take action against him.
 - § A copy of statement indicating misconduct or misbehavior

- § His representation if any
- § Evidence produced during inquiry
- § Findings of each misconduct or misbehavior
- § Orders on case with reasons thereof.
- If disciplinary authority has proposed withholding increment that may adversely affect amount of pension or if it is proposed to stop increment for more than three years, inquiry should be held in manner of inquiry conducted for major penalty.

2.1.2. Procedure for imposing major penalties

Rule No 8 and 9 of Maharashtra Civil Services (Discipline and Appeal) Rules have specified procedure to be adopted for imposing major penalties.

When Medical Officer PHC has reason to believe that any of PHC staff is engaged in misconduct or misbehavior and feels misconduct or misbehavior is sufficient for major penalty, following procedure should be adopted:

- Medical Officer should inform CEO (Disciplinary Authority) through DHO about misconduct or misbehavior of PHC staff along with following documents-
 - § Definite and distinct charges describing misbehavior or misconduct.
 - § Statement of all relevant facts, which support charges.
 - § Copies of any memo given to government servant and his explanations along with comments of MO on explanations.
 - § List of documents by which, and list of witnesses by whom, charges are proposed to be sustained.
- Disciplinary authority appoints inquiry officer under (rule- 8) to conduct inquiry.
- Inquiry officer goes through documents provided by MO, can ask for additional documents and fixes charges on person under inquiry.
- Copy of articles of charges fixed by inquiry officer is delivered to government/ZP servant. This includes.-
 - § Charges fixed on government/ZP servant.
 - § List of documents and witnesses.
 - § Giving specified period for written statement on his defence and to state whether he desires to be heard in person.
- Inquiry authority shall record his findings on each charge after taking such evidence that he/she may think fit.
- Disciplinary authority appoints a government / ZP servant or legal practitioner as “Presenting Officer” to present case in support of article of charges before inquiry authority.
- Government servant under inquiry shall appear in person before inquiring authority within ten working days from date of receipt of charges.
- Presenting officer will produce evidences, which can be cross-examined by government servant in front of inquiry authority.

- On the basis of findings of inquiry on charges put on government servant, his defense, documents and evidence produced, inquiry officer will produce his remarks on each article of charges and penalty proposed.

2.1.3. Action on inquiry report (Rule 9)

- Disciplinary authority furnishes a copy of inquiry report to government servant along with proposed penalty and calling upon him to submit explanation within 15 days of receipt of notice.
- After considering representation submitted by government servant, disciplinary authority will determine what penalty if any, should be imposed on government servant.

2.1.4. Communication of orders

Orders made by disciplinary authority should be communicated to government servant along with copy of report of inquiry.

3. Suspension (See rule – 4 of MCSR (Discipline and Appeal) Rules 1979)

- Suspension is not a penalty but administrative decision.
- Appointing authority or any authority superior to appointing authority may place government servant under suspension. For Zilla Parishad staff, CEO is appointing authority and for state government staff (TB, Leprosy, and Malaria department staff) concerned bureau chief / regional Deputy Director is appointing authority.

3.1. When the government / ZP servant is suspended

- When disciplinary proceeding against government / ZP servant is contemplated or is pending.
- When government / ZP servant is engaged in activities prejudicial to interest of security of country or when any criminal offence is under investigation, inquiry or trial.
- When government servant is in police or judicial custody for a period exceeding 48 hours.
- When government / ZP servant is sentenced to a term of imprisonment exceeding 48 hours and is not dismissed or removed.

If any PHC staff member is engaged in any above-mentioned activity and his/her presence on duty is detrimental to public service or detrimental to inquiry against him, Medical Officer may recommend with reasons in details about suspension of person to CEO through District Health Officer.

3.2. Headquarter during suspension

- Normally HQ of suspended person is same place from where person is suspended. However, suspending authority can change headquarter of person in view of public interest.
- If any suspended Zilla Parishad staff is posted to your PHC as a result of changed headquarter, accept joining. Suspended person need not sign daily muster but should remain present at headquarter and should not get employed or start any business.
- Subsistence allowance is drawn by office from where person is suspended. Govt. Servant under suspension is

entitle for subsistence allowance equivalent to the pay admissible for half pay leave plus DA admissible for such leave for 3 months & if period of suspension is more than 3 months then allowance should be increased to the maximum limit of 50% of the subsistence allowance admissible for the first 6 months.

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6. FINANCIAL MANAGEMENT

1. PHC Budget

Medical Officer and Junior Assistant must understand following important aspects of PHC budget.

- Money allotted for functioning of PHC is called budget. There are two sources of budget
 - § ZP fund budget under section 8 Public Health.
 - § Agency scheme budget under section 123
- Public Health Department sanctions budget grants to Zilla Parishad in the month of April-May.
- Once grants are available to DHO office, they are distributed to all PHCs in the form of budget statement.
- Budget statements are different for each head of account. Statement indicates how much amount is allotted for various purposes like pay, traveling allowances, contingency, Petrol/Oil/Lubricant (POL), etc.
- When you receive budget statement, read it carefully. First see head of account, note down duration of budget i.e. for 4 months, 8 months or whole year. Locate name of your PHC in statement and finally note down amount provided for each activity e.g. pay, TA, POL, contingency, etc. against name of your PHC.
- Payment of all staff and budget for PHC functioning do not come under one budget head but different heads. This is because posts are sanctioned under various health schemes. Get idea about what budget head is applicable to which PHC staff.
- If budget allocation for any particular head is not sufficient, additional demand should be submitted in next quarterly budget with reasoning.
- Budget shown in statement for various purposes is actually deposited to Panchayat Samiti. Medical Officer should submit bills to Panchayat Samiti against budget allotment and get bills sanctioned.
- Medical Officer cannot submit bill once amount allotted under particular head is exhausted. To monitor this, Junior Assistant must write down budget allocation and monthly expenditure of PHC under each budget head and update this account before submission of bills to Panchayat Samiti.
- Total budget allotment for particular head and expenditure so far need to be mentioned in each bill. Check this with

expenditure register before signing bill.

- Budget allocation for one purpose cannot be utilized for another purpose.

1.1. Budget is released to PHC for following purposes

- Pay and allowances of PHC staff
- Contingency
- **POL** and minor repairs (Vehicle grants)
- **Contingency** and compensation for sterilization operations
- Special campaigns like Pulse Polio Immunisation, Family Health Awareness Campaign, school health, etc.

Do not finish budget quickly but use budget in such a way that it should be sufficient for period mentioned.

MO should watch budget provision through monthly expenditure statement submitted to BDO.

2. Cash Book (In form no. 7 as per MZP & PS Account code)

This is important record at PHC which has to be maintained by Junior Assistant and should be daily checked by MO.

2.1. General aspects

- Two cashbooks should be maintained at PHC. One for transferred scheme i.e. District fund & another for Agency scheme.
- PHC transactions take place under two major heads (2210-Medical and 2211-Family Planning). Transactions of both these heads should be entered in one cashbook. However particulars of head of account should be mentioned for each transaction.
- Each page of cashbook must be serially numbered with office stamp. Certificate indicating number of pages in cashbook should be mentioned.
- Cashbook should be written and closed daily. If there is no transaction on any day, that should also be mentioned. Junior Assistant must get each entry signed by MO daily at time of closing office.
- At end of each month MO should check abstract of closing balance.
- MO should verify whether there is any payment remaining un-disbursed for a period exceeding three months. Enquire why payment is not made. If payment cannot be made then Junior Assistant should put a note to MO indicating reasons for non-payment and money should be deposited back to Panchayat Samiti. Enter challan number in cashbook.

2.2. Entries in cashbook

- All monetary transactions should be entered in cashbook as soon as they occur and should be attested by Medical Officer.
- Erasing or overwriting of an entry in cashbook is strictly prohibited. If there is a mistake then put straight line on entry in such a way that it can be read clearly and write corrected entry by red ink in between lines. MO should sign every such correction with date.

- Closing balance of preceding date should be opening balance for next day.
- Receipts collected by means of OPD fees and other receipts should be accounted for, on same day.
- Cheques received from BDO PS & government should be accounted for in cashbook on date of receipt, irrespective of date of realization and they should be checked with cheque receipt register.
- Totals of receipt and expenditure should be verified and closing balance be worked out. Closing balance should be recorded in figures and words & it should be attested.

2.3. Verification by MO

- MO should do short signature for every entry of receipt and expenditure.
- Payments/expenditure should be verified with payees' acquaintance rolls duly dated.
- At end of each month MO should verify cash balance in cashbook and record a signed and dated certificate to that effect, mentioning balance in words and also in figures.
- Verification of cash and certificate of same indicating balance as per cashbook and actual balance in cash box has to be given by MO.

2.4. Cash and cashier

- Cash should be utilized for same purpose for which it has been drawn.
- To carry money when amount exceeds Rs. 5000/- two persons must be sent and one of them must be cashier or clerk.
- Security bond from cashier should be obtained within 30 days from date of taking over charge as per rule 43 of MZP & PS Account code.
- Cash should be kept in double locking pattern cash box. One key should be kept with MO as per rule no. 42 of MZP & PS Account code.
- No heavy cash balances should be kept.
- Cash drawn should be disbursed immediately for the purpose for which it was drawn.

3. Bills at PHC

Junior Assistant prepares bills, which are scrutinized and signed by MO PHC. Bills are as below-

- Pay bills of staff.
- Bills of contingency and other purchases
- Vehicle bills- Diesel, oil, servicing and repairs.
- Traveling allowance bills
- Bills of various campaigns organized at PHC

3.1. Pay bills

This is the most important financial activity in PHC. Monthly and timely payment of staff is primary responsibility of Junior Assistant and MO PHC.

- **Pay** bills need to be submitted in prescribed format. Junior Assistant should start preparing pay bills on 15th of each

month and pay bills should be submitted to Panchayat Samiti by 20th of each month.

- All posts under PHC are derived under various heads of account. Separate bills are required for each head of account.
- Account head wise register of entire staff in PHC is maintained giving details about post, including GR no. by which post is sanctioned, permanent or temporary nature of post and budget head of pay. This is called "Establishment Schedule."
- Deductions made in pay bill in respect of provident fund, income tax, postal life insurance premium, CTD, ZP servants' society should be invariably made by A/c payee cheque/ DD to respective authorities & acknowledgement thereof should be obtained vide rule 75 (3) of MZP & PS Account code.
- Medical Officer should check following registers before signing pay bills.

§ Establishment schedule - To check correct head of account for each staff.

§ Muster roll- Indicating daily attendance of staff. If any staff is absent without permission, MO has to take decision to consider this absence as without pay or not. In that case payment of staff should not be drawn.

§ Increment register - Check whether any staff member is due for increment in that month. Confirm that all increments are added in pay bill. If due increment is not drawn, sanction increment, ask Junior Assistant to make necessary changes and sign pay bill.

§ Long leave register - If leave of any staff is sanctioned, payment should be drawn and if not sanctioned, payment should not be drawn.

- Check whether all deductions are shown in schedule attached to pay bills. Randomly counter check amount on schedule and that on pay bills.
- In case of supplementary claims, note has to be taken in original pay bill to avoid double claim. Verify note taken on original pay bill before signing supplementary bill.
- Undisbursed amount of payment more than 3 months should be credited by challan to respective head vide rule 77 (3) of MZP & PS Account code.

3.2. Bills of office contingency

- Ensure budget provision is available before expenditure.
- MO must be sure that material to be purchased is essential for functioning of PHC.
- For telephone bill, scrutiny certificate of MO on bills is necessary indicating, "Certified that all local and trunk calls made on this telephone are for official purpose and registers of local calls and trunk calls are verified."
- **Electricity** bills - Meter reading book should be maintained. Tally bill with this book and forward for payment. Since 2001 onwards, electricity bills can be paid through OPD

registration fees.

- After receipt of above bills, MO should check bill number, date and amount.
- Enter on backside of bill, name and page number of register in which entry of material has been taken.
- Ensure required material is received in mentioned quantity, specification and in good condition before paying bills.
- After payment, take entry of bill in cashbook. Record cash book number and page number on backside of bill and put Paid and cancelled stamp on bill.
- At close of month, reconciliation with bill register, cheque receipt register should be carried out. An abstract of bills sent for drawal of cheques, cheques received & bill pending at end of month should be drawn & attested after verification.

3.3. Diesel, oil, repair bills of vehicle

Diesel and oil purchases should be entered in logbook of vehicle. Certificate of entry with logbook page number, vehicle number should be entered on receipt.

4. General Provident Fund (GPF)

- It is compulsory for all permanent government / ZP servants and for all temporary government servants after completion of one year government service.
- Monthly subscription for GPF is minimum 6% of basic pay and maximum up to full basic pay. Account of GPF is maintained from March paid in April to February paid in March.
- Entire balance of credit along with interest is paid to government / ZP servant on retirement or to nominee in case of death of a government servant.
- For ZP employees, Chief Accounts & Finance Officer, Finance department, ZP will allot PF number.
- In case of Group-A government servant, Accountant General (AG) gives GPF number and AG maintains all account.

4.1. Important points about GPF

- GPF account number must be entered in service book.
- After transfer, account number needs to be mentioned in LPC.
- Nomination for GPF should be made in prescribed format and sent to AG & in case of ZP servant to CAFO, ZP. Note of nomination should also be taken in service book.
- Lady government servant can omit name of her husband from nomination if she desires. But a male servant has to nominate his wife.
- Yearly account of GPF is sent by AG by September end and if not received it is necessary to contact AG.
- In case of missing credits, following information should be sent to AG / CAFO, ZP:

§ Designation of DDO

§ Account head of monthly salary

§ Month, voucher number and total amount of bill

§ Certificate of DDO about deduction from salary of amount.

- When employee is on half pay or without pay leave, deduction will be as per his/her willingness.
- GPF account of class IV servant should be maintained by head of office.

4.2. Advance from GPF

Government servant can get advance from GPF as below-

- Ordinary advance or refundable advance: Admissible limit is three months basic pay or half of balance at credit, whichever is less.
- Non refundable or special advance: Admissible limit is one half of balance at credit or six months pay which ever is less. However sanctioning authority may sanction up to $\frac{3}{4}$ of balance.
- Advance from GPF (Ordinary or special) may be sanctioned for religious ceremonies, medical treatment of family members, higher education, purchase of plot or house etc.
- Government servant requests for advance in prescribed format. Controlling officer (MO in case of PHC staff) can sanction advance if he/she is satisfied about reason given and amount specified for reason. Bill should be submitted to Panchayat Samiti along with GPF slip and sanction letter.
- Advance from GPF should be paid back by deduction in minimum of twelve, maximum of twenty-four installments and in special case thirty six installments from salary of government servant.
- Government servant cannot take another GPF loan before first loan is fully paid except for medical treatment, higher education, marriage, house building.
- Non-refundable loan is permissible after completion of 20 years service. However for house building or repair, renovation of ancestral house or buying plot it is permitted after completion of 10 years service.

4.3. Final payment of GPF at the time of retirement

- For ZP servant final payment is made by CA & FO.
- For government servant authorization is issued by concerned AG.

5. Group Insurance Scheme (GIS)

This is an insurance scheme covering life of employee while in service. In case of a death of government servant while in service, monetary benefit is given to family members as shown below:

Besides, amount of saving component as per table prescribed may also be released to family of deceased government/ ZP servant. In case government/ZP servant is retired or quits service he/she is entitled to saving component only.

Table 1 : Group Insurance Scheme

Sr.	Group	Monthly subscription w.e.f.1.1.89	Amount payable to family members in case of death
1	Group - A	480	4,80,
2	Group - B	240	2,40,
3	Group - C	60	60,
4	Group - D	30	30,

6. Retirement benefits

Following retirement benefits are admissible to a government servant:

- Pension including family pension
- Gratuity
- Commutation of pension
- GIS and GPF at credit
- Earned leave encashment
- Transfer TA to hometown

6.1. Pension, family pension and gratuity

- MO should maintain directory showing staff retiring in each month & take periodical review.
- Ten years qualifying service is a must for entitlement of pension benefit.
- If service is less than 10 years, service gratuity should be paid as lump sum amount at rate of $\frac{1}{2}$ pay for one year of service.
- In case of death of a government servant, family pension and death gratuity is payable to his/her family.
- Family pension is 30% of basic pay subject to 1275/month.

6.1.2. Pension papers should be prepared in following stages

- Completion of service records including confirmation, verification of pay.
- No dues, no departmental enquiry certificate.
- Preparation of pension documents.
- Verification of pay fixed as per various pay commissions by Accounts officer FD, pay verification unit & for ZP servants by Accounts officer CAFO of ZP.

All records must be submitted to Accountant General six months prior to date of retirement.

6.1.3. Pension is worked out as below

- Qualifying service – Continuous service from date of joining service in substantive/officiating/temporary

capacity to date of retirement.

- Pensionable pay - Pensionable pay is average of basic pay for last 10 months preceding to date of retirement.
- Pension is calculated on 33/66 formula basis. 50% of pension is admissible if servant completes 33 years of service. If service is less than 33 years pension is proportionately reduced.

6.1.4. Calculation of gratuity

Entitled retirement gratuity / death gratuity is 16.5 times of basic pay or Rs. 2,50,000 whichever is less. Formula for calculating gratuity is as follow:

Last basic pay drawn $\times \frac{1}{4} \times$ completed six months of qualifying service = Gratuity

6.1.5. Payment of interest on delayed pension & gratuity

Provision of interest on delayed payment of pension & gratuity has been made in pension rule vide GR dt. 14.5.1987. Therefore care should be taken to make timely payment of pension & gratuity.

6.1.6. Voluntary retirement

Voluntary retirement after completion of 20 years of service is permissible.

6.2. Commutation of payment

$\frac{1}{3}$ of original pension can be commuted & commutation amount in lump sum is eligible. Commutation value at age of 59 is Rs. 10.46 per Rupee. It differs from age to age. Commutation of pension is restored on completion of 15 years from date of commutation.

7. Claims of TA and DA

- Availability of budget should be ascertained while examining claims of TA/DA.
- Bills should be prepared for each month.
- Diaries for visit program should be approved. TA and DA claims should be checked along with diaries.
- Purpose of journey, distance, mode of travel should be written on bills.
- MO can cut down claims during scrutiny of bills if claims are not correct.

7.1. Calculation of DA

Period	DA
More than 12 hrs up to 24 hrs	Full DA
More than 6 hrs up to 12 hrs	50%
Up to 6 hrs	30%

7.2. Admissible DA as per basic pay

Basic pay	General rate	Special for Mumbai, Pune, Aurangabad, Nasik, Amravati, Nagpur
> Rs. 10,000	78	85
Rs. 8,500 to 9,999	70	84
Rs. 6,000 to 8,499	60	75
Rs. 4,501 to 5,999	53	68
< Rs. 4,500	45	60

8. Purchase procedure

Articles like soap, blades, kerosene oil, bulbs, tubes, stationary, etc. are required for day-to-day purpose in PHC. These are purchased through regular contingency. Minor repairs of instrument, equipment and PHC building are required which are carried out through OPD registration fees collection within limits of government resolution. In addition, PHC gets funds for campaigns like Pulse Polio Campaign, Family Health Awareness Campaign, Modified Leprosy Elimination Campaign, etc. MO must follow laid down guidelines for financial transaction of government money, irrespective of source and whether specific guidelines are given or not.

8.1. Purchase of articles of less than Rs. 500/- price

Medical Officer can directly purchase articles of less than Rs. 500/- price. Following aspects should be kept in mind while purchasing any article:

- Budget provision must be available for purchase of article
- MO must be sure that article to be purchased is definitely essential in PHC
- Price quoted by shopkeeper should not exceed maximum retail price printed on the article. For articles without printed price, MO must be sure that price is reasonable as compared to market rates.
- Immediately pay bill to shop keeper & obtain receipt. Delay in payment increases possibility of financial irregularity.

8.2. Purchase of articles of price Rs. 501/- and above

- Budget must be available for purchase of article
- MO must be sure that article to be purchased is definitely

essential for PHC.

- Quotations should be called from shopkeepers. Following guidelines should be followed for calling quotations -
 - § Send letter to at least five shopkeepers mentioning name and specification of article to be purchased.
 - § It is desirable to send letters through post.
 - § At least three parties should respond to your letter by submitting quotations in closed envelopes. Wait for one week for response of shopkeepers.
 - § Open quotations received (at least three) after one week in front of MO and two senior staff members from PHC. They should put signature on envelope and quotation stating that envelopes are opened before them.
 - § Junior Assistant should make comparative statement of rates of all parties and submit to MO.
 - § Party who is willing to supply article of desired quality at lowest price should be selected for purchase and given orders.
 - § MO should compare quotation price with market price and printed price on article. If MO feels prices quoted are higher than market prices, MO can cancel whole process of purchase & start the procedure for different shopkeepers.

Enter article name, quantity, and date of purchase etc. in stock book before paying bill.

Transport allowance is not permissible to government servant who stays within a distance of one km from office.

This allowance is not admissible during absence from duty exceeding 30 days due to leave, training, tour, etc.

9. Various allowances applicable to PHC staff**9.1. House Rent Allowance**

(GR of finance department number Gha-bha-bh/1098/CR-82/98/SER-5 dated 11.12.98)

Sr.	Catagory of place	House rent allowance of city (Rs. per month)
1	A-1	30% of actual basic pay drawn
2	A/B-1/B-2	15% of actual basic pay drawn
3	C	7.5% of actual basic pay drawn
4	Unclassified	5% of actual basic pay drawn

When quarters are available at PHC, staff designated for that quarter (including MO) should not be paid HRA even if staff is not staying in quarter.

9.2. Transport allowance

(GR No. Va-ha-bha/1098/CR-83/98/SER-5 dated 14.12.1998)

Sr.	Pay scale of employee	Rate of transport allowance (Rs. per month)	
		A-1 and A class cities	Other places
1	Rs. 8000-13500 and above	800	400
2	Above Rs. 6500-10500	400	200
3	Below Rs. 6500-10500	100	75

Transport allowance is not permissible to government servant who stays within a distance of one kilometer from office. This allowance is not admissible during absence from duty.

10. Important registers to be maintained at PHC

Following important registers should be maintained at PHC.

10.1. Register for cheques (as per rule 50 of MZP & PS Account code)

A separate register is maintained for cheques issued by Panchayat Samiti office or DHO. In this register date of receipt, issuing office, name of bank, cheque number, amount, date of sending to bank and date of encashment must be mentioned. Entry of these cheques must be taken in cashbook on date of receipt.

10.2. Bill register

For every office there must be a bill register and every bill submitted to Panchayat Samiti should be registered in it.

Serial number starts since April and this number should be written on bill. While entering bill in this register, number, date and details of bill e.g. TA bill of _____etc. should be mentioned.

At end of month summary of pending bills must be made.

10.3. Register of un-disbursed pay and allowances

If a government servant on establishment of office is not disbursed allowances due to any reason, these should be noted in this register. Non-disbursed amounts can be kept for 3 months and after 3 months amount should be deposited by challan in Panchayat Samiti.

10.4. Postage register

Register for postage received in office has to be maintained in registers A and B. In register A, number of tickets received and its daily expenditure is noted. In register B, number of envelopes, parcels posted and postage used is mentioned.

10.5. Electricity bill register

Electricity bills should be recorded in this register giving details about meter reading, units used, rate, previous pending bills, late fee, date when bills paid etc. These bills should be paid as per meter reading and as per domestic rate. Meter-reading book in form no. 34 (Rule 92) should be maintained.

10.6. Telephone register

In order to avoid misuse of telephone, this register needs to be maintained giving details of each call made indicating telephone number, by whom, to whom, for what purpose etc.

10.7. Challan register

Amount deposited in Panchayat Samiti / treasury by

challan is entered in this register, giving details about date, amount, head, reason for depositing etc.

At the end of each month, a summary chart should be prepared indicating amount deposited under each heading.

10.8 Other registers

- Stock account of blank receipt books for OPD collection & blank cheque books if any in form no. 1 (Rule 11 & 26).
- Register of security bonds from cashier, storekeeper, stamp clerk & driver.
- Register of movable property in form no. 32 (Rule 90) & form 33.

11. Audit of PHC

- Internal audit is carried out by internal audit wing of finance department of ZP.
- Statutory audit of PHC is carried out by Deputy Chief Auditor Local fund Accounts.
- Audit objections raised by auditors should be complied with immediately.

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7. MATERIALS MANAGEMENT

Objective of materials management system is to establish and operate an efficient and effective system, which ensures supply of required quantity of quality materials when and where it is needed.

Materials management includes indenting, stocking, and supply of various items essential at PHC. These items include:

- Medicines, bandages, instrument, equipment, etc.
- Contraceptives
- Mattresses and linen
- Cold chain equipment and vaccines
- Information Education Communication (IEC) material
- Dead stock

Important aspects in materials management

1. Assessing requirement and placing demand

1.1. Medicines

Medicines are important for smooth functioning of PHC. It is the responsibility of pharmacist and Medical Officer to keep

adequate stock of required medicine in PHC. Management of PHC medicines will be helpful with VED analysis i.e. categorization of medicines as Vital, Essential and Desirable. Standard list of medicines for PHC along with VED categorization is given in annex. Short description of VED analysis is as follows-

- 'V' items are Vital drugs, forming about 10% of total and as they are vital life-saving drugs, their non availability cannot be accepted. Therefore every effort has to be made to avoid out of stock position for any of these items.
- 'E' items are Essential items, constituting about 40% of total items and their absence can be tolerated for short stretches of time. Alternative medicines may be available for these medicines.
- 'D' items are Desirable items, which form remaining 50% of drugs, and their non-availability can be tolerated for longer period of time. They may be required for treatment of chronic and less serious patients.

1.1.1. Procedure for getting medicines from DHO

a. Calculation of yearly demand of medicines

Study prevalent disease pattern of your area from OPD/IPD records and number of patients of these diseases in one year. Choose medicines required to treat these diseases from standard PHC medicine list and put demand to District Health Officer.

Alternatively medicine demand can be calculated from average consumption of each type of medicine in last three years.

b. Prepare indent for submission to DHO

- List out all required medicines for PHC. Preference should be given to vital and essential group medicines for indenting.
- Once yearly consumption is calculated, add 10% to consumption, which will be provision for increase in number of patients during next year. This is demand of medicine for next year.
- Subtract quantity of medicines available at present in the store of the PHC from yearly requirement. This will give you quantity of each medicine required for next year.
- Prepare indent on basis of demand in prescribed format and submit to DHO.
- Indent is prepared annually or quarterly as per system laid down in district.
- Do not indent large stocks than requirement, as drugs may not be utilized before date of expiry or there may be pilferage.

c. Receiving medicines

- Do not accept medicine in excess quantity than your requirement, as Medical Officer is responsible for use of medicines within expiry period and excess medicines may not be utilized within this period.
- Do not accept medicines that were not included in demand and not useful to your PHC.
- When medicine supply is brought to PHC, MO should personally check whether number of medicines and

quantity of each medicine is as per delivery challan.

- If you have not received medicines from vital group, purchase these medicines from OPD registration fees and get technical sanction from DHO.

1.2. Contraceptives

Assessment of quantity required of contraceptives is based on eligible couples willing to accept particular methods as per Community Needs Assessment. Also consider expected level of achievement while placing demand of various contraceptives.

1.3. Vaccines

Vaccine requirement will be as per number of beneficiaries, number of doses of that vaccine and wastage multiplication factor. Details about calculation of vaccine requirement are given in immunization chapter.

2. Storage

- Store should be in cool and dry place with sufficient light and ventilation, as medicines can lose potency in hot and humid places.
- Store must be free from rodent nuisance and doors should be tightly closed.
- Keep medicines with similar action together e.g. antibiotics, analgesics, antipyretics, ointments etc. Poisonous, narcotics should be stored separately and in locked cupboard.
- Keep near expiry date medicines in front irrespective of date of receipt. While issuing medicine, always first issue early expiry medicines so that they can be first utilized and medicines will not be wasted due to expiry. This is called First Expiry First Out principle.
- MO should frequently check and confirm that all vital drugs are available at all times in sufficient quantity. Check expiry date of vital drugs frequently. Do not worry about expiry of vital medicines without use, as they are lifesaving.
- If any of the emergency drugs are not received from DHO, MO can purchase emergency medicines from OPD registration fees with permission of advisory committee.

3. Supply

All items should be supplied to all those who need it, as per their requirement and at proper time.

- Check demand of health staff whether it is as per requirement or not. This can be checked on the basis of last three years consumption or population norms of beneficiaries.
- Always call stock book of sub centers while issuing material to SC. This will help in keeping SC stock book updated.
- Sign PHC stock book at the time of supply. Never keep stock book completion pending as it will be difficult for pharmacist to remember afterwards that how much medicines were supplied and to whom.

4. Maintenance of record

MO should assign responsibility for maintenance of stock books for various items as below and check them regularly.

4.1. Stock register

Any item received by PHC should be entered in respective stock registers which are in prescribed formats according to nature of items. Stock registers to be maintained at PHC are as below:

Table 2 : Stock registers in PHC and responsible persons

No.	Name of register	Items to be entered	Responsible Person
1	Dead stock register	Items of permanent/ durable nature (Furniture, cots, etc)	Jr. Clerk
2	Medicine stock register	All medicines received in PHC	Pharmacist
3	Instrument, equipment register	OT and routine instruments, cotton, gauze, thread, linen	Pharmacist
4	RCH stock register other than vaccine	Cold chain equipment, contraceptives, needles, syringes	HA(F)
5	Consumable items stock register	Stationery, house keeping items like soap, brooms etc	Jr. Clerk
6	Vaccine stock register	All vaccines	HA(F)

4.1.1. Instructions to be followed

- All stock registers are important record of your PHC. They must be kept in safe custody of responsible person.
- After receiving or purchasing any item for PHC, record item in appropriate register on the same day. Enter stock register page number on bills or vouchers of item. Do not certify any bill before checking entry in stock register.

- Do not use plain register as stock register. Stock registers have specific formats and are supplied by DHO office.
- Before starting use of new register, personally examine whether all pages are machine numbered. If not then give page numbers to stock book by ballpoint pen.
- Certificate mentioning total pages on stock book and manner of numbering (Machine or hand written) should be recorded on first page i.e. number one of stock register.
- Separate page(s) should be allotted for each type of item.
- Appropriate entry has to be made as soon as fresh stock of item is supplied. New stock is to be added to balance of previous stock, if any.
- Any article mentioned in stock register can be written off by following laid down write-off procedure.

4.1.2. Role of Medical Officer

- All entries of stock register should be under signature of MO. Medical Officer should ensure that all columns against particular item are filled while signing entry of newly received item. This includes name, brief description and specification of item, make, size, date of purchase, voucher (bill) date and number, name and address of supplier, price etc.
- Medical Officer should ensure that entry of item purchased is made in stock register before paying bill to supplier.
- Whenever any item is issued for use, this is recorded in register and entry has to be signed by MO.

4.2. Dead stock register

All items of a permanent or durable nature such as furniture, equipment, machinery etc. should be recorded in dead stock or movable property register.

- There is a prescribed register for dead stock entry.
- Each page has to be numbered and certified accordingly at the end of register.
- Allot separate page for each category of article.
- Entry should be taken immediately after receipt of any

material.

- Donated items should also be entered in register.
- For each item full description of article such as name, brief description and specification, make, size, date of purchase, voucher number, date, name and address of supplier, price etc. should be entered in register.
- MO PHC should physically verify all dead stock i.e. movable property items once in a six months. A certificate of verification should be recorded by MO at the end of register.
- Any article in following prescribed procedure dead stock register can be written off (Condemned) following prescribed procedure if it is damaged beyond repairs or rendered useless due to wear and tear.

4.3. Expiry date drugs register

- Separate register should be maintained for expiry date drugs in prescribed format.
- In addition to this register, a list has to be made to show items, which will be date expired in coming three months along with quantity.
- If stock available is not going to be consumed before date of expiry, then MO should give these medicines to nearby PHC or other health institute and get receipt.

4.4. Daily tablet account register

- Drugs dispensed to each OPD patient are recorded daily in this register.
- This register should be maintained in prescribed format by pharmacist and should be completed daily.
- MO should check this register for daily completion.
- Cross check prescription on case papers and number of tablets entered in daily tablet account register to tally entries. Check about 10% case papers once in a week.

5. Verification of stock

- MO should physically verify balance of all items six monthly and also spot-checking should be done for some

- items randomly 2-3 times in a month.
- Stock of expensive drugs should be checked frequently.
- See if there are any discrepancies in balance shown in stock book and actual balance.
- A certificate of physical verification should be recorded and signed at end of register in April and October every year.

- All stock mentioned in stock registers should be personally verified by Medical Officer in June and December of every year and certified as follows –

This is to certify that stock of all items mentioned in this stock register is personally verified by me on date—— and is found as per record in stock register except following items:

Table 3 : Verification of Stock

Sr	Name of item	Page number on stock	Date of purchase	Number on stock	Number during physical verification	Remarks

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8. VEHICLE MAINTENANCE

Vehicles have been provided to PHCs for patient transport and implementation of various activities under national health programs. Vehicle provided to Primary Health Center is a vital resource and MO should ensure that vehicle is in roadworthy condition throughout the year.

1. Responsibilities of MO

- Vehicle budget is distributed by DHO. You also get diesel grant for transport of family planning cases. In addition to this, mobility support as POL budget is sanctioned for implementation of various campaigns or surveys, e.g. PPI, MLEC, GW survey, etc.
- Expenditure on POL should not exceed sanctioned grants. Maintenance and repairs of vehicle should be carried out as per laid down norms.
- Get servicing of vehicle done as per instructions given in vehicle manual.
- Avoid use of vehicle when speedometer is defective. Get speedometer repaired immediately and then use vehicle. Enter km on logbook before and after repair of speedometer.
- Use vehicle in your jurisdiction only.
- Ensure that authorized PHC driver drives vehicle. Do not allow any other person to drive PHC vehicle. If it is done so, responsibility lies with MO.
- Protect your vehicle from fire, flood, accident, theft, riots etc.
- MO is not allowed to hand over vehicle to officers of other departments without permission of DHO except in election time / emergency situation.
- Vehicle being property of Public Health Department should be returned to State Health Transport Organization after completion of its useful life with all accessories, seats, tools, RC/TC books etc. for final disposal.
- Keep warranty card, free service card, owner's manual, and battery card of vehicle in your custody till vehicle is

in the name of your PHC.

- Ensure that driver has valid license and license is renewed before expiry.
- Monthly** report should be submitted every month to DHO in prescribed format.

2. Responsibilities of driver

- Keep logbook in vehicle and make daily entries of vehicle operation in it.
- Have a valid driving license and renew it from time to time.
- Obey orders of MO.
- Do not drive vehicle under influence of alcohol or narcotics, which is a punishable crime.
- Get panchanama done and FIR registered if vehicle meets with an accident.
- Do not give vehicle for driving to any other person.
- If you find any defects in vehicle, which may damage vehicle, bring this to notice of MO and submit report in writing regarding defects in vehicle.
- Ensure that only government officials, staff and patients travel in vehicle for government purpose. Ensure that no article not pertaining to government is transported in vehicle.
- Observe traffic rules, drive vehicle with moderate speed and avoid damage to vehicle.
- It is obligatory on part of driver to provide all necessary record to officers from squad appointed by SHTO.
- Get servicing done at prescribed interval at authorized service center as per owner's manual provided with vehicle.
- Regular daily and weekly maintenance of vehicle is prime responsibility of driver.
- § Ensure fuel is sufficient in vehicle.
- § Check and maintain water/coolant level in radiator.
- § Check fan belt tension, bolt tension, and adjust if

necessary.

- § Check engine oil pressure, vacuum, air pressure, and adjust if necessary.
- § Check and maintain engine oil level, steering box oil level, gearbox oil level.
- § Check and adjust free play of clutch and break pedal.
- § Always clean covers and terminals of batteries. Also ensure sufficient electrolyte and distilled water in battery.
- § Check headlight of vehicle.
- § Park the vehicle at protected & authorized place only.

If any individual gets injured due to PHC vehicle, then it is responsibility of driver and MO to take injured person to hospital and then complete all formalities.

3. Registers & record related to vehicle

It is responsibility of Driver and MO to maintain logbook and history book of PHC vehicle.

3.1. Logbook

- While opening new logbook, check whether all pages are machine numbered. If not write down missing page numbers by ballpoint pen.
- Certify on first page that logbook is for vehicle (number and make) and it contains pages from — to — with page numbers—— written by ballpoint pen.
- Entry of journey made, diesel/oil purchased, etc. should be made on same day evening against date of journey.
- Summary of vehicle movement, amount of diesel/oil used in month, average km run per litre of diesel and total diesel expenditure etc. has to be mentioned.

3.2. History book

Each aspect related to repair of vehicle must be entered in history book. Servicing, oil change, major/minor repair, tire/battery change, etc. has to be included in history book.

For any repair work, a written report from driver is essential. Certificate of repairs is to be attached in history sheet of vehicle.

3.3. Vehicle file

Keep a separate file for vehicle. Instructions and guidelines for vehicle use, correspondence related to vehicle, details about repair and maintenance should be kept in file

3.4. Condemnation of vehicle

Vehicle condemnation is responsibility of State Health Transport Organisation. When PHC vehicle is older than 10 years and/or has traveled more than 2.5 lakh kilometers, get vehicle checked by Mobile Vehicle Maintenance Team and report to DHO.

4. Hired vehicle

For PHCs where vehicle has been condemned and new

vehicle is not provided, provision of hired vehicle has been made by government resolutions, which are modified from time to time. Procedure for hiring vehicle is completed at district level. Guidelines for use of hired vehicle provided to PHC, as per GR no. Sankirna-1000/518/CR-224/ health-5 dated 13 January 2003 are as follows -

- Vehicle will be under control of MO PHC. MO will be responsible for recording of travel details daily.
- Vehicle will run 1200 to 1500 km per month.
- Owner should keep vehicle in a good condition and expenditure for POL, driver allowance will be made by vehicle owner.
- Vehicle will be available 24 hours and will be used in rural, hilly and interior difficult areas.
- Responsibility of major or minor repairs will be of vehicle owner.
- Minor repair should be completed within 1 day and major repair in 3 days.
- Running of vehicle for purpose of repairs will not be included in Zilla Parishad work.
- Filters, oil and labor charges for periodical maintenance will be included in repair and maintenance of vehicle.
- If vehicle remains off-road due to inefficiency of owner of vehicle, amount per day will be deducted from payment as per contract.
- At the end of every month, MO should record number of kilometers travelled by vehicle, no. of days vehicle was off-road and any other important event pertaining to use of vehicle and report to DHO.

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9. CLASSIFICATION OF PHC RECORD

Classification of PHC record should be carried out as per Maharashtra Zilla Parishad and Panchayat Samiti (Classification, preservation and destruction of records) Rules 1964.

1. Classification of record

All record of PHC shall be classified in following classes, based on period for which it has to be preserved.

A class record:	To be preserved permanently
B class record:	To be preserved for 30 years
C class record:	To be preserved for 10 years
C-1 class record:	To be preserved for 5 years
D class records	To be preserved till completion of annual inspection of Office or completion of audit/account matters.

1.1. Categorization of common record of PHC**Table 4: Categorisation of PHC record**

Sr.	Subject matter of record	Class of record
1	PHC/SC property record file	A
2	Manuals, standing orders, circulars of Zilla Parishad and PS	A
3	Government resolutions	A
4	Acts, rules and regulations	A
5	Inward and outward register	A
6	Legal matters	A
7	Orders related to delegation of powers	A
8	Registers of dead stock	A
9	Registers of record destroyed	A
10	Visitor book	A
11	Used counterfoils of cheque books	A
12	Audit notes and action taken thereon	B
13	Proceedings of Zilla Parishad/ PS meetings	B
14	Establishment matters (posting, transfer, promotion)	B
15	Budget files	B
16	Pay bills and acquaintance rolls	B
17	Supply of equipment instrument	B
18	Inspection notes and action taken thereon	C
19	Worksheets	C
20	Representations in connections with service matters	C
21	Service book (after retirement)	C
22	Leave account	C
23	Rural sanitation records	C
24	Measures in interest of public health	C
25	School health services records	C
26	Tour programs and diaries	C-1
27	Indent forms	C-1
28	General cash book	C-1
29	Register of contingent expenditure	C-1
30	Contingency bills with vouchers	C-1
31	Challans of District Central Cooperative banks	C-1
32	Tapal and peons delivery book	D
33	Casual leave register and muster roll	D
34	Applications for causal leave	D

2. Storing the record

- Enter all record generated in the year in record register as per classification.
- Keep D classified record separately and preserve other record in boxes, separate box for each year with classification.
- **Regularly** update record register.

3. Procedure for destroying record

- Every year after completion of annual inspection or audit, destroy D record.
- Review record register and identify record to be destroyed from class-B (30 years old), C (10 years old), C-1 (5 years old) and D (one year old) for that year.
- Write destroyed in remarks column and destroy old record either by tearing or burning in presence of MO.

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10. WRITE-OFF PROCEDURE FOR UNSERVICEABLE ARTICLES

Competent authority should write off all articles that become unserviceable in due course of time. MO PHC should initiate write-off procedure. If write-off procedure is not initiated in time, unrequired articles go on accumulating in PHC occupying most of space in cupboards, rooms, verandah, bathrooms, etc. Write-off procedure for common articles supplied to PHC is mentioned in this chapter except for vehicles. Condemnation procedure for vehicles is mentioned in vehicle management chapter.

1. Linen, mattresses and similar material

- HA (Female) should scrutinize all linen and mattresses twice a year. She should single out torn and discardable linen and mattresses after repeated use.

2.1. Format for unserviceable articles.

Sr.	Name of the article	Quantity	Year and date of article received	Year and date when article became unserviceable	Page number of stock register	Cost of article if known	Depreciation cost of article on day when it became unserviceable	Remarks of DHO
1	2	3	4	5	6	7	8	9

2.2. Calculation of depreciation cost

- Depreciation cost of article should be calculated as per Account Code Rule 241 (10% deduction in cost per year from date of manufacture). Following table explains how to calculate depreciation cost of a suction machine purchased in 1991 for Rs. 5000/- & had become unserviceable in 2005

Table 5 : Calculation of depreciation cost

Year	Depreciation cost	Year	Depreciation cost	Year	Depreciation cost
1991	5000 (full cost)	1996	2952	2001	1743
1992	4500	1997	2657	2002	1569
1993	4050	1998	2391	2003	1412
1994	3645	1999	2152	2004	1270
1995	3280	2000	1937	2005	1143

Table 6 : Form for write-off of cold chain equipment

Sr.	Name of equipment	Quantity	Year and date of receipt of equipment	Year and date when equipment became unserviceable	Page number of stock book entry	Remarks of DHO

- HA (F) should submit note to MO PHC giving details of linen, e.g. type, number in each type, date of supply, duration of use, etc. in form 33 and remarks that this linen can not be used further.
- MO should inspect linen and certify that linen should be written-off.
- Discard linen and mention how it is discarded on note.
- As per mentioned in Account code Rule-98, MO should inform DHO in writing with photocopy of note and procedure adopted. Minus linen from stock register during next stock verification (in next June or December).

2. Dead stock, instrument and equipment

- Medical Officer PHC should prepare up-to-date list of unserviceable articles as per Account Code Rule 98, once in six months. All these articles should be collected at one place in PHC for inspection of DHO. Prepare write-off proposal to be submitted to DHO as follows -

2.3. Remarks of DHO & handing over to DHO office

- When format is completely filled, show articles along with filled in format and relevant stock books to DHO and obtain remarks of DHO for write-off.
- All articles for write-off should be handed over to DHO store after permission from DHO. Get receipt of handover of articles and keep it in write-off file of PHC.
- As mentioned in Account Code Rule-98, drop entries of write-off articles during next dead stock inspection (half yearly inspection).

3. Electrical equipment (ILR, Deep freezer, Stabilizer, etc.)

- Powers of write-off of electrical equipment are with State Health Transport Organization.
- Medical Officer is required to start procedure of write-off of equipment as follows-
 - § Collect information of electrical equipment in following format and get certificate from cold chain technician of district in writing that equipment is unserviceable.

- § Show equipment to DHO when he visits PHC and obtain permission to deposit equipment in district store & mention this in remarks column.
- § Transport equipment to district health store for further transportation to SHTO.
- § Get receipt of equipment for condemnation from district store and attach to write-off file.
- § Drop entries of equipment during next inspection.

4. Benefits of regular write-off procedure

PHC staff gets valuable space in building for day-to-day functioning. It becomes easier to keep premises clean if there are minimum unserviceable articles in PHC.

Regular inspection of dead stock, equipments is useful to update position of these articles, which is important to minimize future complications.

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11. PANCHAYAT RAJ

Primary Health Center functions under administrative control of Zilla Parishad. Therefore MO must know structure and functioning of Panchayat Raj institutions.

1. Three tiers of Panchayat Raj institutions in Maharashtra

- Zilla Parishad at District level,
- Panchayat Samiti at Block level
- Gram Panchayat at Village level.

1.1. Zilla Parishad

- Zilla Parishad members are elected from Zilla Parishad

constituencies spread throughout the rural area of district. All these members constitute general body of Zilla Parishad.

- President, Vice-President and Chairperson of Subject Committees are elected from amongst Zilla Parishad members. President is political head of Zilla Parishad.
- Chief Executive Officer is administrative head of Zilla Parishad. There are various departments like Health, Education, Building and Communication, Animal Husbandry, Finance, etc. in Zilla Parishad.
- Meeting of all Zilla Parishad members (General body meeting) is held every three months. DHO as head of health department attends meeting and provides health related information to house.
- Subject committee meetings are held under chairmanship of Chairman (Subject Committee). Accordingly, health committee meeting is held once in a month under chairmanship of Chairman Health committee. It looks after health related matters of district. District Health Officer is member secretary of Health Committee.
- Decisions regarding health related matters like establishment of new PHCs/Sub centers, distribution of funds for construction, purchase of medicines, instruments, equipments etc. for PHCs is taken by health committee.
- In Zilla Parishad, responsibility of various functions is entrusted to different heads of departments. Medical Officer may need to contact other departments in case of difficulties. Table below gives information of various departments that have relationship with PHC functions.

1.2. Panchayat Samiti

Table - : Important Departments in Zilla Parishads

Name of department	Head of department	Relationship with PHC functioning
General Administration Department (GAD)	Dy CEO (GAD)	■ Establishment matters related to jr. assistant, drivers and class IV servants of PHC ■ Promotion, time scale, transfer files of PHC staff move through GAD.
Finance Department	Chief Accounts and Finance Officer	Finance related matters of district
B & C Dept.	Executive Engineer	Construction & repair of PHC/SC
Women and Child Welfare department	Dy CEO (ICDS)	ICDS scheme implementation
Education Department	Education Officer(Primary)	School Health services

- Panchayat Samiti members are elected from Panchayat Samiti constituencies spread in rural area of taluka. All elected members form Panchayat Samiti. These members elect Chairman and Vice-Chairman of Panchayat Samiti.
- Panchayat Samiti keeps watch on implementation of development programs within taluka.
- Meeting of all Panchayat Samiti members (PS meeting) is held once a month. It is essential for MO PHC to attend meeting unless prior permission is given by Chairman Panchayat Samiti to remain absent.
- It is duty of MO to submit all health related information of PHC to Panchayat Samiti if asked for.
- It is good practice to keep Panchayat Samiti member of your PHC area informed about progress of your PHC in various health programs and your expectations from Panchayat Samiti for smooth PHC functioning.
- As in ZP, responsibility of various functions within the block is entrusted to different heads of departments. Medical Officer may need to contact other departments in case of difficulties. Table below gives information of

various departments that have relationship with PHC functions.

Table - 8 : Important Departments in Panchayat Samiti

Name of The department	Head of The Department	Relationship with PHC functioning
Panchayat samiti	Block Development Officer	- Payments of PHC staff - Contingency bills sanctions
B & C Dept.	Dy. Engineer	Construction & repair of PHC/SC
Women and Child Welfare Department	CDPO	ICDS scheme implementation
Education Department	Education Officer(Primary)	School Health services

1.2.1. Panchayat Samiti Aam Sabha

Aam Sabha is organized for each Panchayat Samiti once a year. Panchayat Samiti Aam Sabha is chaired by local MLA. BDO is secretary of Aam Sabha. Aim of Aam Sabha is to review developmental activities performed during year and to plan for next year. All Panchayat Samiti members, Sarpanch, social activists, local NGOs, all officers from block, headmasters, gramsevak etc. attend Aam Sabha.

a. Role of MO PHC in Aam Sabha

Any health related problem could be raised during Aam Sabha. Therefore MO should be fully prepared for answering all health related issues from PHC.

- Prepare a short note, which should include compliance of last year's Aam Sabha decisions, progress in national health programs and any other additional information called by BDO. Submit information in time to Panchayat Samiti.
- Know basic information of your PHC such as number of villages, population, total eligible couples, and performance in national health programs.
- Discuss important points raised during last Aam Sabha, compliance made, etc. with BDO at least one week before Aam Sabha.
- MO should remain present for Aam Sabha in time. Answer briefly and to the point if any question is asked.
- Note if any decision is taken related to your PHC for future compliance.

1.3. Gram Panchayat

- Gram Panchayat is village level local body. Village is divided into wards. One Gram Panchayat member is elected from each ward. Sarpanch and Dy. Sarpanch are elected from among members of Gram Panchayat.
- Cleanliness, sanitation, safe water supply, information to PHC about any natural calamity including epidemic, etc. are health related functions of Gram Panchayat.
- MO should visit all villages at least once in a month. Meet Sarpanch and discuss about health related needs of village. Inform Sarpanch and Gram Sevak if you notice anything hazardous to health of community.
- Check record related to safe water supply and environmental sanitation during visit to Gram Panchayat. MO should discuss with Gramsevak if there are any problems related to safe water supply and sanitation.

2. Important issues directly or indirectly related to Panchayat Raj

- Village Health Committee**
- PHC Advisory Committee
- Donations to PHC
- Utilization of PHC OPD registration charges

2.1 Village Health Committee (VHC)

MPW male and female are village level functionaries responsible for providing health services to people. They work as per pre-decided schedule approved by Medical Officer. If local community is involved in planning and monitoring activities of health workers, it will help to improve quality of services and also improve accountability of health workers to community.

In order to have a control of community on health functionaries at village level and to achieve objective of decentralized planning, government has issued Resolution No. 2000/261/FP -3 dated 10.11.2000 regarding establishment of Health Committee under Gramsabha at village level.

2.1.1 Structure of VHC

- There should be 15 members in committee. If it is group Gram Panchayat, at least three members from each small village should be included in committee.
- Among total members, 70% should be women representatives.
- Number of Gram Panchayat and Zilla Parishad members should not exceed 5.
- Chairman: Members select Chairman for a period of 3 months.
- Conveyer: Gramsevak is conveyer for committee.

2.1.2. Working of Village Health Committee

- Meeting of committee members will be held every month.
- Tenure of committee is for 1 year.
- Committee will help MPW (M/F) in planning and implementing National Health Programs in village. Committee will also help to motivate families, which are not availing services provided by PHC and SC.
- If committee reports about unsatisfactory work of health worker, enquiry has to be made by district level officer and action to be taken accordingly.
- Confidential report of health workers will be written on basis of remarks and evaluation made by committee.
- Following information will be submitted to committee by MPW male and MPW female at the time of meeting:
 - § Visits to village as per schedule

- § Registration and services provided to antenatal mothers, e.g. antenatal check up, Iron Folic Acid supplementation, TT immunization, examination of high risk mothers by MO
- § Infant deaths/ maternal deaths that have occurred in village
- § Grade III, IV malnourished children
- § Immunization of children
- § Malaria, leprosy, night blindness cases and related activities
- § Eligible couples in village

2.2. PHC Advisory Committee

Idea behind establishment of Primary Health Center Advisory Committee is involvement of community in health care delivery and community participation in planning and implementation of health programs. Establishment of PHC advisory committee is as per government resolution number PHC/1085/3026/Arogya-5 dated 19.12.1985.

2.2.1. Structure of committee

- Chairman: Local Zilla Parishad member or Sarpanch of PHC headquarter village.
- Other members:
 - § Block Development Officer or his representative.
 - § Sarpanch of PHC headquarter village.
 - § Panchayat Samiti members from PHC area.
 - § Lady member of Gram Panchayat or Municipality or lady social worker.
 - § Three non-official members, out of them one should be retired army person and one should be from backward class.
- Member secretary: Incharge Medical Officer of PHC

2.2.2. General rules regarding working of PHC advisory committee

- Block Development Officer issues order of committee formation in consultation with Chairman, Panchayat Samiti.
- Tenure of all members (except ex-officio members) will be generally for three years; however previous advisory committee will continue to work till new committee is formed.
- Committee will meet at least once in three months. Meeting can be called by issue of notice seven days in advance by Chairman of committee.
- No TA/DA or travel expenses are admissible to members
- DHO and district level senior officers can attend any of advisory committee meeting and can participate during deliberations.
- Member secretary will forward report of committee with his remarks to District Health Officer within one week.
- Members of advisory committee cannot give instructions to any of PHC staff directly but members should inspect PHC along with senior Medical Officer and advise accordingly.

2.2.3. Functions of PHC advisory committee

- Advise about improvement in functioning of PHC within framework of government rules and regulations.
- Monitor and advise about utilization of grants received by PHC.
- Receive donations from public and advise PHC about its utilization within regulations of government framework.
- Keep watch on availability of medicines in PHC.
- Regular review of complaint register, visit book and advise accordingly.

3. Donations to PHC

Expectations and demands of community are increasing regarding health services provided by PHCs. In order to increase availability of resources to PHC and active participation of community, government has given permission for accepting donations by GR no. 2002/223/Arogya-3 dated 23.8.2002. As per this resolution, equipments required for PHCs can be accepted in cash or kind from individuals/private organizations/ foreign organizations / NRI as a donation.

3.1. Guidelines for accepting and utilization of donations

- Acceptance of donation must be through PHC advisory committee.
- Donation amount can be used for repair and maintenance of instruments and equipments.
- If equipment/instrument has been given as donation, 5 years maintenance needs to be given by donor.
- No expenditure should be done from government grants for equipments received as donation. This should be made from separate account maintained of such donation.
- Furniture, computer also can be accepted as donation.
- If private practitioner is ready to install his own equipment or machinery at PHC, he can be allowed by accepting rent from him. However it is mandatory for him to use that machinery for Below Poverty Line patients as per government guidelines.
- Separate cashbook or register has to be maintained at PHC for such types of donations.

3.2. Utilization of revenue collected at PHC including OPD registration charges

Revenue collected at PHC from various sources can be utilized for day-to-day functioning as well as maintenance of PHC. Decision for utilization of PHC revenue is entrusted to PHC Advisory Committee. Committee can allow Medical Officer to use revenue for items indicated under government resolution.

3.3. The revenue is generated at PHC from following sources-

- OPD registration fees - All patients (except BPL patients) are charged Rs. 2/- as OPD registration fees.
- Training charges from Intern Doctors from private Medical Colleges.
- Training charges from trainee nurses from private Nursing Schools.
- Donations.

3.4. Guidelines for utilization of OPD registration fees

Guidelines regarding utilization of revenue collected through above mentioned sources have been given by Government Resolution no. PHC/1093/3507/no 414/Arogya-4 dated 6 March 1997 and updated thereafter on 28.9.98 and 30.3.2001. Guidelines are as below:

- Amount collected as above can only be utilized by same PHC.
- OPD registration fees can be utilized for specific purposes and upper limits for expenditure for various reasons is as follows as per GR:
 - § Rs. 5000/- per year for minor repairs of PHC. (Minor repairs include masonry, carpenter, smith and electric works).
 - § Rs. 1500/- per year for cleaning courtyard of PHC.
 - § Rs. 2000/- per year for purchase of life saving medicines required for Below Poverty Line patients admitted in PHC.
- Rs. 1500/- per year for painting equipment, cots, fans, furniture and also repair of fans, equipments. (Coloring of PHC is not allowed).
- § Rs. 1000/- per year for transport arrangement of serious Below Poverty Line patients to Rural Hospital or District Hospital when PHC vehicle is not available.
- § Rs. 9000/- for purchase of stationary.
- § There is no upper limit for expenditure on electricity bills of Primary Health Center.
- If amount required for any of above-mentioned items is more than prescribed for each item, and if sufficient funds are available in PHC account, expenditure is allowed with prior permission of CEO Zilla Parishad.
- No expenditure from OPD fees should be carried out for any item other than mentioned in above list.

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SECTION – III

MEDICAL CARE

1. MEDICAL CARE AT PHC

Primary Health Centers have been basically established to provide a strong base of preventive & promotive health care. Hence to make this base strong & acceptable to people, it is necessary to provide for care of sick including disability services & rehabilitation. Medical care extended to sick & disabled should not be an end in itself but must be utilized to emphasise the preventive, promotive health care with focus on Behaviour Change Communication.

1. Out patient care

Out patient clinic should be conducted every day at PHC headquarter between 8 a.m. to 12.30 p.m. in morning and 4 to 6 pm in evening except Sunday and Dispensary Holidays. In single MO PHCs, MO should visit sub-center instead of conducting evening OPD.

During MCP clinic MO will conduct out patient clinic at sub center. Number of outpatients is few at sub-center, therefore MO should give more time and attention towards monitoring and supervision of MCP clinic and guidance to ANMs in MCH work, supervise work of other Health staff such as Health Assistant (M & F), MPW (Male) etc.

2. In-patient care

Provision of in-door beds in PHC has been minimized to 2 general beds and 4 maternity beds to enable attending doctor to devote more time for other important Public Health Services. Medical Officer should take a daily round of ward in morning before attending outpatient clinic, examine all indoor patients and give instructions to nursing staff regarding care and treatment of indoor patients. This will ensure satisfactory working of Maternity care and help to gain confidence of community.

3. Laboratory services

Almost all Primary Health Centers are provided with microscopes and facilities for carrying out simple diagnostic laboratory tests to help in proper diagnosis and follow up of cases. Detailed information about laboratory functioning is given in Chapter-6 of same section.

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2. BASIC CLINICAL INFORMATION

Basic clinical information required for examining patients at PHC, is given below. This also includes normal values for important investigations for reference of MO although these are not conducted at PHC.

1. Normal Heart Rate

Table 1: Age wise average & range of heart rate

Age	Average	Range
New born	140 beats/min	140 to 160/min
1 yr old	110 beats /min	100 to 130/min

3 yr old	100 beats /min	90 to 110/min
8 yr old	90 beats /min	90 to 100/min
11yr old	80 beats /min	80 to 90/min
Adult	72 beats /min	70 to 100/min

2. Temperature recording

While recording temperature, remember following points:

- Wash thermometer in antiseptic solution and see mercury is well shaken down before using for each patient. Wash again after every use before keeping it in case.
- Keep thermometer for one minute to allow mercury to reach body temperature.
- Site of inserting thermometer -
 - Conscious adults Mouth or axilla
 - Unconscious adults Axilla
 - Young children Fold of groin with thigh flexed on abdomen.
 - Infants Rectum

Temperature of mouth and rectum is generally half degree higher than that of groin or axilla.

Table 2: Temperature range in centigrade and Fahrenheit

Temperature	Centigrade	Fahrenheit
Normal	36.6-37.2	98.7
Hypothermia	< 35	< 95
Subnormal	< 36.6	< 97
Febrile	> 37.2	> 99
Hyperpyrexia	> 41.6	> 107

3. Measurement of Blood Pressure

- Blood pressure is measured indirectly by sphygmomanometer.
- Cuff (width at least 40% arm circumference) is attached to mercury/anaeroid manometer.
- Cuff is inflated around extended arm till radial pulse disappears by palpating method and then slowly deflated.
- Auscultation over brachial artery reveals five phases of Korotkoff sounds during deflation.
- Take an average of three readings.

Table 3: Phases of Korotkoff sounds

Phase 1	First appearance of sounds indicating systolic pressure.
Phase 2 & 3	Increasingly loud sounds.
Phase 4	Abrupt muffling of sounds
Phase 5	Disappearance of sounds indicating diastolic pressure.

3.1. Classification of blood pressure

Classification of hypertension as per recommendations of 7th Joint National Committee on Definition & Classification of Hypertension is as below:

Table 4: Normal & hypertension range of Blood Pressure

Category	Systolic	Diastolic
Normal	115	80
High Normal	130 - 139	85 - 89
Hypertension		
Mild	140 - 159	90 - 99
Moderate	160 - 179	100 - 109
Severe	180 - 209	110 - 119
Very severe	>= 210	>= 120

At PHC level mercury & aneroid BP apparatus are provided. In these instruments BP can be recorded in even numbers like 82, 84, 88 etc.

4. Respiratory rate

Count patient's respiration for half minute, starting when patient's attention is directed elsewhere. It is convenient to do this when patient thinks that you are still counting pulse.

Normal rate in adults is about 16 – 24 per minute.

5. Primary skin lesions

Macule - Non- palpable area & altered color

Papule - Palpable elevated small area of skin- (< 0.5 cm)

Nodule - Solid palpable lesion within the skin - (> 0.5 cm)

Vesicle - Small fluid filled blister (<0.5 cm)

Pustule - Blister containing pus

6. Scale for grading muscle function

Grade- 0: Complete paralysis.

Grade - 1: A flicker of contraction only.

Grade - 2: Power detectable after gravity excluded by appropriate postural adjustments.

Grade - 3: Limb is held against force of gravity but not against examiners resistance.

Grade - 4: Movement possible against moderate resistance. Grade - 5: Normal power is present.

7. Glasgow Coma Scale (GCS)

Glasgow Coma Scale enables relatively accurate assessment of improvement or deterioration in patient's conscious state.

Table 5: Scoring according to Glasgow Coma Scale

Eye Opening		Verbal response		Motor response	
Spontaneous	4	Oriented	5	Obeys commands	6
To speech	3	Confused	4	Localizes pain	5
To pain	2	Inappropriate	3	Normal withdrawal	4
None	1	Incomprehensible	2	Abnormal flexion	3
		None	1	Abnormal extension	2
				None	1

Best score - 15, Worst score - 3. Prognosis is guarded if score is 6 or below.

This scale is important for assessment of unconscious patients, especially for quick assessment of mass casualties.

8. Clinical consequences of thrombocytopenia

This assessment is useful for management of case of Dengue Hemorrhagic Fever (DHF).

Table 6: Clinical features according to platelet count

Platelet count (In thousand)	Clinical features
> 100	Nil
50-100	Possible excessive bleeding after major trauma
20-50	Possible excessive bleeding after minor trauma
< 20	Spontaneous hemorrhage, purpura highly likely
< 10	Significant risk of major bleeding, cerebral hemorrhage

9. Normal values for important investigations

Sr.	Investigation	Normal value range
1	Hemoglobin (WHO criteria)	M – 13 gm % or more
		F – 12 gm % or more
		Pregnant women – 11 gm % or more
		Children – 12 gm % or more
2	WBC Count	4000 – 11,000/ cmm
3	Differential count	Neutrophils - 60-70%, Eosinophils - 1-7%, Lymphocytes - 20-30%, Monocytes - 1-6%.
4	RBC Count	M - 4.5 to 5.5 millions / cmm, F - 4.1 to 4.8 millions / cmm
5	Platelet Count	1.5 to 4.5 lakh/ cmm
6	PCV	Male - 38-50%, Female – 34-43%
7	ESR (Westergen)	M - 0-15 and F- 0-20 mm at end of 1 hour
8	Bleeding time	1-7 minutes
9	Coagulation time	4-8 minutes
10	Blood sugar	Fasting: 70 – 110 mg /dl., PP: < 140 mg %

11	Total cholesterol	Total Cholesterol : 140 – 220 mg %
		HDL: 32 – 54 mg / dl., LDL : 6 – 40 mg / dl.
		LDL / HDL ratio: 3 to 5
12	S. Bilirubin	Adult - 0.3 to 1.1 mg / dl. Newborn-0.4 - 4mg / dl.
13	Proteins	Total : 6 – 8 gm / dl., Alb: 3.5 – 5 gm / dl. Glob: 1.8 – 4 gm / dl.
14	S. transaminase	SGOT (AST):8-40 IU / lit., SGPT (ALT): 0-40 IU / lit.
15	Alkaline phosphatase	1.4-4 Bodansky units/dl

Reference: API textbook of Medicine (Sixth edition)

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3. SUTURING

Suturing is most versatile, least expensive and most widely used technique of securing tissue during an operative procedure.

1. Sutures

Suture is made of a variety of materials with varying properties. It may be synthetic or biological, absorbable or non-absorbable and constructed with a single or multiple filaments.

Suture is graded according to size. Most popular grading system rates suture material downward from a very heavy 2/0 to a very fine ophthalmic suture of 10/0. Tubectomy like operation can be completed with suture material between size 2/0 and 1. Different materials have different strength/s. Strength of all sutures increases with their size.

1.1. Absorbable suture

A suture that degrades and loses its tensile strength within 60 days is generally considered to be absorbable.

Catgut is pliable, is easy to handle and inexpensive. Chromic catgut lasts for 2-3 weeks and is used for ligatures and tissue suture. Do not use it for closing fascial layers of abdominal wounds, or in situations where prolonged support is needed. Plain catgut is absorbed in 5-7 days, and is therefore useful when healing is expected within this period. It is also useful for suturing mucous membranes or when it is not possible for the patient to return for skin suture removal.

Polyglycolic acid is also popular suture material because it is absorbable and has long lasting tensile strength. It is an appropriate suture for abdominal closure. Absorption time for this suture is considered to be 60-90 days.

1.2. Non-absorbable suture

Braided suture is usually made of natural products (silk, linen or cotton). It is acceptable in many situations, but is contraindicated in a wound that is contaminated.

Synthetic monofilament suture, such as nylon polypropamide, may be left in deeper layers, and is not contraindicated in situations of contamination. It is often used as continuous suture. Use non-absorbable suture material when possible.

2. Needles

Surgical needles are classified in three categories:

- Round bodied

- Cutting
- Troche

Within these categories, there are hundreds of different types.

3. Important aspects of suturing

- Use cutting needles on skin, and for securing structures like drains.
- Use round-bodied needles in fragile tissue.
- Troche needles have a sharp tip but a round body. They are useful when it is necessary to perforate tough tissue, but cutting tissue would be undesirable, e.g. linea alba when closing abdominal wall.
- Size of bite, and interval between bites, should be consistent and will depend on thickness of tissue being approximated.
- Use minimal size and amount of suture material required to close wound.
- Leave skin sutures in place for average of 7 days. In locations where healing is slow and cosmetic is less important (back and legs), leave sutures for 10-14 days.
- In locations where cosmetic is important (face), sutures can be removed after 5 days but wound should be reinforced with skin tapes.

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4. MANAGEMENT OF SOME COMMON EMERGENCIES AT PHC

1. Cerebral Malaria

Cerebral malaria is an acute emergency needing urgent treatment. Confirmation of diagnosis by laboratory method is essential for reporting a cerebral malaria case.

1.1. Specific treatment

Quinine hydrochloride is drug of first choice. Dose is 10 mg/kg body weight eight hourly. In adults maximum dose is 1950 mg in 24 hrs.

In children dose is calculated as - Age in yrs / 20 Adult dose

Quinine is given as IV injection or in IV drip. Dose is repeated after every 8 hours.

- IV injection is given in 5% dextrose saline 500 ml drip over a period of four hours.
- Give 100 ml of 25% dextrose before starting drip and again infuse 100 ml of 25% dextrose after completion of quinine drip, because hypoglycemia is common after quinine drip.
- Never give IV quinine at PHC, as there is no facility of ECG monitoring at PHC level.
- Give half the dose if patient has oliguria or black colored urine
- Check pulse and blood pressure two hourly especially if patient has cardiac disease.
- Check for tinnitus or vertigo daily from day of starting dose and for ectopics or bradycardia on third day. Stop quinine and refer patient to specialty hospital if any of toxicity signs are observed.
- Add Tetracycline 250 mg 6 hourly or Doxycycline 100 mg, once a day
- When patient becomes conscious, give oral quinine in same dose as 10mg/kg 8 hourly not exceeding 2 grams in a day.
- Total duration of quinine treatment (parenteral + oral) should be for 7 days.

1.2. Supportive treatment

- If high fever, give Paracetamol 15mg/kg body weight in three divided doses.
- For control of convulsions, administer IV Diazepam 0.15mg/kg body weight.
- In case of hypoglycemia, give IV 25% dextrose.
- Avoid steroids, heparin, adrenaline.
- Patient should be given radical treatment before discharge.

2. Snake Bite

Snakebite is an acute life threatening, time limiting medical emergency. It is one of the most common emergencies in rural areas. When a snakebite patient is brought to PHC, stop all other activities and start treatment of snakebite.

2.1. Poisonous snakes

Neurotoxic : Cobra, King Cobra, Common krait, Branded krait, Coral.

Vasculotoxic: Pitless - Russell's Viper, Saw Scaled Viper, Pit - Bamboo snakes

Myotoxic: Sea snakes

Examine injury. In case of poisonous snake bite, two fang marks are observed. Inverted U shaped mark as a rule suggests nonpoisonous snake bite.

2.2. Signs and symptoms

As ASV dose is same for all types of poisonous snakes, main aim of examination of patient should be to decide whether snake bite is poisonous or non-poisonous.

- Ptosis (most important and seen early), dysarthria, dysphasia and respiratory paralysis are common in cobra and krait bites.
- Suspect cobra bite if there is local edema, giddiness and convulsions.
- Minimal or no local signs, abdominal pain and chest pain are suggestive of krait bite.
- Severe local pain, local bleeding, rapid progressive edema, regional tender lymphadenopathy, bleeding gums, hematemesis, hemoptysis, bleeding of venepuncture site are suggestive of viper bites.
- If patient is well after 6 hrs, bite was non poisonous.

2.3. Investigations

20 minute WBCT (Whole blood clotting time) is simple, bedside gold standard test for diagnosis of snake bite. Draw 2cc blood of patient and place in new test tube. (Tube washed with detergent should not be used). Observe time of clotting of blood in test tube. WBCT more than 20 minutes is suggestive of vasculotoxic envenoming. Perform test at the time of admission and every six hourly. Adjust dose of ASV as per test results.

2.4 Management of snakebite

2.4.1. Reassurance

Psychological upset, severe fright may cause shock, for which patient needs assurance.

2.4.2. Measures to retard absorption of poison

- Immobilize bitten limb with a splint. If crepe bandage is available whole limb should be bandaged firmly to a splint.
- Apply pressure bandage 5 cm proximal to site of bite. After every 15 minutes, release bandage for 3 minutes and then tighten. Keep pressure bandage till half dose of ASV is administered to patient.
- If patient comes within 30 minutes of bite, infiltrate 20 ml. ASV locally at the site of bite. This will neutralize 50% of snake venom.

2.4.3. Anti snake venom

It is most effective if given within 1-4 hrs after the bite.

- Freeze dried ASV powder is reconstituted by adding 10ml distilled water.
- Sensitivity test is performed by injecting 0.02 – 0.1 ml of 1:10 dilution of ASV intradermally. If no reactions occur within 30 minutes then give IV.
- 60 ml. of ASV (6 vials) is added to 500 ml. Normal Saline & given IV over 1-2 hrs.
- Repeat dose if WBCT is more than 20 min, neurotoxicity or shock persists or recurs.
- If patient is sensitive, desensitization is carried out using small dose SC & increasing doses IM.
- Reactions can be prevented by pre treatment with adrenaline (0.5 ml. IM 15 minutes prior), anti histamine and hydrocortisone.

- Dose for children is same as adults.

2.4.4. Supportive treatment

- Supportive treatment should be given which consists of treatment of hypovolemia, care of wound by washing it with antiseptic solution, prophylactic antibiotic like penicillin or erythromycin and TT immunization.
- Check for bleeding tendency and urine output.
- Neuroparalytic snake bite: Immediately give Atropine 1 ampoule followed by Neostigmine 1 ampoule. This is life saving treatment. Repeat dose every 15 minutes for 6 times. Then taper i.e. give after 1 hr, 3 hr and 6 hours. Omit if there is response. If patient gives response to Atropine + Neostigmine then it is cobra bite, if not then Krait bite.
- In Krait bite, there is delayed neuromuscular paralysis, therefore patient should be observed for 12 hours for ptosis, difficulty in deglutition, diplopia, respiratory difficulty etc. If these signs develop, treat patient with atropine, neostigmine as per treatment of cobra bite.
- Respiratory paralysis: If you are confident then intubate (Endotracheal intubation) patient and keep patient on Ambu bag. If no, start Atropine + Neostigmine, arrange for transfer of patient to hospital with ventilator facility, continue to give this medication as per schedule given above.

2.5. Health education

- Use proper clothing, wear shoes during farm work
- Use stick and torch while walking in night hours
- Do not run in case of snake bite, instead call for help, immobilize bitten part and keep part at lower level than heart.
- Immediately rush patient to hospital, never go to quacks as poison can be neutralized by giving injections only.
- Handle dead snake carefully

3. Poisoning

Large numbers of insecticides are used in rural areas for agricultural purpose. Poisoning case may come with accidental or deliberate consumption of insecticide or exposure to insecticide while spraying on crops. Important aspect in management of poisoning is to assess degree of severity of poisoning, use antidote if available and provide life support if necessary to keep patient alive till effect of poison is over.

3.1. Immediate management

- Respiration: First try to clear respiratory route of patient. Food, vomit, secretions & dentures should be removed from patient's mouth.
- Head low in left lateral position to minimize risk of aspirating gastric contents into lungs.
- Assess pulse, BP & temperature.
- Diagnosis should be made on history given by patient & relatives. Clues may be obtained from circumstantial evidence like empty bottles or tablets, capsules found nearby.

- Gastric lavage – Efficacy of stomach wash decreases with time. Therefore gastric lavage should be considered only if a patient has ingested life threatening amounts of poison and brought to PHC within one hour. Do not perform gastric lavage on unconscious patient and in patients with suspected kerosene or acid poisoning.
- After passing tube, aspirate stomach contents & introduce 250 ml lukewarm water. Aspirate after 2-3 minutes. Repeat procedure until 2 lit have been used or until lavage fluid is clear.
- Emesis – Making patient drink a glass of salt water or stimulating pharynx with fingers.
- Fluid & electrolyte balance:- For patients who are vomiting, give IV fluids – Normal saline, Ringer lactate
- Give MagSulf powder 30 gms to all patients after gastric lavage.

3.2. Treatment of specific poisons

Patient usually brings empty pack of ingested poison. Observe contents of pack carefully. Go through treatment measures suggested on pack and then start management of patient.

3.2.1 Chlorinated hydrocarbons (Dicofol, Endosulfan, Lindane)

Control convulsions by administering diazepam 5-10 mg IV.

Start calcium gluconate 10% iv

Give fat free diet

Do not give adrenaline derivatives, morphine, theophylline, ephedrine and atropine.

3.2.2. Organophosphorus compounds (Chlorpyrifos, Diazinon, Dichloroovas, Fenthion, Malathion, Monochrotophos, Thiometon, etc.)

Inject atropine sulphate intravenously in a dose of 2-4 mg (0.04-0.08mg/kg body weight) every 10 minutes till sign of atropinisation (dry mouth, tachycardia and dilatation of pupil) occur. Maintain this level for 48 hours. Give atropine afterwards if symptoms reappear.

While keeping patient duly atropinised, administer 2-PAM 1000-2000 mg (15 mg/kg body weight). Repeat after 2 hours if necessary.

3.2.3. Synthetic pyrethroids (Allethrin, Cyfluthrin, Deltamethrin, Permethrin)

Treatment is symptomatic

Perform gastric lavage and administer activated charcoal

Control seizures with injection diazepam

Refer patient to center with facility of MICU

3.2.4. Carbamate (Carbaryl, Carbendazim, Fenobucarb, Propoxur)

Inject massive dose of atropine sulphate IV 1-3 mg. Repeat every 10 minutes until signs of atropinisation occur. A total of 25-30 mg atropine may be required on first day.

If patient is cyanosed, intubate patient and then start atropine

In case of severe poisoning inject 1.0 gram Protopam IV or IM.

Treat convulsions with diazepam 10-20 mg IV

4. Anaphylactic shock

It is one of the acute & life threatening emergencies, for which prompt & proper treatment should be given to patient.

4.1. Common stimuli for anaphylaxis

- Antibiotics: Penicillin, streptomycin
- Anesthetic agent: Lignocaine
- Others: Foods, parenteral iron dextran
- Antisera: ASV

Onset may be instantaneous or within few minutes after IV injection or sometimes after half an hour of exposure. Anaphylactic reaction begins with itching, flushing of skin, severe dyspnea, and fall of BP.

4.2. Management

- Ensure free airway.
- Start IV fluids (Normal saline) as fast as possible, one pint every 30 minutes till hypotension is corrected.
- Start Oxygen and give in high concentration
- Inj. Adrenaline 0.5 - 1 ml. of 1:1000 strength, dilute in 10 ml of Normal saline, give over 10 minutes. Repeat every 30 minutes if necessary. If no response or bronchospasm or cardiovascular collapse, give 5-10 ml. of 1: 10,000 solution IV.
- Inj. Hydrocortisone 200 mg IV followed by 100 mg 6 hourly to prevent late manifestations of anaphylaxis for first 24 hours. Shift to oral after 24 hours and taper in 5 days.
- Aminophylline 250 mg. in 20 ml dextrose IV slowly to relieve bronchospasm.
- Diphenhydramine 50 mg IV (1 mg/kg) slowly only after hypotension is corrected and repeated if necessary.

5. Drug Reaction

It is a common observation to get patients of drug reaction in OPD. Such patients should be carefully examined and given treatment as follows -

5.1. Systemic management

- Stop all the drugs that patient may be taking.
- Give Corticosteroids in high doses. If patient is very toxic, give Hydrocortisone 200 mg IV stat, then 100 mg. 6 hourly or Dexamethasone 4 mg. IM 8 hourly or Prednisolone 1mg/kg/day depending on severity.
- Antibiotics – Antibiotics of choice are Erythromycin, Roxithromycin or Azithromycin. Start with one tablet 250-500 mg. on first day, 2 tablets on second day & if well tolerated (i.e. no exacerbation of disease) then increase tablets 3-4 times a day.
- Avoid analgesics as far as possible. For fever use ice bag, sponging & fan. Only if fever is very high Paracetamol

may be tried, starting with very small doses.

- Antibiotic / analgesic suspected to be causing the drug reaction should be avoided.
- If patient is in shock, first treat shock as described in Anaphylactic shock management.
- Start Antihistaminic in low dose first and give up to five days.

5.2. Local (Topical)

- Use only bland, soothing applications such as calamine lotion.
- Take proper hygienic measures i.e. sponging with mild antiseptic.

6. Scorpion sting

Red scorpion is very poisonous than black scorpion. Management of scorpion bite consists of following actions

- Local infiltration of 1% lignocaine if severe pain.
- Systemic analgesics.
- Prazocin is drug of choice. Start Prazocin - 0.5 mg in children and 1 mg in adults.
- Antivenin if available – 10 ml. IV over 10-30 minutes.
- For pulmonary edema frusemide, O₂ inhalation, aminophylline.
- In patient with pulmonary edema, Inj. Pethidine gives dramatic effect along with other measures like Frusemide, O₂ inhalation, Aminophylline & Prazocin. Dose of Pethidine is 50 mg IM, which can be repeated after 12 hours.
- In patient with tachycardia, hypertension and priopism, start Prazocin as prophylaxis.

7. Heat stress

Human beings are homoeothermic (warm-blooded) and need to maintain a relatively constant deep body temperature. Substantial deviation from normal body temperature can result in adverse effects that range in severity from minor annoyance to life threatening illness.

Acute physiological response to heat stress includes perspiration and peripheral vasodilatation. Perspiration increases cutaneous moisture, allowing greater evaporative cooling. Peripheral vasodilatation tends to reroute blood flow, enhancing transmission of heat from body's core to peripheral body parts, from where it is radially lost.

In Maharashtra state, Vidharb and Marathwada region experience heat waves during summer season causing lot of heat stress related illnesses in community.

7.1. Important disorders resulting from exposure to heat are as below:

7.1.1. Heat syncope

- Person standing in sun becomes pale and collapses suddenly.
- This results from pooling of blood in lower limbs due to dilatation of blood vessels resulting in reduced blood

returning to heart & lack of blood supply to brain. There is no practically rise in body temperature.

- Treatment consists of bringing patient in shade, giving head low position and rest.

7.1.2. Heat exhaustion

- Heat exhaustion is milder illness than heat stroke. It is effect of exposure to high temperature for several days and is caused by imbalance or inadequate replacement of water & salts which are lost in perspiration due to thermal stress.
- Body temperature may be normal or slightly elevated, but does not exceed 102° F.
- Symptoms are dizziness, weakness & fatigue.
- Treatment consists of plenty of fluids and electrolytes, bringing patient in shade & fanning.

7.1.3. Heat hyperpyrexia

- There is impaired functioning of heat regulating mechanism.
- It is defined as a temperature above 106° F & this may proceed to heat stroke.
- Treatment consists of plenty of fluids and electrolytes, bringing patient in shade & fanning.

7.1.4. Heatstroke

- It is characterized by very high body temperature, which may rise to 110° F (43.3°C).
- Skin is dry & hot, there is failure of heat regulating mechanism.
- Patient may have delirium, convulsions & partial or complete loss of consciousness.
- Classically sweating is absent or diminished but many patients perspire profusely.
- Chances of death are significantly more.
- Treatment: Rapidly cooling body in ice water bath till rectal temperature falls below 102° F (38.9° C).
- Further treatment is supportive, concentrating on complications like hypovolemia, hyperkalemia, hypocalcaemia, bleeding diathesis, for which if needed patient may be referred to higher center.

7.2. Role of MO

- Orient all health workers about effects of heat stress, preventive measures & control measures during monthly meeting April onwards.
- Keep adequate stock of medicines like ORS, IV fluids.
- Ensure that, fans are working in PHC & also deep freezer, refrigerators are in working condition.
- Keep ready ice & ice packs every day.
- Appropriate management of heat stroke patients.
- Visit Employment Guarantee Scheme (EGS) works in PHC area & inform concerned about effects of heat stress, management required, preventive measures etc.

- IEC about heat stress in PHC area.

7.3. Reporting

Submit heat stroke report weekly to DHO. Reporting weeks and dates are fixed for submitting weekly heat stroke report. Every year, weekly report starts from 1st April. MO should submit weekly report to DHO on fixed dates: 1st, 8th, 17th and 22nd for months of April, May and June. Last report is submitted on 22nd June.

8. Asphyxia neonatorum

If fetal distress is identified during intra natal period Give mother -

- Left lateral position
- Oxygen through mask
- I. V. Fluids
- Stop oxytocin

8.1. Resuscitation of newborn

- Avoid cooling. Keep baby warm.
- Clear respiratory airway with a mucus catheter or vacuum suction machine. Suction machine should be used very cautiously as vigorous suction may cause injuries to oral mucous membrane of a newborn.
- Give artificial respiration with an Ambu bag connected to 100% oxygen. (Negative pressure should be 5mm Hg).
- Give O₂ with intermittent positive pressure not more than 25 cm of water
- Give cardiac massage: Apply pressure over middle third of sternum, with tip of index & middle finger. Pressure should be sufficient to depress sternum by 1-1.5 cm. Judge efficacy by palpating femoral artery. Rate should be 100 – 120/min.
- Volume expanders – Ringer lactate or Normal Saline 10ml./kg body weight.
- Calcium gluconate - IV 0.5-1 ml/kg slowly while monitoring heart rate.
- Soda bi carbonate – Give 2mg/ kg Soda bi carb intravenously, slowly in 10% glucose.

9. Resuscitation of patient

Resuscitation of patients is required in emergency situations, e.g. severe trauma, drowning and other accident emergencies.

9.1. Priorities for resuscitation are

- Ventilate.
- Perform cardiac massage.
- Restore circulating volume loss.
- Remove any cause, hazard or noxious agent.
- Make a diagnosis, if possible.

There are no drugs that will make someone breathe. Only treatment for non-breathing patient is to inflate lungs mechanically, preferably with a resuscitation bag and mask or a tracheal tube.

9.2. Drugs in resuscitation (adult doses)

Drug	Indication/Action	Dose
Epinephrine (Adrenaline)	Cardiac Arrest Acute anaphylaxis	0.5 to 1 mg IV
Atropine	Bradycardia Vagal asystole	0.5-1.0 mg IV
Mephentine	Hypotension after spinal anesthesia	10-30 mg IV
Calcium chloride (Not in patients on Digoxin)	Inotropic support in cardiac arrest	10 mg in 10 ml IV
Sodium bicarbonate	Proven acute acidosis	30-100 mmol (50 ml IV stat if hypotension)
Lidocain	Ventricular arrhythmias	1-2 mg/kg IV
Beta blockers	Hypertensive crisis	Various beta blockers

9.2.1. Key points about drugs

- Always give drugs intravenously during resuscitation.
- Most drugs are only helpful once cause of cardiac arrest has been diagnosed, but epinephrine is an exception and should always be given to patients with circulatory arrest.

9.3. Resuscitation skills

Some practical skills are essential for initial resuscitation of injured patients. Only way to learn them is by gaining practical experience under supervision of a person who is skilled in their use.

Skills you need include:

- Making a rapid examination to diagnose and treat life-threatening injuries, including possible need for cardiopulmonary resuscitation
- Airway skills: simple maneuvers, artificial airway use, tracheal intubation and tracheostomy, if needed
- Use of an intravenous cannula in any available vein
- Management of shock
- Patient handling.

Once patient is stable, shift patient to specialty hospital with full details of treatment given at PHC.

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5. OPERATION THEATER

In PHC, operation theatre is mainly used for Family planning operation and MTP. MO should personally give attention to OT cleanliness and fumigation. Important aspects of OT (cleaning, fumigation & maintenance) are described in this chapter.

1. General aspects related to Operation Theatre

- Good lighting and exhaust fan must be available in OT.
- All equipment, instrument and emergency medicines kept in OT should exclusively be used for OT purpose only. Never take them out for general patients.
- Keep all doors of operating room closed except as needed for carrying equipment, for movement of health staff and patient.
- Store some sutures and extra instruments in OT to decrease

movement of health staff during procedure.

- **Allow** minimum staff to enter OT.
- Between uses, clean and disinfect table. Clean OT at the end of the day.
- Clean all surgical instruments immediately after use and keep them ready for autoclaving.

2. Culture sensitivity swabs

- OT swabs should be sent for culture sensitivity before first use of OT, after renovation or if OT is closed for one month or more and thereafter every six months.
- If swab report is positive wash floor/walls/ceiling/equipment inside OT and refumigate. Send swab again for culture. Never use OT for any purpose unless swab report is negative.

3. Sponge and instrument counts

It is essential to keep track of materials being used in OT in order to avoid potentially disastrous loss of sponges and instruments in abdomen.

- It is a standard practice to count supplies (instruments, needles and sponges):
 - Before starting surgery
 - On completing procedure.
 - Before final closure
- Aim is to ensure that materials are not left behind in abdomen or lost. Pay special attention to small items and sponges.
- Prepare standard list of instrument/sponges, sutures, etc. as checklist for each procedure and keep exact number as stated in checklist on table. This will be useful to check equipment at the beginning of operation and then for counts during closure of abdomen and after completion of case.

4. Scrubbing and gowning

Before each operation, all members of surgical team i.e. those who will touch sterile surgical field, surgical instruments or wound should scrub their hands, arms to elbows. Scrubbing cannot completely sterilize skin, but will decrease bacterial load and risk of wound contamination from hands.

4.1. Instructions to follow while scrubbing

- Remove all jewellery and trim nails.
- Use soap, a brush (on nails and finger tips) and running water to clean thoroughly around and underneath nails.

- Scrub your hands and arms up to elbows.
- After scrubbing, hold up your arms to allow water to drip off your elbow.
- Turn off tap with your elbow.

4.2. After scrubbing hands

- Dry them with a sterile towel and make sure towel is not taken near sterile surgical field or used during operative procedures.
- Hold your hands and forearms away from your body and higher than your elbows until you put on a sterile gown and sterile gloves.
- Surgical gloves prevent transmission of HIV and other infections diseases transmitted through blood and body fluids. There is always possibility of accidental injury and glove puncture. Promptly change punctured glove and rinse your hand with antiseptic. Re-scrub hands if glove has leaked. Remember, patient safety is of primary concern, change your gloves when it is safe for patient.

5. Cleaning of OT

- After each use clean floor with a mop soaked in 0.5% chlorine solution.
- Operating table, table tops, light handles should be wiped with 0.5% chlorine solution.
- For preparation of 0.5% chlorine solution use either bleaching powder or hypochlorite solution. 15 grams of bleaching powder is added in 1 liter of water or if 5% hypochlorite solution is available at PHC, make dilution with water as 1:10 to give 0.5% chlorine solution.
- Weekly cleaning of OT by washing & using disinfectant is a must.

6. Fumigation

For purpose of fumigation formaldehyde gas is used.

6.1. Formaldehyde gas

Formaldehyde gas can be generated by two methods.

- Commercial formalin is boiled in water (Dose is 500 ml. formalin + 1 liter water for 1000 cubic feet) with help of fumigator. (Most commonly used method).
- Alternatively Potassium Permanganate (170 to 200 grams is poured in Formalin (500 ml) for 1000 cubic feet (length × breadth × height) of OT space. Person should immediately come out of OT after pouring potassium permanganate in formalin.

6.2. Procedure for fumigation

- Fumigation should be done weekly. Depending on load of cases it may be done frequently & ideally before every operation day.
- Wash OT thoroughly, make walls and equipment inside wet as formaldehyde acts more effectively on wet surface.
- Close doors & windows tightly, close exhaust fan outlet from outside OT.
- Keep OT closed for at least 12 hours after starting fumigation.

- HA(F) should be made responsible for OT fumigation. Do not give this responsibility to class IV servant.
- Enter all details of fumigation on same day in Fumigation register.
- Note down area of OT, dose of formalin required and name of responsible person on first page of Fumigation register and also on doors of OT.

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6. LABORATORY AT PHC

It is important to develop facilities for carrying out basic laboratory tests in PHC which is useful for diagnosis and follow up of patient. Laboratory technician attached to PHC (from Malaria, tuberculosis or any other departments) should perform basic laboratory tests. Following basic laboratory tests should be performed at PHC.

- Hemoglobin estimation by Sahli's method (All PHCs).
- Urine examination for Albumin and Sugar (All PHCs)
- Peripheral Blood Smear for Malaria parasite (All PHCs)
- Sputum smear preparation and staining (In DOTS microscopy center)

1. Hemoglobin estimation by Sahli's method

Hemoglobin estimation is performed for all antenatal mothers, tubectomy cases and suspected anemic patients.

1.1. Procedure

- Take 0.1 N HCl up to mark 20 in a glass tube from Sahli's apparatus.
- Clean ring finger of left hand of patient with spirit and prick with sterile disposable lancet. Wipe out first drop of blood and suck blood in Sahli's pipette up to mark 02 ml.
- Put this blood in glass tube of Sahli's apparatus. Mix HCl and blood well with pipette and wait for 8 minutes.
- Add distilled water or HCl, drop by drop in glass tube and match color in glass tube with color indicator plate on hemoglobinometer.
- Take reading on glass tube when color from test tube matches with color on hemoglobinometer. This reading indicates Hb as gm %. While taking reading, Sahli's apparatus should be at eye level, so that reading will be correct.

1.2. Diagnosis of anemia

World Health Organization has given cut off points for anemia diagnosis as indicated below-

Male:	13 gm.
Females:	12 gm.
Pregnant women:	11 gm.
Children:	12 gm.

1.3. Action to be taken by MO

- **If** ANC is anemic start with therapeutic dose of IFA tablets.

- If she has severe anemia & is in third trimester, refer her for delivery at hospital where blood transfusion facility is available.
- In tubectomy client, if she is anemic, prescribe IFA tablets and call after 1 month.

2. Urine examination

Urine examination for albumin & sugar is indicated for all ANC and tubectomy cases. Test can be performed by using uristix or by using laboratory reagents.

2.1. Urine examination for Albumin

2.1.1 Procedure and interpretation of results

- Take urine in a test tube up to two third capacity.
 - Warm upper part of test tube on a spirit lamp. Do not boil. If warmed part of urine become turbid, add 2-3 drops of 3% glacial acetic acid & reheat.
- Look for turbidity in test tube after reheating. Interpret results as follows -

Table 7 : Interpretation of urine examination results

Observation	Interpretation	Albumin concentration
No turbidity.	Negative	No albumin
Cloudiness or ring can just be seen on black background.	Very slight trace (+ or -)	Albumin 0.01% or less.
Cloud distinct but not granular. No definite flocculation or ring is sufficiently definite to be seen without a black background.	Slight trace (+)	Albumin 0.01 to 0.05%
Cloud is distinct & granular without definite flocculation. Ring is dense but not fully opaque when viewed from above.	Moderate trace (++)	Albumin 0.05 to 0.2%.
Cloud is dense with marked flocculation or ring is heavy, opaque & sometimes curd.	Heavy cloud (+++)	Albumin 0.2 to 0.5%.
Heavy precipitant on boiling. Solid or very dense ring.	Very heavy cloud (++++)	Albumin 0.5-3%
Solid formation after boiling	Albumin boils solid.	Albumin 3%

2.1.2. Actions to be taken by MO

- If albumin is present in urine of ANC, she is a high risk case. Check, whether she has high blood pressure and signs of pre eclampsia. Regular follow up of such cases is essential.
- If tubectomy case has albumin, she will have to be investigated for cause of proteinuria. Do not perform tubectomy. Refer her to higher centre.

2.2. Urine examination for sugar (Benedict test)

Urine sugar estimation is done at PHC for routine check up of antenatal mothers, and as a pre operative investigation of tubectomy cases.

2.2.1. Procedure and interpretation of results

- Take 5 ml. of Benedict's solution in a test tube, add 8-10 drops of urine and boil on spirit lamp.
- Allow it to cool to room temperature and interpret results as follows according to change in color.

Table 8 : Interpretation of Benedicts test results

Color change	Sugar
No change	No sugar
Greenish blue (+/-)	Traces
Green (+)	0.5%
Greenish brown (+ +)	1%
Yellow (+ + +)	1.5%
Brick red (+ + + +)	2%

2.2.2. Actions to be taken by MO

- If urine examination of ANC is positive for sugar, she is a

high risk case and refer her to higher centre. Regular follow up is essential.

- If urine examination of tubectomy case is positive for sugar-
 - § If it is puerperal ligation (within 6 weeks after delivery) urine sugar may be due to physiological lactosuria. Call mother after one month and repeat the test. If urine is negative for sugar, tubectomy can be performed provided there are no other contraindications. If urine is still positive for sugar, refer case to specialist as this could be diabetes.
 - § If it is interval ligation (after six weeks from delivery) and urine is positive for sugar, refer case to specialist for further investigations as this could be diabetes.

3. Blood smear for Malarial Parasite

- Blood smear is collected from every patient of fever to confirm or exclude malaria.
- For taking blood smear sterilized pricking needle or disposable lancet should be used.

3.1. Procedure

- B.S. is taken from tip of ring finger of left hand. In case of newborn babies or small children sample can be collected from heel or tip of big toe.
- Hold finger. Apply gentle pressure, sterilize by using spirit swab. Allow spirit to dry.
- Prick tip of finger. Blood will come out, wipe out first drop of blood. Next drop is placed in the middle of slide to prepare thin smear.
- Take another slide. Use it as a spreader. Keep edge of that

slide on drop of blood & allow blood to run along its edge.

- Push spreader along with slide away from drop, keeping spreader at an angle of 45°. Spreader should be in even contact with surface of slide till blood is being spread. Thin smear prepared should be tongue shaped.
- To prepare thick smear – After collecting drop to prepare thin smear, apply further pressure to express more blood & collect 2 to 3 large drops on slide about 1 cm. from previous drop.
- Using corner of spreader join these 2-3 drops & make a round of diameter 1 cm. by circular movements of corner of spreader. Allow the BS to dry.
- Slide number is written by using pencil on thick smear.
- Staining – Method is known as JSB staining.

4. Sputum smear preparation & staining

Sputum smear is collected from suspected patients of tuberculosis (h/o cough for more than 3 weeks).

4.1. Preparation of sputum smear

- Sputum cups have been provided for collection of sample.
- Ask patient to stand facing wall, keeping hands on waist, take deep breath, cough out sputum and spit in cup. Cup should be immediately capped after sputum collection.
- Take a glass slide. Yellowish, sticky part of sputum should be spread on glass slide with the help of stick.
- Make round of size of coin of one paisa with the help of stick.
- **Allow** it to dry & then fix on spirit lamp by gentle warming.

4.2. Staining

Staining method is Ziehl Nelson staining.

- Cover sputum smear with carbol fuchsin by pouring it on slide and warm slide with the help of spirit lamp until steam rises from staining solution. Do not boil.
- Keep this for 5 minutes and repeat procedure again.
- Wash with water and decolourise with 20% Sulphuric acid till colorless.
- Counter stain with methylene blue for one minute, wash with water and dry.
- Examine under oil immersion.

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7. JEEVANDAYEE AROGYA YOJANA

Jeevandai Arogya Yojna, started on 11 October 1997 is social security scheme in which financial support is given to below poverty line patients. MO PHC has no direct role in implementing Jeevandai Arogya yojana scheme, however, s/he should know diseases covered, criteria for beneficiary selection and procedure to guide needy poor patients properly.

1. Objective

To provide super specialty services to economically

backward patients.

2. Important aspects of scheme

2.1. Diseases covered

- Heart disease
- Kidney disease
- Brain & nervous system disorders

2.2. Benefit given

Amount of Rs. 70,000 is sanctioned for surgery of patients below poverty line for diseases specified under scheme.

2.3. Eligibility criteria

- Patient should be Below Poverty Line i.e. having 'Yellow Ration Card' or certificate of income from Tehsildar of respective place.
- Patient must be resident of Maharashtra state.
- Patient should bring estimated cost certificate from identified hospital.

2.4. Hospitals

Under scheme, government publishes list of identified hospitals & treatment has to be received from these identified hospitals only.

3. Procedure

- Patient of above-mentioned diseases fulfilling criteria of BPL status and residence status is first examined at District Hospital by Civil Surgeon & specialist.
- After this preliminary examination patient is referred to regional committee headed by Deputy Director Health Services, i/c circle for sanction of amount.
- The regional level committee scrutinizes application and refers patient to appropriate hospital, which is identified and recognized for this purpose.

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8. INFECTION CONTROL MEASURES

Problem of infections acquired in health care setting is becoming serious day by day due to spread of HIV, Hepatitis-B and antibiotic resistant microorganisms.

Infection spread in PHC settings is possible in following ways

- From one patient to another patient during health care delivery (most common)
- From patient to health care worker (Doctors, nurses, laboratory technicians, assistants)
- From health care worker to patient (Rare)

Patient to patient spread of infection is mainly due to improper sterilization of instrument, equipment, dressing material, etc. ignoring aseptic precautions during procedures and overall lack of cleanliness in PHC.

Risk of transmission of blood borne viruses to health care workers is 0.05 – 0.4 % for percutaneous exposure of HIV, 9 - 30 % for hepatitis B & 3 -10% for hepatitis C.

1. Principles of infection control

- **Rationalization of Patient admission:** Do not admit patient in PHC unless it is absolutely necessary. Patient should be discharged as early as possible.
Patients with communicable diseases such as cholera should be isolated.
- **Proper disinfection procedure:** Cleaning and sterilisation of equipment, instrument and linen helps to reduce risk of infection.
- **Disposal of hazardous Hospital waste:** Proper waste disposal reduces risk of infection among patients, health care providers and community.
- **Training of health care provider:** Health care providers need to be trained regarding infection control measures to be adopted in health facility.

2. Standard bio-safety guidelines

- Wash hands with soap and water before and after all patient or specimen contacts and after work is finished. If gloves are worn, wash hands with soap and water before use and after removing gloves.
- Wear protective material (e.g. gloves, masks, goggles, gown, etc.) during procedures, when handling infectious materials or in case of potential contact with blood and other body fluids.
- Discard gloves whenever they are contaminated or perforated. Wash your hands, and put on new gloves. Do not leave workplace or walk around while wearing gloves.
- Disinfect or sterilize all instrument, equipment and material used for patients as per standard guidelines.
- Handle instruments and equipments carefully. Avoid unnecessary contact with sharp instrument. Place used syringes immediately in nearby impermeable container; DO NOT recap or manipulate needle in any way.
- Wear protective devices. Handle all linen soiled with blood and/or body secretions as potentially infectious.
- Hospital waste management is equally important. Carefully follow procedure of hospital waste management in your PHC.

3. Important infection control measures

Following important measures should be carried out for infection control in PHC.

- Hand washing
- Use of protective material
- Disinfection
- Sterilization
- Safe injection and blood safety practices
- Decontamination of laundry and spills
- Safe laboratory practices
- Hospital waste management

All these important measures are described in detail below except hospital waste management, which is described in separate chapter.

3.1. Hand washing and decontamination

Pathogenic organisms from infected patients are carried on hands of staff and represent an important mode of spread of infection in hospital. Hand washing is the most effective and simple method for preventing transfer of infection.

Following are methods of hand washing

3.1.1. Social hand washing

In social hand washing, vigorous and mechanical friction is applied to all surfaces of hands using plain soap and water for at least 10 seconds using a defined technique. Hands are rinsed under a stream of water and dried with paper towel. In absence of running water, a clean bowl of water should be used for hand-washing purposes.

Social hand washing is indicated -

- Before handling food, eating and feeding patient.
- After visiting toilet.
- Before and after nursing patient (e.g. bathing, bed making)

3.1.2. Hygienic hand washing

Antiseptic detergent preparation is used in hygienic hand washing. Wet hands with clean (running) water, apply cleanser (3-5ml) or soap and wash hands for 10-15 seconds and then apply antiseptic solution over all hand surfaces, rinse and dry.

Hygienic hand washing is indicated -

- Before performing non-invasive procedures.
- **Before** caring for susceptible patients (Immunocompromised.)
- Before and after use of gloves.
- After contact with blood secretions or following situations in which microbial contamination is likely to occur.

Agents used are, 4% chlorhexidine gluconate, Povidone- iodine, 0.5% glycerol etc.

3.1.3. Surgical hand washing

Aim of surgical hand washing is to remove and kill transient flora and to decrease resident organisms to prevent risk of wound contamination when gloves are damaged. Agents are same as for hygienic hand washing. A defined technique for decontamination of hands is of greater importance than detergent used.

Surgical hand washing is done before surgical procedures or interventions. In surgical hand-washing, scrubbing of hands and fingernails is very crucial. Hands should be scrubbed at least twice with warm water. Hands should be washed up to elbow. After washing, water should not drip down from unwashed area of arm to washed hands. To assure this, hands are kept in upright position folded at elbow. After drying, surgeon must put on gown and gloves.

3.2. Use of protective material

3.2.1. Gloves

- Ideally gloves must be disposable. Routinely single gloves are sufficient, however double gloves must be used in high- risk patients.
- Wash hands thoroughly with soap before wearing gloves

and after degloving.

- Check gloves for gross defects every time you wear them. Cover cuts or wounds in hand with waterproof band-aid before gloving.
- Discard gloves at least suspicion of puncture. Change gloves between two procedures.
- Do not touch areas not directly involved in procedure.

3.2.2. Masks

- Masks are mandatory to prevent airborne infection from/to patients.

3.2.4. Type of exposure & protective barrier

Table - 9 : Exposure and protective barriers

Type of exposure	Protective barriers	Examples
Low risk: Intact skin, no visible blood	Gloves helpful but not essential	Injections, minor wound dressing
Medium risk: Probable contact with blood. Splashing unlikely	Gloves, gowns and apron	Vaginal examination, insertion or removal of intravenous cannula, handling of laboratory specimens, large open wound dressing, venepuncture, spill of blood
High risk: Probable contact with blood, splashing, uncontrolled bleeding	Gloves, waterproof gown or apron, eye wear, mask	Vaginal delivery, major surgical procedures particularly in orthopedic surgery and oral surgery

3.3. Disinfection

Disinfection and sterilization are necessary to prevent cross-infection from skin, equipment and surfaces used in all hospitals. Disinfection is used to reduce number of microorganisms on an object or surface, although disinfectant used rarely destroys all microorganisms or spores that come into contact with. Decontamination renders an article safe for handling.

3.3.1. Rules for use of disinfectants

- Carefully read and follow manufacturer's instruction before using any new disinfectant.
- Check expiry date of solution.
- Ensure that optimum dilution is used.
- Always wash and clean articles before disinfection.
- Do not refill disinfectant containers without sterilizing container between each use. Topping up is not allowed.
- Do not use empty containers to store any other solutions. This is dangerous and must be discouraged. Chemicals can be harmful when used in wrong situation.
- Disinfectant should not be used to sterilize instruments or equipment (unless specified in disinfection policy, e.g. endoscopes).

- Masks should be used by health staff involved in operative procedure
- Masks should be disinfected with liquid bleach before washing.

3.2.3. Plastic aprons

Wear plastic aprons outside clothing to protect against splashes, can also be worn beneath gowns when heavy contamination is suspected e.g. while conducting delivery.

- Open containers of disinfectant should not be used, as there is a serious risk of contamination with multiple antibiotic-resistant bacteria such as *Pseudomonas* species and spores.
- When disinfectants are indicated for use on surfaces, they should be used for wiping.

3.3.2. Approved disinfectants

Povidone iodine : An intermediate level disinfectant can be used as a (1% available iodine) surface disinfectant for instrument tray, headrest, hand piece etc.

Sodium hypochlorite 1% is a low-level disinfectant and 5% acts as strong disinfectant even in presence of debris. However users are cautioned that it can cause rusting of many instruments and has an offensive residual odour.

Glutaraldehyde : When used for sharp instruments, 2% glutaraldehyde provides high-level disinfection, which approximates sterilization. Its strong odour precludes its use as a surface disinfectant. Glutaraldehyde can be reused.

Right choice of disinfectant can be made depending on need. Objects must be soaked/wetted/immersed (as is possible) in disinfectant.

Table -10 : Disinfection of contaminated articles to prevent spread of disease

Sr.	Articles	Method of disinfection
1	Sputum	All sputum cups after examination should be submerged in a bucket containing 5% hypochlorite solution or 5% phenol solution overnight & then burnt in a pit / incinerator.
2	Stools, urine, vomitus, bed pans, urine bottles	Add five percent phenol or concentrated chlorine solution and keep for 30 minutes. Dispose off by burial. Wash bedpans with boiling water.
3	Clothes, bed	Dip for 30 minutes in five percent phenol linen and then wash

4	Utensils, glasses and cutlery	Dip in five percent hypochlorite solution for five minutes and then clean with detergent and water as usual.
5	Belongings of patients	Inexpensive items should be burned, clothes bed linen, etc. should be disinfected as described above. Costly items of patient can be swabbed with 1:1000 cetrimide solution and allowed to dry.
6	Mattresses/Pillows	Cover with water-impermeable sheets. Wash cover with detergent solution and dry. Disinfect with phenol when necessary
7	Trolley tops	Wipe with warm water + detergent to remove dust and keep dry.

3.3.3. Chlorine releasing compounds as disinfectants

Chlorine releasing compounds (TCL and liquid chlorine) are effective against majority of the bacteria and viruses including HIV virus. However these compounds have to be diluted for making appropriate concentration. Household bleach (TCL) contains 30% of available chlorine and Sodium Hypochlorite (Liquid chlorine) contains 5% available chlorine. When using chlorine releasing compounds, minimum contact time of 30 minutes is recommended.

3.3.4. Other chemical disinfectants effective in inactivating HIV

Ethanol 70%	- 3-5 minute
2-propanol 70 % (isopropyl alcohol)	- 3-5 minute
Povidone iodine 2%	- 15 minute.
Formalin 4%	- 30 minute.
Gluteraldehyde 2% (CIDEX)	- 30 minute.
Hydrogen Peroxide 6%	- 30 minute.

3.4. Sterilization

Sterilization (absolute term) is used to remove all living microorganisms, including spores, from an object by highly effective chemicals or heat sterilization.

Heat sterilization is the cheapest, safest and most effective method of sterilization. It could be dry heat such as flame or wet heat such as autoclaving. Proper sterilization ensures protection against all viruses and bacteria including spores. Instruments should be soaked in disinfectant for 30 minutes, cleaned and then sterilized by autoclaving.

3.4.1. Important aspects of sterilization at PHC

Following are guidelines for sterilization by autoclaving-

- Needles, syringes especially for immunisation, instruments for tubectomy, dressing material, linen, and equipments for delivery should be autoclaved.
- Give responsibility of autoclaving to Health Assistant (Female). Responsibility of autoclaving should not be given to a class IV servant.
- There should be a clock in room where autoclaving is done, so that time required for autoclaving can be monitored.
- Signoloc register has to be maintained at PHC. HA (F) should enter sterilization details daily and MO should check register during morning round. Signoloc register includes following information:

Table 11 : Signoloc register format

Date	Material	Time of		Signoloc strips		Person attended		Signature of MO
		Starting	Completion	Outer	Inner	Name	Signature	

3.4.2. Packing the drum for autoclaving

- Wrap material to be autoclaved in loose flat bundles to allow easy penetration of steam.
- For autoclaving of needles & syringes, wrap each set of piston & barrel in gauze after confirming that, barrel & piston are in pair.
- Do not pack drum tightly; leave free spaces between objects.
- One signoloc strip should be kept inside drum & other outside of drum.

3.4.3. Procedure of autoclaving

- Fill up water up to mark and place autoclave on stove.
- Load drum with material to be autoclaved. Open side

holes of drum and put loaded drum in autoclave.

- Put lid of autoclave on body and tighten diagonally opposite screws simultaneously till the lid is airtight.
- Start gas or stove. Pressure starts rising. Keep valve open till air inside autoclave is released out and steam starts coming out from autoclave at least for 2 – 3 minutes. This is important as if air remains inside, penetrating power of steam decreases and optimum effect is not achieved.
- Close valve. Pressure starts rising as is shown in pressure meter. When pressure reaches 15 lb, note time and let pressure remain for 20-30 minutes depending upon type of articles to be autoclaved (e.g. 20 minutes for gloves, needles, syringes and 30 minutes for linen, cotton and gauze).

- After stipulated time, put off gas and let off the steam.
- Remove lid by loosening screws of lid. Remove dressing drum. Check outer signoloc strips for color change indicating successful sterilization. If there is no color change, repeat procedure carefully.
- Close side holes of drum & lock it. Complete signoloc register.

3.4.4. Confirmation of completion of autoclaving

Signoloc strips, which are green before autoclaving become gray, or black, which indicates that, autoclaving is successfully completed. Both inner & outer strips should become gray or black.

3.5. Safe injection and blood safety practices

Avoiding unnecessary injections, suturing and blood transfusions for reducing infections through blood-borne route. Injections should be used when absolutely indicated. As a part of national policy, injection of antibiotic should be avoided if an equally effective oral preparation is available or if one injection can be given instead of multiple doses. Adequate number of sterile syringes or needles must be arranged. There is no need to wear gloves when giving injections.

3.5.1. Good practice for safe handling of sharps

- Never pass used sharp instruments from one person to another by hand, always use tray.
- During exposure-prone procedure, risk of injury should be minimized by ensuring that surgeon has best possible visibility, e.g. by positioning patient, adjusting good light source and controlling bleeding.
- Protect fingers from injury by using forceps instead of fingers for guiding suturing.
- Never recap, bend or break disposable needles.
- Place used needles and syringes in a rigid container until ready for disposal.
- Locate sharps disposal containers close to point of use, e.g. in injection room, on medicine trolley and in treatment room etc.
- Never place used sharps in other waste containers, use puncture-resistant container.
- Keep all sharps and sharps disposal containers out of reach of children.
- Prevent overflow by sending sharps disposal containers for decontamination or incineration when three - quarters full.

3.6. Decontamination of laundry, mattresses and spills

3.6.1. Laundry

Contaminated linen must be disinfected before giving to dhobi for washing. Disinfection can be done by chemical disinfectant or by boiling or autoclaving at low pressure of steam. Both 'clean (less contaminated)' and 'contaminated' linen should be transported to laundry separately in thick polythene bags of

different colors.

3.6.2. Decontamination and washing of mattresses

It is advisable to cover all mattresses with waterproof synthetic material like Rexene or Plastic. This makes disinfection of mattresses easier. Washing can be done manually.

3.6.3. Management of spills

- Spills on floor, of infected or potentially infected material should be covered with paper towel/blotting paper/newspaper.
- Pour 1% Sodium-hypochlorite solution on and around spill area and keep as it is for 10 minutes.
- After 10 minutes, paper should be removed with gloved hands and area wiped out.

3.7. Guidelines for collection and transportation of blood samples

PHC staff has to collect blood sample for tubectomy patients, during epidemic or routinely for investigations. Following precautions should be taken while collecting blood sample-

- Use gloves and take special care if there are cuts or scratches on hands.
- Take care to avoid contamination of hands and surrounding area with blood.
- Use only disposable/autoclaved syringes and needles.
- Use 70% ethanol or isopropyl alcohol swabs/sponges for cleaning site of needle puncture.
- Use tourniquet above puncture site and thick dressing pad or absorbent cotton below forearm when drawing blood.
- Do not remove needles from syringe after collecting blood sample. Place them as it is in puncture resistant container with disinfectant.
- Seal specimen containers securely. Wipe off exterior of container free of any blood with a disinfectant. Place vials in small plastic bags, which should be appropriately tied.
- Wash hands following completion of blood collection.
- In event of needle stick or other skin puncture wound, wash thoroughly with soap and water and let blood flow freely. Then apply Tincture of iodine.
- Label all specimens carefully without soiling test request forms.
- Decontaminate by autoclaving all potentially contaminated material used in laboratory before disposal or discard in a bucket containing sodium hypochlorite solution.

All Clinical specimens should be regarded as potentially infectious and should be transferred to laboratory in spill proof screw capped tubes. Special precautions should be taken for blood suspected to be from patients of Hepatitis or AIDS, which should be transported in leak proof polythene bags.

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9. MANAGEMENT OF OCCUPATIONAL EXPOSURE & POST EXPOSURE PROPHYLAXIS OF HIV

Most exposures do not result in infection. Risk of infection varies with type of exposure, amount of blood involved in exposure, amount of virus in patient's blood at the time of exposure & whether post exposure prophylaxis (PEP) was taken within recommended time.

Prevention is mainstay of strategy to avoid occupational exposure to blood/body fluids. All biosafety precautions must be practiced at all times for all patients' blood and body fluids while providing medical services.

An 'exposure' that may place health staff at risk of HIV infection is defined as a percutaneous injury (e.g.-needle-stick or cut with a sharp instrument), contact of mucous membrane or non-intact skin (e.g.-when exposed skin is chapped, abraded,

or afflicted with dermatitis), or contact with intact skin when duration of contact is prolonged (e.g.-several minutes or more) with blood or other body fluids.

HIV post exposure prophylaxis (PEP) may be recommended and it should be started as soon as possible, preferably within a few hours. Initiating treatment after 72 hours of exposure is less effective.

Decision to start PEP is made on the basis of degree of exposure to HIV and HIV status of source from which exposure/infection has occurred.

When any of the PHC staff is exposed to infective material in the form described above s/he should immediately contact voluntary Counselling and Testing Center of District Hospital. His/her visit & exposure will be explored and arrangement & counselling, HIV testing, ART will be made by the concerned VCTC.

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SECTION - IV

COMMUNICABLE DISEASES

1. CONTROL OF COMMUNICABLE DISEASES

Communicable diseases, account for majority of illnesses and deaths in rural areas and therefore MO PHC should give high priority to these diseases. Different types of microorganisms, which are transmitted directly or indirectly, from infected person or animal to a susceptible host, cause these diseases.

Important communicable diseases

Water borne diseases: - Cholera, Gastroenteritis, Dysentery, Typhoid fever, Viral hepatitis, Poliomyelitis

Vector borne diseases: - Malaria, Dengue fever, Japanese Encephalitis, Filariasis

Airborne diseases: - Tuberculosis, Leprosy, Measles, Mumps, Pertussis

Sexually transmitted diseases :- RTI/STI including HIV / AIDS

Zoonotic diseases:- Leptospirosis, Plague, Rabies

Helmenthic infections Ascariasis, Ankylostomiasis, etc.

Number of factors decide establishment of disease (infection) in host, e.g. body resistance, health and nutritional status of host, virulence and toxicity of pathogenic organism, measures adopted in prevention of spread of disease, etc.

In order to control and prevent infectious diseases, we should know source of infection, mode of spread of disease and susceptible at risk persons of acquiring the disease. Based on this knowledge, following control measures are universally recommended.

1. Measures directed at source

These measures include detection of source of infection and methods for keeping pathogenic organisms confined to source or destroying pathogen, so that no harm results from them.

1.1. Early detection and prompt treatment (EDPT)

This is most important activity which reduces the spread of disease in epidemic form. Majority of infectious diseases originate from infected person (person who harbours pathogenic organisms). This person may be in incubation period, may have mild or severe illness, or may be carrier who is outwardly healthy. It is difficult to identify person in incubation period and healthy carriers, but those who are ill can be detected at earliest by efficient disease surveillance system. Such cases are detected when they attend hospital for treatment (passive surveillance) or during house-to-house survey by MPW (active surveillance). Prompt treatment of detected cases kills organisms which helps to prevent spread of infection to others in community.

1.2. Elimination of zoonotic source

Some diseases originate from animals, which are called as zoonotic diseases. Such animals can be identified and treated, immunized or killed (e.g. dogs in rabies, cattle in leptospirosis).

1.3. Isolation of infectious cases

Isolation of patients of infectious disease is another method for controlling source of infection. This is because patient of infectious disease discharge microorganisms through gastrointestinal or respiratory route or through direct contact including sexual contact. Isolation is effective if patient is isolated during entire infectious period.

2. Measures for prevention of transmission

Microorganisms can be transmitted from source of infection to susceptible host in many ways.

- Some diseases spread through respiratory route via droplets (air borne infection).
- In some diseases microorganisms are excreted in stools or urine.
- Disease causing organisms from stool or urine contaminate soil and enter susceptible host through broken skin or mucus membrane (e.g. worm infestations, leptospirosis)
- Some infections spread through sexual contact and are called as sexually transmitted infections (STIs)
- Medical instruments, syringes, needles, etc. get contaminated with microorganisms. If not properly sterilized they may lead to transmission of serious diseases like hepatitis and AIDS.
- Diseases like malaria, dengue fever, filariasis, JE are transmitted by insects.

Transmission of microorganism from source to susceptible host can be prevented by -

- Personal hygiene including safe handling of water, hand washing, cleanliness
- **Daily** chlorination of water
- Use of sanitary latrine, sanitary disposal of excreta and solid waste.
- Protecting food from flies and dust, avoid touching food without washing hands
- Control of houseflies, mosquitoes and other insects by keeping surrounding clean and preventing accumulation of water
- Other vector control measures like anti-adult/anti-larval measures and use of personal protective devices.
- Disinfection of contaminated articles of patients.
- Safe sex
- Good ventilation

3. Measures to protect susceptible person

Every person has natural defense mechanism and resistance against microorganisms. Resistance against infection can be further enhanced by –

- Enhancing immunity of body by good nutrition, exercise and better living conditions.
- Immunization of susceptible host at right age, in appropriate doses. Temporary protection can be provided

by injecting antiserum specific to infection e.g. rabies, viral hepatitis, tetanus, diphtheria, etc.

- Protection is also possible by taking prophylactic treatment (chemoprophylaxis) e.g. chloroquine against malaria, furazolidone against cholera, doxycycline against leptospirosis.

Important definitions used in epidemiology are given in annex

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2. DISEASE SURVEILLANCE

Communicable diseases contribute to a significant disease burden and are a major cause of morbidity and mortality in the state. Many of these diseases are epidemic prone.

Communicable disease surveillance is a basic tool for assessing the problem of communicable diseases. It can define the behavior of disease in populations. On this basis the magnitude of the public health problem caused by particular disease can be assessed and an effective strategy can be developed.

The importance of communicable disease surveillance is evident with surveillance of acute flaccid paralysis. Currently in polio eradication, acute flaccid paralysis (AFP) surveillance has shown the areas of wild poliovirus transmission. On the basis of this, intensive immunization programme has been started which has resulted into drastic reduction in polio cases.

1. Definition

Disease Surveillance can be defined as a continuous scrutiny of all aspects of occurrence and spread of a disease pertaining to effective control. Disease surveillance helps to identify impending epidemic in the early stage for early action. It is data collection for action. Surveillance data is required for planning disease control activities and also for evaluating impact.

Course of an outbreak is dependent on how early the outbreak is identified and how effectively specific control measures are applied. Epidemiological impact of outbreak control measures can be expected to be significant only if these measures are applied earlier and in time. Measures taken after the outbreak that has already reached a peak are wastage of resources.

2. Diseases included for surveillance

Diseases, which have potential of causing outbreaks and diseases with high morbidity/mortality, are included in surveillance activity. For PHCs, following diseases have been included for routine surveillance in our state.

Table - 1: List of diseases included for surveillance

1	Cholera	9	Acute Flaccid Paralysis
2	Gastroenteritis	10	Tetanus including Neo Natal Tetanus (NNT)
3	Acute Dysentery	11	Pertussis
4	Viral hepatitis	12	Measles
5	Enteric fever	13	Diphtheria
6	Malaria	14	Leptospirosis
7	Dengue fever/ DHF/DSS	15	Plague
8	Acute Viral Encephalitis Syndrome	16	Unusual Event

3. Disease surveillance activities in PHC -

Following aspects are important for smooth and effective implementation of disease surveillance activities in PHC -

- Knowledge about standard case definitions of all the diseases under surveillance.
- Early detection of cases through effective surveillance.
- Compilation and analysis of surveillance data.
- Timely and appropriate action taken to avert the impending epidemic.

3.1. Standard case definitions

Standard case definitions are important to ensure identification of all cases by village level workers, paramedical staff, Medical Officer, Private Practitioners, etc. so that there is uniformity in reporting and all reporting units use the same criteria for reporting cases.

Each case identified under surveillance is classified in one of the three groups as follows -

- **Suspect** - Diagnosis on the basis of history and symptoms by paramedical personnel.
- **Probable** - Diagnosis on typical history and clinical examination by a Doctor (MO).
- **Confirmed** - Clinical diagnosis by doctor (MO) and positive laboratory diagnosis.

Standard case definitions to be used by PHC for disease surveillance are as follows-

Table - 2 : Standard case definitions of diseases under surveillance

Sr.	Disease	Suspect	Probable	Confirmed
1	Cholera	Acute watery diarrhoea with dehydration in > 5 years age group	Severe dehydration or death from acute watery diarrhoea in a patient 5 years of age or more	V. Cholerae 01 or 0139 isolated from stool samples of patient
2	Viral Hepatitis	Yellow discoloration of eyes and urine.	Fever followed by jaundice, anorexia, malaise, tender hepatomegaly, SGOT /SGPT > 8 times S.Bilirubin > 2 mg	Virus isolation or four fold rise in antibody titre for any type of hepatitis virus

3	Enteric fever	Continuous fever more than 7 days	Fever more than 7 days, Relative bradycardia, Tender splenomegaly, Relative leucopenia, Widal test positive.	Blood culture: Isolation of S. Typhi, Widal test shows four fold rise in antibody titre
4	Malaria	Acute fever with chills less than 7 days duration	Fever with classical hot and cold stages Hepatospleno-megaly	Microscopic confirmation of Plasmodium species.
5	Dengue Fever	Acute high fever < 7 days, severe headache severe body ache or joint pains. Pain behind eyes	Suspected case of Dengue Fever High Aedes density Peripheral smear negative for Malaria Parasite	Isolation of virus from blood, or detection of IgM in single serum sample or four fold rise of IgG in paired sera
6	Dengue Hemorrhagic fever	Symptoms of DF plus bleeding from any orifices	Suspected case plus positive tourniquet test	Thrombocytopenia < 1,00,000/ mm ³ Haematocrit increase by 20%
7	Acute Encephalitis Syndrome	High fever, Decrease in level of consciousness, Convulsions	Suspected case of AES Meningeal irritation, neurological deficit, presence of amplifying host (pig) in village	Four fold rise in IgG antibody titre, Detection of IgM antibodies
8	Leptospirosis	High fever, Jaundice, Edema Breathlessness	Suspected case plus hepatic / renal failure, s/o pulmonary edema, bleeding tendencies, Positive Dry Dot Test.	Isolation of leptospira from urine or blood, Detection of IgM antibodies, MAT Test Positive
9	Plague	History of rat fall. Sudden onset of fever, chills, weakness, headache plus - Bubonic - Intense pain with tender swelling in groin, axilla. Pneumonic - Cough, chest pain and haemoptysis Septicemic - High fever followed by sudden death	Suspected case plus Bubonic - Very tender swollen lymph nodes in groin and axilla. Pneumonic - Signs of pneumonia, consolidation Septicemic - Signs of septicemia	Laboratory isolation of plague bacilli
10	Pertussis	Cough more than 2 weeks, Excessive cough bouts and vomiting after bout of cough. Typical whoop in older children	Prolonged coughing followed by apnea, cyanosis or vomiting, Sub-conjunctival hemorrhage, Classical inspiratory whoop, WBC count 15000/cmm or more, predominantly lymphocytes	Positive culture for Bordetella Pertussis
11	Measles	Fever with generalized blotchy rash, cough, running nose, red eyes	Generalized maculo-papular rash 3 or more days, fever 101°C, conjunctivitis, Koplik's spots, cough, sore throat	Isolation of measles virus or detection of IgM antibodies or four fold rise in IgG titre
14	Diphtheria	Sore throat, grayish white membrane in throat	Grayish white membrane in throat, acute Pharyngitis nasopharyngitis, laryngitis diphtheria like bacilli on staining	Isolation of Corynebacterium Diphtheria culture
15	Tetanus	Adult - Difficulty in opening mouth, H/o injury or ear infection, stiffness or convulsions Neonatal tetanus - History of normal suck or cry first two days of life, unable to suck 3-28 days, death of unable to suck child, stiffness or convulsions	Adult - Lock jaw or neck stiffness, trismus, generalized muscle rigidity, clear mind, Convulsions induced by noise, light or slight touch Neonate - Normal suck and cry followed by inability to suck and cry from second day onwards, generalized muscle rigidity	Entirely clinical diagnosis, no laboratory diagnosis
16	Polio-myelitis	Abrupt weakness in one or more limbs within 4 weeks No progress in weakness after 3 days	Suspected plus no sensory loss, absent or diminished deep tendon reflexes, residual paralysis after 60 days	Isolation of wild polio virus from stool sample of case

3.2. Early detection of cases through surveillance

Several methods are used to detect the cases of diseases under surveillance. Important methods used at PHC level are passive surveillance, active surveillance, laboratory surveillance and vector surveillance.

3.2.1. Passive surveillance

Passive surveillance means recording the cases when they are diagnosed while attending OPD or IPD for treatment. As MO PHC diagnoses these cases, they are classified as probable or confirmed cases depending upon clinical examination and laboratory results.

All the Patients diagnosed as having any of the diseases under surveillance must be separately recorded in the Passive Surveillance Register to be filled up by the Medical Officer. Separate pages should be used for each disease. Important information of the diagnosed patient should be noted in the register.

Format for passive surveillance register should be as follows -

Disease Year.....

Sr	Date of reporting	Name of patient	Full address	Age	Sex	Date of onset	Immunization status	Remarks*

* Enter result of lab. investigations and outcome of disease (discharge/referral/death) in remarks column.

3.2.2. Active surveillance

Active surveillance is the responsibility of Multi Purpose Worker (Male). He has to identify cases of diseases under surveillance during his regular home visits, collect information in prescribed format and inform HA or Medical Officer. However MPW (F) should also report cases of diseases under surveillance if she identifies during her regular home visit or during *Arogya seva satra*.

During active surveillance, MPW should collect correct information of symptoms like fever, diarrhoea, cough with expectoration, skin rash, skin patch etc., and arrive to suspected case diagnosis with the help of disease definition chart. Case should not be reported as of particular disease unless examined and diagnosed by MO, except for Cholera, Gastroenteritis, Viral Hepatitis and Malaria. Standard case definition of the diseases under surveillance must be known well to the MPWs and HAs and revision of this should be carried out during MIS meeting every month.

Daily surveillance is also carried out during the outbreak to initiate early treatment to cases, to determine extent of outbreak and to start control measures.

3.2.3. Laboratory surveillance

Laboratory surveillance is important in following areas:

- Regular testing of water samples from all the water sources used for domestic purpose within PHC area to determine the risk of waterborne outbreaks. Medical officer should

personally visit villages with contaminated water samples and advise Gram Panchayat about corrective measures in writing.

- Peripheral blood smear examination of fever patients gives information about whether the patient is suffering from malaria. If PBS is positive for malarial parasite, radical treatment is given to patient. Vector survey and epidemic control measures are started if number of cases is more than usual occurrence.
- The laboratory also plays important role in surveillance of diseases like Viral Hepatitis (virus isolation from stool/serum), dengue fever (virus isolation or antibody demonstration), Cholera (V. Cholera in stool samples), poliomyelitis (isolation of polio virus from stool samples of AFP cases) and Typhoid by isolation of S. Typhi from blood.

3.2.4. Vector surveillance

Vector surveillance is important to monitor the presence and density of vectors of public health importance e.g. Anopheles, Aedes and Culex mosquitoes, Rat flea, etc. Increase in density of insects (e.g. mosquito, flea) should be taken as early warning signals for vector borne disease outbreaks. Following steps should be taken for vector surveillance.

- Periodically check for breeding in permanent breeding places. Advise Gram Panchayat to fill up the ditches or draining the water collections.
- Release guppy fish or apply larvicidal oil if filling or draining of breeding places is not possible.
- When leakages from canal, pipelines are noticed, they should be checked for anopheles breeding.
- Water storage facilities in village like Cement tanks, buried earthen pots (Ranjan), barrels and discarded tins/bottles/tyres should be checked for Aedes breeding.
- If any complaint regarding nuisance of insects is received, visit the place and verify the complaint. If it is associated with health problem in community, request DMO to send entomologist to assist you to identify the vector and initiate control measures.

3.3. Compilation of surveillance data

Disease surveillance data will be collected from multiple sources as follows:

Method	Source of Data
Passive Surveillance	Passive Surveillance registers, OPD and IPD registers, reports from private practitioners.
Active Surveillance	MPW (M/F) diary, HA (M/F) Diary
Laboratory Surveillance	PHC laboratory report, District Public Health laboratory report.

3.3.1. Frequency of compilation / reporting

Disease surveillance data is collected weekly, monthly and in case of epidemics daily till the epidemic is declared as over.

It is the responsibility of Medical officer to develop system for regular reporting.

Following steps are to be taken to ensure smooth reporting.

- Give responsibility of disease surveillance reporting to one HA in PHC. In case of unavailability of HA, pharmacist should prepare the report.
- List all the reporting units in one register (e.g. OPD, IPD, Health workers, Private practitioners etc.). Develop registers at each place of reporting unit. Compilation of figures reported in this register should be done weekly and monthly.
- HA should monitor timely submission of weekly and monthly reports from all reporting units in PHC. In case report is not received on given day or date, this should be promptly brought to the notice of MO.
- Prepare register for compilation of data. For weekly compilation make separate register as given below. For monthly compilation, use MIS compilation register.

Disease: Year of Reporting:

Period: From to

Sr.	Reporting unit	Week number													
		1	2	3	4	5	6	7	—	—	—	—	51	52	
1															
2															
3															

Reporting units should include OPD/IPD of PHC, all MPW (M) and MPW(F) from PHC area, HAs, private practitioners, laboratory technicians etc.

a. Actions to be taken for regular weekly report

- Develop system for receiving reports of all the field staff and private practitioners on every Saturday morning.
- Enter disease wise figures for all reporting units in register. Give separate page for each disease. Addition of figures from all reports will generate the PHC weekly report.
- Analyze the disease wise figures; compare them with reporting of previous week and same week of last year. If you find more than expected figures, locate the area where rise in cases has occurred.
- Visit the place where increase in number of cases is indicated in weekly report. Investigate the reason for rise in cases. If this is indication of impending epidemic, start control measures and prevent the disease to spread in new areas. Inform DHO in detail. Remember main aim of weekly disease surveillance is to recognize the epidemic in early stage.
- Communicate the compiled weekly report to DHO by telephone or post (as decided in the district). Monthly reporting should be done through computerised MIS system.

3.4. Analysis of surveillance data

Medical Officer should analyze the surveillance data of PHC and look for trend of the diseases under surveillance. Following steps should be taken for analysis.

- Make a booklet of 16 large size graph papers. Use one graph paper for each disease.
- Mark 52 weeks on X-axis of graph paper and suitable scale of number of cases on Y-axis. Suitable scale should be decided on the basis of average number of cases reported in one week e.g. for AFP the scale can be 1 case for each cm, for viral hepatitis 5 cases for each cm and for gastroenteritis, 25-50 cases for each cm.
- If weekly data of last five years is available make average for each week and mark in red ink. When these red spots are joined together, the red line indicates usual number of cases in the PHC.
- Indicate number of cases reported in particular week for each disease on the graph of that disease.

3.5. Action on surveillance data

If the line of reported cases in that week crosses the red line then check in which village the cases have increased. Visit the village and investigate the reason for increase. Epidemiology of disease should be kept in mind while investigating the reasons for increase in number of cases of particular disease in the village. eg. search for breeding places in vector borne diseases or investigate for fault in water supply in water borne diseases.

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3. EPIDEMIC INVESTIGATION

Epidemic is public health emergency. When information of epidemic is received, PHC staff should rush to affected village. This is because delay by few hours may result into increase in the number of cases and possibly deaths that could have been prevented with quick action by PHC staff.

The data collected during outbreak must be utilized for improving programme activities and the surveillance system. This helps to strengthen the surveillance system by filling the gaps. The results should be documented in prescribed formats for Primary and final reporting.

1. Two major areas of epidemic investigation and control

- Diagnosis, investigation and management of patients
- Epidemic investigation leading to identification of the cause and extent of epidemic and to start control measures on the basis of findings of investigations.

Activities related to both the areas should be carried out simultaneously and in coordination. MO should divide the PHC staff in two groups. First group will help MO in treatment of patients and collection of laboratory material for diagnosis by opening the isolation ward. Second group will assist medical officer in epidemic investigation and control measures.

2. Why investigate the epidemic

- To ascertain its etiology
- To know high-risk areas and groups
- The data collected is used for taking control measures.
- To prevent occurrence of epidemics in future

Epidemiology of each disease is different. Keep this fact in mind while investigating outbreaks. Symptoms of patient, environmental factors and laboratory report will help in decision-making.

Do not wait for confirmed diagnosis to start control measures.

3. Steps in investigation of epidemic

Take following steps in a given sequence for effective investigation and control of any epidemic.

3.1. Information of epidemic

Information of outbreak is responsibility of local Gram Panchayat (RDD GR. No 1096/1280/07 dated 28 November 1996). Early information of epidemic is very important and has many advantages -

- Patients will get treatment at early stage, due to which there will be less morbidity and mortality.
- Early starting of control measures will slow/stop progress of epidemic to adjacent areas leading to further reduction in morbidity and mortality.
- As epidemic is confined to small area in early stage, it is easier to investigate the epidemic and start control activities in small area.
- Medical officer is expected to do following activities for early information of epidemic:
 - Whenever you are visiting the village, always remind the Sarpanch, Gramsevak and prominent leaders of village about informing either to PHC or to health worker, in case of increase in number of cases of outbreak prone diseases.
 - Try to develop at least two to three informers from each village / wadi / pada to give immediate epidemic information to PHC. Give more attention to remote and small villages. Take the help of Anganwadi worker, depot holder, FTDs, DDCs, Village Link Workers, dai, teachers etc.
 - Patient himself is most important and early source of epidemic information. When any patient of epidemic prone disease attends the OPD, always enquire whether there are more cases of similar symptoms in the village.
 - Request private practitioners in area to inform PHC if they notice unusually more number of cases of similar symptoms attending their hospitals.
 - During the sanitary survey of water supply scheme of village, inform Gram Panchayat in writing about its responsibility regarding information and control measures of natural calamity like epidemic.

3.2. Verification of diagnosis

- On arrival in the village, the first step should be to examine the cases and arrive at probable diagnosis with the help of Standard Case Definition.
- If it is known disease, examination of few cases will help in diagnosis. However for unknown disease, large number of cases may have to be examined to clearly understand the syndrome complex and actual disease.
- Take the help of laboratory facilities. For example, you can immediately examine PBS for malaria in fever outbreak. You should send the samples to District Laboratory for diagnosis of other diseases.

3.3. Confirmation of existence of epidemic

- Once the diagnosis of patient is verified, confirmation of existence of epidemic is essential. Compare the number of reported cases of this disease with the normally expected cases for that village during the same period of year. Normal expectation is decided with the help of weekly disease surveillance record of the disease in same week of last five years or monthly cases for the same month of last five years.
- If this information is not available then following working definition should be used for confirmation of epidemic-
 - Single case of disease, which is eliminated from the state e.g. Guinea worm, Plague, etc.
 - Single case of disease, which is not common in area, e.g. Japanese Encephalitis, Dengue Haemorrhagic Fever, etc.
 - A single case of vaccine preventable disease, e.g. Polio, Diphtheria, Tetanus etc.
 - For commonly occurring water-borne diseases, if number of cases are more than 5 per 1000 population within one incubation period time.
 - Any single death due to any of the diseases under surveillance.

3.4. Reporting to DHO

3.4.1. Immediate report

After confirmation of epidemic immediate report has to be sent to the DHO by telegram, telephone, fax or by special messenger.

Following information should be included in first report.

- Name of the village, population, PHC and Taluka.
- Name or symptom complex of disease (provisional diagnosis)
- Date and time of receiving the information of epidemic.
- Mode of information.
- Date and time of visit of Medical Officer to the village
- Cause of epidemic (if possible)
- Number of cases and deaths.
- Details of each death including name, age, sex, symptom complex, treatment history and cause of death.
- Control measures initiated

- Assistance required from District Health Officer.
 - Expert advice (Visit of RRT)
 - Medicines
 - Manpower

3.4.2. Daily report of epidemic

Daily report has to be sent from the day of first report. It should include number of attacks and deaths on the day of reporting and progressive attacks and deaths. If there is death then name of the death case and probable cause of death.

Detailed death investigation report should be dispatched on the same day by post. The daily report should be sent by telegram, fax or telephone. Continue to send the daily report till the epidemic is officially declared as over.

3.4.3. Primary report of epidemic

Primary report should be submitted to DHO within 3 days of starting of epidemic. There is prescribed form for the primary epidemic reporting (given in annex). It includes information regarding date of starting epidemic, date of report received, visit by MO after reporting, visits of district level officers during epidemic, details about previous visits by health staff and MO, information about water samples during last 3 months, laboratory samples taken and probable cause of epidemic.

3.5. Establishment of treatment facility

Early and correct treatment is important to save the life of patient. This will also help in controlling the epidemic by making the patient noninfectious and preventing transmission of disease. Following activities should be carried out for treatment facility:

- Select suitable place to establish treatment center and isolation ward. Always admit all the cases with severe diarrhoea irrespective of their dehydration status and keep under observation as such cases may go into severe dehydration any time. For diseases like Malaria, Viral hepatitis, Dengue fever etc. treat the patients on OPD basis; admit or refer to Sub-District hospital if any complications are noticed.
- Keep all the required medicines in sufficient stock. If needed, request the DHO for more medicines. Avoid prescribing medicines from outside Medical Stores during epidemic period.
- Give the responsibility of all the medicines required in isolation ward and keeping inventory of stock to one HA (F). If the epidemic is large, then depute pharmacist to affected village for smooth supply of medicines.
- Keep the isolation ward clean. Provide mattresses, mackintosh, etc. to admitted patients. Request the Gram Panchayat for help.
- During the epidemic of diarrhoeal disease, keep one weighing machine ready in isolation ward. Weighing of patient is essential to calculate dose of Ringers lactate for patients with severe dehydration.
- Display charts of symptomatology and treatment schedule of disease of epidemic in isolation ward and temporary OPD, indicating symptoms, laboratory sample collection

and standard management for ready reference to health staff.

- Assign round the clock duties to nurses and other required staff.
- MO should not leave the village till the epidemic is under control.

In addition to providing treatment, health education to the community is important, indicating actions required by community. Give information during home visits, organize Gram Sabha, and display health education material available at major places.

3.6. House to house survey

Once the treatment facility is established, house-to-house survey of affected village and surrounding villages is essential. This will help to get correct idea of extent of epidemic. Health worker should identify patients during house-to-house survey and refer them to temporary treatment facility. Opportunity of house-to-house survey should be utilized to give important health education messages to community.

Planning of house-to-house survey is essential to carry out quick and useful survey. Call quick meeting of all health workers to brief on survey. Follow the steps given below to plan the survey during epidemic.

- Use suspect case definition for the survey. Discuss this definition with the health workers during briefing. Simple and objective criteria should be used in defining the case. Make sure that all the workers have understood the definition.
- Develop survey format. Make Copies of the format and give to the health workers. Following format can be used as guideline for the survey.
- List all the areas of the village including surrounding hamlets. Make map of village which should include all the areas mentioned in list.
- Allot the area among all workers selected for survey. One health worker can survey up to 500 population in one day. Survey should be finished within two days. Show the area of each health worker in the map. If the survey cannot be completed within two days through available PHC staff, request THO/DHO for additional staff.
- Make one HA responsible for collection of reports and immediate compilation daily in the evening.
- Prepare daily report of epidemic on the basis of survey findings and OPD. Cross check the patients, as there may be duplication. Send report to DHO.

3.7. Laboratory investigations

Laboratory investigations depend upon nature of disease, epidemiology and laboratory facilities available in the area. Laboratory samples are to be collected from active patients, carriers, vectors and zoonotic reservoirs.

Following are the general guidelines for Laboratory investigation:

Section - IV : Communicable diseases

Form A: SURVEY INFORMATION

NAME OF VILLAGE :

DATE OF SURVEY :

NAME OF HEALTH WORKER :

M No.	Name of head of family	No. of family members								No. of patients in family
		0-5		6-15		16-55		56+		
		M	F	M	F	M	F	M	F	

Form B: PATIENT INFORMATION

Line listing of cases should be made as below:

Name of PHC :

Name of village :

Date of line listing :

Probable diagnosis :

Sr. No	Name of Patient	Address	Age	Sex	Complaints	Date of onset	Date and Place of treatment if taken	Present condition	Remarks

- Specimen should be collected before administration of specific treatment or antibiotics.
- All aseptic precautions should be taken while collecting blood sample, container should be sterile, and no contamination should occur when transporting specimen.
- Proper labeling of the sample, which includes name of the patient, age, sex, address is essential for sample identification.
- Samples collected should be sent to laboratory immediately.
- The samples collected should be in adequate quantity e.g. blood or serum sample should be minimum 5 ml and stool sample 8-10 grams or properly stained rectal swab in CB medium.
- In large outbreaks collecting samples from all patients and sending them to laboratory places puts unnecessary burden on laboratory facilities and it is also not necessary for management of cases and epidemic control. Except PBS for malaria, do not collect serum/stool or other samples from all patients during the epidemic. Samples from 5 - 10% of cases are sufficient to know cause of epidemic. However in case of small outbreak, send adequate number of samples to confirm the diagnosis (Not less than 10)
- Sometimes immunological studies are necessary to detect antibody titre in sera. In many cases, especially viral diseases, paired sera are required to study four fold rising antibody titre. Keep photocopy of first list of samples sent to laboratory. After about 10 days, collect second samples of these cases. Mention these samples as second samples in laboratory form.
- Control activities and treatment should not be delayed till the laboratory results are received. Action should be based on clinical, epidemiological and entomological findings.
- Always submit information of patient along with sample (laboratory form) to laboratory. This should include specimen number, name of patient, date of onset of symptoms, nature of symptoms, provisional diagnosis, date of sample collection and condition of patient at the time of sample collection. Forward this information along with the specimen to laboratory.
- Different types of samples (stool, blood, sputum etc.) are required to diagnose the diseases under investigation. Samples required to be collected for common diseases are given in the table below -

Table - 3: Laboratory samples required for diagnosing particular causative agent

Sr. no.	Suspected disease	Specimen	How to transport	Where to send	Remarks
1	Cholera, Gastroenteritis	Stool for isolation/ culture	In CB media at room temperature	District Public health Laboratory (DPHL)	Collect in early stage.
2	Viral hepatitis	Stool for isolation of viral agent	Plain bulb in cold chain (8-10gm)	National Institute of Virology (NIV), Pune	
		5 ml blood for serum antibody titre	Plain bulb in cold chain at 4°C	National Institute of Virology, Pune	
3	Enteric fever	5 ml. blood for culture and antimicrobial sensitivity	Enriched media at room temperature	District Public health Laboratory (DPHL)	Media available in DPHL
		5 ml. blood for serology	Plain, sterile bulb	District Hospital / RH laboratory	Paired samples required
4	Malaria	PBS	Slide box at room temperature	Malaria laboratory may be at PHC/ RH/malaria clinic	
5	Dengue fever	5 ml. blood sample for antibody titre	Plain, sterile bulb. Maintain cold chain at 4°C	NIV Pune. DH/RH laboratory for hematology tests and platelet count	Paired samples required
		Aedes mosquitoes	In test tube at room temperature	NIV Pune	Contact DMO
6	Meningococcal meningitis	5 ml. blood for culture. CSF for serology and microscopy	Sterile, plain bulb at room temp./blood in blood culture broth	Nearest Medical College Hospital	Contact HOD of Microbiology department of Medical College
7	Plague	Bubo fluid. Blood for culture and serology. Sputum for staining/ culture	Sterile container Plain bulb, plain sterile container		

3.8. Other epidemiological data

Additional relevant information like source of water supply, large movement of people like yatra, presence of Aedes larva in household water collection, flies in village, etc. should also be collected during the survey.

3.9. Description of epidemic and analysis of data

Information collected during house-to-house survey should be utilized to know the extent and cause of epidemic, age and sex distribution. Analyze the data by age and sex distribution of cases. This indicates which age group or sex is maximum affected.

3.9.1. Develop epidemic curve

Following steps should be carried out to develop the epidemic curve.

- Tabulate the date wise distribution of cases according to the date of onset (and not the date of reporting). You will know the index case. Case first reported may not be the index case.
- On a graph paper, indicate days on x-axis and number of cases on y-axis. Plot the number of cases on each date by point at appropriate place on graph. Joining these points by line will give epidemic curve.

- Epidemic curve will give idea whether the epidemic is in rising trend or declining. It will also give idea about probable day(s) of contamination if we subtract one incubation period days from first case.

3.9.2. Prepare spot map of the epidemic

- Enquiry of village map should be first made with Gram Panchayat. If map is not available prepare the village map.
- To prepare village map, go to centre of village. Stand at the center facing towards north. First mark the place you are standing at center of paper, then roads starting from the place to all directions. Indicate temple, school, Anganwadi, Gram Panchayat etc. in relation to roads. Mark houses on map. If epidemic is waterborne, mark the water supply system (pipeline, wells, hand pumps) & if mosquito borne then breeding places on the graph.
- Put approximate M numbers/number of houses in each area on map.
- With the help of survey tables given above in which number of cases in each household along with M number is mentioned, put one dot per case on the houses shown in the map. Now the spot map is ready.
- Spot Map will indicate most affected area in the village.

You should now concentrate on these areas to know the causes of epidemic.

- Prepare 5-6 serial spot maps showing situation of disease on each day, starting from first day of epidemic. Interval between two serial spot maps will depend on the incubation period of disease under investigation. It should be per day for diseases like gastroenteritis, cholera, measles, DF etc. and weekly or biweekly for diseases like hepatitis, enteric fever etc. These spot maps will indicate where the epidemic started and how it is spreading to other areas of village.
- Serial spot maps will indicate direction of spread of the epidemic.

3.10. Identify the cause of epidemic

- You have identified the time of introduction of disease in community with the help of epidemic curve and area first affected with the help of serial spot map. Concentrate on the indicated time period and area from where the epidemic has started as indicated in spot map for further investigation.
- If it is water borne epidemic, identify the place of contamination. (Details of how to identify area of contamination is given in water borne epidemic)
- For vector borne epidemics, search for breeding places. Breeding places are different for each type of mosquito. For example, anopheles mosquitoes breed in clean and large water sources like, wells, seepages from irrigation fields, canals, irrigation tanks, etc; Aedes mosquito breed in small artificial water collections like water collected in tyres, broken bottles, house hold water collections (barrels, earthen pots), etc.

Detailed enquiry with the help of these tools will provide enough information about the nature, origin and cause of epidemic.

4. Control of epidemic

Medical Officer should immediately start control measures on the basis of information available through primary investigations and should not wait for confirmation of diagnosis. Inform the Gram Panchayat in writing about control measures to be taken. Medical Officer should personally meet the Sarpanch and other leaders and inform them about cause of epidemic and important actions necessary by Gram Panchayat and community. If the Gram Panchayat has not responded within 24 hours, inform BDO and DHO. Daily review the progress of measures taken by village till the epidemic is over.

Detailed control measures are mentioned in the chapter of specific epidemics.

5. Declaration of epidemic as over

Surveillance activities should be continued for double the incubation period of the particular disease from occurrence of last case. If there is no case during that period then it is declared that the epidemic is over.

6. Final report of epidemic

This is the detailed report of epidemic to be submitted by MO within 10 days after the epidemic is over. Final reporting

should be in prescribed format. There are six separate formats of final report, which give detail information about following components –

- General information of epidemic.
- Date wise line listing of cases
- Details of water/stool/blood samples taken during epidemic period
- Water supply and chlorination
- Investigation of death if occurred during the epidemic
- Control measures

Format of final report is given in annex.

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4. WATER BORNE DISEASES

4.1. DIARRHOEAL DISEASES

Diarrhoeal diseases include acute diarrhoea, persistent diarrhoea (diarrhoea duration two weeks or more) and dysentery (blood stained stools with fever). Diarrhoeal diseases are one of the most common causes of epidemic in our state.

Most of the deaths in diarrhoeal diseases are due to dehydration which is preventable by timely and adequate replacement of fluids.

Following are important causes of diarrhoeal diseases in rural areas

- Acute diarrhoea – Cholera, Rota virus, Food poisoning, gastrointestinal disorders and medications (rare)
- Persistent diarrhoea – Chronic bacterial infections, inflammatory bowel disorders, malabsorption syndrome
- **Dysentery**—Amoebiasis, Giardiasis, Shigellosis

1. Important diseases causing diarrhoea or dysentery in adults

1.1. Cholera

Cholera is the most important diarrhoeal disease which leads to rapid dehydration. Epidemics of Cholera are observed in all parts of Maharashtra state.

1.1.1. Etiologic agent

Cholera is caused by bacteria *Vibrio cholerae* which exists in two biotypes, Classical and El tor. Each biotype is further divided into two subgroups Inaba and Ogawa.

1.1.2. Epidemiology

V. cholerae can survive in water for three weeks and on soiled linen up to one week. Transmission occurs by faecal-oral route through contaminated water. Epidemics of cholera are usually single source, explosive type & spread rapidly.

1.1.3. Clinical manifestations

Cholera is an acute infection of small intestine manifested as watery diarrhoea and vomiting. Clinical spectrum of cholera is broad, ranging from in-apparent infection to cholera gravis, which may be fatal in few hours. Incubation period of 24 to 48

hours is followed by abrupt onset of painless, profuse and watery diarrhoea associated with vomiting.

Symptoms and signs of cholera are entirely due to loss of large volume of isotonic fluid and resultant depletion of intravascular and extra vascular fluid leading to severe dehydration, metabolic acidosis and hypokalemia. Patient develops thirst, cramps, and anxiety due to depleting isotonic fluid.

1.1.4. Diagnosis

Suspect cholera when patient has severe watery diarrhoea and vomiting. Collect stool sample of suspected cases in Cary Blair media and transport to District Public Health Laboratory. However, treatment and control measures should be started immediately on the basis of clinical symptomatology without waiting for laboratory confirmation.

1.1.5. Treatment

Carefully examine patient for signs of dehydration and treat as per dehydration status. Most important treatment of cholera is rehydration of patient with ORS and Ringer's Lactate. In addition to this, start one of the following antibiotics to patient-

- Cap. Doxycycline 6 mg/kg/ day as a single dose for 3 days
OR
- Cap. Tetracycline 50mg/kg/day in 4 divided doses for 3 days OR
- Tab. Erythromycin 30mg/kg/day in 3 divided doses for 3 days.

1.1.6. Prevention

Disinfection of water is an important preventive measure. *Vibrio Cholera* is sensitive to chlorine. Daily water chlorination, personal and environmental hygiene and food safety measures prevent cholera.

1.2. Amoebiasis

Human infection with *Entamoeba* is called as amoebiasis.

1.2.1. Etiologic agent

Amoebiasis is contracted by ingestion of cyst form of *Entamoeba histolytica*. After entering the bowel, cysts develop into trophozoites which colonize in colon.

Large numbers of cysts are developed from trophozoites which pass through stools completing life cycle.

1.2.2. Epidemiology

Man is the major reservoir of amoebiasis. Untreated water and contaminated food are important source of infection. Chlorination has little or no effect on amoebic cysts. Intestinal amoebiasis may occur within two weeks of infection or may be delayed for months.

1.2.3. Clinical features

More than ninety percent individuals infected with *E. histolytica* are asymptomatic. Many infected persons have nonspecific gastrointestinal symptoms such as abdominal pain, bloating or watery diarrhoea. Few patients develop amoebic dysentery and manifest as abdominal pain and bloody diarrhoea.

Rarely patient may develop fulminant amoebic colitis with

high fever, peritonitis and colonic perforation resulting into high mortality. Few patients develop extra intestinal complications, commonest of which is liver abscess.

1.2.4. Diagnosis

Diagnosis of amoebiasis depends upon microscopic examination of stools. Finding of trophozoites in stools indicates occurrence of invasive colitis.

1.2.5. Treatment

Metronidazole 250 mg tid for 5-7 days OR Tinidazole 2 grams stat OR Furazolidone 100 mg qid for 7-10 days.

Information about Rotavirus infection and Shigellosis is given in Section-06 : Child Health.

DIARRHOEAL DISEASES CONTROL PROGRAMME

1. Definition of diarrhoea

By definition, diarrhoea is passage of three or more liquid / watery stools in 24 hours. However, change in consistency has more importance than number of stools passed.

2. Diagnosis of dehydration

Although number of organisms are responsible for causing diarrhoea, clinical presentation is same i.e. passage of watery stools leading to dehydration in all these cases. Therefore assessment of dehydration status and correct management of dehydration by ORT is mainstay of diarrhoeal disease control programme.

2.1. General guidelines

- Diagnosis of dehydration is very simple, provided you examine patient systematically. MO, HAs, MPWs, and Anganwadi Workers from PHC must know how to examine diarrhoea patient for diagnosis of dehydration.
- Discuss diagnosis and management of dehydration in detail during monthly meetings of April and May and revise important points in subsequent meetings at least up to month of September.
- All Anganwadis and sub centers must have charts indicating diagnosis and management of dehydration. Also keep charts in the room of MO, HA, Pharmacist and ward in PHC.
- All MPWs must keep with them dehydration treatment card and 10 packets of ORS during home visits.

There is no need to give other medicines not mentioned in these guidelines, e.g. higher antibiotics, other IV fluids, multivitamins, anti-motility drugs, etc. to patients during management of dehydration. Addition of these medicines will unnecessarily increase cost of treatment and may divert your attention from correct management of dehydration, which is vital to save life of patient.

For systematic examination for dehydration, special indoor paper for patients of diarrhoea/dysentery should be used so that no point will be missed in correct assessment and management of dehydration. MO or health worker should only tickmark appropriate boxes of examination points, diagnosis and management. Printed indoor paper will cover all points and

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improve management practices of diarrhoea cases. (Table- 3.2)

Following steps should be carried out in given sequence for management of diarrhoeal diseases.

2.2. Classify patient into type of diarrhoea.

Important clinical types are acute diarrhoea, persistent diarrhoea and dysentery. Table below will help in classifying the patients.

Table – 4 : Diagnosis of diarrhoea

Sign/symptom	Acute diarrhoea	Persistent diarrhoea	Dysentery
Frequency of stools/day	Three or more	Three or more	Three or more
Consistency of stools	Watery	Variable	Variable
Duration of diarrhoea	Less than 2 weeks	Two or more weeks	Less than 2 weeks
H/o fever	No	Variable	Yes
H/o blood stained mucus	No	Variable	Yes
Effect on appetite	No	Loss of appetite	Loss of appetite
Dehydration	Important, may lead to severe dehydration if not treated in time.	Patient may have some dehydration.	Patient may have some dehydration
Treatment principle	Management of dehydration is priority	Start management of dehydration. Simultaneously find cause of persistent diarrhoea and treat accordingly.	Start management of dehydration. Simultaneously start appropriate antibiotics.
Long term effects	No long term effect for occasional episodes. Repeated attacks may lead to PEM.	If not treated correctly, child may get severe Protein Energy Malnutrition	Repeated attacks may lead to Protein Energy Malnutrition

2.3. Assess status of dehydration of patient.

Table below will help in diagnosing dehydration status in diarrhoea case -

DEHYDRATION DIAGNOSIS CHART PHC

Name of patient: Age Sex: M/F

Address:

Sign/Symptom	Severity of symptoms and signs (Encircle the finding)		
	No dehydration	Some dehydration	Severe dehydration
General condition of Patient	Patient well alert	Restless and irritable	Lethargic, unconscious, floppy
Presence of thirst	Normal/not thirsty	Thirsty, drinks water immediately when offered	Not able to drink
Dryness of mouth and tongue	Moist mouth and tongue	Mouth and tongue dry	Mouth and tongue very dry
Condition of eyes	Normal	Sunken	Very sunken, patient's face looks like old man's face.
Condition of tears	Tears appear while crying	Tears appear while crying	No tears, dry eyes even in crying child
Skin turgor	Normal. Pinch to skin immediately goes back to normal.	Pinch slowly goes back and takes some time to become flat.	Pinch remains as it is for 2-3 seconds and then slowly goes back.
Classification of dehydration	No dehydration	Some dehydration	Severe dehydration
Treatment of dehydration	Plan - A	Plan – B	Plan - C

Important:

- Dehydration status should be decided by the column from which maximum signs and symptoms are observed.
- Patient with only thirst without any other sign or symptoms

of dehydration should be classified as having *some dehydration* and given Plan-B rehydration treatment.

- Lethargic child not able to drink with history of acute diarrhoea should be classified as having *severe*

dehydration and given Plan-C rehydration treatment.

3. Management of dehydration

Most important aspect in management of diarrhoeal diseases is correction of dehydration.

Treatment of dehydration is divided into three plans as follows-

- Plan-A: For patients with no dehydration – principle is to prevent dehydration.
- Plan-B: For patients with some dehydration – principle is treatment of some dehydration and preventing patient from going into severe dehydration.
- Plan-C: For patients with severe dehydration - This is life saving plan. Rehydrate patient as early as possible and prevent from going again into severe dehydration.

Description of treatment plans in details is as follows-

3.1. Plan-A

Plan-A is for patients who are having diarrhoea but no signs of dehydration.

3.1.1. Principle of treatment

As diarrhoea is continuing, there is continuous loss of water and electrolytes from body of patient which may lead to dehydration. Therefore principle of Plan-A schedule is correction of whatever loss of water and electrolytes before the patient develops signs of dehydration. Plan-A can be advised at home to caretaker of patient. However make sure that care taker has understood danger signs of dehydration (like thirst) before he/she leave the hospital. Following steps are recommended in Plan-A –

a. Home available fluids

- Advise to give Home Available Fluids (HAF) e.g. sarbat, lassi, vegetable soup, khir, buttermilk, tea, coconut water, etc. i.e. any liquid available at home to patient as much he/she can drink. In case of under-five children, MPW/HA should not leave house of child till the mother has started giving ORS/HAF to child as child may quickly go into dehydration.
- Continue breast feeding and feeding – If child is being breastfed, then breast-feeding should be continued. Regular feeding of non-breast fed child should also be continued.

b. ORS to prevent dehydration

- If frequency and amount of diarrhoea is not declining or amount of stool is large, then start ORS. For other patients, if you have sufficient ORS packets, give one packet to mother for maintenance of hydration of child.
- Contents of WHO ORS are as follows –

Sodium chloride	3.5 grams
Potassium Chloride	1.5 grams
Sodium Citrate	2.9 grams

Glucose	20 grams
---------	----------

Dissolve the packet in one litre of water to prepare ORS.

Show caretaker how to prepare ORS. Following steps should be carried out for preparation of ORS -

- Take clean pot of one and half litre capacity and one clean spoon.
- Pour 1 litre of clean drinking water in the pot. (No need to boil water).
- Add whole packet of ORS into one-litre of water and stir till all powder is dissolved. Now ORS is ready for use.
- Give ORS by cup or spoon to small children and by glass to bigger children and to adults as per indicated dose.
- **If** patient has vomiting, wait for 5 minutes and start again.
- Keep ORS covered. Once prepared, ORS should be used within 24 hours. Do not use ORS beyond 24 hours, as there are chances of contamination.
- If child develops swelling on eyelids, stop ORS as it indicates overdose.

Ask relative to give ORS in following doses after passage of each liquid stool

Less than 6 months	-	50ml
6 months to 2 years	-	50 - 100 ml
2 to 5 years	-	100 - 200 ml
5 +	-	As per demand

c. Watch for signs of dehydration

- Ask caretaker to watch for signs of dehydration – Advise to bring patient to SC/PHC in case of following conditions-
 - Increase in severity and/or frequency of diarrhea
 - Patient becomes thirsty
 - Irritable

3.2. Plan -B

Start Plan-B treatment to patients showing signs and symptoms of some dehydration as per dehydration diagnosis chart. Aim of this plan is to correct dehydration and prevent patient from going into severe dehydration.

3.2.1. Principle of treatment

Patient with some dehydration should be given ORS for correction of dehydration.

Steps in preparation of ORS are given in Plan-A

Dose of ORS: Dose of ORS is calculated preferably according to weight of patient. Give ORS in a dose of 100ml/kg in 4 hrs. If weighing is not possible, calculate age wise ORS requirement for four hours as given in table below.

Continue breast feeding and feeding – If child is being breastfed, then breast-feeding should be continued. Regular feeding of non-breast fed child should also be continued.

Table -5 : Age wise ORS requirement for four hours

Age	< 4 months	4–11 months	12–23 months	2 – 4 years	5 – 14 years	15 + years
Dose	200 - 400 ml	400 – 600 ml	600 – 800 ml	800 – 1200 ml	1200 – 2200 ml	2200 - 4000 ml

3.2.2. Re-examination of patient

Re-examine patient after every four hours for status of dehydration with the help of dehydration diagnosis chart and decide plan freshly as per dehydration status as follows -

Condition of patient on re-examination	Management advise
Patient improves, no signs of dehydration on examination and diarrhoea stops	Keep patient under observation for 24 hours. Continue HAF. Observe if diarrhoea and/or vomiting start again.
Patient improves, no signs of dehydration on examination but diarrhoea continues	Continue giving ORS in doses suggested in Plan-A, re-examine after four hours.
Dehydration status same	Continue with Plan-B. Check whether ORS is being given in correct dose. Re-examine after four hours. If severity and frequency of diarrhoea increases and patient is at home or SC, shift patient to PHC.
Signs of severe dehydration	Switch on to Plan - C (start IV fluids). Shift patient to PHC if patient is at home or SC. Continue to give ORS as much as possible during shifting.

3.3. Plan – C

If signs and symptoms of patient are suggestive of severe dehydration, start Plan – C. This is emergency plan. Incorrect or incomplete management of severely dehydrated patient may lead to death of patient. Medical Officer must personally examine patient and treat for severe dehydration.

3.3.1. Principles of management

Principle of management of severe dehydration is replacing fluid loss by giving rapid IV infusion. Only Ringer's lactate should be used as IV fluid and the dose is as given in table below. MO should personally verify that said quantity of IV fluid is being pushed to patient within prescribed time during treatment. This is extremely important as majority of deaths due to dehydration in hospitals are because of insufficient or slow IV infusion or use of incorrect IV fluid.

Table -6 : Details of Ringer's Lactate administration

Age group	Intensive phase	Maintenance phase	Duration of treatment	Remarks
Infants (0-1 year)	30-ml/kg body wt. during first 1 hour.	70ml/kg body wt in next 5 hours.	6 hrs	Assess patient after every 6 hours
Older children and adults	30-ml/kg body wt. in first half hour.	70ml/kg body wt in next 2½ hrs.	3 hrs	Assess patient after every 3 hours

Examples**Example-1: Infant of 4 kg body weight.**

- Total dose of IV Ringer's lactate is 400 ml. (100 ml/kg body weight)
- Give 120 ml (30 ml/kg body weight) in first one hour and remaining 280 ml (70 ml/kg body weight) in next 5 hours.
- Assess child after 6 hours and advise further treatment according to dehydration status.

Example -2: Adult of 60 kg body weight

- Total dose of IV Ringer's Lactate is 6000 ml. (100 ml/kg body weight)
- Give 1800 ml (30 ml/kg body weight) i.e. 3-4 bottles of Ringer's Lactate in first 30 minutes and remaining 4200

ml (70 ml/kg body weight) i.e. 8 bottles of Ringer's Lactate in next 2½ hours.

- Assess patient after 3 hours and advise further treatment according to dehydration status.
- Continue breast feeding and feeding – If child is being breastfed, then breast-feeding should be continued. Regular feeding of non-breast fed child should also be continued.

3.3.2. Re-examination of patient

Re-examine patient after every six hours in infants and three hours in adults for status of dehydration with the help of dehydration diagnosis chart and decide management plan as follows -

Condition of patient	Treatment advise
Patient improves, no signs of dehydration on examination and diarrhoea stops	Keep patient under observation for 24 hours as patient may start diarrhoea/vomiting again
Patient improves, no signs of dehydration on examination but diarrhoea continues	Continue giving ORS (Plan-A)
Patient improves, signs of some dehydration on examination.	Stop IV fluids after required dose is administered. Continue giving ORS (Plan-B)
Dehydration status same	Continue with Plan-C. Check for any complications like anuria. If yes carefully examine the patient and decide for referral. Continue giving IV during transportation of patient.

3.4. Use of antibiotics and other drugs

Antibiotics are recommended only to suspected patients of cholera and dysentery. Other drugs like anti motility drugs, binding agents, anti secretory agents and steroids are not of any use in management of diarrhoea. They are harmful to patients and therefore not at all recommended for treatment.

4. Strategies for lowering diarrhoea deaths

Following important actions will help to reduce incidence of diarrhoea and deaths -

- Promote healthy environmental and personal hygiene practices. Coordinate with Gram Panchayat for safe drinking water supply and sanitation.
- Discuss correct assessment and management of dehydration with PHC staff during monthly meetings especially before and during rainy season.
- Make ORS readily/freely available. Widen the net of providers who can treat diarrhoea. Train AWWs, link workers and volunteers in management of dehydration. Train private practitioners of modern and ISM systems in rational treatment of diarrhoea.
- Ensure prompt emergency care on admission, correct diagnosis and treatment of diarrhoea cases in PHC.
- Always keep sufficient supply of Ringer's Lactate and ORS. Ensure adequate supply of ORS at village level through health workers, AWW, Dai, depot holders etc.
- Continue to emphasize on following points:
 - Exclusive breastfeeding up to the age of 6 months
 - Never use bottle for feeding a child
 - Dangers of diarrhoea – dehydration, malnutrition
 - Use of HAF in case of diarrhea
 - Use of ORS and availability of ORS in village
 - Measles immunization as a preventive measure for diarrhoea/dysentery

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4.2. ENTERIC FEVER

Enteric fever is an acute, febrile illness, caused by bacterium *Salmonella typhi* which may become sometimes life threatening.

1. Etiologic agent

Enteric fever is caused by *Salmonella typhi* and *S. paratyphi*. Enteric fever caused by *S. typhi* is more severe and frequent. (Commonly called as typhoid).

2. Epidemiology

Man is the only natural reservoir of *S. typhi*. Ingestion of food or water contaminated with human feces is most common mode of transmission. *S. typhi* is present for about 1-2 months in stools of patients. Carriers are important epidemiologically

because they are mainly responsible for spread of typhoid in community. Complete antimicrobial therapy reduces chances of carrier stage.

3. Clinical manifestations

After incubation period of 10-14 days, typhoid fever has an insidious onset characterized by fever, headache, constipation, malaise, chills and myalgia. Splenomegaly, leucopenia, abdominal distention and tenderness are generally present. If untreated, fever increases up to 40°C and fatigue, anorexia, abdominal symptoms and cough may appear with increase in severity. Nausea and vomiting in second and third week suggest complications.

4. Diagnosis

S. Typhi is most frequently isolated from blood during first week of illness. Collect blood sample of suspected enteric fever case before starting antibiotic. Widal test, which measures antibody response to H and O antigens, can only suggest diagnosis of enteric fever. Widal test results are not definitive and must be interpreted with care because titre may be elevated without enteric fever. If Widal test is performed, repeat the test after 10 days. Four-fold rise in antibody titre of second sample should be used for diagnosis rather than single test result.

5. Treatment

Effective antimicrobial therapy reduces morbidity and mortality from typhoid fever. Without therapy, illness may last for 3 to 4 weeks, and there could be 12-30% deaths.

Multi-drug resistant typhoid fever is reported from many places in the state. Therefore presently drug of choice for typhoid fever is Ciprofloxacin 500-750 mg twice a day for 15 days. Alternatively Ceftriaxone and Cefaperazone can be used if resistance to Ciprofloxacin is documented.

6. Control of Typhoid outbreak

Following steps should be carried out for confirmation of diagnosis of fever outbreak -

6.1. Confirmation of diagnosis

- Start survey of affected area. Decide whether cases are clearly in excess than expected fever cases from village. If yes inform DHO about fever outbreak and your clinical diagnosis of cases.
- First collect and examine PBS of all fever cases for malaria even if your clinical diagnosis is not malaria. Exclude malaria on the basis of negative PBS results.
- Once malaria is excluded try to differentiate fever cases on the basis of clinical examination into viral fever or typhoid fever. Diagnostic features of typhoid fever are atypical fever pattern, coated tongue, relative bradycardia, tender splenomegaly and relative leucopenia.
- If you suspect typhoid, collect 5 ml blood for culture, inoculate on enriched media (available at District Public health laboratory) and send to District Public Health Laboratory by special messenger. Keep media at room temperature during transportation. Alternatively you can request DHO to send Public health laboratory

microbiologist for blood culture examination. Also request laboratory for antibiotic sensitivity pattern.

- Do not declare epidemic as of typhoid on the basis of serological examination such as Widal test as this test is not confirmative of Typhoid fever.
- If you are confident about clinical diagnosis then start antibiotic after collection of blood for culture.
- Once you get result of blood culture, and if blood culture is positive for *S. typhi*, then label epidemic as of Typhoid fever. Change antibiotics suitably if investigations indicate resistance of *S. typhi* to Ciprofloxacin.

6.2. Prevention and Control of Enteric Fever

- Preventive and control measures of enteric fever are described in chapter of control of water borne diseases.

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4.3. VIRAL HEPATITIS

Presently five viruses are responsible for viral hepatitis as they have common characteristics as primary replication in liver. Each virus belongs to different taxonomic family. Amongst these, two viruses, Hepatitis A virus (HAV) and Hepatitis E virus (HEV) are transmitted by fecal-oral route, produce acute self-limiting infections and they have ability to develop into epidemic form. Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Delta Hepatitis virus (HDV) are transmitted by blood and body fluids and have ability to produce a persistent infection and chronic liver diseases. They rarely present in epidemic form.

Clinical symptomatology does not distinguish between different types of viral hepatitis. Therefore clinical symptoms alone should not be used to establish etiologic diagnosis in jaundice patients. Enterically transmitted viral hepatitis (Viral Hepatitis A and E) is described in this chapter whereas parenterally transmitted viral hepatitis (Viral Hepatitis B, C and E) are described in Chapter 7B)

1. Characteristics of Enterically transmitted Viral Hepatitis

Salient characteristics of enterically transmitted types of hepatitis are given below.

1.1. Hepatitis-A

Hepatitis-A is endemic in our state. HAV is non-enveloped single-stranded RNA virus. It spreads through faeco-oral route.

1.1.1. Clinical characteristics

Incubation period of HAV is between 14-45 days with median of 28 days.

Characteristics of HAV infection are - fecal shedding of virus, viremia, age dependent expression of clinical illness (i.e. jaundice), occasional occurrence of liver failure, and absence of chronic liver disease.

Children under six years of age generally have mild, nonspecific symptoms that include malaise, nausea, vomiting, diarrhoea, fever and dark urine. Jaundice is uncommon in this age group. Among adolescent and adults infected with HAV,

majority have classic signs and symptoms, including jaundice, fever, malaise, nausea, vomiting, loss of appetite and dark urine.

Susceptible household contacts have a 10 to 50 percent risk of acquiring disease from a family member with acute illness. During epidemic of Hepatitis A, contact with children under six years of age appears to be a risk factor for infection.

1.1.2. Prevention of Hepatitis-A

Hepatitis-A is prevented by avoiding contamination of water, boiling drinking water during epidemic and personal hygiene. Effective vaccine against Hepatitis-A is available. As HAV infection is very common among preschool children, it is asymptomatic in this age group and gives immunity after infection; Hepatitis-A vaccine is not yet included in National Immunization Schedule.

1.2. Hepatitis-E

Epidemics of Hepatitis-E are now becoming very common for last few years. Incubation period of Hepatitis-E is longer than Hepatitis-A with a range of 22-60 days. A prodromal phase lasting for 1 to 10 days is followed by nausea, dark urine, abdominal pain, vomiting, pruritis, diarrhoea, etc in varying number of patients. Children have lower rate of symptomatic infection.

A high case fatality rate among pregnant women has been consistent feature of Hepatitis-E and has ranged from 5-25%. Most persons with Hepatitis-E have a self-limiting disease with complete recovery.

1.2.1. Spread

HEV is primarily transmitted by faeco-oral route. In endemic areas, primary source of infection is fecally contaminated drinking water, although food-borne transmission is suggested but not proven. Person to person transmission is rare and secondary attack rate among household is low (less than one percent).

1.2.2. Diagnosis

It is difficult to differentiate Hepatitis-E clinically from other forms of hepatitis. Hepatitis-E is observed in areas where Hepatitis-A is endemic. However, few epidemiological features distinguish Hepatitis-E from Hepatitis-A. In Hepatitis-E there is high attack rate among adults and high case fatality among pregnant women. Highest prevalence of Hepatitis-E is observed in age group of 20-29 years. As secondary attack rate in Hepatitis-E is very low, it is rare to find secondary case in same house.

1.2.3. Prevention

Most important means of prevention of Hepatitis-E is protection of water from fecal contamination. Chlorination of water has no definite effect on HEV. Boiling water for 10 minutes definitely kills HEV.

2. Investigation and control of Hepatitis outbreak

Once you get report of jaundice case, immediately visit the village along with PHC team. Following points will help you to arrive at conclusion whether outbreak is due to enterically transmitted viral hepatitis or not:

- If single case is reported then diagnosis could be any type of hepatitis including obstructive jaundice. However occurrence of multiple cases in same village within one incubation period (3-6 weeks) almost rules out parenterally transmitted hepatitis and obstructive jaundice.
- Examine clinically the reported case. First try to rule out obstructive causes of jaundice. Severe abdominal pain, absence of prodromal symptoms particularly fever and malaise, rapid deep jaundice, itching of skin, etc. are important factors to distinguish obstructive jaundice from viral hepatitis.
- Carefully ask patient about h/o blood transfusion, surgery, injections, unsafe sex etc. in last 6 months to rule out parenterally transmitted Viral Hepatitis.

If you suspect that jaundice in cases is due to enterically transmitted hepatitis, start control measures as described for control of water borne diseases in Chapter 3G in addition to special precautions for pregnant women as follows -

- Ask MPWs to identify pregnant women & personally advise them about -
 - Drinking only boiled water
 - Follow personal hygiene rules strictly
 - Get human immunoglobulin injections when arranged by PHC staff
- Arrange for giving Human Immunoglobulin to all pregnant women in affected village. Human Immunoglobulin should be from pooled sera of Indian donors. Dose of Human Immunoglobulin should be checked with the manufacturer's dose schedule.

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4.4. GUINEA WORM DISEASE

Maharashtra is guinea worm free since 1991. However regular GW survey and rumors investigations are necessary till the disease is declared as eradicated from country. Although not fatal, it causes morbidity and enormous socioeconomic burden in rural areas & hence considered for eradication.

1. Etiologic agent

Guinea worm disease (Dracunculiasis) is caused due to infection by parasite *Dracunculus medinensis*. Adult male Guinea worm measures 2-3 cm whereas adult female worm measures 50-120 cm. in length.

2. Life cycle

- Life cycle of *Dracunculus medinensis* starts when person with Guinea Worm disease enters ponds or step well. After contact with water, female guinea worm releases thousands of larvae which are picked up by cyclops in water.
- After going through two cycles of about 15 days inside Cyclops, larvae are ready to infect susceptible person. When a person drinks water containing infected Cyclops,

Cyclops are killed in stomach by gastric juice and larvae become free.

- Free larvae migrate through stomach wall into abdominal cavity and develop into male or female parasites which mate in abdominal cavity. Male worm is short (2-3 cm) and dies after mating and is absorbed in body. Female worm continues to grow.
- About 10-14 months after beginning of infection, adult female worm measuring about one meter long (50-120 cm) migrates towards skin. Once female worm reaches skin it releases toxin which forms a painful blister. When blister ruptures (usually after immersion of limb in water), gravid female worm which resembles thick milky thread, releases thousands of larvae in water.
- Total cycle (from ingestion of infected Cyclops to appearance of GW) takes approximately one year and continues in village every year till contact between infected Cyclops and susceptible person continues.

3. Clinical manifestations

- Though female worm is growing inside body, infection is asymptomatic during the year long incubation period.
- Shortly before worm emerges, patient may experience nausea, fever or aching but often first sign of infection is painful blister or appearance of worm under skin.
- Although most of the victims suffer from only one worm that emerges through lower leg, multiple parasites may emerge from any part of body. Painful infection incapacitates person for averaging two months.

4. Diagnosis

Diagnosis of the disease is facilitated by striking appearance of milky white, thick, thread like worm emerging through skin, since no other human infection manifests in this way.

5. Treatment

Treatment includes relief of pain (anti-inflammatory) and prevention of secondary infection (antibiotics). Injection TT should also be given to patient if not previously immunized.

Physical removal of worm by slowly wrapping it around a stick over several days or weeks shortens duration of suffering. Great care should be taken to avoid breaking worm, since withdrawal of broken worm into body spills larvae in tissue and causes a severe inflammatory reaction.

6. National Guinea Worm Eradication programme

6.1. GW eradication strategy

National campaign for eradicating Guinea Worm Disease started in 1984. The eradication strategy comprises of following elements -

- Provision of safe drinking water (elimination of step wells)
- Control of Cyclops
- Disease surveillance
- Treatment of GW disease case by admission in hospital
- Health education of community regarding not using step

wells, use of Temphos, filtering water and reporting GW disease case.

6.2. GW eradication activities

In view of the sustained efforts of the state, GW is eliminated from Maharashtra state in 1991. Presently following activities are carried out under the programme -

- **GW disease surveillance:**
 - Passive surveillance by all health institutions.
 - Active surveillance once a year in the month of June by house-to-house survey.
- Health education to community regarding identification and reporting of disease.
- Investigation of rumors of GW disease case and reporting to State GW officer.

6.2.1. GW disease surveillance

a. Passive surveillance

All cases with blister attending OPD are thoroughly examined for evidence of thread like worm. If required, case is followed up for 1-2 weeks.

b. Active surveillance

Active surveillance is carried out once a year in the form of house-to-house visit by health workers. It is usually carried out in month of June. Exact dates of active surveillance are communicated by DHO. Guidelines for active surveillance of GW disease are as below -

- Prepare programme for survey of all villages, wadi/pada/hamlet in PHC area with help of MPWs and HAs.
- Provide photo card of GW disease patient to all MPWs and HAs. MPW/HA should show this card in every house and ask whether any family member was suffering from such disease since last survey and also whether they know any one who has developed such disease.
- Showing picture is very important because majority of people have not seen a case of GW disease since long time.
- After visiting each house, marking is made on door, which indicates that MPW has visited house for guinea worm surveillance activity.

6.2.2. Health education

Opportunity of house-to-house survey should be utilized for health education of community. Write slogans related to GW disease identification on walls. Show pictures of GW disease cases and request to inform nearest PHC if such case is seen.

6.2.3. Investigation of rumor of GW disease case

MO himself must investigate all rumors of GW disease case.

- Take careful history of patient. Examine blister and surrounding area of skin. Blister is very painful and inflamed in GW patient.
- Clean blister and surrounding area with antiseptic solution and look for thick, thread like white structure coming from blister. Sometimes purulent discharge from abscess may

dry and look like thread.

- Gently clean wound with wet cotton swab. If thread is of purulent discharge, it will dissolve and disappear while cleaning. If it is female GW then it will not be dissolved and will try to come out of wound confirming the diagnosis.
- Any worm coming out of blister is only GW disease.

6.3. Action to be taken when case is confirmed

- If GW disease is confirmed, immediately inform DHO.
- Motivate patient for admission in PHC. Wind worm around small stick and keep attached near wound by cotton bandage. Ask patient to go on winding worm as it comes out of skin.
- When complete worm comes out of skin, preserve worm in formalin. Write full details of patient on bottle and hand over specimen to DHO. This bottle will be sent to entomological laboratory for confirmation of worm.
- Record last five-year movement of patient.
- Start survey of all villages within 5 KM radius around affected village.
- Start survey for any step well in village. Immediately close well with help of Gram Panchayat.
- Apply Temephos to all drinking water sources. Temephos will be provided by DMO.

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4.5. HELMINTHIASIS

Infection by intestinal worms is recognized as an important public health problem, particularly in developing countries. Intestinal helminthes rank first as cause of disease burden in children aged 5-14 years and also rank high as disease that can be efficiently controlled by cost-effective intervention.

Adverse effects of worm infestation:

- Affects nutritional equilibrium and induces mal-absorption of nutrients.
- Reduces food intake and competes for absorption of available micronutrients.
- Reduces growth and affects cognitive development.
- Causes internal bleeding and surgical complications (obstruction, rectal prolapse, and abscess).

Common worm infestations

1. Ascariasis (Round worm)

It is most common intestinal worm infestation caused by *Ascaris Lumbricoides*.

1.1. Life cycle

Adult female releases millions of fertile and infertile eggs which are laid into soil along with stools. Eggs become infective in 2 – 3 weeks. Infective eggs are ingested by a person through contaminated food. Eggs hatch in gut and resulting larvae penetrate gut wall. Larvae invade portal vein, pass through blood stream to liver and then to lungs. In lungs they break through

alveolar walls and migrate into bronchioles. They are coughed up through trachea and are swallowed by human host. On reaching intestine they become mature and start laying eggs.

1.2. Mode of transmission

Mode of transmission is fecal-soil-oral, through food contaminated with eggs. Inhalation of airborne eggs may produce infection.

1.3. Clinical features

Most individuals are asymptomatic. Heavy infestation can produce nutritional deficiency and growth retardation. Fever, intestinal colic, urticaria, vomiting and diarrhoea, giddiness can occur. In few children, pneumonitis or bronchitis with eosinophilia may develop when larva migrate through lungs.

Occasionally worms may form a bolus causing intestinal obstruction in children.

1.4. Treatment

Any of the following medications are useful for Ascariasis:

- Mebendazole: 100 mg twice daily for three days.
- Albendazole: Given as a single dose of 400 mg.
- Pyrantel pamoate: Effective in a single dose of 10 mg per kg body weight
- Piperazine citrate: This is used in case of intestinal obstruction. Dose is 75 mg/kg body weight with maximum dose of 3.5 gm for 2 days.

1.5. Prevention and control

Prevention of Ascariasis requires proper disposal of human waste, provision of safe drinking water and food hygiene. Health education regarding use of latrines, personal hygiene, and food hygiene should be given.

2. Hookworm disease

It is caused by *Ankylostoma duodenale* and *Necator americanus*. Worms live in duodenum and upper jejunum. They get attached to mucosa, suck blood and intestinal fluid rich in proteins.

2.1. Life cycle

Adult female lying in small intestine liberates eggs which after fertilization are excreted in stools. When eggs are deposited in soil, they hatch in 2 days and develop into infective larvae. Fully developed larvae on coming in contact with human host, pierce skin most commonly through gaps between fingers of feet. Once inside body, larvae enter blood vessels, migrate to lungs through heart in blood stream, break into alveoli, ascend bronchi and trachea and get swallowed. Larvae are fully-grown into adult worm when they reach small intestine and become sexually active.

2.2. Clinical features

- When larvae penetrate skin, it may produce local pruritic rash with blister formation. Secondary bacterial infection may occur if lesions are scratched.
- There may be transitory cough, breathlessness and fever when larvae are in lungs.
- Patient may develop iron deficiency anemia, hypoalbuminemia and edema.

- In children, severe anemia may lead to loss of appetite, cardiac failure, retarded physical, mental and sexual development, impaired learning and cognitive development.

- Pica with constipation may be seen.

2.3. Mode of transmission

Hookworm larvae enter body through feet by penetrating skin or may be acquired through oral route by contaminated fruits and vegetables.

2.4. Treatment

- Mebendazole, albendazole and pyrantel pamoate are effective in doses given for ascariasis.
- Iron supplementation for treatment of anemia.

2.5. Prevention and control

- Avoid open air defecation, ensure sanitary disposal of human waste.
- Wearing shoes
- Health education for use of latrines, use of footwear and food hygiene

3. Enterobiasis (Pin worm)

Enterobiasis is caused by *Enterobius vermicularis* usually involves school-aged children. It affects children and those who live collectively in hostels etc. Enterobiasis spreads rapidly within families, institutions, day care facilities etc. Adult worm lives in caecum, appendix and large intestine.

3.1. Life cycle

Gravid female is carried in bowel to anus at night where she deposits eggs on perianal skin and dies. When child scratches peri-anal region, larvae get attached to fingertips to fingernails. Auto infection or infection to others occur by swallowing eggs attached on fingertips or fingernails. Larvae are released from eggs in small intestine from where they migrate to caecum. Life cycle takes one month to complete.

3.2. Mode of transmission

Ingestion of infective eggs via contaminated fingers, fomites.

3.3. Clinical features

Only symptom is pruritus ani. When this is severe may lead to secondary bacterial infection in perianal region. Vulvovaginitis and urinary tract infection in females may occur.

3.4. Treatment

- Mebendazole in a single dose of 100 mg repeated after 2 weeks or pyrantel pamoate 10 mg/kg in a single dose repeated after 2 weeks is effective.
- All family members need to be treated simultaneously.
- Good personal hygiene which includes clean hands, scrubbed nails, fresh garments and bed linen are equally important.

3.5. Prevention and control

- Proper personal hygiene practices like washing hands after defecation, before eating or before preparation of food.
- Discourage bare perianal scratching.

- Change undergarments and bedding regularly.

4. Trichuriasis

Trichuriasis is extremely common infection caused by *Trichuris trichura* or *whipworm*. Co infection with *Ascaris* or hookworm is common. Adult worms are found in large intestine.

4.1. Life cycle

Adult female lays eggs which are passed in faeces. Eggs become infectious after 3 weeks. When they are ingested, eggs hatch in small intestine and penetrate gut wall for a short period of time. After penetration they return to lumen and migrate to colon to mature in to adults.

4.2. Clinical features

Light infections are asymptomatic. Abdominal pain, anorexia, diarrhoea can be seen. In heavy infection, colitis occurs with passage of blood and mucus. Anemia may develop due to bleeding from gut. Dysentery may be severe leading to prolapse of rectum when heavy worm loads lead to local irritation and constant straining at stool.

4.3. Treatment

Mebendazole, albendazole and pyrantel pamoate in doses used for ascariasis are effective.

4.4. Prevention and control

Proper disposal of human waste. Avoid ingestion of unclean vegetables and fruits contaminated with soil.

5. Taeniasis

This is helminthiasis caused mainly by three types. They are hermaphrodites and absorb nutrients directly through cuticle.

5.1. Types of taeniasis

5.1.1. *T. saginata* (Beef tapeworm)

This occurs where cattle are reared and sanitation is poor. Gravid segments of *T. saginata* are passed in human faeces. When they are ingested by grazing cattle, eggs hatch to release embryos that encyst in muscles as cysticerci. Humans are infected by eating uncooked, half cooked beef containing viable cysticerci.

5.1.2. *T. solium* (Pork tapeworm)

Life cycle of *T. solium* is similar to that of beef tapeworm, except that pig is host to larval stage. Humans become infected by eating undercooked pork containing cysticerci. Cysticerci develop into an adult worm in small intestine.

5.1.3. *H. nana*

Both larval and adult stages are found in human intestine and there is no intermediate host. Eggs passed in faeces are immediately infective. Eggs are transmitted in most cases directly from person to person. Internal autoinfection also occurs.

5.2. Clinical features

Tapeworm infections are generally asymptomatic. Occasionally non specific symptoms like abdominal discomfort, nausea and dizziness may occur. Diarrhoea, abdominal pain, vomiting and weight loss are seen in infection with *H. nana*.

5.3. Treatment

- Niclosamide in single dose of 2 gm should be given on fasting.
- Praziquantel 10 mg per kg as a single dose is also effective.

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4.6. PREVENTION OF WATER BORNE DISEASES

Water borne diseases can be prevented by safe water supply and improvement in environmental sanitation in villages.

1. Important aspects in safe water supply to community

- Water quality monitoring
- Water quality surveillance

1.1. Water quality monitoring

Agency, which has responsibility of supplying safe water to community, is responsible for regular water quality monitoring. As Gram Panchayat (GP) is responsible for safe water supply to community in rural areas, it is responsible for maintaining water quality supplied to village.

1.1.1. Responsibilities of GP included in water quality monitoring

- Daily disinfection of water at source at least half hour before supply.
- Daily OT test to check water disinfection. If OT test is negative then repeat chlorination and ensure proper chlorination.
- Regular inspection of leakages, blocks, etc. in water supply scheme and timely repairs of these defects.
- Keeping surrounding of water supply source, overhead tanks, valves, pipeline and stand posts clean.
- Proper storage of TCL. Uninterrupted supply of TCL to water supply scheme.

1.1.2. Water supply and sanitation committee

Each village now has water supply and sanitation committee and at least one village water supply worker. Call meeting of committee in Gram Panchayat before monsoon every year. Ensure that water supply worker is also present during meeting. Inform them about importance of regular water disinfection, procedure of water disinfection, water quality monitoring and TCL quality. Show committee members water sample and TCL testing reports of previous year and discuss about reasons for contamination if any.

a. Responsibilities of village water supply worker

- Identify and register all water sources and population dependent on each source.
- Daily water disinfection by TCL. Dose of TCL is estimated by MO PHC.
- To release water to all areas half hour after disinfection.

- Regular sanitary inspection of area surrounding water supply scheme, timely repairing valve leakages, draining the water collections formed due to leakages, minor maintenance and repairs of valves, pipeline, stand posts, etc.
- Daily OT test (Orthotolidine test) to check the chlorination of water and recording the test result in OT register.

1.1.3. Record related to water supply kept at Gram Panchayat

- Information of all water sources, total water quantity in each source, dose of TCL required for chlorination of each source.
- Daily OT test record
- TCL stock and quality monitoring
- TCL daily use and daily chlorination record
- Water sample reports received and corrective action taken.

1.2. Water quality surveillance

Water quality surveillance is carried out to ensure that safe water is being supplied by Gram Panchayat to the community. This responsibility has been entrusted to health department. Medical Officer is responsible for water quality surveillance of all the villages in PHC area.

1.2.1. Activities for water quality surveillance

- OT test of water in all villages in maximum possible frequency.
- Collection and sending of water samples to laboratory.
- Communication and advice on results of testing to water distribution authority.
- Notify and document the trends in seasonal changes in water quality.
- If water sample of any Gram Panchayat is reported as unsafe, identify the reason(s) for water contamination and advise the water supply authority accordingly.
- Meeting with members of village water supply committee at least once in year.
- Training of water supply workers and Gram Sevaks in water disinfection and record keeping.
- Checking stock of TCL, its storage and chlorination procedure, TCL quality record.
- Periodic sanitary survey.
- Generate, summarise and analyze surveillance data for improvement.

1.2.3. Responsibilities of health staff in water quality surveillance

Overall responsibility of PHC is to identify the contaminated source in time and suggest corrective action to Gram Panchayat, so that unwanted situations like epidemics are averted. To achieve this objective, there should be good coordination between PHC and Gram Panchayat. Responsibilities of PHC staff in ensuring safe water supply to community are as follows:

a. Multi Purpose Worker (Female and Male)

MPW-Female is responsible for water quality surveillance of sub centre HQ village and MPW-Male should look after remaining villages of the sub centre. In case of single village in sub centre, this will be the responsibility of MPW - Male.

Detailed responsibilities of MPWs in water quality surveillance are as follows-

- Always start village visit with OT test of water from one or two houses. Conduct OT test at various points in village afterwards and record in OT register.
- If OT test is negative, then collect the water sample. In case of negative OT test, at least two water samples from each village per month - one at the place of entry (first water connection) and another at lower end of distribution (area of lower end should be changed every time) should be collected. If population of village is more than 5000, collect one more water sample for each 5000 population from different sites of the village. If there is a group GP then one water sample of common water source from each wadi/wasti/pada should be taken.
- Send the water sample to Rural Hospital designated for your PHC for testing by field test (H_2S method), or to District Public Health Laboratory if testing facility at RH is not available. If field test is repeatedly positive for a particular source then water sample of that source is sent for microbiological examination at District Public Health laboratory. Send water sample at least twice in a year for chemical analysis for chemical potability to District Public Health Laboratory.
- In addition to water sample, also collect TCL sample from each Gram Panchayat every three months. Collect 25-50 grams of TCL in polythene bag and close the bag airtight. Put this bag into another polythene bag and close carefully again. Enter name of village, date of sample collection, name of manufacturer, batch number and date of manufacturing on the label of sample and hand over to HA. TCL sample can be taken in glass bottle also.

b. Responsibilities of Health Assistant (Female and Male)

- OT test at the time of visit to any village, enter in OT test register and convey to GP.
- Monitor the OT test results and water sample collection by MPW in the allotted area.
- Arrange for transport of water samples from PHC HQ to Laboratory.
- Arrange for training of GP staff in water quality monitoring.
- Assist medical officer in sanitary survey of the water supply schemes.
- Visit to GP to supervise adequacy of TCL stock, regular chlorination, TCL quality record.

c. Responsibilities of MO

Medical officer should visit each GP in his area at least once a month. Following are the responsibilities of MO in quality

water supply –

Training

MO should conduct training of Village Water Supply and Sanitation Committee members, Gram Sevak and water supply worker in water quality monitoring once a year before monsoon. Concerned HA and MPW should also be involved in this training. Water quality monitoring training includes following aspects:

- Importance of safe water supply and water quality monitoring
- Measuring the water quantity in water sources like well and calculation of TCL requirement of water supply scheme
- Water chlorination procedure
- OT test procedure and interpretation
- Storage of TCL
- Water quality monitoring records and their significance.

Ensure regularity of chlorination of water

Following points will give medical officer the idea of regularity of chlorination of water:

- Check OT register and see whether daily OT test is taken and result noted. Free chlorine should be within 0.2 to 0.5 PPM.
- Check the time of water chlorination and time of OT test and see whether place of OT test is changed daily and last stand posts are included.
- Review the action taken by GP when the OT test was negative.
- Inspect the stock of OT reagent and condition of chloroscope.
- Enquire in houses about smell of chlorine to water
- Personally go and inspect TCL residual heap at the place of chlorination

TCL stock and inventory

- Check the TCL stock: Availability of TCL on the day of visit: Not more than 3 months requirement of TCL should be purchased each time.
- Check ISI mark on the TCL used by GP, as only ISI mark Grade - I (Chlorine 34%) or Grade - II (Chlorine 32%) TCL should be purchased.
- Place of TCL bag – It should be dry, cool, dark place.
- Closing of TCL bag - TCL bag is in two layers. Both the layers should be separately closed. Inside polythene/plastic layer should be firmly closed and then outside layer should be closed.
- Check how TCL is measured daily for chlorination.

Water samples

- Arrange for the transport of water samples to RH for field-testing and also to District Public Health laboratory for crosschecking and detailed analysis.
- Communicate the results to the concerned water distribution authority with advice about corrective measures.

- GP is supposed to take corrective measures as proposed by Medical Officer if the report of water sample indicates contamination. Medical officer should verify whether the actions as per recommendations have been taken by GP.
- If GP is not responding to the instructions given by the Medical Officer which may lead to unsafe water supply to community then following procedure should be adopted:
 - Reminder to GP regarding corrective measures to be taken.
 - If no response in two weeks, write to BDO stating the importance of corrective measures.
 - If no response to this letter in two weeks then write to DHO and send copies to GP, BDO and Dy. CEO (Panchayat).
 - DHO should bring such matter immediately to the notice of DY. CEO (Panchayat) and discuss in Health Committee and Coordination Committee meeting of Zilla Parishad.
- Conduct sanitary survey of water supply scheme once a year and issue Green/Red card and identify high-risk villages holding red cards. (Details given below)

2. Collection of water sample for bacteriological examination

2.1. Water sampling should fulfill following requirement

- Sampling should be properly planned.
- Sampling points should be representative of water source and located in proportion to population served.
- Sample should be collected properly, in adequate quantity (at least 200 ml), in a sterile glass bottle with properly fitting stoppers or caps and properly dispatched.

As per the WHO guidelines the number of samples and its frequency on basis of population served should be as given below:

Table -7: Frequency of water sample collection

Population served	Frequency	Minimum samples to be collected in a month
Less than 20,000	Per month	10
20,000-50,000	Per week 5	20
50,001 to 1,00,000	Per week 10	40
More than 1,00,000	Per week 20	80
Corporation area	Per day 5	120

2.2. Method of water sample collection

2.2.1. Tap or fixed hand pump outlet

When water is taken from tap, flame the mouth of tap and allow the water to run for 3 minutes before filling the bottle.

2.2.2. Sampling from water source or reservoir (Lake, river, tank, etc.)

Insert the bottle with stopper on mouth, 12-15 inches below the surface of water. Open the stopper carefully without touching the bottle. Replace the stopper after the bottle is filled with water. Avoid the collection of surface water as it contains organic matter.

2.2.3. Sampling from dug well

Attach a suitable sized stone (after washing thoroughly) with a string to the sampling bottle in such a way that while immersing, the bottle will have 45° angle with water surface. Remove the stopper or unscrew the cap, lower the bottle slowly, immerse the bottle about 12-15 inches below water surface, fill and bring up. Discard some top water and replace the stopper.

2.3. Storage and transportation of the samples

There can be changes in coliform and E. coli content of the water during storage hence prolonged storage should be avoided and therefore in no case the time interval between the collection and examination of the sample should exceed 24 hours.

2.4. Labeling

Sample should carry the label on the bottle giving following particulars:

- Name of the sender:
- Source:

- Location:
- Place:
- Date and time of collection:
- Collected by:

3. Collection of water sample for chemical examination

- Collect the water sample in a glass or plastic container.
- Ideally a new container should be used but if unavailable, wash the used containers first with chromic acid cleaning mixture, then rinse with tap water and then with distilled water.
- Collect two samples of 2.5 litres each. First sample is for chemical analysis and second sample for chlorine dose estimation.
- Avoid surface scam.

4. Characteristics of Drinking Water

When the water sample of a new water source is sent for analysis, following important aspects are tested in District Public Health laboratory. Upper limit of important characteristic and medical significance in short is as below:

Table - 8 : Drinking water norms

Sr	Characteristic/ substance	Desirable limit	Significance
1	Colour	5 (TCU)	Colour may be due to coloured organic matter or metals or industrial waste. Above 5, consumer acceptance decreases.
2	Odour and taste	Unobjectionable	Indicates some form of pollution. May be by-product of chlorination
3	Turbidity	5 (NTU)	Caused by particulate matter. Above 5 consumer acceptance decreases. Interferes with disinfection.
4	pH	6.5 to 8.5	Beyond this range water affects mucus membrane and causes corrosion of water supply pipes
5	Total hardness	300 mg/lit	If more, may cause scale deposition in water supply system. If low level, corrosive effect on pipes.
6	Iron	0.3 mg/lit	Beyond this, taste/ appearance is affected. Adverse effect on domestic uses and water supply structures. Promote growth of 'iron bacteria'.
7	Chloride	250 mg/lit	Beyond this limit taste, corrosion and palatability are affected.
8	Dissolved Solids	500 mg/lit	Beyond this limit solids palatability decreases and may cause gastro intestinal irritation.
9	Sulphates	200 mg/lit	Beyond this causes gastro intestinal irritation.
10	Nitrate	45 mg/lit	Methemoglobinemia takes place beyond this limit. Bottle fed infants < 3 months are more susceptible.
11	Fluoride	1 mg/lit	It should be as low as possible. High fluoride may cause fluorosis.

5. Collection of bleaching powder sample for chemical examination

- Sample shall not be exposed to atmosphere for longer time than necessary and sampling shall be done as rapidly and thoroughly as possible.
- Sampling instrument should be clean and dry when used.
- To draw a representative sample, content of each container shall be mixed as thoroughly as possible by rolling, shaking or stirring by suitable means while container is closed.
- Draw with an appropriate galvanized iron or other suitable plastic sampling instrument, small portion of material from different parts of each selected container.
- Sample shall be placed in clean, dry and airtight glass or polythene bag on which the material has no action.
- Sample containers shall be of such a size that they are nearly filled by sample.
- Each sample container so filled shall be sealed airtight after filling and marked with the full details of sampling, the date of sampling, the month and year of manufacture of material and its grade.
- Precautions shall be taken to protect the sample; the material being sampled, the sampling instrument and containers of the sample from adventitious contamination.
- Care should be taken to avoid direct contact of bleaching

powder with skin. Face should be kept at a safe distance from the container when it is opened.

5.1. Storage

- Sample shall be placed in a cool and dry place.
- Sample should be stored in such a manner that the temperature of material does not vary unduly from the normal shade temperature.
- The label should not come in contact with bleaching powder sample. In order to protect the label it should be kept in a sealed plastic bag along with the sample.
- Samples should be sent to The District Public Health Laboratory at an earliest.

6. Sanitary survey of the water supply scheme

- Medical officer should conduct sanitary survey of all the water supply schemes in PHC area every year during the months of October to January.
- Survey should start from the water source and should end at last stand post of the distribution system.
- If there is possibility of water contamination from source to last stand post due to any of the reasons given below MO should issue Red card to the GP indicating the faults:
 - § Irregular water disinfection
 - § Lack of cleanliness of surroundings of water supply scheme
 - § Leakages
 - § Inadequate or no stock of TCL
 - § Unprotected wells with dirty surroundings
 - § Cracked bore well platforms and stand posts
 - § Any other finding that may contaminate water supply.
- MO should also suggest corrective measures needed to be taken for making the water supply safe at the time of issuing the red card.
- If the water supply scheme is without any faults and water disinfection is regular then Green Card is issued to GP.
- Red and Green cards will be supplied by District Health Officer.
- All the villages that were issued red cards should be again surveyed before Monsoon i.e. in last week of May or first week of June by the Medical Officer. If the corrective measures are taken and water supply is safe then Green card should be issued. If no or inadequate corrective measures are taken then maintain the red card status of GP.
- Inform the BDO about Green/Red status of all the GPs from your PHC area along with the reason for giving red card on 10th June every year.
- If there is outbreak in the village that was issued Red card then bring this matter to the notice of BDO and DHO by DO letter. Mention the status of village (Green/Red card) while submitting the epidemic investigation report to DHO with one copy to BDO.

7. Chlorination of water

7.1. Chlorination of well water

- Calculate volume of water in litres (All the measurements should be in meter).
 - § Square well - Length $\times$ breadth $\times$ height of water $\times$ 1000 = water in litres
 - § Round well - Well Diameter² $\times$ height of water $\times$ 785 = water in litres
- Calculate the dose of TCL: For 1000 litres of water 5 gm of TCL containing 33% chlorine is used.

7.2. Chlorination by liquid chlorine

- Liquid chlorine mixes with water quickly without residue. So when house to house chlorination or chlorination of water containers is to be done, liquid chlorine is more convenient than TCL. Liquid chlorine is mainly used during epidemics, fairs and festivals. The liquid chlorine supplied is usually having concentration of 5% chlorine.
- Add 1ml liquid chlorine (5%) solution to 50 litres of water to get 1PPM chlorine level.
- Add two drops of liquid chlorine solution to one bucket water (Approx. 10 litres)

7.3. Chlorination by using stock (mother) solution

When liquid chlorine is not available, stock (mother) solution can be prepared from TCL and used as liquid chlorine. Steps in preparation of stock solution are as follows -

7.3.1. Preparation of 5% stock (mother) Solution

- Take 5 liters of water in plastic bucket. Add 1kg bleaching powder to water. Stir well and cover bucket for 15 minutes.
- Supernatant liquid is 5% stock solution. Use solution immediately after preparation. If you want to stock solution for future use, pour supernatant liquid in water tight container and close the lid tightly.
- Concentration of chlorine in stock solution slowly decreases even if it is stored in water tight container. To avoid this, stock solution should be prepared only when it is required and should not be kept for more than 7 days.

7.3.2. Uses of stock (mother) solution

Stock solution should be used for water disinfection in following conditions -

- House to house chlorination
 - § At the time of epidemic of water-borne diseases
 - § When water source can not be disinfected e.g. lake, river, etc.
 - § When multiple water sources are used by community and it is difficult to chlorinate each water source. This situation particularly arises in tribal and hilly areas.
- Disinfection of water containers during fairs, festivals and large gathering of people for any reasons.

7.4. Chlorination by use of chlorine tablets

Chlorine tablets are also used sometimes in place of liquid chlorine. These tables are of different sizes. Indications for use

of these tablets are similar to liquid chlorine. As it takes 10-15 minutes for dispersal of tablets, the water container should be kept covered for 45 minutes before use if chlorine tablet is used for disinfection. Dose of chlorine tablets should be used as per guidelines given by manufacturer.

7.5. Chlorination of hand pump

This is not routinely done. If water sample is found to be contaminated, then corrective actions like repairing handle of hand pump, clearing cracks in the platform, cleaning the area etc. has to be done on priority. In addition to this as a supplementary action, chlorination of hand pump is done as follows:

Dose of TCL depends on the diameter of bore well. If diameter is 4 inches, dose is 150gm and when diameter is 6 inches dose is 300 gm.

TCL is mixed with 1/2 litre of water and solution is added by removing 3 bolts of hand pump. This should be done in the evening and hand pump should not be used for 6 - 12 hrs.

8. Orthotolidine Test

OT test indicates amount of chlorine available in water. It is used to verify whether correct dose of TCL has been used and chlorination is proper or not.

At source free chlorine from chlorinated water should be 1 ppm and at the end of distribution system, it should be 0.2 to 0.5 ppm.

MO should ensure that, each worker has a good quality working chloroscope.

OT test is carried out with the help of chloroscope as follows

- Fill up both the tubes with water to be tested.
- Place the tubes in chloroscope.
- Add two drops of OT reagent in tube on right side of chloroscope.
- Match the colour of tube with small discs of yellow colour shades parallel to tube.
- Nearest matching yellow coloured disc indicates concentration of chlorination.

Precaution

Do not allow the OT reagent to spill on hands or never smell the OT reagent. In case of accidental contact with OT reagent, wash with plenty of water.

9. Water sample testing (H_2S -strip field test)

9.1. Important aspects

- At Rural Hospital, H_2S -Strip field test for detection of fecal pollution of water sample is being performed. Report is received within 24 hours and time is saved on transportation.

- Reliable, rapid method, simple, low testing cost, easy interpretation of results (black colour formation), technical compatibility are the advantages of the test.
- It is useful during outbreaks as a rapid screening test.
- Principle of the test is that, presence of coliforms in drinking water is consistently associated with the organisms that produce Hydrogen Sulfide (H_2S), such as Salmonella, Proteus, and Citrobacter etc. When contaminated water is being tested it contains these organisms. They produce Hydrogen Sulfide gas and this gas leads to black colour in the tested water sample.

9.2. Method and results

- Ready to use medium bottles are provided, which contain filter paper with 1 ml. concentrated media.
- Add 20 ml. of water sample under test to already prepared media bottle. Incubate the inoculated bottle at $37^\circ C$ for 24 hours.
- Observe the results after 24 hours.
- Fecal contamination is indicated by the development of black colour of the contents in the bottle and water is graded as unfit for human consumption.
- If there is no colour change in the contents, incubate further for 24 hours. If no colour change even after 48 hours, water is fit for human consumption bacteriologically.

10. Sanitation

Bad sanitary conditions in village lead to contamination of water supply, increase in nuisance of flies and mosquito breeding resulting into possibility of epidemics like gastro, cholera, hepatitis, malaria, dengue fever, etc.

It is the responsibility of HA to inform and recommend GP for cleanliness in and around village. Following actions should be taken in this regard -

- Visit each house, pada, vasti once in at least two months to look for sanitation status.
- Look for garbage, animal waste, cesspools, etc. in the village.
- Inform GP in writing about the sanitary condition mentioning exact place of nuisance and control measures required to be taken.
- In case of possible water supply contamination, the information should be given immediately.
- Check whether the control measures suggested last time have been implemented. If not then inform MO with request to give instructions to GP indicating health hazards of bad sanitary conditions.
- Guide the village health committee during Gadgebaba Gram Swachchata Abhiyan about sanitation measures.
- Keep separate sanitation file for each Gram Panchayat.

11. Summary of responsibilities of health staff for water borne disease control

Sr.	Activity	Responsibility of PHC staff	
		Designatio	Responsibility
1	Water quality surveillance	MPW (M)	OT of all the villages in sub center during each fortnight visit. Collection of at least three water samples (one at source, one at beginning of distribution system and one of last stand post) if OT is negative and sending to PHC on same day.
		MPW (F)	OT of HQ village and collection of water sample as mentioned above.
		HA (M)	Transport water sample to laboratory Provision of sterilized bottles to MPWs Keeping record of water quality surveillance Communicating Gram Panchayat about water sample quality
		MO	Investigation of cause of water contamination Advise to Gram Panchayat about corrective measures for safe water supply.
2	TCL Sample collection	MPW (M/F)	TCL sample collection of each village once a month. Collect sample from TCL bag which is currently in use
		HA (M)	Transporting sample to laboratory Keeping record of TCL sample examination and advise to Gram Panchayat
		MO	Communication to GP and BDO about result of TCL examination and advise about corrective measures
3	Sanitary survey	HA (M)	Assisting MO in sanitary survey Keeping record of sanitary survey and issue of Red/Green card
		MO	Sanitary survey of all water supply schemes once a year. Issue of red/green card to GP. Resurvey of red card issued water supply schemes before monsoon
4	Training of GP staff in water supply	HA (M)	Collection of information of all the persons responsible for water supply and arrangement of training of these persons Keeping record of training
		MO	Conducting training of water supply for all the villages in PHC area.
5	Sanitation	MPW	Inspection of village surroundings
		HA	during visit to village
		MO	Communicating the GP if there is fly nuisance, water supply contamination, breeding of mosquito or any health hazard seen

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4.7. CONTROL OF WATER-BORNE DISEASES

EPIDEMICS

Water-borne epidemics are the commonest epidemics observed in rural areas of the state. Thus medical officer must know the characteristics, management, investigation and control measures of the epidemics. Detailed instructions about epidemic control are given at the beginning of this section in Chapter-1. Specific instructions related to water borne disease epidemic is given below-

1. Characteristics

- It is confined to the people who are drinking water from a particular source of water.
- Outbreak is usually explosive i.e. many cases report in short period.
- Outbreak declines after stoppage of use of contaminated water source or disinfection of that particular water source.

2. Laboratory investigation

Following laboratory samples should be collected for investigation:

- Water samples should be collected before starting control measures. Minimum five water samples should be collected. Places of water sample collection should be -
 - § One sample from reservoir (well, tank etc.)
 - § One sample at place of entry to village (main valve)
 - § Two samples from last stand posts in village.
 - § One sample from house of index case.
- Fifty grams TCL should be sent to DPHL from storage point to know the available chlorine in the TCL.
- If you suspect cholera, collect stool samples in CB media.
- For enteric fever, whole blood for culture, sensitivity and serology.
- Viral hepatitis: Serum sample for antibody titre and stool samples for virus isolation should be collected. Both the samples should be transported in cold chain.

3. Control measures to be taken in case of water-borne diseases epidemic

3.1. Chlorination of water

Start Chlorination of water immediately. In case of piped water supply, chlorine level should be 0.5 PPM at the last stand post. If you are not getting desired level then start house-to-house chlorination by using either mother solution or chlorine tablets. Help of school children can be taken for this. In any case each and every person should drink only chlorinated water.

3.2. Identify the place of contamination (cause of epidemic).

Identifying place of contamination and taking corrective measures will halt spread of epidemic. Following steps are useful in identifying the exact place of contamination -

- You have identified the time period of contamination with the help of epidemic curve and area first affected with the help of serial spot map. Concentrate on the area from where the epidemic has started as indicated in spot map.
- Ask the members of household about any change/alteration in drinking water e.g. change in taste, colour or odour. Also ask whether the source of drinking water was changed during that period because of any reason.
- Ask the Gram Panchayat to chlorinate the water up to 1PPM and release the water supply in this area.
- Start walking along the main pipeline in this area towards flow of water and go on performing OT test from each household on this line.
- You will find sudden reduction in chlorine concentration of water at some household. Pipeline between the tap of house with 1PPM concentration and tap of house with reduced concentration is having leakage. Carefully reexamine this area for leakages and request Gram Panchayat for control measures accordingly.
- Reduction in free chlorine concentration at leakage takes place due to mixing of organic matter in pipeline by sucking mechanism, which suddenly increases chlorine demand of water and absorbs the available free chlorine.
- You can also identify contamination spot from the leakages. When water supply is released, it gets collected around the leakage, mixing all the surrounding dirt. When water supply valve is closed, all this water collection is sucked in the pipeline due to the negative pressure. Ask households about any such situation in the area.

3.3. Start housefly control measures

Houseflies are restless insects. They continuously move to and fro between food and excreta resulting into contamination of food. Houseflies also deposit their stools on food, which is also a rich source of pathogens. Inform Gram Panchayat for starting fly control measures. Cleaning the village by removal of garbage is most important. Flies breed on human excreta, manure of animals, garbage, decaying fruits and vegetables etc. which should be removed from the village. Adult flies should be killed by spraying insecticides like lindane (0.5%), malathion (5%) or ronnel (5%). Insecticide spraying without cleaning the

environment is wastage of time and resources, as flies reappear again within 2-3 days.

3.4. Personal hygiene

Six rules of cleanliness to be observed at home should be conveyed to villagers. These are;

- Drinking water should be covered.
- It should be kept at height
- For taking out water for drinking, use long handled pot.
- Before eating and before preparation of food wash hands rubbing well with soap and water.
- After defecation wash hands with soap and water.
- After cleaning child, wash hands with soap and water.

3.5. Health Education

Gram Sabha followed by person-to-person communication during survey are the best approaches. If village is large then it should be supported by distribution of pamphlets, and loudspeaker announcements and ward wise meeting of Gram Panchayat members.

4. Sanitary survey of water supply scheme

Carry out sanitary survey of village water supply scheme as indicated in Chapter-6.

Inform the Gram Panchayat in writing about the findings of sanitary survey. If the Gram Panchayat has been already issued red card, this should be mentioned in report.

5. Epidemic kit

Necessary instruments, equipment and medicines required for epidemic control should be kept in one box and labelled as 'Epidemic Kit'. As the treatment and control measures of gastro epidemic and fever epidemic are totally different, two kits one 'Gastro Epidemic Kit' and another 'Fever Epidemic Kit' should be kept ready.

5.1. Preparation & maintenance of Gastro Epidemic Kit

Instructions given below should be followed regarding preparation and maintenance of kit.

- Use cardboard or paper box of suitable size for the kit.
- Label the kit in bold letters on white paper as '**Gastro Epidemic Kit**'.
- Put mentioned quantity of medicines, equipment and instrument in the kit, wrap with transparent plastic sheet and close in such a way that it should not get damaged while transportation or become wet during rains.
- Keep both the kits in MO room on left side of chair of MO. If this place is not suitable then any other prominent place may be identified and should be known to everyone in PHC including Group-D staff and Part Time Lady Attendant.
- Open the kit after every three months, check the condition of medicines, take back the near expiry medicine for routine use and replenish the stock. Do not keep expired medicine in kit.
- Never use medicines in the kit for routine purpose.

5.2. Contents of Gastro Epidemic Kit

Table - 9 : Contents of gastro epidemic kit

Sr.	Particulars	Quantity	Use
1	Tab. Furazolidine 100 mg	1000	For children below 12 years
2	Cap. Tetracycline 250 mg	1000	For cholera
3	ORS Packets	100	Treatment of dehydration
4	Ringers lactate bottles	50	Treatment of severe dehydration
5	Cotrimaxazole tablets	100	For treatment of dysentery
6	CB media bottles	10	Stool sample collection
7	Sterile glass bottles	5	Water sample collection
8	Polythene bags	5	TCL sample collection
9	Liquid chlorine 1 lit.	5	House to house chlorination
10	IV set	100	For IV fluids
11	Scalp vein set	50	For IV administration to small children
12	Cotton bundle, Bandage	2 each	Minor purposes
13	Vene-section set	1 Set	Severely dehydrated patient
14	Forceps, Scissor, Blade	2 Each	For patients
15	Weighing machine	1	Weighing for calculation of IV dose
16	Rope - 5 meters	1	Multipurpose

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5. VECTOR-BORNE DISEASES

**WAR BETWEEN MAN & MOSQUITOES IS UNENDING
WILL SURVIVE – THE FITTEST ONE i.e.....?**

**NATIONAL VECTOR-BORNE DISEASES CONTROL
PROGRAMME**

All the vector-borne diseases of public health importance are now clubbed together under one programme called as National Vector-borne Diseases Control programme (NVBDC).

Diseases which will be considered for control under this programme are -

- Malaria
- Dengue Fever
- Japanese Encephalitis
- Filariasis
- Kala Azar (Not found in Maharashtra)

Primary Health Center is expected to implement control activities of all diseases mentioned under NVBDCP. Malaria shows its presence throughout the state; though risk of malaria transmission differs from place to place. Dengue Fever, Japanese Encephalitis, Chandipura viral disease and Chikungunya are newly emerging diseases and are being reported from new areas every year, therefore all PHCs must be alert for these diseases. Filaria is prevalent in more than half districts of the state. We do not get cases of Kala Azar in Maharashtra, so it need not be discussed. Many other diseases are also spread by various types of vectors. Important vectors and diseases spread by them in Maharashtra state are as follows –

Table -10 : Important vector-borne diseases

Sr.	Vector	Diseases transmitted
1	Anopheles mosquito	Malaria
2	Culex mosquito	Filaria, Japanese Encephalitis
3	Aedes mosquito	Dengue fever, Chikungunya
4	Sand fly	Sandfly fever, Chandipura Encephalitis
5	Rat flea	Bubonic plague
6	Cyclops	Guinea worm disease
7	Houseflies	Diarrhea, dysentery, typhoid

Transmission of vector-borne diseases

- Direct contact: Vector directly transmitted from man to man during direct contact, e.g. scabies
- Mechanical transmission: Disease agent is mechanically transmitted by vector. Majority of diseases transmitted by housefly are mechanically transmitted.
- Biological transmission: Disease agent multiplies and/or undergoes some developmental change in vector host e.g. malaria, filaria.

5.1. MALARIA

Malaria is protozoal disease caused by infection with parasite of the genus Plasmodium and transmitted to man by certain species of infected female anopheline mosquitoes. Clinical features of malaria vary from mild to severe and complicated form according to the species of parasite and susceptibility of individual. In India it is estimated that there

are more than one crore cases of malaria every year out of which approximately one fourth are reported. More than 10,000 people die due to malaria every year.

1. Etiologic agent

There are four species of malaria parasite namely *Plasmodium vivax*, *Plasmodium falciparum*, *Plasmodium malariae* & *Plasmodium ovale*.

Of these four species, only two i.e. *vivax* & *falciparum* are commonly found in Maharashtra.

2. Epidemiology

2.1. General features

- All age groups and both sexes are susceptible.
- Malaria in pregnancy can lead to intra uterine death, premature labour or abortion thus leading to maternal & infant deaths.
- June to December is high transmission season for malaria.
- Rainfall increases relative humidity, which contributes to better longevity of vector mosquito. However heavy rains have adverse effect on mosquito density by flushing out breeding places. Early rains, rains interspersed with few rainy days are associated with heavy epidemics.
- People migrating from one place to another especially on large projects, sugar cane factories, nomadic tribes, etc.

are likely to introduce malaria parasite in non-malarious areas.

2.2. Vector of malaria

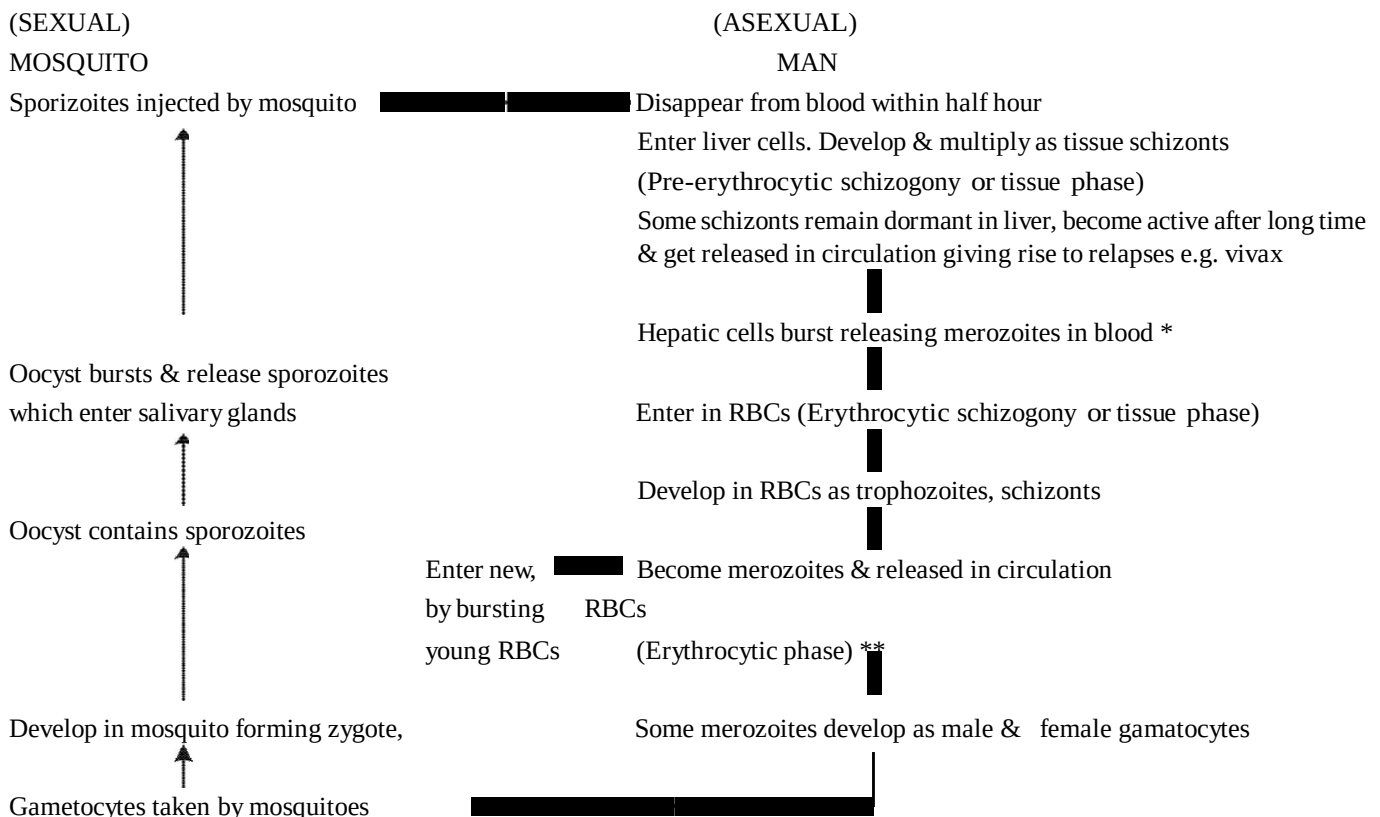
- Anopheline mosquitoes are the important vectors of malaria in India. Three important species transmitting malaria in Maharashtra state are *Anopheles culicifacies* in rural areas, *Anopheles stephensi* in urban area and *Anopheles fluviatilis* in hilly areas.
- They breed in fresh & stagnant water collections such as wells, cisterns, fountains, overhead tanks, seepages of canals etc.

2.3. Life cycle of malaria parasite

Malaria life cycle consists of two phases: (See the figure on next page)

- Sexual phase (Sporogony): With development and multiplication of malarial parasite in female anopheline mosquitoes.
- Asexual phase (Schizogony): In man – Consists of two parts –
 - § Schizogony in liver cells – Pre-erythrocytic schizogony or tissue phase
 - § Schizogony in red cells – Erythrocytic schizogony or erythrocytic phase

LIFE CYCLE OF MALARIA PARASITE



* Time from infection till the appearance of parasite in blood is called as pre patent period. It varies with species. For *vivax* it is 6 - 8 days & for *falciparum* it is 5.5 - 7 days.

** Erythrocytic phase is responsible for febrile paroxysm & in *falciparum* & *vivax* malaria this occurs every 48 hours

3. Clinical manifestations

3.1. Salient clinical features

Salient features of malaria include periodic fever, splenomegaly, anemia & leucopenia.

Prodromal symptoms consist of malaise, muscle pain, headache, anorexia, mild fever and abdominal discomfort. Most important and consistent symptom of malaria is fever. Classical malarial fever consists of three stages namely cold stage, hot stage, and sweating stage. However, classical picture of malarial fever is seldom seen in actual clinical practice. This is because symptomatology of malaria is modified by many factors like age, sex, immune status, presence of other concomitant infections, pregnancy etc.

Thus none of the clinical features of malaria are diagnostic except fever which is constant in almost all patients of malaria. Results of blood slide examination can only confirm the diagnosis

Due to the non-consistent features of malarial symptomatology every fever case is presumed as malaria case unless proved otherwise by laboratory examination.

3.2. Clinical manifestation of vivax malaria

- Incubation period may vary from 12 to 17 days.
- Classical symptoms of malaria are more commonly seen with abrupt onset initiated by rigors, sensation of extreme cold, rising temperature to about 40-41° C, increasing severe headache, epigastric discomfort, nausea, vomiting, followed by sweating.
- Enlargement of spleen is a characteristic of vivax malaria.
- Some pre-erythrocytic liver schizonts may get converted into hypnozoites and may remain dormant in liver and get activated after long time, thus relapses after variable duration is the key feature of vivax malaria.

3.3. Clinical manifestation of falciparum malaria

- Incubation period is 9 to 14 days with an average of 12 days.
- Onset is insidious with gradually increasing headache, pain in back and limbs, gastro-intestinal symptoms.
- A sensation of chilliness rather than frank chill, a prolonged and intensified hot stage and lack of terminal sweating are classical features of falciparum malaria.
- Fever is continuous or remittent and during the period of remission there is no return of sense of well being.
- Anemia of hemolytic type is an important feature.
- Short term relapses occur mostly up to one year and true long term relapses are not found, as all the pre-erythrocytic liver schizonts are released and do not get converted into hypnozoites.

3.4. Clinical manifestation of severe malaria (Pernicious malaria)

About 1-2% of patients with falciparum infection may develop severe manifestations in the form of failure of various organ systems. It is due to delayed treatment.

Severe falciparum malaria may manifest as severe anemia, cerebral malaria, jaundice, pulmonary edema, circulatory collapse, DIC, acute renal failure

Most important amongst all above-mentioned complications is cerebral malaria, as it may rapidly lead to death. Suspect cerebral malaria if patient of falciparum malaria is suddenly showing a change in orientation with or without loss of consciousness.

3.5. Malaria in pregnancy

Immunity against Pl. falciparum is reduced in pregnant women from second trimester to delivery leading to severe falciparum malaria. Falciparum malaria infection causes intrauterine growth retardation and rarely fetal loss.

4. Diagnosis of malaria

Any fever case should be suspected as a case of malaria unless proved otherwise. Therefore Peripheral Blood Smear (PBS) of all fever cases should be collected and examined. On the basis of clinical symptomatology and PBS results, malaria case is classified as follows -

4.1. Suspected malaria case

All fever cases with or without classical symptoms of malaria.

4.2. Confirmed malaria case

When any type of malarial parasite is detected in PBS, it is confirmed malaria case.

4.3. Seriously ill malaria case

- Cerebral malaria - Fever with variable consciousness appears without any other obvious cause in patients with P. falciparum infection.
- Patient with hyperpyrexia, convulsions, severe anemia, pregnancy or pulmonary edema with P. falciparum infections.

4.4. Death due to malaria

Death of cerebral malaria case: Death of microscopically confirmed P. falciparum infected patient due to any of the complications mentioned above.

5. Implementation of malarial control activities

Important malaria control activities are as below -

- Identification of risk status of PHC & villages (whether high risk or not)
- Early fever case detection and prompt treatment (EDPT) through active & passive surveillance.
- Immediate laboratory examination of blood smears (within 72 hours).
- Radical treatment within one week
- Vector (mosquito) control by various means e.g. sanitary measures, insecticide spraying, fogging, antilarval methods including guppy fish programme.
- Personal protection measures
- IEC

Following steps should be carried out for prevention and

control of malaria in PHC area.

5.1. Identification of the high-risk status of PHC area

All villages in PHC may not have malaria problem of uniform severity. Malaria problem may be more in some areas. These areas are called as high-risk areas. Criteria have been developed to identify high-risk areas as below:

- Recorded death due to malaria in last three years by locally acquired infection.
- Slide Positivity Rate (SPR) 5% or more in one year or doubling of SPR during last three years and SPR reaches 4% or more in any of the year.
- Plasmodium falciparum proportion 30% or more when SPR 3% or more.
- Detection of more than 25% cases with RII and RIII Chloroquine resistance.
- Aggregation of labour in project areas.
- New settlements in endemic, receptive and vulnerable areas.

If your PHC fits in any one of above criteria then it is high risk PHC. Inform the high-risk status of PHC to District Malaria Officer in the prescribed format given in annexure.

5.2. Early fever case detection through fever surveillance

Early fever case detection is possible with systematic fever surveillance of the area.

Fever surveillance activities in PHC should be planned in such a way that all fever cases from PHC area are detected at earliest. Surveillance network should also indicate the trend of fever cases so as to recognize epidemic at early stage. These are called as early warning signals. Fever case detection activity is carried out as follows:

5.2.1 Active surveillance

Health functionaries take active role in surveillance of fever cases by house-to-house visits.

a. Village level

There are Fever Treatment Depot holders (FTD) and Drug Distribution Centers (DDC) at village level. The volunteers working at FTD and DDC play important role in malaria control. FTDs collect PBS and give presumptive treatment to fever cases in village, whereas DDCs only give presumptive treatment without collecting PBS. Fever surveillance by these volunteers is called as active surveillance. These volunteers are from same village; they are first to know the rising trend of fever cases in particular village. All high risk PHCs should have strong network of village level volunteers for early recognition and effective control of fever epidemic.

b. Sub center level

MPW (Male) visits each house in his area once in fortnight and searches for fever cases. If he finds any person with fever or history of fever since his last visit, he collects PBS and administers presumptive treatment. Surveillance by MPW (Male) is backbone of Malaria prevention and control activities. MPW (Female) should also collect PBS if she finds fever case

during her house-to-house visit in sub center area and give presumptive treatment.

5.2.2 Passive surveillance

Detection of fever cases from patients attending OPD is called as passive surveillance. PBS of such patients is collected by laboratory technician in PHC. PBS collected in PHC, RH or Civil Hospital or any other government or non government institution is categorized under passive surveillance.

a. Health center level

PBS of fever cases attending OPD of PHC, Ayurvedic, Allopathic dispensary, Health Unit, etc. is collected and given presumptive treatment.

b. Malaria clinic

If laboratory facility is available at PHC, PBS of fever case is immediately examined for malarial parasite and if found positive, radical treatment is given before patient leaves OPD.

5.2.3 Planning of active fever surveillance

a. Active surveillance by Fever Treatment Depot (FTD) holders & DDC

Fever case detection (active surveillance) is basic responsibility of MPW (M). If your PHC is categorized as high risk PHC, then volunteers called as Fever Treatment Depot holder or Drug Distribution Center are appointed to strengthen active fever surveillance. Responsibilities of FTD holders & DDC are as follows-

i Fever Treatment Depot (FTD) holder

Selection criteria

- There will be one FTD per 1000 selected tribal population. Pada workers appointed under Navsanjeevani scheme can be appointed as FTD.
- FTD holder should be resident of that village.
- He/she should be able to read & write for record keeping
- MO should select volunteer in consultation with community leader of the village.
- **Display** board at the residence of FTD indicating name of FTD, name of village/pada and population covered.

Training

Give one week training to all selected FTDs at PHC. Training should include blood smear collection, administration of age wise presumptive treatment, impregnation of bed nets, promotion of larvivorous fish, stock maintenance, record keeping and referral.

Responsibilities

- FTD holder will collect (at least five) blood smears from all fever cases and cases with history of fever from his/her area.
- FTD should keep record of all PBS collected in MF-2.
- FTD will administer presumptive treatment to such case as per age of patient. Patient should swallow medicines in front of FTD holder.
- FTD will refer seriously ill patient to nearby PHC after

collection of PBS and administration of presumptive treatment.

- Honorarium of Rs. 25/- per month is given to all FTD holders.

ii Drug Distribution Center (DDC)

If it is not possible to get a volunteer who can collect blood smear, MO should appoint DDC in such village. Guidelines for identification, working pattern and record keeping are similar for FTD holder and DDC except that DDC will not collect blood smear and will only administer the presumptive treatment as per age of patient.

DDCs should be imparted training for 1 - 2 days for identification of fever cases, administration of presumptive treatment, promotion of preventive measures like distribution & impregnation of bed nets, larvivorous fish, source reduction etc. for vector control.

iii Support to FTD and DDC

Medical Officer must ensure that appropriate support is extended to all FTDs and DDCs in PHC area for smooth functioning of this village level network.

- FTD should have stock of 100 chloroquine tablets, 50 micro slides, 50 disposable lancets and 50 alcohol swabs.
- DDC will always have stock of 100 chloroquine tablets.
- MPW (M) will visit all FTDs once a fortnight in his area and replenish the micro slides, drugs etc, observe the blood smear collection technique and record keeping.
- MPW (M) will visit DDC once in a fortnight and replenish drugs, observe the dose schedule, record keeping. Newly recruited and less competent FTDs/DDCs must be visited more frequently.
- Establish the system to transport PBS collected by FTD holders regularly.
- Remember that in between two consecutive visits of MPW in that village, DDC/FTD is the only functionary who can treat fever case with chloroquin tablets & will check the spread of the disease in community.

b Active surveillance by MPW (M)

Active fever surveillance by MPW (M) is vital for malaria control. Home visits as per work schedule; prompt presumptive treatment and supervision of FTD holders/DDCs are important functions of MPW (M).

Fortnight blood collection by active surveillance is the key activity. Technical justification for fortnightly survey is that, the incubation interval for *P. vivax* is approximately 22 days & for *P. falciparum* is 35 days. Surveillance cycle of less than one incubation interval will catch most of the secondary cases before the commencement of next cycle.

Incubation interval is the duration of the full cycle of malaria parasite. It is the sum of the time taken for the development of the parasite in the mosquito & that in the human being.

Visits as per work schedule

Suitable work schedule of MPW (M) should be developed

for timely and effective case detection activity. Following steps should be carried out for planning and implementation of work schedule of MPW.

- Firstly MPW should update village wise population register (MF-1). This should be updated every year in January. MF-1 is useful for preparing 10 days working programme and for evaluation of MPW activities, e.g. expected smears in one surveillance cycle or on any particular day.
- Second important step is fixing the fortnightly house-to-house visit schedule. Ten days fixed programme calendar for one year is prepared by DMO in the month of December. Villages to be visited on each day should be planned by MPW and HA in consultation with MO. MO should verify that all hamlets, padas, lonely farmhouses and new settlements, projects, mass labour movements are included while approving 10 days schedule.
- For planning of schedule, first divide population of sub-center by 10. This is average daily population to be surveyed. Start with head quarter village. Consider population, distance and approach facility to each village, hamlets, etc. while allocating population to be surveyed per day. More population should be allotted on the days of surveillance of HQ and nearby villages and less during surveillance of remote village, hamlets and lonely farm houses.
- For each day schedule indicate, first M number to start for house visit and last M number i.e. end point of that working day.
- Stenciling: House stenciling is compulsory for MPW (M). He should record his visit to household by putting date and signature on door.
- **Health** Assistant should check the "dailyvisitschedule of MPW" once in a week and MO should check once a month.

Collection of blood smear and administering presumptive treatment

- MPW (M) should make sure before surveillance cycle begins about sufficient stock of glass slides, lancet, alcohol swabs, chloroquine etc.
- He will ask about any one suffering from fever at present, any one who has suffered from fever since his last visit and any one who has come as a guest and suffering from fever.
- If answer to any of the above is 'yes', then MPW will collect blood smear and administer age wise presumptive treatment. Patient should swallow chloroquine in front of MPW. MPW will keep the record in MF-2 register.
- MPW will advise seriously ill cases to visit nearby PHC for immediate intensive treatment. He should accompany semiconscious or unconscious patients with history of fever.

Supervision of FTD holder/DDC

- MPW will contact FTD holders/DDCs during his visit to the village. Collect blood smears and MF-2 record from

FTDs and send it to PHC laboratory.

- MPW will replenish stock of slides and/or drugs to FTD holders/DDCs.
- MPW will check record of DDCs & will visit those persons in the villages, who had received presumptive treatment from DDCs & will collect PBS.

c. Active surveillance by ANM

- ANM will ask all antenatal and post-natal mothers about history of fever during visit. If any mother gives history of fever then she should collect blood smear, administer presumptive treatment and immediately send slide to laboratory.
- ANM will collect blood smear from all other fever cases, which come across during her routine home visits.
- She should create awareness in community that malaria is very serious complication in pregnancy and postpartum period, which leads to high mortality.

d. Role of Health Assistant (M) in surveillance activities

- HA (M) will supervise all anti-malaria activities of MPW (M & F).
- He will do concurrent (along with MPW) and consecutive verification (after visit of MPW) of home visits of MPWs.
- If post of MPW is vacant HA will do rapid survey of population, will collect PBS of fever cases & contact all FTD holders/DDCs in sub center area and supervise the surveillance.
- HA will administer radical treatment to all positive cases in PHC area.

5.2.4. Planning of passive surveillance

MO has key role in implementation of malaria control activities under National Vector-borne Diseases Control programme in PHC area. For this, MO should carry out following activities-

- MO should ensure that all fever cases attending OPD are identified, PBS collection is clearly mentioned on case paper of such patients and PBS is actually collected by the lab. technician.
- Presumptive treatment should be given under supervision after PBS collection.
- If there is facility of Malaria clinic at PHC, MO will ensure that PBS of fever case attending OPD is examined immediately and if found positive, radical treatment is given before patient leaves PHC.

5.2.5 Role of MO in malaria control

MO should -

- Prepare fortnight calendar of MPW (M) and routinely check whether MPW (M) follows visit schedule as per the calendar.
- Appoint FTD holders/DDCs in PHC area in consultation with community.

- Ensure that sufficient stock of micro slides, lancet, anti-malarials etc. is available with field staff and at PHC HQ.
- Check registers maintained at level of MPW, HA, laboratory and PHC.
- Analyze PHC data, identify early warning signals and take necessary actions so that it will not take epidemic form.
- Refer severe and complicated case to RH/district hospital for further treatment.
- Investigation & control of fever outbreak
- Monitor vector control activities
- Plan, implement & monitor health education activities

5.3. Ensure administration of correct presumptive treatment to all fever cases

All fever cases are presumed as "suspected case of malaria" irrespective of clinical presentation of the patient, therefore treatment given is called as presumptive treatment i.e. anti malarial given to fever case presuming that it is a malaria case. It is given immediately after PBS collection.

Presumptive treatment is given to all age groups and to both sexes (including neonates, old persons and pregnant women). Antimalarials and doses of presumptive treatment change with risk status of area and chloroquine sensitivity. Therefore MO must know risk status and chloroquine sensitivity of PHC area. This information is available with DMO.

5.3.1. Presumptive treatment in low risk area

Single dose of chloroquine phosphate as 10 mg / kg bodyweight is given. Schedule has been simplified age wise for easy administration as follows:

Table -11: Presumptive treatment of chloroquine in low risk areas

Age	Chloroquine	
	Mg. base	Number of tablets (150 mg base)
< 1 years	75	½
1 - 4 years	150	1
5 - 8 years	300	2
9 - 14 years	450	3
15 years	600	4

5.3.2. Presumptive treatment in high-risk area

- FTD/DDC: FTD holders/DDCs will administer age wise chloroquine as mentioned in low risk area (refer above table).
- MPW (Sub center) and above level: Chloroquine 25 mg / kg body weight over three days (10 mg / kg body weight on first and second day and 5 mg / kg body weight on third day) along with single dose of Primaquine 0.75 mg / kg body weight on first day.

Table - 12: Presumptive treatment in high risk areas

Age in years	First day		Second day	Third day
	Chloroquine mg (tablet)	Primaquine mg (tablet)	Chloroquine mg (tablet)	Chloroquine mg (tablet)
< 1	75 ($\frac{1}{2}$)	Nil	75 ($\frac{1}{2}$)	37.5 ($\frac{1}{4}$)
1-4	150 (1)	7.5 (1)	150 (1)	75 ($\frac{1}{2}$)
5-8	300 (2)	15 (2)	300 (2)	150 (1)
9-14	450 (3)	30 (4)	450 (3)	225 ($1\frac{1}{2}$)
15	600 (4)	45 (6)	600 (4)	300 (2)

* Numerals in the bracket indicate number of tablets of 150 mg chloroquine & 7.5 mg primaquine.

Note: Pregnant women and infants (below 1 yr) should not be given Primaquine.

5.3.3. Presumptive treatment in areas with chloroquine resistant *P. falciparum* strain.

MO will get information from DMO about sensitivity status of *P. falciparum* strain in PHC area. If PHC has chloroquine resistant *P. falciparum* strains, use following schedule for presumptive treatment. You will be provided with required medicines from DHO/DMO.

Table - 13: Presumptive treatment in chloroquine resistance areas

Agency	Drug	Dose
DDC/FTD	Chloroquine	600 mg base for adult and follow the age wise treatment schedule given for low risk area.
MPW and HA during active surveillance	Chloroquine+ Primaquine	Chloroquine - 1500 mg. for 3 days + Primaquine 45 mg. on first day for adults. For children below 15 years reduce the doses as per schedule given for presumptive treatment for high-risk area.
PHC OPD	Sulphalene/ Sulfadoxin + Pyrimethamine	1500 mg. + 75 mg. base (combination 3 tablets) for adults as single dose. Reduce the doses as per age.

Note:

- Ø At MPW/HA level, first day dose of presumptive treatment (Chloroquine + Primaquine) should be administered in front of the MPW/HA (supervised).
- Ø If immediate microscopic diagnosis facility is not available at PHC, then add 600 mg Chloroquine to adults (reduce according to age for below 15 yrs) along with Sulfadoxine + Pyrimethamine combination because sulfa combination has very little action on *P. vivax*.
- Ø Sulpha combination should be swallowed in front of pharmacist in PHC.

Ø Presently in Maharashtra, malaria resistance is known in only few areas of Gadchiroli & Gondiya districts.

5.4. Laboratory examination of peripheral blood smears

The peripheral blood smear should reach laboratory within 3 days & should be examined on the day of receiving and positive result should be communicated to MO/HA for radical treatment within 24 hours of examination. Medical officer must establish flow of blood smears from site of collection to laboratory in such a way that, every smear collected will reach within 3 days. Remember, late examination of blood smears will make all surveillance efforts useless.

Following guidelines should be implemented to achieve this objective:

- First get the information of persons and institutions collecting blood smear in PHC area. These include FTD, MPW (M+F), Dispensary (if any) and your PHC.
- Prepare flow chart of blood smear transportation with help of MPW (M & F) and HA (M & F) in such a way that every PBS collected in PHC area should reach laboratory at least by third day of collection.
- Fix responsibility to HA of concerned area, for PBS transportation from each place of blood smear collection. Prepare chart of this and display in MO room. Never give PBS transportation responsibility to MPW (M).
- Plan micro slide flow to laboratory in such a way that slides of sub centers reach laboratory evenly without segregation on particular days. Two fixed days in a week may be decided for each sub center for slide transportation.
- Avoid congregation of collection of PBS in last week of a month.
- All PBS collected in tribal PHC should be examined within 48 hours, and from non-tribal PHCs within 72 hours.
- If more number of PBS reach laboratory and it is difficult to examine them within stipulated time period, send PBS to nearest laboratory or DMO office. DMO will guide you for sending micro slides to other laboratory. It is the responsibility of MO to get examined all slides from PHC area within 48 hours and convey results to HA/MO (MO of any PHC which is attached for laboratory examination) for radical treatment.
- PHCs, which do not have laboratory facility, are attached to nearby PHC having laboratory. Such MO should monitor time lag between sending micro slides and obtaining results. Inform MO in charge of laboratory if time lag is more than 48 hours.
- In Malaria clinic, examination of PBS of all fever cases attending OPD is carried out immediately on collection. Request patient to wait for 2 hours to obtain the results. If PBS result is positive, give RT according to type of malarial species before patient leaves PHC. This will ensure prompt RT & will prevent further spread of the disease.
- Review Laboratory work done by technician at least once a week. Check MF-2 & MF-7 to see whether micro slides

are arriving laboratory within time. Check whether all micro slides are examined daily and results are communicated on same day.

5.4.1. Role of laboratory technician at PHC/malaria clinic

- At malaria clinic laboratory technician will collect PBS from all fever cases, examine them immediately and inform result to MO.
- He/She will maintain record of BS collected at malaria clinic in MF-2.
- Laboratory technician will accept PBS along with MF- 2, from peripheral staff of PHC and nearby attached PHC, stain and examine..
- At least 100 fields of each PBS should be examined before slide is declared as negative.
- Laboratory technician will report daily to MO all slides examined on that day along with MF-2. He will also keep daily record in prescribed format.
- In suspected serious and complicated *P. falciparum* malaria cases, laboratory technician will examine PBS on emergency basis and record density of parasites and submit results to MO.
- He/she will supply micro slides, antimalarials to all peripheral staff and maintain stock register.
- He/She will keep record and stock of staining material and other required laboratory material.
- Laboratory technician will maintain daily record in following register:

a. Laboratory daily register

Date	Blood smears in hand				Blood Smear examined			Remaining BS
	Backlog	Received today		Total (2+3+5)	Back log	Today's	Total (6+7)	
		Active	Passive					
1	2	3	4	5	6	7	8	9

Action for remaining BS			Remarks	Signature of Lab. Tech.	Signature of MO
Kept for tomorrow	Dispatched to other Laboratory				
	Name of Lab	Number of BS			
10	11	12	13	14	15

Note: Fill up this register daily and show to MO at the time of closing of laboratory. Mention date of oldest PBS examined on that day from backlog slides in remarks column.

5.4.2. Cross-checking(quality control) of laboratory results

- All blood smears found positive at PHC are crosschecked at district level for parasite species and stage. Laboratory Technician should preserve all positive slides.
- 5% of all negative slides are also crosschecked.
- A specific code number is given for every month by DMO

for selection of negative slides for cross checking.

- Laboratory technician should carry all examined slides to DMO office on 1 st of each month for cross checking.

5.5. Give radical treatment to positive cases

When PBS of patient is positive for malaria parasite, radical treatment is given. Radical treatment means, treatment to kill all stages of malarial parasites including gametocytes in the body of patient.

For transmission of malaria from one person to other, gametocyte must be present in body of patient at the time of mosquito bite. All the gametocytes in patient's blood should be killed for breaking the malaria cycle. Chloroquine has very little action over gametocytes. Therefore Primaquine has to be given to patient along with Chloroquine in all microscopically positive cases to kill gametocytes. Primaquine also kills liver hypnozoites and prevent relapse in vivax malaria. Thus administration of Primaquine ensures a complete cure from malaria in positive cases, makes the patient non-infective to mosquitoes, and helps in preventing spread of malaria. This is the epidemiological basis for early radical treatment to all positive cases as patient continues to spread malaria in community till he/she receives Primaquine. Therefore MO should ensure earliest administration of RT.

Radical treatment depends upon type of malarial parasite found, risk status of area and sensitivity of parasite to Chloroquine.

5.5.1. Radical treatment in low risk area

a. *P. vivax*, *P. malaria* and mixed infections

Chloroquine is administered as single dose on first day and primaquine from first to fifth day (for five days) as a radical treatment of *P. vivax*, *P. malariae* and mixed infection (*Vivax* and *Falciparum* together) as shown in table below:

Table - 14 : Radical treatment for *P. vivax* *P. malaria* and mixed infections

Age in years	Day 1				Day 2 to 5	
	Tab. Chloroquine		Tab. Primaquine		Tab. Primaquine (2.5mg)	
	Mg. base	No. of tablet	Mg. base	No. of tablet	Mg. base	No. of tablet
< 1	75	½	Nil	Nil	Nil	Nil
1-4	150	1	2.5	1	2.5	1
5-8	300	2	5	2	5	2
9-14	450	3	10	4	10	4
15	600	4	15	6	15	6

Note: In high-risk areas where presumptive treatment is given for three day (adult - 1500 mg base), *P. vivax* positive patient need not be given Chloroquine again for radical treatment. Only Primaquine should be given to such patient as per schedule for 5 days.

b. *P. falciparum* infection

In low risk area, complete radical treatment with a single dose of tablet chloroquine 10 mg/kg body weight combined with

0.75 mg/kg body weight of primaquine should be given.

Table - 15 : RT for P.Falciparum

Age	Tab. Chloroquine (150 mg)		Tab. Primaquine (7.5 mg)	
	Mg. base	No. of tablet	Mg. base	No. of tablet
< 1	75	½	Nil	Nil
1-4	150	1	7.5	1
5-8	300	2	15	2
9-14	450	3	30	4
15	600	4	45	6

5.5.2. Radical treatment in High-risk area

a. RT for P. vivax, P. malariae and mixed infections

In high-risk area, where presumptive treatment with 1500 mg. chloroquine & 45 mg. primaquine has been given, chloroquine need not be administered again but primaquine must be given for five days.

Table - 16: RT for P. vivax, P.malariae&mixed infection in HR Area

Age	Tab. Primaquine 2.5 mg base (Daily dose for five days)	
	Mg. base	No. of tablets
< 1	Nil	Nil
1-4	2.5	1
5-8	5	2
9-14	10	4
15	15	6

b. RT for P. falciparum infection

In high-risk areas fever cases are given 1500 mg Chloroquine (Over 3 days) and 45mg Primaquine as a presumptive treatment. If such case is found positive for P. falciparum on PBS examination, patient need not be given radical treatment again.

5.5.3. Chloroquine resistant P. falciparum case

If Chloroquine resistance to falciparum is reported from your PHC, Sulphalene /Sulphadoxine and Pyrimethamine combination followed by primaquine should be given.

Sulfa + Pyrimethamine combination and Primaquine should not be given on the same day as both are known to precipitate hemolytic crisis in sensitive cases with G-6 PD deficiency.

Patient should swallow the Sulfa + Pyrimethamine combination in presence of health worker. Primaquine should be handed over to patient to consume on next day morning.

Table -17 : Treatment for chloroquine resistant P. falciparum malaria

Age in yrs.	Day 1 Sulfa + Pyrimethamine		Day 2 Primaquine (15 mg tablets)	
	Mg. base	No. of tablets	Mg. base	No. of tablets
< 1	125 mg. + 6.25 mg	¼	Nil	Nil
1-4	500 mg. + 25 MG.	1	7.5	1/2
5-8	750 mg. + 37.5 mg	1 ½	15	1
9-14	1000 mg. + 50 mg	2	30	2
15+	1500 mg. + 75 mg.	3	45	3

Note: Use Chloroquine (10 mg/kg body wt) for P. vivax infection even when the area is declared as Chloroquine resistant.

In pregnant women & infants primaquine is contraindicated.

5.5.4. Treatment of severe & complicated malaria

- In severe & complicated malaria due to P. falciparum (clinically & microscopically confirmed), IV quinine is the drug of choice, irrespective of chloroquine resistance status of the area.
- Quinine salt 10 mg /kg. body weight 8 hourly in 5% dextrose saline is preferred. Patients should be switched over to oral quinine as early as possible & oral dose is 10 mg/kg body weight eight hourly not exceeding 2 gm in a day in any case. Total duration for quinine therapy should be for 7 days including both parenteral & oral doses.
- Injectable form of artemisinin may be used for the management of severe & complicated malaria in non-pregnant adults as below:
 - § Artesunate: 2.4-mg/kg body weight IM/IV followed by 1.2 mg/kg body weight after 12 hours, then 1.2 mg/kg body weight once daily for total duration of 5 days.
 - § Artemether: 1.6 mg/kg body weight IM followed by 1.6 mg/kg body weight daily for total of 6 injections or 1.6 mg/kg body weight IM injection twice daily for 3 days, a total of 6 injections.
 - § Artether: 150 mg daily IM for 3 days in adults only.
 - § Artemisinin: 10 mg/kg body weight at 0 & 4 hours followed by 7 mg/kg body weight at 24, 36, 48 & 60 hours.
 - § Artemisinin derivatives are not recommended in pregnancy & infants.

5.5.5. Chemoprophylaxis

No true chemoprophylactic drug is available which acts directly on "sporozoites" and prevents establishment of malaria infection.

a. Anti malarials used for chemoprophylaxis

- In Chloroquine sensitive areas chloroquine is to be given.
- Chemoprophylaxis with chloroquine is not recommended beyond 3 years because of cumulative toxicity.
- In Chloroquine resistance areas, chloroquine is to be supplemented with proguanil.
- In chloroquine resistant areas chemoprophylaxis is recommended with chloroquine 5 mg/kg body weight weekly & proguanil 100 mg daily.

The chemoprophylactic drugs used at present are schizonticidal drugs, which do not prevent spread of malaria infection but suppress appearance of clinical symptoms by acting on erythrocytic stages. Guidelines for chemoprophylaxis are as below:

b. Chemoprophylaxis for visitors traveling to malarious area

- Chemoprophylaxis is to be started a week before arriving to malarious area for visitors.
- Start with loading dose of 10 mg/kg body weight & followed by 5 mg/kg body weight. This is to be continued till one month after return from endemic area.
- The terminating dose should be 10 mg/kg body weight along with 0.25 mg / kg body weight of primaquine for five days.

c. Chemoprophylaxis for pregnant women

- Prophylaxis should be initiated from second trimester.
- Start with loading dose of 10 mg/kg body weight followed by 5 mg/kg body weight. This is to be continued till 1 month after delivery. The terminating dose should be 10 mg/kg body weight along with 0.25 mg / kg body weight of primaquine for five days.

5.5.6. Important aspects of drugs used in malaria treatment

a. Chloroquine

- Chloroquine is synthetic 4-aminoquinoline formulated as phosphate salt for oral use. Chloroquine is highly effective blood schizonticide and remains the principal anti-malarial drug in malaria management.
- **Adverse effects:** Chloroquine is usually well tolerated. Nausea, vomiting, abdominal pain, headache or blurring of vision may be noticed rarely. Administration after meals reduces majority of side effects.
- **Contraindications:** Chloroquine is contraindicated in patients with psoriasis as it may precipitate acute attack. Chloroquine should not be used in patients with visual field abnormalities. Kaolin and calcium/magnesium containing antacids should not be administered along with Chloroquine as they interfere with absorption of Chloroquine.

- Chloroquine is considered safe in pregnancy and for young children.

b. Primaquine

- Primaquine is synthetic 8-aminoquinoline, well absorbed orally, reaching peak plasma levels in 1-2 hours. It is gametocidal and also active against hepatic stage of all malarial parasites.
- **Adverse effects:** Primaquine in recommended doses is generally well-tolerated. It infrequently causes nausea, epigastric pain, abdominal cramps and headache. These symptoms are more common when taken on empty stomach. Rarely Primaquine may cause haemolysis (manifested by cyanosis), especially in persons with G6PD deficiency.
- **Contraindications:** Primaquine should not be given to patients with G6PD deficiency. It should also not be given along with quinidine. It should not be given to pregnant women & infants.

c. Quinine and quinidine

- Quinine is rapidly acting, highly effective blood schizonticidal against all the species of malaria. It is drug of choice for cerebral malaria. However, quinine is not active against liver stage parasites.
- Therapeutic doses of quinine and quinidine commonly cause tinnitus, headache, nausea, dizziness and visual disturbances called collectively as cinchonism. Therapeutic doses may cause hypoglycemia through stimulation of insulin release. Thus quinine should always be given in glucose saline.
- Blackwater fever is rare severe illness that includes marked hemolysis and hemoglobinuria after administration of quinine due to hypersensitivity reaction to drug.

Quinine should be discontinued if signs of severe cinchonism, haemolysis or hypersensitivity occur. It should not be given along with aluminium containing antacids.

5.6. Anti-malaria activities in project areas

Areas with temporary aggregation of labourers for construction, irrigation purposes or any other developmental activities are called as project areas. Once the malarial parasite is introduced in any area through migrated persons of projects, it is very difficult and takes long time to make the area malaria free again. Thus it is always wise and economical to plan anti-malaria activity since beginning in project area.

Following activities should be carried out in project areas

5.6.1. Fever surveillance

Assign population among MPWs in PHC, if population of project area is less than 1000. If population is more than 1000, contact DMO for additional staff for surveillance, supervision and laboratory services. One additional worker should be appointed for every 4000-labour population (including family members).

5.6.2. Appointment of FTD

Choose one volunteer among the labourers as FTD holder. Train the selected volunteer about BS collection, presumptive treatment and breeding places elimination. Supply adequate micro slides, lancets, alcohol swabs, Chloroquine tablets to FTD holder.

5.6.3. Condensed Radical Treatment (CRT)

This is a very important activity. It is given for one day. Screen all incoming laborers in project area and collect blood smear of each member from family of labour irrespective of age, sex and fever status of individual. Administer Condensed Radical Treatment (CRT) to all of them as per schedule below-

Table - 18 : Condensed Radical Treatment (CRT)

Age	Chloroquine (150 mg base)		Primaquine (15 mg base)	
	Mg. base	Number of tablets	Mg. base	Number of tablets
< 1	75	½	Nil	Nil
1-4	150	1	7.5	½
5-8	300	2	15	1
9-14	450	3	30	2
15+	600	4	45	3

For adult population blister packs (600 mg. chloroquine and 45 mg. Primaquine) are available.

5.6.4. Immediate PBS examination

If number of surveillance workers for fever surveillance is more than 4, request DMO for one laboratory technician and one HA per 5 workers.

5.6.5. Control of breeding places

- MPW(M) during fortnightly visit should observe for any water collection/breeding site and inform project in charge immediately in writing.
- Contact project in charge and inform about importance of malaria control in labour camps. Advise about water management at the site of labour camps in writing as below:
 - § All fresh water collections should be covered by fine mesh.
 - § Construct drainage system so that waste water should not get collected around labour colony.
 - § Drain if any water collection is already there.
- Release guppy fish in all water collections around the project area.

5.7. Refer serious malaria case to District/Sub-District hospital

P. vivax and P. malaria infections usually do not lead to complications except infant or young children who may get disoriented or get convulsions due to high fever.

Serious complications usually arise in P. falciparum infection. They may sometimes develop suddenly in a short span of time and may lead to death of patient if not treated promptly and adequately. Management of cerebral malaria is given in the chapter on 'Management of emergency at PHC'.

5.7.1. Referral criteria for peripheral worker

Peripheral health workers include FTD, DDC, MPW (M and F). Patient first comes in contact with these peripheral workers. Medical officer should repeatedly train these workers in identifying serious cases of malaria and early referral before patient becomes serious. Criteria for referral by peripheral health center to PHC are:

- Persistence of fever for 48 hours after starting presumptive treatment.
- Continuous vomiting
- Disorientation
- Increase in intensity of headache
- Severe weakness - unable to walk
- Convulsions
- Anemia /Jaundice

5.7.2. Referral criteria for PHC level

- Cerebral malaria patient not responding to quinine
- Severe anemia (Hb less than 7 gm%)
- Haemoglobinuria
- **Pulmonary** edema
- Oliguria not responding to administration of diuretics.

These patients require investigations, oxygen, blood transfusion etc for management. You have to refer the patient at the nearest place where these facilities are available. If telephone facility is available at referral center, inform hospital about referred patient.

5.8. Vector control measures in PHC area

Vector control measures should be carried out in PHC throughout the year irrespective of risk status of malaria. Proper vector control measures lower the mosquito density resulting into interruption of malaria transmission and reduction in quantum of morbidity in the community. Vector control measures include

- Anti-larval measures
- Anti-adult measures
- Personal protection methods or
- Combination of all above

Details of vector control measures are given in the chapter "vector control".

6. Epidemiological parameters

Important parameters/indices have been developed to understand malaria situation in particular area and also to evaluate the control measures taken. Medical officer must know how to calculate these parameters and their epidemiological importance.

Sr	Parameter /Index	How to calculate	Epidemiological significance
1	Annual Blood Examination Rate (ABER)	No. of BS examined in year $\div$ Total population $\times 100$	This parameter reflects efficiency and adequacy of fever surveillance. ABER of 10% is fixed for estimated fever rates. ABER should not be less than 1% per month during June to December.
2	Annual Parasite Incidence (API)	Total no. of BS positive in one year $\div$ Total population $\times 1000$	Most important criterion to assess malaria situation in PHC area provided ABER of PHC is more than 10%. At present API is used to decide the anti malaria strategy for spraying.
3	Annual Falciparum Incidence (AFI)	Total no. of BS positive for P.falciparum in one year $\div$ Total population $\times 1000$	AFI expresses the falciparum incidence in your PHC area.
4	Slide Positivity Rate (SPR)	Total no. of BS positive for malaria parasite $\div$ Total no. of BS examined $\times 100$	This parameter is independent of ABER. Progress of containment measures can be determined by this parameter. Monthly SPR helps to find out seasonal trend of malaria prevalence. SPR in children (2-9 age especially is important to assess impact of control operations.
5	P. falciparum percentage (Pf%)	Total no of BS found positive for P. falciparum $\div$ Total no of BS found positive for malarial parasite $\times 100$	This parameter gives relative proportion of P. falciparum infection and identifies trends of P. falciparum incidence in relation to total caseload of malaria in the community.

7. Responsibilities of PHC functionaries

Sr.	Activity	Responsibility of PHC staff	
		Designation	Responsibility
1	Updating village wise population, stenciling on doors	MPW	To complete survey every year in December, completing stenciling on all doors
		HA (M)	Supervise 20% survey and stenciling on doors
		MO	Supervise 5% survey and stenciling on doors
2	Establish and improve surveillance for malaria in PHC area	FTD	Take BS of all fever cases and send to PHC or to MPW (M)
		DDC	Give presumptive treatment to all fever cases
		MPW	Visit all houses fortnightly and take BS of fever cases (MPW-M). MPW (F) asks H/O fever to all ANCs, PNCs and collects PBS. In addition to this, collects PBS from all other fever cases found during her routine home visits.
		HA	Check visits of MPW concurrently and consecutively, supervise BS collection as per population norm (8-10 per 1000 population), ensure that, BS are taken from all villages in both fortnights.
		MO	Passive search in OPD (15% of total OPD), supervising active surveillance, appointing FTD holders/DDCs in PHC area especially remote areas
3	Presumptive treatment	MPW	Give age wise presumptive treatment
		Pharmacist	Give age wise presumptive treatment in OPD.
		FTD/ DDC	Give age wise presumptivetreatment

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4	Radical treatment	HA (M)	Give RT to all positive cases in PHC area and ensure that patient consumes tablets in front of you
		Pharmacist	Give age wise and species wise radical treatment at malaria clinic as recommended by MO immediately after PBS examination.
		MO	Review and ensure all positive cases get RT immediately (within seven days)
		MPW	Follow up of positive cases (M) given RT by HA
5	Inventory of lancets, slides, drugs, spirit, slide box	Lab. Tech. OR HA(M)	Indent all material as per requirement, supply to MPWs, pharmacist and keep record
		MPW	Provide lancets, slides, and (M) drugs to all FTD holders/ DDCs/AWWs from his area as per requirement.
6	Biological method	MPW	Continuous survey of (M) breeding places in his area, develop and maintain guppy fish hatcheries in area, release guppy fish at breeding places
		HA (M)	Survey breeding places during May, supervise breeding places survey, give numbers to breeding places
		MO	Review biological control activities, check 10% breeding places & all hatcheries monthly.
7	Spraying	MPW	Inform all people about (M) dates of spraying, care to be taken of food material, attend spraying activity in his area, HE to community
8	BS examination and record, reporting.	Lab. Tech.	Taking BS of all fever cases attending OPD, immediate examination
9	Monitor success of anti malaria activities in your PHC	MO/HA	Calculate various indicators and take corrective actions accordingly.

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5.2. DENGUE FEVER

In Maharashtra state, outbreaks of Dengue Fever /Dengue Hemorrhagic Fever occur either in post-monsoon period when breeding of mosquitoes is highest due to accumulation of rain water in discarded materials or during scarcity season due to aedes breeding in stored water in cement tanks and earthen pots which are not emptied regularly.

1. Etiologic agent

DF/DHF is caused by a group B arbovirus (Flavivirus) and include serotypes 1,2,3, and 4 (Den-1, Den-2, Den-3, and Den- 4). Infection with any one serotype confers lifelong immunity to the virus serotype, but no cross protection for the other serotypes.

2. Epidemiology

Life cycle of Dengue virus occurs in both man and Aedes aegypti female mosquitoes. The virus enters mosquito when it bites viraemic host having dengue infection. Mosquito becomes infective after extrinsic incubation period of 8-10 days. After completion of extrinsic incubation period, infective mosquito can transmit the virus to susceptible human host.

3. Vector for DF Aedes aegypti

- DF is transmitted by bite of an infected Aedes aegypti female mosquito. It is common in most urban areas & recently also seen in rural areas.

- The mosquito** rests indoor, in closets and other dark places.
- Aedes mosquito is domestic breeder. Breeding can occur in any artificial, clean water container such as desert coolers, flower vessels, overhead tanks, discarded buckets, half buried earthen pots (Ranjan), cement tanks, tyres, utensils, etc which are not emptied and cleaned periodically.

4. Clinical manifestations

Dengue infection causes mild illness in the children, while in adults it frequently produces symptoms. The incubation period of Dengue Fever is usually 4-6 days but may vary from 3 to 10 days. Dengue fever is a self-limiting disease in majority of cases of dengue infection. However, dengue virus sometimes causes severe form of clinical syndrome, namely, dengue hemorrhagic fever/dengue shock syndrome (DHF/DSS).

4.1. Undifferentiated fever

Infants, children & some adults who have been infected with dengue infection for the first time develop a simple febrile illness indistinguishable from other viral infections.

4.2. Dengue fever (DF)

It is most common in older children & adults. The symptoms of dengue fever are an acute biphasic fever with headache, body ache, joint pains and retro-orbital pain. Other common symptoms include anorexia, altered taste sensation, constipation, colicky pain, abdominal tenderness, dragging pains

in the inguinal region, sore throat and general depression. Patient may or may not have rash. Although DF is commonly benign, it may be incapacitating disease with severe muscle & joint pain & occasionally with unusual haemorrhages.

4.3. Dengue Hemorrhagic Fever (DHF)

It is a severe form of dengue fever. Secondary dengue infection is the risk factor for DHF. Although DHF can occur in adults, most cases occur in children less than 15 years. During first few days, illness resembles classical dengue fever. Critical stage is reached after 2-7 days, when fever subsides. Accompanying or shortly after a rapid drop in body temperature, varying degree of circulatory disturbances occur.

- Patient is usually restless and has cold extremities. Sometimes there may be sweating.
- Patient may develop haemorrhagic diathesis, which is demonstrated by scattered fine petechiae on extremities, face, trunk and in axillae. Bleeding from the nose, gums and gastrointestinal tract is less common. Hematuria is extremely rare.
- Liver is usually enlarged, soft and tender but usually jaundice is not observed.
- Approximately 50% of patients have generalized lymphadenopathy.
- Chest X-ray shows pleural effusion, as a constant finding.
- In severe cases, the condition of patient suddenly deteriorates a few days after onset of fever. At the time of or shortly after the temperature drops, between three to seven days after the onset, there are signs of circulatory failure. The skin becomes cool, blotchy & congested, circum-oral cyanosis is frequently observed & the pulse becomes weak & rapid. Patient goes in critical stage of shock. Acute abdominal pain is frequent complaint shortly before the onset of shock. Major cause of death in patients of DHF is leakage of plasma in pleural and abdominal cavities leading to hypovolaemic shock.

4.4 Grading the severity of DHF

Grading the severity of the disease is important & is found useful clinically & epidemiologically in epidemics. Four grades as per severity are as below:

- Grade I: Fever accompanied by non-specific constitutional symptoms; the only hemorrhagic manifestation is positive tourniquet test.
- Grade II: Spontaneous bleeding in addition to manifestations of grade I patients, usually in the form of skin & or other hemorrhages.
- Grade III: Circulatory failure manifested by rapid & weak pulse, narrowing of pulse pressure (20 mm Hg or less) or hypotension with presence of cold & clammy skin & restlessness.
- Grade IV: Profound shock with undetectable blood pressure & pulse.

5. Diagnosis

5.1. Case definition of dengue fever

5.1.1. Suspect case

- Acute onset with high fever of less than seven days duration
- Severe headache, backache, joint and muscle pain
- Pain behind eyes (specific sign of Dengue fever)
- Presence of skin rash (Not in all patients)

5.1.2. Probable case

- Suspect case of DF +
- High vector density (*Aedes aegypti*)
- Presence of confirmed case in the area
- Blood slide negative for malarial parasite and patient does not respond to anti-malarial drugs

5.1.3. Confirmed cases

- Isolation of virus from blood in early phase
- Serological test for IgM antibody in single serum samples or 4 fold rise of IgG antibodies in paired serum samples.

5.2. Case definition of Dengue Hemorrhagic Fever (DHF)

5.2.1. Suspect case

- Signs and symptoms of Dengue fever plus bleeding tendencies

5.2.2. Probable case

- Suspect case of DF +
- Positive tourniquet test

How to carry out Tourniquet test

- § Apply sphygmomanometer cuff to the arm and record blood pressure. Calculate mean blood pressure by adding systolic and diastolic blood pressures and dividing the addition by two.
- § Inflate cuff up to mean blood pressure and hold for three minutes.
- § Make round of 3 cm diameter on a plain paper. Put the paper on arm in such a way that the round is placed on cubital fossa.
- § Examine the skin on cubital fossa through the round for petechiae. If petechiae are seen then count them. If you can count more than 20 petechiae in 3 cm diameter circle, the test is positive.

5.2.3. Confirmed case

- Probable case +
- Thrombocytopenia $< 1,00,000/\text{mm}^3$.
- Haemoconcentration (haematocrit increased by $> 20\%$ or evidence of increased capillary permeability) (e.g. pleural effusion in X-ray chest).

Determination of haematocrit and platelet is essential for diagnosis and case management. The time course relationship between fall in platelet count and a rise in haematocrit level appears to be unique to DHF. These changes occur before fever

subsides and before onset of shock and are correlated with disease severity.

5.3. Laboratory diagnosis

Diagnosis of DF/DHF can only be confirmed by serological tests. The tests include detection of IgM antibodies, which appear around the end of first week of onset of symptoms and are detectable for 1-3 months after acute episode. A rising titre of IgG antibodies in paired sera taken at an interval of ten days or more is confirmatory.

6. Clinical management

Depending upon severity of infection, management of the cases differs. Early diagnosis & admission of DHF patients is important in order to reduce case fatality rates.

6.1. Dengue fever

Management of Dengue fever is symptomatic and supportive.

- Bed rest is advisable during acute febrile phase.
- Antipyretics and sponging is essential to keep body temperature of patient below 37°C. Do not prescribe Salicylates (Aspirin) to suspected DF patient. Paracetamol is preferred.
- Analgesic or a mild sedative may be prescribed for severe pain.
- ORS solution is recommended for patients with excessive sweating, nausea, vomiting or diarrhoea to prevent dehydration.
- Patients should be monitored in DHF area until they become afebrile & after platelet & hematocrit determinations are normal.

6.2. Dengue Hemorrhagic Fever

6.2.1. Management of Grade I DF/DHF

- Management during febrile phase is similar to that of DF.
- Patient should be monitored closely. Critical period for monitoring is transition from febrile to afebrile stage, which usually occurs after third day of illness.
- Platelet count & hematocrit estimation is essential.
- Presently facility of platelet count is available at RH.
- Drop in platelet count to <100,000/cumm i.e. 1-2 platelets per oil immersion field usually precedes rise in hematocrit. A rise of more than 20% indicates need for intravenous fluid therapy.
- If hematocrit determination is not possible, hemoglobin estimation may be carried out as an alternative.
- Hematocrit should be determined daily from the third day until the temperature remains normal for one or two days.
- Paracetamol is recommended to keep temperature below 40°C. Dosages of paracetamol recommended are: 1 - 2 years: 60-120 mg/dose, 3 - 6 years: 120 mg/dose & 7 - 12 years: 240 mg/dose.
- Plenty of fluids like ORS & or fruit juices should be given orally, to the extent patient tolerates.

6.2.2. Management of Grade II DF/DHF

- Any person who has DF with thrombocytopenia & hemoconcentration & presents with abdominal pain, black tarry stools, epistaxis, bleeding from gums etc. needs to be hospitalized. Such patient should be observed for signs of shock.
- The critical period for development of shock is transition from febrile to afebrile phase of illness, which usually occurs after third day of illness.
- A rise of hematocrit of 20% or more reflects need for IV fluid therapy.
- If despite of treatment, patient develops features of shock, management of grade III & IV should be started.
- Blood transfusion may be indicated in patients with severe shock, massive bleeding and DIC.

7. Vector control activities

7.1. Larval control measures

Larval control measures are simple to carry out, effective and inexpensive. Important larval control measures are emptying and cleaning of all water containers in village weekly along with adult control measures will virtually eliminate all Aedes mosquitoes in the village. Discard all unused material like broken bottles, old tyres, plastic jars etc.

7.1.1. Larval surveys

In larval survey, house to house information is collected. The basic sampling unit is house or premise, which is systematically searched for water holding containers. Containers are examined for the presence of mosquito larvae.

7.1.2. Calculate larval indices

Larval indices are calculated based on the information collected during house-to-house survey. This will help to know the impact of control measures.

a. House Index: Percentage of houses positive for larvae of Aedes aegypti.

$$\frac{\text{No. of houses with at least one container showing larval breeding}}{\text{Total number of houses examined}} \times 100$$

b. Container index: Percentage of containers positive for Aedes breeding.

$$\frac{\text{No. of containers with larval breeding}}{\text{Total number of containers examined}} \times 100$$

c. Breteau index: Number of positive container for Aedes aegypti per 100 houses.

$$\frac{\text{Number of containers positive for Aedes breeding}}{\text{Number of houses examined}} \times 100$$

7.1.3. Interpretation of entomological indices (Larval indices)

Entomological index	High risk transmission	Low risk transmission
Breteau index	> 50	< 5
House index	> 10	< 1
Container index	> 15	< 1

Container index is mostly utilized for drawing vector control strategy.

7.1.4. Biological control methods

Use of larvivorous guppy fish is recommended.

7.1.5. Chemical control measures

These are recommended in permanent big water containers, where water has to be conserved or stored because of scarcity or irregular & unreliable supply. Use of Temephos in the dose of 1ppm (1 mg per litre of water) is recommended.

7.2. Adult control measures

Fogging by knock down insecticide is effective. Weekly fogging by using pyrethrum for two days along with emptying and cleaning of all water collections leads to immediate decline in Aedes population.

7.3. Personal protection

Insecticide treated bednets (ITBN) have limited utility in dengue control since the vector species bite during the daytime. However ITBNs can be effectively used to protect infants & night workers who sleep during day.

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5.3. CHIKUNGUNYA FEVER

Chikungunya is rare form of viral fever caused by an alphavirus that is spread by Aedes aegypti mosquito. The name is derived from the Swahili word meaning “that which bends up”. This is due to the stooped posture developed as a result of the arthritic symptoms of the disease. The disease is not considered to be fatal. The clinical diagnosis is confused with DF because Chikungunya virus circulates in region where dengue virus is also endemic.

In Maharashtra during 2003, there was an outbreak of Chikungunya in Barshi, District Solapur. In 2006, Malegaon & districts from Marathwada are affected due to this disease.

1. Etiologic agent

Chikungunya is caused by the Chikungunya virus, which is from Togaviridae, genus alphavirus.

2. Epidemiology

The disease occurs mainly in urban area. Epidemics are sustained by human – mosquito – human cycle. Mosquitoes transmit the disease by biting the infected person & then after the extrinsic incubation period is completed, mosquito become infective & can transmit the disease to other susceptible persons.

3. Vector for Chikungunya

The disease is transmitted by bite of an infected Aedes aegypti mosquito. Humans are the major source of Chikungunya virus for mosquitoes. An infected person can not spread the infection directly to other person.

Aedes aegypti breeds in variety of manmade containers like discarded tires, flowerpots, old oil drums, water storage vessels, etc. Details about the vector are in section on vector control.

4. Clinical manifestations

- Time required from bite of an infected mosquito to development of symptoms ranges from 1 to 12 days.
- Chikungunya starts suddenly with fever, chills, headache, nausea, vomiting, joint pains & maculopapular rash.
- Severe joint pain (arthritis) is the most common feature of the disease. Joints of extremities typically in the knee, ankle & small joints of the extremities become swollen & painful to the touch. Although recovery is the expected outcome, some patients can suffer from persistent joint pain for months & may require analgesic for a longer time.

5. Standard case definition of Chikungunya

- Sudden onset of fever as high as 104 degrees F.
- Headache, nausea, vomiting
- Polyarticular arthralgia, particularly affecting small joints & one or more major joints like wrist, elbow, and knee.
- Maculo-papular rash on face & neck on first day of illness, onset may be delayed.

6. Laboratory diagnosis

- Diagnosis is based on either virus isolation or demonstrating four fold rise in antibody titer in paired sera collected during the illness.
- Serum sample should be collected after five days of onset of illness & sample should be sent to National Institute of Virology, Pune.

7. Clinical management

- There is no specific treatment for Chikungunya. Illness is usually self limiting & resolves with time. Supportive treatment that helps to relieve the symptoms, such as nonsteroidal anti-inflammatory & analgesic drugs like Paracetamol, Diclofenac sodium or Brufen should be given. Tab Ranitidine or Gellucil may be used along with this to relieve gastric irritation.
- In case of dehydration, depending on degree of dehydration, ORT or IV fluids should be given.
- Rest is beneficial.
- Use of antibiotics should be minimized & steroids should not be given.
- Infected persons should be isolated from mosquitoes in order to prevent the transmission of the disease.
- No vaccine is currently available for the disease.

6. Control measures

These are similar to as described in the chapter on Dengue Fever.

- Anti larval measures
 - § Container emptying at least weekly by observing dry day.
 - § Use of abate larvicide in large domestic water storage.
 - § Use of guppy fish in large water storages.
 - § Reduction in small water containers like coconut shells, unused tyres, empty bottles etc.
 - § Regular cleaning of water coolers, refrigerators, large vessels at least weekly.
 - § Reduction of aedes mosquito breeding places.
- Anti adult measures
 - § Two rounds of indoor fogging with pyrethrum extract with 8 to 10 days interval. Fogging should be done between 8 to 10 AM & 3 to 5 PM.
- Personal Protection measures
 - § Reduction of exposure to mosquito bites by using repellents, wearing long sleeves clothes.
 - § Use of mosquito bed nets.
- Effective IEC activities

Health education regarding the disease, how it is transmitted, personal protection measures, treatment facilities, reduction in mosquito breeding places should be given.

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5.4. JAPANESE ENCEPHALITIS

Japanese Encephalitis (JE) is a mosquito-borne zoonotic disease. It is a disease of public health importance because of high case fatality rate and permanent neurological sequelae in cured patients. The virus infects mainly animals and birds. Man is an incidental host. JE is primarily a disease of rural agricultural areas, where vector mosquitoes proliferate in close association with pigs and other animal reservoir.

1. Etiologic agent

JE is caused by a group B arbovirus (flavivirus). The virus is antigenically related to other flaviviruses including dengue and yellow fever viruses.

2. Epidemiology

- JE virus has its natural cycle in water birds / animals and mosquitoes. Water birds such as pond herons, cattle egrets, poultry birds and ducks play a significant role in the natural history of JE virus. The animal hosts include pigs, cattle and horses.
- Pigs have special importance in JE epidemic. Infected pigs do not manifest any overt symptoms of disease; but develop tremendous viraemia, which in turn increase the

concentration of virus in mosquitoes. Hence, pigs are called as amplifying hosts.

- Infection is transmitted through the bite of an infected culicine mosquito. In human beings, viraemia is mild and lasts for a short duration. Infection in man is the dead end of transmission. Man to man transmission has not been documented.
- Epidemics usually coincide with the monsoon and post-monsoon period when the vector density is high. However, in endemic areas, sporadic cases may occur throughout the year.
- Risk factors for JE outbreak are high density of Culex mosquitoes, presence of amplifying hosts (pigs), and presence of JE virus in area.
- The incubation period in man, following mosquito bite varies from 5 to 15 days.

3. Vector of JE Culex vishnui group

- Mosquitoes belonging to the Culex vishnui group (Culex vishnui, Culex pseudovishnui, Culex tritaeniorhynchus) are the most important vector species in India.
- Culex mosquitoes generally breed in water bodies with luxuriant vegetation. Irrigated rice fields, shallow ditches and pools are common breeding places.
- Female mosquitoes get infected after feeding on a viraemic host. They can transmit the virus to other hosts after an extrinsic incubation period of 9 to 12 days. The mosquitoes remain infected for life.

4. Clinical manifestations

The clinical features of JE are those of encephalopathy. The patient gives history of acute fever and change in behavior or sensorium lasting for more than 24 hours. Disturbances of sensorium are reflected as lethargy, somnolence, irritability, apathy or loss of consciousness. The patient may develop difficulty of speech and other neurological deficits like ocular palsies, hemiplegia, tremor and ataxia. Typical feature of neurological deficit in JE is its asymmetrical presentation. There may also be loss of bladder and bowel control. The focal neurological signs may be stationary or progressive.

In majority of cases, infection is mild with no overt clinical symptoms or with mild fever and headache. Individuals develop permanent immunity after infection.

Case fatality rate is high in severe cases, which may be 20 to 40%. Patients who recover from acute episode may have neurological sequelae. These occur with variable frequency and depend on age and severity of the illness. Commonly observed sequelae are mental impairment, severe emotional instability, personality changes and paralysis.

5. Diagnosis

5.1. Case definition

5.1.1. Suspect case

- High-grade fever of acute onset with at least two of the following:

- § Decrease in level of consciousness independent of convulsions
- § Significant change in mental status either in behavior or personality
- § Convulsions

5.1.2. Probable case

- Suspected case of Japanese Encephalitis, and
- Usually not more than a few cases (1-2) in one village.
- With or without signs of meningeal irritation and varying degree of asymmetrical neurological deficits.

5.1.3. Confirmed case

- High IgM antibody titre
- Fourfold rise of antibodies in paired serum samples.

5.2. Laboratory confirmation of diagnosis by serological tests

- Diagnosis of JE can be confirmed by serological tests. Detection of IgM antibodies, which appear after first week of onset of symptoms and detectable for one to three months after the acute episode is the confirmatory test.
- A fourfold rise in IgG antibody titre in paired sera taken at an interval of 10 days or more is also confirmatory. IgG antibodies indicate previous infection and are useful for conducting sero-epidemiological studies to determine extent of silent infection and immunity levels in the local population.
- Each sample should be accompanied with the information about name, age, sex, address, name of the PHC sending the sample, date of onset, clinical findings, hospitalization, date of collection of sample, provisional diagnosis.

6. Clinical management

- There is no specific treatment of JE. However, supportive treatment and good nursing care can significantly reduce case fatality rate. It is, therefore, important that cases are referred to hospital with Medical Intensive Care Unit (MICU) facility as early as possible if encephalitis is suspected. Treatment should be commenced without waiting for laboratory results.
- In acute phase, clinical management is directed at maintaining fluid and electrolyte balance. Keeping the airway open in a comatose patient is important. Patients with hypoxia may require oxygen. If patient has convulsions, appropriate drugs are prescribed.

7. Vector control

- Anti adult measures: This includes outdoor fogging to knock down the infected mosquitoes.
 - Personal protection to prevent the bite of mosquitoes.
- Details about outbreak control are given in the chapter on control of vector-borne diseases outbreak.

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5.5 FILARIASIS

Filariasis is a disease of lymphatic system. Although not fatal, it is responsible for considerable suffering, disability and deformity. It is transmitted by bite of infected mosquito and is caused by two important nematode worms *Wuchereria bancrofti* (Bancroftian filariasis) and *Brugia Malayi* (Brugian filariasis).

1. Etiologic agent

Filarial species present in India are *Wuchereria bancrofti* and *Brugia malayi*. In Maharashtra, only *W. Bancrofti* is found.

Microfilaria have nocturnal periodicity. It is transmitted by a bite of infective culex mosquito during night. Appearance of microfilaria in peripheral blood of man synchronizes with biting period of vector mosquito.

2. Epidemiology of filariasis

2.1. Life cycle: Filaria parasites develop in two hosts. Man is primary host (definitive host) whereas mosquito is secondary host (intermediate host). Development of parasite in man takes a long time (5-18 months).

Adult worms live in lymphatic system. Female worms give birth to microfilaria which find their way into blood circulation. Mosquito cycle begins when Mf are picked up by vector mosquito during blood meal. Further development takes place in mosquito. After extrinsic incubation period of 10 to 14 days mosquito becomes infective. During bite of mosquito, larvae of filarial worm enter body & finds lymphatic system for rest. After developing into adult stage it produces microfilaria.

2.2. Reservoir and host factors

Only human being is reservoir of filarial parasite *W. bancrofti*. There are no animal reservoirs. Infected persons are microfilaria carriers. All ages can get infected, but rise in incidence is observed after twenty years of age. Small proportion of infected persons develops disease. Both sexes acquire disease equally. Industrialization, urbanization, population migration, outside sleeping habits increase risk.

3. Vector mosquito

- Vector for *W. bancrofti* is *Culex quinquefasciatus*.
- *Culex* mosquito breeds in any accumulation of polluted/semi polluted water such as drainages, septic tanks, cesspools, etc.
- *Culex* is indoor retester (Endophilic) and midnight biter. (Peak biting between 12 to 2 in midnight). Biting period synchronizes with peak microfilariae density in human host.
- *Culex* mosquito rests on hanging object, clothes etc.

4. Clinical manifestations of filariasis

- Filariasis is a disease of lymphatic system. When filarial adult worms are lodged in lymphatics and in lymph glands, they obstruct mechanically flow of lymph and also produce inflammatory and allergic reactions.
- Time lag between entry of parasite and appearance of symptoms (incubation period) is 5-18 months.
- Lymphatic filariasis is characterized by a wide spectrum

of clinical manifestations with signs and symptoms often differing from one endemic area to another. Clinical course of filariasis can be divided into asymptomatic, acute and chronic stages.

- **Asymptomatic stage** is characterized by presence of microfilaria in peripheral blood, although there are no clinical manifestations of filariasis.
- In **Acute stage** clinical manifestations are characterized by fever with chills and rigors, headache, backache, body ache and sweating. Acute manifestations are lymphadenitis i.e. painful, enlarged lymph glands at various places, lymphangitis which is acute inflammation of lymph channels, resulting in reddish streaks on skin and funiculitis which is an acute, painful inflammation of spermatic cord. There may be epididymo-orchitis and also tropical pulmonary eosinophilia.
- **Chronic stage** develops after age of 15 years with chronic signs of filariasis and only a small proportion of infected community is affected. During chronic stage, microfilariae are usually absent from blood. Chronic manifestations are hydrocele, chyluria, lymphoedema leading to elephantiasis.

5. Diagnosis of filariasis

- **Clinical diagnosis:** It is based upon clinical signs and symptoms of disease. A clinical history of recurrent fever associated with adenolymphangitis is strongly indicative of filariasis.
- **Parasitological diagnosis:** Parasitological diagnosis is made by finding microfilariae (mf) in blood. Twenty micro litres of blood is taken from finger or ear lobe prick and spread as a thick film. Time of blood collection should be as close as possible to peak of microfilarial density.
- Blood may be collected after **Diethylcarbamazine (DEC) provocative test**. This provokes microfilaria in lung capillaries to invade peripheral blood. Method is used when night blood collection is not possible.

6. Treatment

Objective of treatment is to eliminate parasite from blood of patient that will halt spread of disease and prevent morbidity. Treatment consists of chemotherapy directed against adult worm and microfilaria.

6.1. Di-ethyl Carbamazine Citrate (DEC)

DEC is the drug of choice for treatment of filariasis. It is cheap, safe and with least side effects. It kills almost all microfilaria as well as good proportion of adult worms.

6.1.1. Mode of action: DEC exerts no direct lethal action on microfilaria but modifies them in such a way that phagocytes engulf them thereby removing them from circulation.

6.1.2. Dosage: DEC is administered as 6mg/kg body weight per day for 12 days. Age wise dose schedule of DEC is as follows-

Table - 19 : Age wise dose schedule of DEC

Age in years	Dose of DEC	Number of tablets (100 mg)
< 2 years	Nil	Nil
2 – 5 years	100 mg	1 tablet
6 – 14 years	200 mg	2 tablets
15 years and above	300 mg	3 tablets

6.1.3. Side effects: Mild side effects like fever, headache, and body pain are found. Few patients especially healthy microfilaria carriers, may experience nausea, vomiting, allergic rashes, inflammation of lymph glands or slight edema etc.

6.1.4. Precaution: Drug should not be given on empty stomach.

7. Revised strategy for elimination of filariasis

Aim of filariasis control is to bring down disease prevalence and infection at low level, reduce morbidity and interrupt transmission so that it is no longer a public health problem.

Recently Govt. of India has recommended single day mass therapy with DEC at a dose of 6 mg/kg body weight annually in filarial endemic areas of state. Following activities are suggested under revised strategy for elimination of filariasis.

- Single day mass therapy to all community members above 2 years age
- Management of acute and chronic filariasis. Self care by patients of filariasis
- IEC for preventive and control measures for filariasis.
- Vector control measures.
- Treatment for microfilaria carriers detected in clinic by administering DEC in dose of 6 mg/kg body weight for 12 days.

7.1. National Filaria Day (NFD)

7.1.1. Strategy

- National Filaria Day will be observed during the month of November every year for next five years (2004-2009) in endemic districts for filariasis. On this day DEC is given to all persons except those below 2 years, pregnant women and seriously ill patients.
- Approach for drug distribution is “supervised drug administration by door to door visit” preferably on a single day.
- It has been observed that single day treatment once a year is as effective as 12 days therapy in reducing transmission. In addition it has lesser side effects.

7.2. Activities

7.2.1. Population estimation and coverage

- No separate survey for population estimation should be carried out.
- Figures obtained during yearly survey of eligible couples and beneficiaries carried out in month of April should be used for planning of National Filaria Day.

- Population covered will be all people excluding children below 2 years, pregnant women and seriously ill persons on the day of MDA.

7.2.2. Planning

- Village wise micro plan should be prepared. Identify number of houses in each village, pada etc. and distribute houses among drug distributors. Do not forget lonely and farm houses.
- Age wise administration of DEC will be carried out by HA, MPW, Anganwadi workers or any other health functionary or health volunteer. Drug distributors will be imparted required training.
- There will be one supervisor for 4 to 5 drug administrators.
- Drug will be administered on fixed day. Duration may be extended up to 3 days for mopping up operation during which those left out on first day should be covered.

7.2.3. Drug administration

- DEC is available as 100 mg tablet. Dose for single day mass DEC treatment is 6 mg/kg body weight. As weighing each individual in field is not feasible, dose as per age is given as mentioned earlier in this chapter.
- Drug has to be swallowed in front of drug distributor and should not be given on empty stomach. Drug should not be handed over for use in future.
- Requirement of DEC (100 mg tablet) is calculated as: Total population of PHC x 2.5. This also includes 10% reserve requirement.

7.3. Management of an acute attack

An acute attack is painful. Management of acute filarial attack consists of:

- Oral antibiotics to shorten duration of attack
- Paracetamol for fever every six hourly as analgesic and antipyretic.
- A cloth soaked in water and placed around leg can relieve pain. Alternatively leg can be soaked in bucket of cold water.
- Patient should rest and elevate leg comfortably.
- Patient should not exercise during an acute attack.

7.3.1. Morbidity management for prevention and control of disability

Filaria patients with damaged lymphatic vessels have more bacteria & fungi on skin than normal healthy person. Large number of bacteria on skin, multiple skin lesions, slow lymph fluid movement and reduced ability of lymph nodes to filter bacteria cause inflammation characteristic of an acute attack. Repeated bacterial infections precipitate frequent acute attacks, which further damage lymphatic vessels in skin, reducing ability to drain fluid.

Advise to patient to prevent and control disability -

- Wash legs thoroughly with water and soap daily ideally at night before sleeping covering all skin folds and between toes.

- Use anti fungal and anti bacterial creams for prevention of lesions.
- Elevate leg by using pillows.
- Perform exercise like walking short distances, standing on toes. Exercise helps by improving drainage. Exercise should not be done during acute attack.
- Wear proper footwear which protects feet from injury.
- If patient develops lesion in spite of above-mentioned precautions then he/she should be advised to consult doctor at earliest. Early lesions should be treated with oral antibiotics, topical antibiotics and antifungal cream.

7.4. Vector control measures

7.4.1. Anti-adult measures

Usefulness of insecticides in control of lymphatic filariasis is limited. Residual spray is not very effective against Culex mosquito due to change in resting behavior and development of resistance. Space spray at regular interval though effective, is cost prohibitive in absence of any anti-larval measures.

7.4.2. Anti-larval measures

a. Chemical control

Larvicides commonly used are Mosquito Larvicidal Oil (MLO), Paris green and Organophosphorus insecticides like temephos (abate).

- Mosquito larvicidal oil (MLO) stops respiration of larvae and larvae are killed due to suffocation. Oviposition (laying of eggs) by mosquitoes is avoided.
- Paris green is a direct poison and kills mosquito larvae. Only 10 grams of 1% dust per sq. meter area is sufficient to kill all larvae. It should be applied once a week.
- Organophosphorous compound like Temephos (Abate) is relatively non-toxic to mammals and rapidly biodegradable, it can therefore be used in mosquito breeding sites that are also sources of drinking water. It is a contact poison with residual effect, supplied as 50% concentrated emulsion. 2.5 ml emulsion is added to 10 litres of water i.e. 0.125% temephos. For septic tanks, 20 ml of diluted solution is used.
- As far as possible, breeding places should be cleared of scum and vegetation, before larvicide is applied, so as to maximise its efficacy.

b. Biological control

Biological agents such as larvivorous fishes (Gambusia, Guppy) are effective against larvae. It is cheap and does not require repeated application. Wherever possible, always use larvivorous fish for larval control measures.

c. Environmental control

Environmental management is the most cost effective method of controlling Culex vectors. Since majority of breeding habitats are created by bad engineering practices and are man-made, permanent elimination of these habitats by better engineering practices leading to source reduction should be first priority. Proper drainage system, filling for elimination of water

logged areas, minor engineering methods like construction of pucca drains, construction of soakage pits, filling up of unused wells will prevent water logging and thus prevent mosquito breeding.

7.4.3. Personal protection

Protective clothing, repellents, mosquito coils and mats, bed-netting, use of synthetic pyrethroid impregnated nets, avoidance of mosquito biting environments and screening of houses are some of the common methods used for personal protection. These methods prevent man-vector contact and hence reduction in disease transmission.

7.5. Filariasis survey

- All persons in house should be examined. Record name, age, sex, and family relationship to head of household in survey proforma.
- Timing of blood collection should be in accordance with periodicity of microfilaria. For nocturnal periodicity, blood should be collected between 2000 hrs to midnight.
- 20 micro litres of blood (5drops) from each person should be taken on a clean glass slide and made into a thick smear and slide should be numbered.
- From each person, history of fever, lymphangitis and other signs and symptoms of disease should be noted in form.
- Blood slides should be sent to laboratory for staining and examination for presence of microfilariae.

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5.6. ANTI-VECTOR MEASURES

Vector-borne transmission especially by mosquitoes is the main route for many communicable diseases. Controlling vector population is important intervention for these diseases. Vector control is achieved by various methods.

1. Important aspects about mosquitoes

1.1. Mosquito life cycle

It is essential to understand mosquito life cycle for effective implementation of vector control measures. There are four stages in life history of mosquito; egg, larvae, pupae and adult.

- Mosquitoes require water to lay eggs. Anopheles mosquitoes lay eggs in clean water and singly. Egg stage lasts for one to two days and larva come out of egg on second day. Aedes female mosquito lays eggs in artificial, clean water containers. It takes 24-48 hours to develop larvae from eggs.
- Larva is a free-swimming creature with an elongated body. It feeds on algae, bacteria and vegetable matter. Anopheles larva floats horizontally on water. The larva stage occupies 5-7 days and is converted into pupa. Aedes larvae live in water for about a week.
- Pupa is comma shaped in appearance. It is resting stage in life history of mosquito. It does not feed but prefers to stay quiet on surface of water. Pupa stage lasts for 1-2

days. When development is complete, pupal skin splits along the back and adult mosquito emerges.

- Under favorable conditions of temperature and food supply, the life cycle from egg to adult is completed in 7-10 days. Normally adult mosquito lives for about two to three weeks. Males are generally short lived.

1.2. Important mosquitoes & diseases transmitted

Mosquitoes	Diseases transmitted
Anopheles mosquito	Malaria
Culex mosquito	Filaria, Japanese Encephalitis
Aedes mosquito	Dengue fever, Chikungunya

1.3. Characteristics of vector mosquito

1.3.1. Anopheline mosquitoes

Anopheline mosquitoes are the important vectors of malaria in India. Three important species transmitting malaria in Maharashtra state are Anopheles culicifacies in rural areas, Anopheles stephensi in urban area and Anopheles fluviatilis in hilly areas. The characteristics of anopheles species are as below:

- They breed in stagnant water collections such as wells, cisterns, fountains, overhead tanks, seepages of canals etc.
- They have nocturnal biting habits i.e. they bite during night hours.
- After blood meal anopheles has habit to rest on the walls inside house (indoor resting). This habit is used as the basis for residual spraying of insecticides as an anti-adult mosquito measure.

1.3.2. Aedes aegypti

- DF is transmitted by bite of an infected Aedes aegypti female mosquito.
- Once the mosquito becomes infected, it remains so for life. Aedes aegypti has an average adult survival of 8 days. During the rainy season when survival is longer, the risk of virus transmission is greater.
- Aedes mosquito has characteristic white stripes on the back and legs, and therefore aedes are also known as 'Tiger mosquito'.
- Aedes mosquito prefers to rest in dark, humid, secluded places inside houses or buildings including bedrooms, closets, bathrooms & kitchens. Preferred indoor resting surfaces are the underside of furniture, hanging objects such as clothes & curtains & on walls.
- Aedes mosquito is a domestic breeder. Breeding can occur in any artificial, clean water container such as desert coolers, flower vessels, overhead tanks, discarded buckets, half buried earthen pots (Ranjan), cement tanks, tyres, utensils, etc which are not emptied and cleaned periodically.
- Since water is essential during first 8 days in the life of mosquito, emptying containers once a week will greatly reduce risk of dengue fever.
- The mosquito has two periods of biting activity, one in the morning for several hours after daybreak & other in

the afternoon for several hours before dark.

- Aedes mosquito can fly up to a limited distance of within 100 meters but can spread over vast distances mechanically in various types of vehicles used by man.

1.3.3. Culex vishnui group

- Mosquitoes belonging to the Culex vishnui group (Culex vishnui, Culex pseudovishnui, Culex tritaeniorhynchus) are the most important vector transmitting JE in India.
- Culex mosquitoes generally breed in water bodies with luxuriant vegetation. Irrigated rice fields, shallow ditches and pools are common breeding places.
- Culex mosquitoes are zoophilic, feeding primarily on animals and wild birds. They rest outdoors in vegetation and other shaded places but in summer may also rest indoors.
- The mosquitoes remain infected for life. Culex mosquitoes can fly for long distances (4-5 km).

1.3.4. Vector of filariasis Culex quinquefasciatus

- Vector for W. bancrofti is Culex quinquefasciatus, which breeds in any accumulation of polluted/semi polluted water such as drainages, septic tanks, cesspools, etc.
- It is indoor rester (Endophilic) and midnight biter.
- Mosquito rests on hanging objects, clothes etc.

1.3.5. Differences between anophelini (Anopheles) & culicini (Culex, Aedes & Mansonia)

No.	Anophelini (Anopheles)	Culicini (Culex, Aedes & Mansonia)
1	Larvae rest parallel to water surface	Suspended with head downwards at an angle to water surface
2	When at rest, inclined to an angle to surface	When at rest, the body exhibits a hunch back
3	Wings are spotted	Wings are unspotted

2. Vector control measures

Mosquito breeding places in and around houses can be divided into two main types -

Breeding sites with clean water that include potable water collections and rain filled water bodies which are suitable breeding sites for some *Anopheles* and *Aedes* mosquito species. Some *Anopheline* and *Aedes* species also breed in small collection of clean water in peri-domestic habitats.

Breeding sites with polluted water are the water bodies polluted / contaminated with infective and parasitic agents, poisonous chemicals, industrial or other wastes or sewage material. Pollution and contamination are result of human activity. These types of breeding places are suitable for breeding of *Culex* species.

Classification of vector control measures

Vector control measures should be carried out in PHC throughout the year irrespective of risk status of malaria. Proper vector control measures lower the mosquito density resulting

in interruption of malaria transmission and reduction in quantum of morbidity in the community. Vector control includes:

2.1. Chemical Control: Following chemicals are used for control of mosquito density.

- Indoor residual spray (IRS) is being carried out in selected villages during transmission season every year. Due to development of resistance in vector species in Maharashtra against DDT & Malathion, only synthetic Pyrethroids are used for IRS as below:

- § Deltamethrin 2.5% wp,
- § Cyfluthrin 10% wp,
- § Lambda Cyhalothrin 10% wp
- § Alphacypermethrin 5% wp

- Larvicides used are:

- § Temephos (Abate) 50% EC for potable water.
- § Fenthion (Baytex) 82.5% W/V for polluted water.
- § Mosquito Larvicide Oil (MLO) for polluted stagnant water.
- § Use of insecticide impregnated mosquito bed nets.

2.2. Environmental control: Environmental control includes, elimination/source reduction of breeding sites of mosquito by filling and draining areas where there is stagnant water and removing objects around house that may collect water. Proper drainage system, filling for elimination of water logged areas, minor engineering methods like construction of pucca drains, construction of soakage pits, filling up of unused wells will prevent water logging and thus prevent mosquito breeding.

2.3. Biological Control: Mosquito population can be controlled at its larval stage by using various biological methods. These methods include

- Use of biolarvicides (Bacillus Thurengensis Israellensis) And
- Use of larvivorous fish.

3. Various vector control measures used in PHC area

- Anti-larval measures
- Anti-adult measures
- Personal protection methods
- Combination of all above

3.1. Anti larval measures

3.1.1. Use of biolarvicides

Bacillus Thurengensis Israellensis and B. sphericus are used as antilarvals and are sprayed on breeding sites uniformly every fortnight. This product is presently being used in Urban Malaria Schemes in selected towns.

3.1.2. Use of Larvivorous fish

Larvivorous fish are effective biological control agents and are now being used increasingly since last few years. This is environment friendly, effective and most economical among all other vector control methods. The fish once released in breeding sites multiply on their own and take care of breeding sites.

Most of the fishes eat mosquito larvae but all of them are not equally efficient, *Gambusia affinis* and *Poecilia reticulata* (Guppy) are considered as efficient larvivorous fish for mosquito larval control.

a. *Gambusia affinis*

- *Gambusia* is very hardy fish, can survive in all types of water bodies but does not tolerate very high organic pollution. Length of male fish is 4.5 cm and female fish is 5.2 cm. Life span of *Gambusia* fish is 4 ± 1 Years.
- The female *Gambusia* fish matures in 3-6 months and breeds throughout the year at monthly intervals. Young ones are released in brood of 25-30 at a time and a full-grown fish may produce up to 300 offsprings per year, i.e. 900-1200 offsprings during its life span.
- Larvivorous efficiency: *Gambusia* is surface feeder and highly larvivorous fish. A single full-grown fish eats about 100-300 mosquito larvae per day.

b. *Poecilia reticulata* (Guppy fish)

- Guppy is an exotic fish introduced in 1910 and now widely distributed in India. Presently Guppy fish is most extensively used for biological vector control.
- Guppy fish is very hardy and survives in all types of water bodies. It can tolerate high degree of organic pollution as compared to *Gambusia*.
- Size and longevity: The female Guppy fish measures 6cm and male 3 cm in length. Average life span of Guppy fish is 4 ± 1 years
- Guppy fish takes about 90 days to mature. The female gives birth to young ones in a brood of 5-7 at a time. About 50-200 young ones are released by female every year. It breeds throughout the year at the interval of about 4 weeks after maturity.
- Larvivorous efficiency: Less efficient than *Gambusia affinis*, a single fish eats about 80-100 mosquito larvae in 24 hours. It is a surface feeder and negotiates margins of ponds more easily.
- It is highly carnivorous and parents of older brood may eat their own offspring. Therefore a fair amount of weeds are required in the water so that young ones can hide and survive.

3.1.3. Fish Hatchery

The Hatchery for larvivorous fish can be established in a natural water body or special hatchery can be constructed.

a. The natural water body

- It should be a permanent water body and depth of water should be at least 1.5 meter or more.
- Water should be confined and there should not be any big natural outlet.
- The minimum size of water body should be at least 5m x 4m. The water body of 10 m x 5 m can support a fish of 50,000 population.
- It should be free from other carnivorous fishes.

- Water should not be contaminated by chemical or other harmful substances.
- Easily accessible for daily or periodic inspection & for collection of fishes from mother stock.

b. Construction of hatchery

- Construct tanks of 10 m length 4 m breadth 1.5 m depth size. Divide the tank in two equal sizes with central separator (one part for egg laying & other for holding grown fishes).
- The tank constructed should be preferably above ground level, brick made and lined with good quality of cement plaster. Floor should have slope from the partition towards sides and there should be outlet at the bottom of tank and inlet at 1.25 m height.
- Cover bottom of tank with uniform thickness of sand for about 10 cm, plant water grass or weeds over sand to enable small fish to hide and then the bottom should be seeded with organic matter about 2 kg/sq.m.
- Cover tank with fine wire mesh to prevent damage
- Once all above things are done, allow the tank to mature for 10-15 days
- Change 25% of water daily.
- This arrangement will support at least 10,000 fishes per sq.m of water.
- When an optimum fish population is attained, transfer fishes from hatchery to mosquito breeding places or other water bodies for maintaining a healthy stock.

c. Transportation of fishes

When sufficient stock of fishes has risen in hatchery and no mortality is observed in mother stock, they can be released in the field of larval habitats.

i. Collection of fishes

- Collect the fish from hatchery by netting. Net is circular iron ring of 60 to 90 cm diameter, fitted to wooden handle. Nylon net is attached to ring.
- Sufficient quantity is collected by repeated dips.
- Collect in bucket or drum till they are packed for transportation.

ii. Method of transportation

- Take polythene bag of 3 litre capacity and fill it with 1.5 litre of water
- Introduce the fishes in the bag till the total volume of water + fish is two litres.
- Bubble the oxygen in bag from O₂ cylinder or from air.
- Close the mouth of bag with a string leaving sufficient space at the top.
- Put the bag in a thermocol container and close the mouth of container.
- The container can be transported for a period 24 hours without introducing oxygen. If the period of transport is more than 24 hours then arrange for change of water &

oxygenate.

- Note that fish do not tolerate sudden temperature changes. Avoid food for 10 – 12 hours prior to packing for transportation.

iii. Release of fishes

- To release the fishes in the water body, measure the perimeter of water body.
- Release the fishes at the rate of 6-10 fishes per linear meter.
- If the larval density is high more fishes (up to 20 fishes/ liner meter) can be released.

iv. Precautions during release of fishes

- Fishes should be released in morning hours or in evening.
- Before releasing, ensure that temperature of water both in container and in the larval habitat is more or less same.
- Ratio of male : female at the time of release should be 1:3
- Clean out dense vegetation from the water body.
- Ensure that water body is free from frogs, tortoises, etc.

v. Follow up procedure

- Visit water body every week to inspect whether the fishes are surviving.
- If some fishes die, replenish to make up the required density.
- Check the water body for vegetation or weeds.

3.1.4. Checking of breeding places & guppy fish hatcheries

Biological control methods are being implemented in Maharashtra from 1997. Since then Guppy fish hatcheries are developed at all levels from sub-center, Primary Health Center, Taluka to District level. These hatcheries as well as the breeding places are code numbered and enumerated twice a year (May and October every year) to know whether they are permanent or temporary in nature.

a. Coding of Guppy fish Hatcheries

District is considered as one unit for hatchery numbering. All the hatcheries in the district are serially numbered. District Malaria Office allots the serial numbers to each hatchery. District initials are attached to serial number making the number unique in the state. For example, in code no STH-1, ST stands for Satara, H for Hatchery and number '1' is serial number of the hatchery in the district.

b. Coding of breeding places

Coding of breeding places is done by Medical Officer at PHC level. For example-in code no. A1B-1, 'A1' stands for the code name of the PHC, 'B' stands for breeding place and no '1' stands for serial number of the breeding places in a PHC. This data is available at PHC. This information is subsequently compiled at the district HQ.

c. Cross-checking of Hatcheries

District level officers are expected to crosscheck 10% of hatcheries ending with certain number, which is communicated by the Joint Director of Health Services (Vector-borne Diseases), Pune. The reports of monthly crosschecking of hatcheries are

to be sent to the Joint DHS (VBD) Pune & District Malaria Officer.

d. Cross-checking of breeding places

Medical Officers and supervisory staff of PHC are expected to cross-check 10% of breeding places ending with certain number which is communicated by the Joint Director of Health Services (Vector-borne Diseases), Pune. The reports of monthly crosschecking of breeding places are submitted to the Jt. DHS (VBD), Pune through the District Malaria Officer.

Additional points to be verified during cross checking are RT of malaria positive cases, stenciling activity, work of DDC & FTD and few hatcheries from the village.

3.1.5. Important aspects for anti larval measures at PHC

Anti larval measures in PHC should be carried out as follows-

- The water collections where mosquitoes lay eggs are called breeding places.
- List all breeding places in PHC area: Plan survey of the breeding places of PHC during the months of May & October. As May is the hottest month in the state with water scarcity at its peak, breeding places found in May usually remain as active breeding places throughout year. Such breeding places are called 'permanent breeding places'.
- Give code number to all the permanent breeding places in PHC as described above. Fix responsibility of destroying permanent breeding places to specific HA (M) or MPW (M).
- Steps for eliminating permanent breeding places:
 - § Draining of water towards slope by digging the pitch or refilling water collection by stones, bricks etc. This method is expensive. Inform Gram Panchayat about hazards of breeding place in writing and follow till breeding place is drained and dried.
 - § If draining of water or refilling is not possible then release guppy fish in the water. Release 6-10 guppy fish per linear meter. If frogs are present in water collection, double the number of guppy fish. Observe the sustainability of fish every week for one month and monthly thereafter. If number of guppy fish in the breeding place is reducing, release guppy fish again.
 - § If repeated release of guppy fish is not successful, make separate list of such permanent breeding places. Contact DMO for alternative strategy like use of temephos or biocides.
 - § Number of breeding places will start increasing as monsoon starts. MPW must survey for appearance of new breeding places during fortnightly home visit and release guppy fish in new water collections.
- Release of guppy fish in water collections is a very effective and inexpensive method. MO PHC needs guppy fish in sufficient quantity to release in all breeding places in PHC area. There should be at least one guppy fish

hatchery for each sub center.

3.2. Anti adult measures: Indoor Residual Spraying

Residual spraying is being used for control of vector-borne diseases since inception of the malaria control programme. Insecticide is sprayed on walls, roof, corners, etc. of houses. Peculiar habit of Anopheles mosquito to rest on wall after blood meal is used for the strategy of indoor spray. Insecticides have residual effect. Mosquitoes having bite on an infective person will rest in the house & will pick up sufficient insecticide particles sprayed on the walls & other indoor surfaces & its longevity will be reduced so much so that it does not survive to become infective. It is extremely important to plan insecticide-spraying programme systematically and to supervise by MO. HA and MPW (M) of concerned area should remain present throughout spraying and MO should visit village being sprayed, at least for half hour daily for supervision.

3.2.1. Indication for spraying

- Spraying is done in following situation:
 - § Areas with API more than 2.
 - § Focal spray: On detection of death case/outbreak of malaria, focal spray of 50 houses around the positive case is carried out.
- DMO identifies areas and prepares plan of spraying. Information about village selected for spraying from PHC,

spraying schedule, name of insecticides, total quantity required etc will be communicated by DMO well in advance. Detailed guidelines for dilution of insecticide, method of spray etc. will also be communicated. MO must read guidelines carefully before supervision of spraying.

- Target area: MO should ensure that, following areas are covered during spraying:
 - § All the interior walls & ceilings of permanent human dwellings
 - § Field huts where people sleep during planting or harvesting season.
 - § Underside of furniture, back of doors, outside porch
 - § Cattle sheds should not be sprayed. This will conserve insecticide & improve coverage of human dwellings. This prevents diversion of mosquitoes from sprayed cattle shades to human dwelling.
- Insecticides used: Due to development of resistance in vector species in Maharashtra against DDT & Malathion, only synthetic pyrethroids are used for IRS as below:
 - § Deltamethrin 2.5% wp
 - § Cyfluthrin 10% wp
 - § Lambda Cyhalothrin 10% wp
 - § Alphacypermethrin 5% wp

Table - 20 : Dosages for IRS

No.	Insecticide	Preparation of suspension in water	Dosage per sq. meter of active ingredient	Residual effect in weeks	Area to be covered by 10 litres of suspension
1	Deltamethrin 2.5% wp	400 gm / 10 litres	20 mg	10 - 12	500 sq. m.
2	Cyfluthrin 10% wp	125 gm / 10 litres	25 mg	10-12	500 sq. m.
3	Lambda Cyhalothrin 10% wp	125 gm / 10 litres	25 mg	10-12	500 sq. m.
4	Alphacypermethrin 5% wp	250 gm / 10 litres	25 mg	10-12	500 sq. m.

3.2.2. Planning of spraying

Following actions should be taken by MO

a. Storage of insecticide

Insecticide to be used for residual spray will be supplied by DMO office to PHC. Insecticide is very costly. It is the responsibility of MO to store the insecticide at safe place.

- Storing site should be away from food, children and animals.
- Insecticide should not be exposed to sunlight, rains or high temperature & should be stored in well-ventilated room.
- Empty container should be disposed off by deep burying or burning so that they are not used for storing food material or for other household purpose by any body.

b. Propaganda of the spraying

This is the key activity to be implemented by PHC related to insecticide spraying. Inform Grampanchayat in writing. Organize Gram Sabha for cooperation of community in spraying

operation. This is essential to increase coverage of spraying. MO must attend the Gramsabha. This should be followed by house-to-house visit by MPW and HA communicating about presence of at least one responsible member of family on the day of spraying and cooperate the squad for 100% coverage.

3.2.3. Supervising the spraying

All houses should be informed one day before spraying and again at least half hour before arrival of spraying squad, so that food grains, food stuff, water are covered properly. Spraying squad should provide plastic sheet to household at least 15 minutes before arrival for covering household articles.

a. Important aspects of supervision

- Check that spray suspension is prepared just before the start of the spray operations every day.
- Check whether insecticide is diluted as per the guidelines. The procedure for the preparation of suspension is same irrespective of the insecticide used. However the quantity of insecticide used for 10 litres will vary as per the

insecticide.

- Observe method of preparation of suspension: See that required quantity of the insecticide is measured with a plastic mug & poured into 15-litre bucket. A paste is made with the small quantity of water. Remaining water is poured slowly into the bucket & mixture is stirred properly to get uniform suspension. The suspension is then poured into another bucket through a cloth sieve to remove any particulate matter that may clog the nozzle of the spray pump.
- Observe actual spraying: Check that the spray lance should be kept 45 cm. (18 inches) away from the wall surface & nearly at 90 degrees to wall. The swath should be parallel. Spray is applied in vertical swath of 53 cm (21 inches) wide. Successive swaths should overlap by 7.5 cm (3 inches). Spray is done from roof to floor, using downward motion to complete one swath, then stepping sideways & spraying upwards from floor to roof. Spray nozzle should not be directed against wind direction.
- Randomly examine discharge rate of few spray pumps: Discharge rate should be 750 to 850 ml per minute. To get this discharge rate pump man should give 20-26 strokes per minute with 10 - 15 cm. plunger movement at a pressure of 10 PSI at the nozzle tip. Check the discharge rate by asking spray man to spray in a bucket for one minute & measuring the quantity in a graduated mug whether the discharge rate is 750 - 850 ml/min. Nozzle tip should be discarded if discharge rate is more than 850 ml per min.
- See that spraying workers do not leave any room or part of room, without spraying.
- Spraying register is provided by DMO office to the spraying squad. Check register whether all columns are filled and information is correct.
- Supervisor will put stencil mark on the door of house indicating spraying status of house. Check whether stenciling is done as per the actual coverage of spraying. It takes about 5 minutes to spray a house with surface area of 150 square meters.
- Verify the quality & coverage of spray randomly. A good quality spray should give uniform deposits on walls & other sprayable surfaces. Deposits of synthetic pyrethroids are visible on wooden structures.
- MPW should remain present throughout the spraying activity and should prepare abstract of daily spraying report indicating insecticide used, number of houses sprayed, coverage etc and submit to MO.
- Observe spraying worker for:
 - § Safe handling of insecticides – Use of gloves, masks while spraying. Thorough bathing and change of clothes after daily spraying is finished.
 - § Spraying worker should not smoke or drink during spraying.
 - § Avoid exposure to skin, eyes and face.
 - § In case of accidental exposure of the eyes or skin, eyes should be flushed with clean water for 5 minutes

& skin should be washed with clean water & soap.

3.3. Personal protection methods

3.3.1. Impregnated bed nets

Bed nets are impregnated with residual insecticides e.g. synthetic pyrethroids like Deltamethrin, Cyfluthrin and are supplied in high risk and tribal areas. When mosquitoes are attracted towards man to get blood meal they come in contact with insecticide impregnated bed net resulting in shortening of life span. Thus impregnated bed nets provide personal protection from mosquito bites and at the same time expose mosquitoes to insecticides. Nylon nets are preferred over cotton nets because they are durable, quicker in drying after impregnation and insecticide stays longer on the surface of the nylon fiber.

a. Procedure for impregnating bed net with insecticide

- Measure length, breadth and height of bed net in meters.
- Calculate total surface area of net with help of equation given below:

$$2(\text{length} + \text{breadth}) \times \text{height} + (\text{length} \times \text{breadth}) = \text{total area.}$$
- Calculate dose of insecticide to be used. Two types of synthetic pyrethroid insecticides are in use. The doses are Deltamethrine - 25 mg per square meter and Cyfluthrine - 50 mg per square meter.
- Take required quantity of water in bucket. Quantity of water should be such that, bed net should be soaked but water should not drip from net. Mix calculated quantity of insecticide in water and stir to make uniform solution.
- Dip bed net in the prepared solution. See that the solution gets applied to all parts of bed net. Keep this impregnated bed net on plastic sheet till it is half dried & then hang it in the shade for complete drying. Do not hang bed net immediately after dipping otherwise water along with insecticide will drop from the bed net.

b. Important messages to be given to family

- All the family members should sleep in the bed net.
- Bed nets should be used daily, seven days a week.
- Bed nets have residual efficacy for six months. Do not wash bed nets for six months, as washing will loose the insecticide impregnation.

c. Precautions to be taken while impregnating bed net

- Persons impregnating net should wear rubber gloves.
- Avoid contamination of skin, eyes, mouth etc.
- If skin, eyes, mouth gets contaminated; wash with plenty of water and soap.

Table-21 : Deltamethrine dose for bed nets impregnation

Type	Bed net	Approximate area	Approximate water requirement	Deltamethrin dose
Cotton bednet	Single	10 sq. meter	2 lit	10 ml
	Double	15 sq. meter	3 lit	15 ml
Nylon bednet	Single	10 sq. meter	750 ml	10 ml
	Double	15 sq. meter	1250 ml	15 ml

3.3.2. Mosquito repellent cream

These are available for individual use.

- Action lasts for short time usually for 6-8 hours.
- Has to be applied daily when protection is required.
- Some individuals may experience adverse reactions due to skin sensitivity.

3.3.3. Impregnated coils/pellets

- Effective in closed, confined sleeping area.
- Efficacy differs from product to product and is estimated at 60-80% protection.

- They are costly.

3.4. Health education for prevention of mosquito bites

- Wear clothes that cover arms and legs, this will prevent mosquito bite.
- Use mosquito nets or insect repellents while sleeping at night
- Children should not wear shorts and half sleeved clothes during evening hours in malaria endemic area.

4. Summary of responsibilities of health staff for vector control

Sr.	Activity	Responsibility of PHC staff	
		Designation	Responsibility
1	Identification of breeding places, numbering and eliminating	MPW (M)	Identification of breeding places from area. Permanent breeding places should be identified on priority Eliminating the breeding filling, guppy fish release or place by draining of water, other larvicide measures
		HA (M)	Numbering the breeding places Advising about eliminating the breeding place
2	Hatchery formation, maintenance and release of Guppy fish	MPW (M)	Identification of suitable place for hatchery, formation of hatchery and maintenance of hatchery Release of guppy fish to breeding places
		HA (M)	Numbering the hatchery, regular supervision to inspect the hatchery Coordination for breeding place elimination

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5.7 CONTROL OF OUTBREAKS OF VECTOR BORNE DISEASES

All important vector-borne diseases present with the common symptom of fever. It is most important to have clinical diagnosis of fever cases and confirmation whether cases are in excess than expected.

1. Characteristics of vector-borne diseases outbreak

- Disease is geographically distributed to the areas where vector is present
- Seasonal variation corresponds to the growth and density of vector species.
- Epidemic declines with decrease in vector species.
- Parasite / virus can be controlled by controlling the vector.
- Outbreak can be controlled by actions against the vector.
- All the important vector-borne diseases manifest as fever

Common causes for fever outbreak –

- § Malaria
- § Dengue fever/Dengue Hemorrhagic fever
- § Chikungunya
- § Japanese Encephalitis

§ Influenza or any other acute viral fever

§ Typhoid fever: This has been covered in the chapter on water-borne diseases.

2. Important steps for control of fever outbreak

2.1. Confirmation of outbreak

Malaria shows clear seasonal variation. The incidence increases during & following the monsoon rains. This variation should not be labeled as an outbreak. The incidence should be compared with the same period of last year to demonstrate clear increase.

- Keep watch on high risk areas e.g.
 - § Arrival en block of non-immune population into a malarious area e.g irrigation projects, sugar factory workers etc.
 - § Mixture of large numbers of immune & non-immune population living in primitive condition.
 - § Increase in breeding & density of mosquitoes.
- To define normal occurrence, plot the median or merely number of malaria cases for every calendar month for previous years.
- The third quartile of malaria incidence every calendar

month of previous years is the normal range. Compare this with the current data & if it is clearly abnormal increase, label it as epidemic.

- To know the trend, plot the month wise malaria incidence for last two years & compare with this year.
- MO should analyse the data from village wise register of PHC (MF-9) for timely detection of outbreak.
- Other sources of information for early identification are
 - § Increase in fever rate reaching to one third or more of new OPD cases in PHC.
 - § Rise in malaria positivity rate in laboratory examination
 - § Rising fever incidence reported by FTD holder/MPW, community leaders, press, panchayat members or private practitioners from the area.

2.2. Reporting of outbreak to DHO

- **I**f number of fever cases is in excess than expected, inform DHO about outbreak by fastest means.
- Reporting should include name of village affected, number of cases and deaths, probable cause of fever, prominent symptoms, results of PBS examination if available, control measures started and any assistance required.
- If you have difficulty in diagnosis of the fever outbreak, request DHO to send Rapid Response Team from district level.

2.3. Fever survey of affected population

- **Rapid fever survey:** In case of an outbreak, every village in the suspected epidemic zone is covered in a short duration by deploying additional manpower. House to house visits are undertaken & all fever cases are screened by taking blood smears. These blood smears are to be examined at the earliest by establishing temporary field laboratory at the village level. Peripheral blood smears of all the fever cases should be collected by rapid survey. Depute one health worker for 1000 population. Complete the survey within 2 days.
- Divide the village among health workers. Ask all MPWs to take PBS and give presumptive treatment of Malaria to all fever cases found during the survey. One MPW should survey at least 500 population in one day. If village has large population and cannot be covered by PHC staff within two days, request Taluka Health Officer to depute more staff from nearby PHCs.
- Activate DDC & FTD especially where surveillance is weak.
- During fever survey ensure that all age groups are covered with special attention to children, pregnant women, migrants, & investigate death case to confirm the cause of death.

2.4. Laboratory investigations during epidemic

- Simultaneously arrange for immediate examination of PBS. Establish laboratory to check PBS for malarial parasite in village itself. If less than 100 fever cases are

expected, arrange PBS examination in nearby laboratory. If more than 100 cases are expected, shift the laboratory to affected village. If more than 150 fever cases are expected, request DMO for additional laboratory technician.

- It is extremely important to examine all PBS on same day and get the results. Test all the PBS on same day evening. Laboratory technician should start staining in afternoon and should not leave the village till all the slides of that day are finished and result is communicated to MO.
- In case of positive PBS, Radical Treatment should be immediately given to patient after getting the results.
- When malaria is ruled out & you suspect cause of epidemic as viral fever, serum samples of patients should be collected for diagnosis of viral fever.
- Collect sample from the cases within 3 days from onset for viral isolation. For serology collect sample after five days of starting disease. This is required to detect IgM antibodies, as at least five days are needed for formation of IgM antibodies. Collect second sample of same patient (paired sera) ten days after first sample for detection of rising titre.
- Collect 5 ml blood sample from the cases, separate serum and send to National Institute of Virology, Pune. Details of sample collection and transportation are given in the chapter "Disease surveillance". Send the particulars of patient along with sample such as name, age, sex, address, presenting symptoms, date of onset of symptoms and condition at the time of blood sample collection to laboratory.
- Collect samples of 5% patients & maximum upto 10.
- At least ten days are required to get the results of serum sample. Do not wait for results of serum samples to start control measures. Start control measures on the basis of clinical diagnosis, result of PBS examination for MP and presence of Aedes mosquito larvae in village.

2.5. Entomological investigation

Entomological investigations should be carried out in vector-borne disease outbreaks, as they are useful to confirm or rule out the probable cause of the outbreak and also to implement the control measures.

Trained entomological assistants are available at DMO office. Contact DMO for entomological investigations. Mosquitoes should be collected with the help of insect collector and transported to NIV Pune, contact DMO or DHO so that for this activity you will get help from them.

- If PBS is negative for malaria parasite, look for breeding of Aedes aegypti in small water collections like earthen pots, household cement tanks, flower vessels, cracked bottles, tyres, coconut shells, etc.
- If the outbreak is during monsoon season, examine water collection in small containers like broken bottles, coconut shells, old tyres on roof tops, garbage etc. for Aedes breeding.

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- For outbreaks occurring in summer season, examine water storage containers, particularly half buried earthen pots, cement tanks and pots kept in cool dry place. Aedes larvae are never seen in drinking water containers as these containers are daily cleaned and fresh water is stored.
- Collect the larvae with some water in transparent glass.

Allow the water to settle and observe the larvae on the surface of water. Aedes larvae have short siphon tube and they form approximately 45° angle to water surface. Disturb the water surface with small stick; Aedes larvae will go down by angular jerking movements.

- Use the format given below for larval survey.

Table - 22 : Form for larval survey during fever outbreak

Name of village _____

PHC _____

M No.	Name of head of family	Water containers examined								Total	
		Earthen pots (Ranjan)		Cement tanks		Discarded material		Other containers			
		No. examined	Breeding +	No. examined	Breeding +	No. examined	Breeding +	No. examined	Breeding +	No. examined	Breeding +

2.6. Treatment of the cases

2.6.1. Malaria

- If you find PBS positive for malarial parasite in case of fever outbreak and if number is more than expected, consider the outbreak as of malaria.
- Administer Condensed Radical Treatment (CTR) to all fever cases without waiting for the result of PBS. Details are given in the chapter on Malaria.

2.6.2. Dengue fever

- If all the PBS are negative for malaria parasite and there is breeding of Aedes mosquitoes in the village then suspect dengue fever.
- Collect blood sample for hematocrit and send it to District Hospital or RH laboratory.
- Management of DF is symptomatic and supportive. Details are given in the chapter on DF.
 - § Bed rest is advised.
 - § Antipyretics or sponging is required.
 - § Never give salicylates (Aspirin), as they may cause bleeding in patients.
 - § Home available fluids or ORS should be given for patients with excessive sweating, vomiting or diarrhoea.

2.6.3. Dengue Haemorrhagic Fever

- Management during febrile phase is same as above.
- IV fluid replacement by using DNS, Ringers lactate in the dose of 10-20 ml/kg/hr
- Blood transfusion is required in case of profound shock. Therefore patient should be referred to such a place where

this facility is available. While referring the patient continue the IV line, send ANM or HA (F) along with the patient.

2.7. Vector control

2.7.1. Vector control of malaria

Anopheles mosquito is the vector for Malaria. Anopheles breeds on large fresh water collections like wells, canal seepages, percolation tanks, etc. After taking blood meal, they rest on walls. Vector control measures in malaria are based on the peculiar breeding and resting habits of Anopheles. Malaria control guidelines have been given in details in the chapter on Malaria.

- Control of breeding places: Draining the stagnated water is the most effective method. Release Guppy fish (12-15 fish/sq. meter of surface) or use of MLO or kerosene to destroy the larvae.
- Indoor fogging by pyrethroids with weekly interval.

2.7.2. Vector control for DF

a. Larval control measures

Larval control measures are simple to carry out, effective and inexpensive. Following measures should be carried out for Aedes control.

- Emptying and cleaning of all water containers in village, as one time activity is most effective method of larval destruction. Repeating this activity for three days along with adult control measures will virtually eliminate all Aedes mosquitoes in the village.
- Arrange Gramsabha and inform villagers about importance of one time emptying and cleaning of container for epidemic control. Villagers will not easily discard water from all storage containers. Request Gram Panchayat or

tanker authority if it is scarcity village to supply water in more quantity and at convenient time after cleaning the containers.

- All villagers must empty all water containers, clean inside with brush, wipe dry and keep dry for 6 hours at least once in a week.
- Discard all unused material like broken bottles, old tyres, plastic jars etc.
- Covering and sealing water tanks, removal of rubbish and removal of water from coolers and other places where water has remained stagnant are also important measures.
- Calculate larval indices: This will help to know the impact of control measures. Larval indices are calculated based on the information collected during house-to-house survey. Important indices are,
 - § **House Index:** Percentage of houses positive for larvae of *Aedes aegypti*
 - § **Container index:** Percentage of containers positive for *Aedes* breeding. It is used for drawing vector control strategy.
 - § **Breteau index:** Number of positive containers for *Aedes aegypti* per 100 houses.

Interpret risk of transmission as per the entomological indices as given in chapter on Dengue Fever.

Call the entomological team from DMO office for further entomological investigations. This team will identify adult mosquitoes, calculate mosquito density, catch them, and send for viral isolation.

b. Adult control measures

As adult *Aedes* mosquitoes do not rest on walls after bite, indoor spraying is not effective in *Aedes* control. Fogging by knock down insecticide is effective. Daily fogging by using pyrethroids for three days along with emptying and cleaning of all water collections leads to immediate decline in *Aedes* density.

2.8. Final reporting

Final report should be submitted to DHO within ten days in prescribed format after epidemic is over.

3. Investigation and control of Japanese Encephalitis outbreak

3.1. Confirmation of outbreak

- If a patient with high-grade fever, altered sensorium and/or convulsions is brought to PHC or reported, first examine PBS to rule out cerebral malaria.

4. Fever Epidemic Kit

Table - 23 : Contents of fever epidemic kit

Sr.	Particulars	Quantity	Use
1	Tab. Paracetamol 500 mg.	1000	Fever treatment
2	Tab. Chloroquine 150 mg	1000	For presumptive treatment of Malaria
3	Tab. Primaquine 2.5/5/15 mg	100	For radical treatment of Malaria
4	ORS Packets	25	For hydration (DHF patients)
5	Ringers lactate bottles	10	Treatment of shock (DSS patients)

- Examine the neurological signs. Asymmetrical neurological signs strongly suggest JE.
- Primary health centers do not have facility to treat JE. Immediately refer the patient to Sub District or District hospital where Medical ICU facility is available.

3.2. Investigation of JE outbreak

- Start active surveillance in affected village and surrounding villages. Survey high-risk pockets on priority (places where piggeries are commercially established). JE cases are scattered. You will not get more than 1-2 cases in one village.
- Investigation of JE outbreak is similar to other epidemic prone diseases. First principle is to confirm diagnosis and to take prompt measures for control of the outbreak.
- Line list of cases, including age, sex and address should be maintained. Active search should be made for more cases. Serum samples should be collected for laboratory confirmation of diagnosis.
- Vector surveillance should be immediately initiated and should include collection of adult mosquitoes, identification of mosquito species and assessing density and susceptibility of vectors to available insecticides with the help of DMO.

3.3. Outbreak control measures

- The preventive measures are directed at reducing the vector density and in taking personal protection to prevent the bite of mosquitoes. Immediate measures are fogging with insecticides in affected villages. Community should be informed to take necessary precautions against mosquito bite.
- Isolation or destruction of the amplifying hosts (usually pigs), which are the main source of infection, is not practical as these animals do not show any overt signs of illness and it is not possible to identify infected animals.
- On confirmation of an outbreak of JE, take precautionary measures in other potentially high-risk pockets in the district.
- Isolation of patients and disinfection of secretions and excretions are not required, as JE virus is not transmitted from person to person.
- After the outbreak is over, a detailed report of the outbreak must be submitted to DHO.

6	Cotrimoxazole tablets	500	As antibiotic, if required
7	Micro slides	300	For PBS of patients
8	Disposable lancets	300	For PBS of patients
9	Plain sterile bulbs	20	For Serum samples from suspected DF cases
10	Syringe 10cc disposable	20	For Collection of serum samples
11	Needle 16/18 G disposable	20	For Collection of blood samples
12	Spirit swabs	50	Blood collection, IV preparation
13	IV set	10	IV fluids
14	Cotton bundle, Bandage	2 each	For Minor purposes
15	Forceps, Scissor, Blade	2 Each	For minor procedures
16	Rope - 5 meters	1	Multipurpose

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6. ZOONOTIC DISEASES

6.1. LEPTOSPIROSIS

Leptospirosis is an animal infection caused by spirochetes having several serotypes called as *Leptospira*. This disease is known to occur in our country since long and is wide spread in India. Increasing number of Leptospirosis cases are being reported from Maharashtra state since last few years. Therefore Medical Officer at PHC should keep in mind leptospirosis as one of the differential diagnosis for fever cases.

1. Etiologic Agent

Leptospira are small, thin, thread like organisms tightly coiled about their long axis. Actively motile leptospira rotate on their long axis often with whip like motion and called as spirochetes.

Primary reservoir of most serotypes is wild mammals and some domestic or peridomestic animals like dogs, cattle, sheep, goats, horses, swine, rats and mice. *Leptospira* are excreted in urine of infected animals for long time. *Leptospira* shed in urine can survive for weeks in soil and water causing high environmental contamination. Infection may spread from wild animals to domestic livestock and then to humans. Rats and small rodents are the most common reservoirs.

2. Epidemiology

- 1. *Leptospira* are present in urine of infected animal. When animal or rodent urinates, large numbers of leptospira are excreted into environment. They can remain alive in soil for weeks.
- 1. Healthy person can contract leptospira from direct or indirect exposure to such contaminated environment.
- 1. Direct exposure means when a person walks through leptospira contaminated soil, leptospira pierce skin and enter human body. Direct exposure is common in occupational groups who have to work in muddy soil e.g. farm workers and sewage workers.
- 1. Indirect exposure is through contaminated water without getting direct contact with urine of infected animal. *Leptospira* can gain entry through breaks in skin as well as via mucus membranes.

- Humans are dead-end hosts and person-to-person transmission is rare.
- Epidemic may occur as a result of heavy rainfall and consequent flooding. It is predominantly a disease of adult males due to risk of occupational exposure.

3. Clinical manifestations

- Disease varies from mild clinical form to severe form and sometimes fatal disease with liver and kidney involvement.
- Common symptoms of disease are influenza like illness. Symptoms include, fever, generalized enlargement of lymph glands, a macular to maculopapular rash, particularly with pretibial distribution, abdominal pain and aseptic meningitis and encephalitis. Severe form affects liver, kidney.
- Incubation period is usually 10 days.
- Illness is biphasic, with an initial febrile stage lasting 3 to 7 days followed by second immune stage lasting from 0 to 30 days or more. Involvement of organs like liver, kidneys, eyes, meninges becomes apparent in immune stage.
- Mortality is generally low but is higher for older persons and in those with jaundice.

4. Diagnosis

Isolation of leptospira from blood during acute stage of illness and from urine after first week helps to confirm the diagnosis.

5. Treatment

- Penicillin G 1.5 million units every 6 hours IV or ampicillin 500 to 1000 mg every 6 hours IV are appropriate for severe leptospirosis.
- In milder cases, doxycycline 100 mg twice daily or ampicillin 500 to 750 mg four times per day or amoxicillin 500 mg four times daily can be used.

6. Prevention and control

- All leptospirosis cases should be investigated to detect potential common source of outbreak.
- Rodent control measures are most effective in prevention

of Leptospirosis.

- Wearing of rubber boots is recommended for sewer workers and agricultural workers who get exposed to water contaminated with rodent urine.
- Preventing drinking of contaminated water will reduce chances of getting indirect infection.

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6.2. PLAGUE

Plague is primarily a zoonosis caused by *Yersinia pestis* involving rodents and fleas. Naturally occurring plague is either enzootic or epizootic.

In enzootic plague *Y. pestis* is maintained in relatively disease resistant rodent population, disease is stable and has a low mortality. In epizootic plague, infection is amplified in susceptible rodents and fleas. Resultant rodent die-off promotes rapid and dangerous spread of plague, since infected fleas leave dead hosts to seek other blood sources like humans. Whenever there is 'rat fall' observed in village, one must suspect possibility of plague outbreak & MO must keep in mind possibility of plague while examining patients.

In India since last reported case in 1966, there were no laboratory confirmed cases till its reappearance in 1994 when four persons were tested positive for bubonic plague in Beed, followed by apparent pneumonic plague in Surat (Gujrath). Recently (2004) few cases of pneumonic plague have been detected in Himachal Pradesh.

1. Etiologic agent

Plague is caused by gram negative bacillus *Yersinia pestis*. Plague bacilli are found in buboes, blood, spleen and other viscera of infected persons and in sputum of cases of pneumonic plague.

2. Epidemiology

Fleas are the only arthropodes known to transmit *Y. pestis* in nature. High vector flea densities on rodent hosts are associated with increased likelihood of spread of plague. Commonest and most efficient vector of plague is *Xenopsylla cheopis*.

Rodents are primary hosts for both enzootic (maintenance) and epizootic (amplification) plague. Fleas are primary source of spread. Other naturally involved mammals like rabbits, hares, gerbils and humans are incidental hosts that only occasionally serve as direct sources of infection to other animals or humans.

Characteristics of plague

- Plague first spreads among rodents and then humans, thus human plague is always seen after rat fall.
- Bubonic plague does not spread from person to person.
- Transmission of pneumonic plague requires close, direct contact with ill person.
- Plague infection responds rapidly to commonly available antibiotics.

3. Clinical manifestations

Human plague occurs in primary and secondary forms.

- Primary form: Classic human form of *Y. pestis* infection in humans, bubonic plague occurs in 90 percent of cases.
- Secondary form: Other clinical forms e.g. septicemic, pneumonic, meningial usually occur as a complication of bubonic plague.
- Clinical manifestations of bubonic plague are fever, chills, headache, myalgia, arthralgia, development of pain and tenderness in affected lymph nodes draining site of fleabite and eventually lymph node enlargement (Bubo). Septicemia develops in untreated cases which lead to death.
- Secondary pneumonic plague results from hematogenous spread from bubonic or septicemic plague. Such patient expels plague bacilli while coughing, which enter in healthy persons through respiratory route resulting in development of Primary pneumonic plague.
- Symptoms of primary pneumonic plague are of severe respiratory infection and pneumonia.

4. Diagnosis and treatment

- For diagnosis of bubonic plague, culture of aspirated bubo material is essential. If aspiration is 'dry', sterile saline should be injected into node and aspirated.
- If clinical and epidemiological evidence is strong, initiate antibiotic therapy without waiting for laboratory tests.
- Antibiotic of choice is Streptomycin in a dose of 30 mg per kg. body weight IM daily, for 7 to 10 days.
- Other highly effective antibiotic is tetracycline in a dose of 30 – 40 mg per kg body weight daily for 7 – 10 days.
- Gentamycin and chloramphenicol are acceptable alternatives.
- Penicillin, cephalosporine, macrolides are not effective against *Y. pestis* and should not be used.

5. Care of cases and contacts

- Cases with bubonic and septicemic plague may develop secondary pneumonic plague therefore should be placed in respiratory isolation for at least 48 hours after beginning specific antibiotic therapy.
- Household members and other sharing same environmental circumstances should be placed under surveillance because of possibility of exposure to same source.
- All persons who have had close contact with a pneumonic plague in a previous 6 days period should be given post exposure prophylaxis for 7 days. Drug of choice is tetracycline in dose of 500 mg 6 hourly.
- Doxycycline and Chloramphenicol are acceptable alternative prophylactic agents.
- Exposed persons should be kept under close observation including measurement of body temperature twice a day. If person develops fever, he should be immediately hospitalized and investigated.

6. Prevention and control

- Rapid identification and evaluation of any suspected human case of plague.
- Anti flea measures: Insecticide spraying is principle control measure. Rodent burrows, rodent runs and other places where rodents and fleas may be found should be sprayed or dusted with insecticide. Spraying is done covering entire floor area, bottom of all walls up to 3 feet height, back of doors, roofing, crevices in wall, rat runs etc.
- Community should use personal protective measures against fleas e.g. use of highted beds, mosquito nets, full sleeves cloths, etc.
- Anti rodent measures: Maintain living and working environment free from rodents. Environmental sanitation includes removal of garbage, removal of any rodent food source. Killing of rodents should start after flea nuisance is controlled. Otherwise fleas escaped from dying rodents may worsen epidemic situation.
- Rodent control is most effective method of plague prevention.

7. Role of PHC

If any of following three warning signals are noted in PHC area, MO should immediately visit village and investigate reason. These signals include -

- Clinically suspected case of plague having fever with bubo, as per symptomatology given above.
- Rat fall: An unusual mortality among rodents in large number is known as “rat fall”.
- Increased flea nuisance.

If you find presence of any two of warning signals during investigations, suspect plague and immediately start following activities –

- Inform DHO about plague outbreak and request for Rapid Response Team.
- Confirm that swelling is bubo of plague. Aspirate bubo of patient before giving antibiotics. This is extremely important for confirmation of diagnosis of patient.
- Treat patient with Streptomycin or tetracycline and isolate patient
- Administer Tetracycline to all contacts with patient. If it is small village, you can give tetracycline to all villagers.
- Request DMO to send team for entomological investigation, insecticide spray and dusting.
- Start antirodent measures only after flea nuisance is reduced.

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6.3. RABIES & DOG BITE

RABIES

Rabies is an acute viral infection affecting central nervous system. Major reservoir of rabies is wildlife, but it becomes a public health hazard because of its endemicity in dogs. Humans are only incidental hosts.

Rabies exists in nature in two epidemiological forms: First is urban type in dogs and second is wildlife rabies in wild animals like jackals, wolves, foxes, mongoose, cat, bats etc. Urban rabies constitutes the main source of human infection.

1. Etiologic agent

Rabies virus is an enveloped, single stranded RNA virus belonging to rhabdo virus group. Glycoprotein on viral envelop binds to acetylcholine receptors and contributes to its neurovirulence.

2. Epidemiology

Rabies virus may be present in saliva 5 days before onset of symptoms in dogs and for longer interval in wildlife. Transmission among animals and from animals to man is mainly through bite. Respiratory transmission is possible in laboratory workers and in bat caves which is not seen in our country.

3. The disease

After inoculation into a wound, virus travels along nerves from peripheral site to central nervous system.

Incubation period is variable and is determined by location of bite and distance virus must travel to brain. Therefore incubation period is short after facial bites and longer after bites on extremities. Typical incubation period is about 6 weeks, but extremes of 10 days to 15 months are reported.

4. Clinical manifestations

Rabies in humans runs its course within 1 week. Salient points are

- H/o animal bite
- Pain at the site of bite, paresthesia
- Hydrophobia – The term derives from fact that swallowing of water is difficult because it produces reflex painful contraction of muscles of deglutition while passing through. Therefore patient refuses to drink water. Fear becomes so intense that, mere sight of water induces contraction.
- Intolerance to light and noise
- Restlessness, extreme excitability
- Convulsions
- Paralysis
- Increased lacrimation and perspiration

5. Diagnosis

Diagnosis is based on clinical features as above along with h/o animal bite.

6. Treatment

There is no cure for rabies and outcome is invariably fatal.

Patient should be referred under sedation (preferably pethidine) to hospital where ICU facility is available.

DOGBITE

Dog bite is commonest mode of transmission for rabies. As there is no cure for rabies, local wound care and prophylactic immunization should be started immediately after dog bite. Important aspects of dog bite treatment are:

1. Local treatment of wound
2. Classification of exposure
3. Use of vaccine

1. Local treatment of wound

Immediate local treatment of bite wounds and scratches is most important step in management of dog bite. Proper wound treatment reduces risk of rabies significantly. Follow steps given below for local treatment of Dog bite:

- Flush and wash wound, scratches and adjoining area with plenty of soap and water preferably under running tap, at least for 5 minutes. This treatment is most effective when applied immediately after exposure. However it should not be neglected even if several hours or days have passed after bite. Washing wound reduces chances of developing rabies by 80%.
- Chemical treatment - Apply Tincture or Povidone Iodine or any other virucidal agent to wound after cleaning. Do not use Savlon or Cetavlon as they are not effective.
- Do not suture wound. Additional trauma will facilitate attachment of rabies virus to nerve endings. If necessary suturing should be done after 48 hours under cover of ARS with minimum number of stitches.
- Local anti rabies serum - Local application or infiltration around wound after sensitivity test.

2. Classification of exposure

Classify exposure first, as dose of vaccine depends on this classification which is based on risk of contracting rabies.

Class I (Minor risk):	Touching, fondling of animal, consumption of unboiled milk of suspected rabid animal
Class II (Moderate risk):	Licks, scratches without oozing of blood.
Class III (Severe risk):	Even single transdermal bite with oozing of blood.

3. Use of vaccine

Use of nerve tissue vaccines is now discontinued. Presently cell culture vaccines are used for prevention of rabies. Cell culture vaccines are modern, highly potent vaccines with least side effects. Volume of these vaccines is much less; they are least painful and are given intramuscularly or intradermally.

3.1. Important aspects of cell culture vaccine

- Vaccine should be given in deltoid region or in antero lateral aspect of thigh in case of small children. Never give vaccine intra-venously.

- Doses for adults and children are same. A protective antibody titre is achieved after a series of 3 injections.
- It is not necessary to observe interval with regard to other vaccinations.
- Immunization schedule should be followed exactly as recommended even if considerable time has elapsed since exposure.
- There is no any contraindication for post exposure prophylaxis as Rabies is a fatal disease. However in case of known hypersensitivity appropriate precaution should be taken.
- Vaccine is safe during pregnancy.
- Vaccine should be stored in 2° to 8° c and should be used immediately after reconstitution.

3.2. Post exposure immunization

Dose of 1 ml given IM in deltoid on day 0, 3, 7, 14, 28 (or 30) and booster dose on day 90.

3.3. Pre exposure immunization

Pre exposure prophylaxis is recommended for high-risk group. One ml dose should be given on deltoid on day 0, 7, 28 and 365.

3.4. Side effects of cell culture vaccine

Usually there are no serious side effects, but sometimes redness, pain, headache, fever for short time may be observed.

3.5. Immunization schedule for re-exposure

If a patient is re-exposed after receiving *the* anti rabies treatment, schedule to be followed is as below

Less than 1 year:	Vaccine on day 0 and 3
1 – 5 years:	Vaccine on day 0, 3, and 7.
More than 5 years:	Full course depending on exposure.

4. Anti Rabies Serum

Anti rabies serum or immunoglobulin is indicated in class III exposures.

- Best results of anti rabies serum are obtained if serum is administered immediately. After 6 days of exposure it is of little value.
- Maximum quantity of serum should be infiltrated into wound after cleaning thoroughly. As per the current recommendations of WHO, maximum serum (more than half) should be infiltrated around the bite wound.
- Horse Anti Rabies Serum should be given in a dose of 40 IU/Kg body weight.
- Human Rabies Immunoglobulin if available is given in a dose of 20 IU/kg body weight.
- When Anti Rabies Serum (ARS) or Rabies Immunoglobulin (RIG) is given 2 booster injections of vaccine are recommended on 24 th and 34 th days after completion of vaccination.

5. Important aspects to be remembered by MO

- Give inj. TT to all cases of dog bite.

- Rat bite is also very common in India especially in rural area. World wide literature reveals that, rats are very poor transmitters of rabies & hence it is not necessary to give ARV in patients with rat bite.
- Always keep adequate stock of ARV. Indent ARV before complete stock is utilized and over.
- Maintain cold chain of vaccine.
- ARV should be administered by Medical Officer and not by para-medical staff.
- Keep patient under observation for half an hour after ARV is given.

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6.4. AVIAN INFLUENZA (BIRD FLU)

Avian influenza or bird flu is a communicable disease caused by virus that normally infects only birds & less commonly pigs. While all bird species are thought to be susceptible to infection, domestic poultry flocks are especially vulnerable that can rapidly reach epidemic proportion.

The disease in the birds has two forms. The first causes mild illness, sometimes expressed as ruffled feathers or reduced egg production. Second form is known as “highly pathogenic avian influenza” (HPAI), which is characterised, by sudden severe illness & rapid death with a mortality that can reach 100%. This has potential for more widespread infection in the human population.

Since December 2003, human infections with influenza A (H5N1) have been reported in Vietnam, Thailand & also Cambodia, Indonesia & China. Similarly H5N1 outbreaks have been reported from Asian countries. In the year 2006 Avian influenza was found in poultry birds in Nandurbar district & Jalgaon district of our state.

1. Agent

Avian influenza is part of family Orthomyxoviridae & belongs to type A. There are 16 avian influenza subtypes & amongst them H5N1 is of particular concern, as it mutates rapidly & it has propensity to acquire genes from viruses infecting other animal species.

People at risk of contracting avian influenza are workers handling poultry in farms, markets & involved in culling activity, veterinary workers.

2. Epidemiology

Avian influenza A virus does not usually infect humans, however some instances of human infections have been reported.

Influenza A virus undergoes major antigenic shift causing worldwide pandemics with high morbidity & mortality. They are genetically unstable & their behaviour cannot be predicted.

As these virus does not commonly infect humans, there is little or no immunity against the virus in humans.

2.1. Mode of transmission

Certain water birds such as waterfowls & migratory birds act as reservoir of influenza viruses by carrying the virus in their intestine & shedding it. Infected birds excrete the virus at least for 10 days orally & in faeces, thus facilitating further spread.

Direct contact with infected poultry or surfaces & objects contaminated by their faeces is presently considered as the main route of human infection.

Exposure is considered most likely during slaughter, defeathering, butchering & preparation of poultry for cooking. There is no definite evidence of human-to-human transmission.

3. Clinical symptoms

The reported symptoms of avian influenza in humans range from typical influenza like symptoms (fever, cough, sore throat, muscle aches) to eye infection, pneumonia, acute respiratory distress & other severe & life threatening complications.

The WHO definition of avian influenza in humans is as below:

3.1. Suspected case

- Fever (body temperature of 38° Celsius or higher); in addition to
- One of the following symptoms - Muscle ache, cough, abnormal breathing (unusual breathing difficulty) or suspected of pneumonia by physician, or influenza; in addition to
- H/o direct contact with infected/dead birds in the past 7 days or occurrence of unusual death of birds in the community within the past 14 days; or contact with the pneumonia patient or another patient suspected of avian influenza.

3.2. Probable case

The above mentioned symptoms of suspected case &:

- Preliminary test shows infection of influenza group A, but cannot yet be confirmed whether it is influenza from humans or birds.
- Respiratory failure
- Death

3.3. Confirmed case

Suspected/probable case with final PCR test or virus isolation showing H5 strain of influenza group A, which is a bird strain.

Note: Diagnosis of suspected & probable case can be changed if confirmation tests show that the patient's infection was caused by other factors.

4. Specimen collection for laboratory diagnosis

Following clinical samples are collected preferably within 72 hours of illness & sent to the laboratory within 24 hours of collection.

- Nasopharyngeal swab/ oropharyngeal swab/ throat swab
- Serum sample

The samples are packed properly, labeled & sent to National Institute of Virology, Pune for examination.

5. Clinical management of avian influenza cases

Principles are as below

5.1. General & supportive treatment

- Hospitalise & isolate cases
- Monitor vital signs
- Maintain airway, breathing & circulation (ABC)
- Maintain hydration, electrolyte imbalance & nutrition
- Provide oxygen therapy, when indicated
- Manage fever symptomatically with Paracetamol

5.2. Specific treatment

- Antiviral drugs: In adults, Oseltamivir (Tamiflu) is to be given orally in the dose of 75 mg BD for 5 days. This drug reduces the severity & duration of the disease.
- Broad-spectrum antibiotics should be added to cover secondary pulmonary infection.

6. Public awareness

Public awareness in the community regarding various aspects of bird flu is important. Emphasis should be given on following aspects:

- Proper cooking at more than 70° temperature for 30 minutes eliminates the virus & it is absolutely safe to consume properly cooked poultry meat. While cooking it should be ensured that no part of the chicken remains pink.
- Foe eggs obtained from affected area, outer surface of egg should be washed with soapy water & it should be thoroughly cooked. Do not use raw eggs in any cooked preparation.
- If areas from where bird flu has been reported from poultry, unnecessary contacts with live, sick, dead poultry should be avoided especially prevent children from coming in contact with poultry. In such area, avoid visiting local market where live & slaughtered chickens are sold.

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7. AIR-BORNE INFECTIONS

7.1. TUBERCULOSIS

1. Introduction

India accounts for 1/3rd of the global burden of tuberculosis. Each year nearly 20 lakh people in India develop TB & over 4.5 lakh die from it. Daily more than 20,000 people become infected with the tuberculosis bacillus, more than 5000 people develop TB & more than 1000 people die of TB in India.

2. Epidemiology

- TB is a bacterial disease caused by Mycobacterium

tuberculosis. These organisms are also known as tubercle bacilli or as acid-fast bacilli.

- Transmission of tuberculosis occurs by airborne spread of infectious droplets. Source of infection is patient of tuberculosis who spreads tuberculosis bacilli during coughing, sneezing, etc.
- Most common symptom of pulmonary TB is persistent cough for three weeks or more, usually with expectoration. Persistent cough for 3 weeks or more may be accompanied by one or more symptoms such as weight loss, loss of appetite, tiredness, evening rise fever, chest pain, shortness of breath and hemoptysis.
- Greatest burden of tuberculosis incidence & mortality is in adults 15-60 years.
- One smear positive patient can infect approximately 10 to 15 persons per year, thereby increasing the pool of infected persons. Many patients who do not complete treatment have isolates, which are resistant to drugs they have taken. These patients infect others people, with drug resistant bacilli.
- Incidence of tuberculosis is usually similar in both sexes below 15 years of age, thereafter incidence is higher in males than females and difference is greatest in old people.
- As transmission decreases incidence of disease in young people falls. However, incidence in old people does not fall rapidly.
- In successful tuberculosis control programme, peak of incidence gradually moves from young people to old people.
- Early detection of sputum positive tuberculosis case and conversion into sputum negative by effective treatment are most important measures for tuberculosis control.

3. Estimated Tuberculosis cases

Cross sectional nation wide study was conducted in different parts of the country to assess the prevailing epidemiological situation of tuberculosis. Accordingly Annual Risk of Tuberculosis Infection was estimated, which is 1.5% for the nation.

There are 216 cases of tuberculosis per 1 lakh population per annum as per this estimate in the state.

Break up of these cases for 100000 population is as below

Category	Tuberculosis cases				70% case detectio
	Sputum positive	Sputum negative	Extra pul	Total	
Cat I	80	16	3	99	56
Cat II	40	0	0	40	
Cat III	0	64	13	77	
Total	120	80	16	216	151

Thus in a PHC having 30,000 population, there will be approximately 65 tuberculosis cases in a year. Considering the target of 70% case detection, that PHC will have to diagnose &

treat total 45 cases of tuberculosis.

REVISED NATIONAL TUBERCULOSIS CONTROL PROGRAMME (RNTCP)

1. Objectives of RNTCP

- Cure rate of at least 85% of new sputum positive patients detected
- Detection of at least 70% of all new sputum positive cases

2. Programme strategy

- Revised National TB Control programme is based on 'DOTS' strategy. Five key components of DOTS are:
 - § Political commitment to sustain TB Control activities.
 - § Case detection by sputum smear microscopy among symptomatic patients
 - § Standardized short course chemotherapy regimen for all TB cases to be given under direct observation.
 - § Regular uninterrupted supply of anti-TB drugs.
 - § Systematic recording and reporting system that allows assessment of treatment results for each and every patient and TB control programme.
- Alternate day treatment (DOTS) suggested under RNTCP is as effective as daily treatment because doubling time of *M. tuberculosis* is 18 hours and intermittent regimen allow organisms to re enter active metabolic phase in which bactericidal drugs are more effective.
- DOTS means Directly Observed Treatment, Short-Course Chemotherapy, in which a health worker or other trained person who is not a family member of patient observes as patient swallows anti-TB medicines in his presence.
- RNTCP shifts the responsibility of cure from patient to health system.

3. Organizational set up for implementation

For smooth management of RNTCP, PHCs and Rural Hospitals are classified into three types of institutions called as Tuberculosis Unit (TU), Microscopy Center (MC) or Peripheral health Institute (PHI). Responsibilities of various centers under RNTCP are as follows -

3.1. Tuberculosis Unit (TU)

One tuberculosis unit is established per 5 lakh population. It is usually Rural Hospital or PHC located at central place. Functions of TU are-

- Maintaining map of various hospitals, NGOs and other agencies, who carry out TB control activities.
- Act as referral point for all MCs and PHIs in the area for diagnostic problems, drug reactions, treatment failure patients etc.
- Maintaining regular supply of drugs, reagents and other logistics to all MC and PHI
- Supervision of MC and PHI for RNTCP activities.
- Monitoring and updating RNTCP records of TU, MC and PHI.

Medical officer in charge of the institution where TU is established is also in charge of TU and is designated as Medical Officer- Tuberculosis Control (MOTC). Senior Treatment Supervisors (STS) and Senior Tuberculosis Laboratory Supervisors (STLS) are responsible for overall supervision of programme in TU area.

3.2. Microscopy Centers (MC)

One microscopy center is established for one lakh population. This means there is one MC for 3-4 PHCs. Functions of MC include-

- Collection of three sputum smears of all chest symptomatic patients (3 weeks cough) referred from PHI or directly attending OPD.
- Staining and examination of sputum smears and communicating results to referring PHI in prescribed laboratory form.
- Categorizing patient from own area and start treatment.
- Referral of sputum negative and extra pulmonary patients to TU for diagnosis.
- Maintenance of records.

3.3 Peripheral Health Institute (PHI)

All other PHCs (not selected as TU or MC) function as PHI. Important functions of PHI are as follows -

- Enlisting suspected cases and motivation of these cases to attend MC for sputum examination.
- Start DOT to all TB diagnosed patients from area as per guidelines after receipt of sputum examination report from MC.
- Make all possible efforts to maintain regularity of treatment by patients.
- MO PHI should monitor and supervise TB diagnosis and treatment activities in PHC area. MO should also make home visits to defaulted patients whenever required.

4. Implementation of RNTCP

4.1 Ensure identification of tuberculosis suspects

People with chest symptoms and other symptoms suggestive of TB contact medical personnel from either governmental or private facility. These individuals need to be identified and advised sputum smear examination to arrive at diagnosis. Patients suspected of having extra pulmonary TB and patients who are contacts of sputum smear positive patients, should have their sputum examined for AFB if they have any chest symptoms, regardless of duration of these symptoms.

In order to detect as many cases of pulmonary TB, following activities are suggested.

- All chest symptomatics with cough more than three weeks should be advised sputum examination.
- Encourage MPWs and HAs to identify chest symptomatics during their home visit.
- Health education to community for self-reporting when there is cough more than three weeks.

- Sensitize and involve private practitioners and NGO in RNTCP activities. Encourage them to refer chest symptomatics to microscopy center for sputum examination.
- If proper history is taken usually 2-3% of adult outpatients are chest symptomatics. Medical officer should periodically review this.

4.2. Collect sputum from all chest symptomatics

Once you identify chest symptomatic, three sputum examinations are essential. This is responsibility of all the institutions.

- Sputum is collected from all symptomatics (cough for more than three weeks) attending OPD and from contacts of sputum smear positive patients, irrespective of duration of cough.
- If your center is MC, collect three sputum samples from each suspected patient as mentioned below and if your center is PHI then refer patient to nearby Microscopy Center.
- § Collect first sample under supervision when chest symptomatic attends MC.
- § Second sample is early morning sample to be collected by chest symptomatic at home. Hand over sputum collection cup to patient; explain how to collect sputum in cup and request to bring sputum-collected cup to PHC next morning.
- § Third sample is again supervised sputum sample to be collected on second day at PHC when patient attends PHC to handover second sample.
- If sputum specimen is collected at a place other than microscopy center, specimen identification number is written and if it is Microscopy Center then laboratory serial number is written on sputum cup before sputum is collected.
- All sputum cups after examination should be kept in a bucket containing 5% hypochlorite solution or 5% phenol solution overnight & then burnt in a pit.

4.3. Sputum examination

Sputum examination is the responsibility of MO, Microscopic Center. Steps to be followed for sputum examination and recording are mentioned below-

- Laboratory technician will enter all collected slides in Tuberculosis Laboratory Register.
- Slides will be stained by Ziehl-Neelsen Stain & examined under oil immersion lens.
- All smear-positive results should be recorded immediately after examination of slide in red ink in Tuberculosis Laboratory Register. Results of slide examination status should be recorded as follows -

Table-24 : Grading of sputum microscopic results

No. of AFB on slide	Result	Positive (grading)	No. of fields to be examined
More than 10 AFB/field	Pos	3+	20
1-10 AFB/field	Pos	2+	50
10-99 AFB/100 field	Pos	1+	100
1-9 AFB/100 fields	Scanty	Record exact figure	200
No AFB in 100 fields	Neg	-	100

- If patient is referred for PHI, fill up laboratory form indicating results of three sputum examinations and send back patient to referring PHI within 24 hours.
- If your center is MC, laboratory technician will submit report to Medical Officer for diagnosis and categorization.

4.4. Disease classification and diagnosis

Once you get result of sputum examination, classify the patient according to sputum smear results and site of involvement as follows -

4.4.1. Sputum smear positive tuberculosis case

- At least two-sputum specimen smears positive for AFB or
- One sputum smear positive and radiographic abnormalities suggestive of active tuberculosis or
- One sputum smear positive and culture positive.

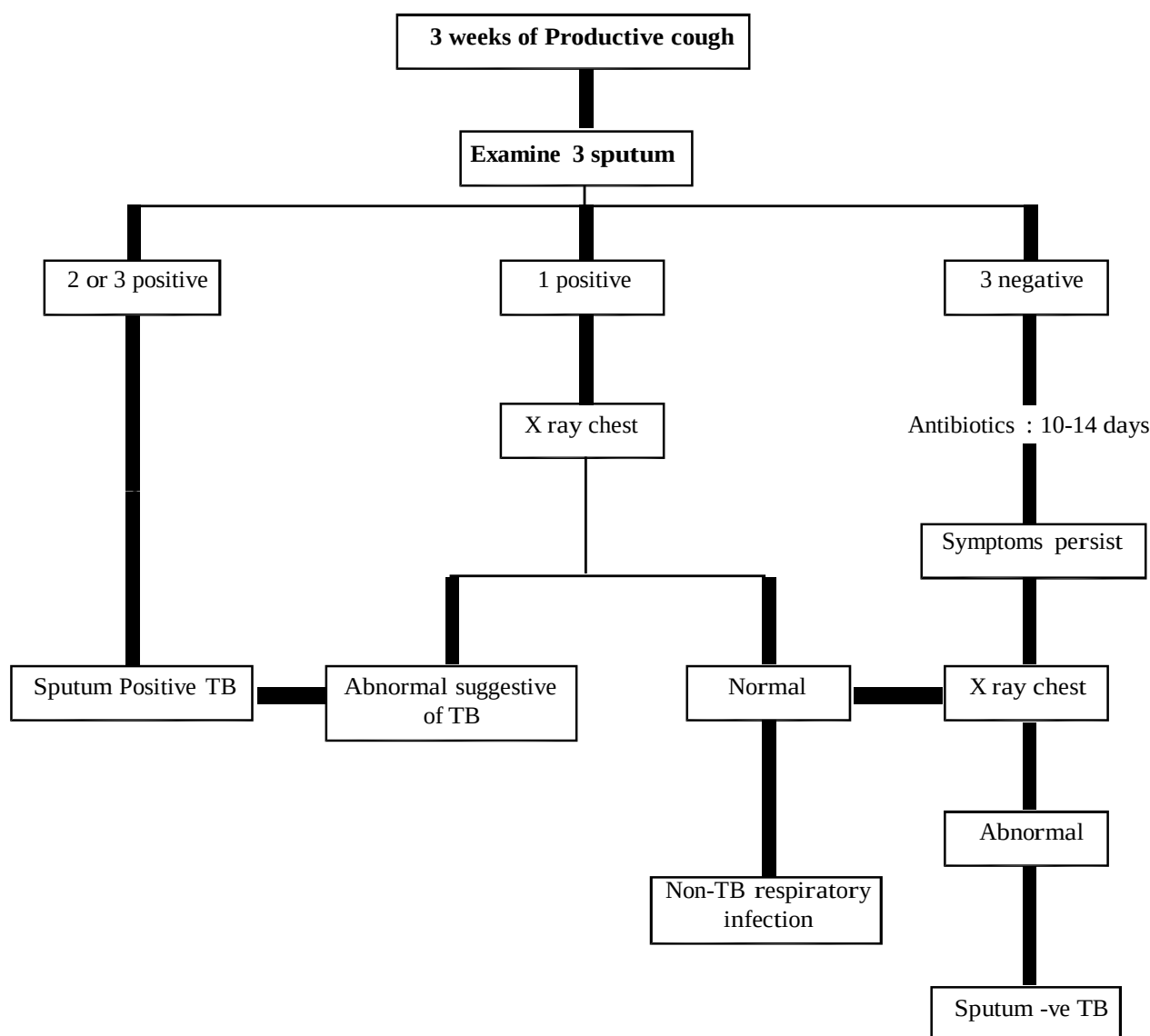
4.4.2. Sputum smear negative Tuberculosis case

- Three smears negative but radiographic abnormalities suggestive of active tuberculosis.
- All three sputum smears negative and culture positive case.

4.4.3. Extra pulmonary Tuberculosis case

- Tuberculosis of organs other than lungs e.g. pleura, lymph node, abdomen, genitourinary tract, skin, bone, joints, meninges, brain etc. is labeled as Extra-Pulmonary Tuberculosis case.
- Extra-Pulmonary Tuberculosis case is diagnosed from positive culture or histological evidence or strong clinical evidence.
- If patient has both pulmonary & EP tuberculosis; patient is classified as pulmonary TB & site of EP is written.
- A patient with Extra Pulmonary (EP) Tuberculosis may have symptoms such as weight loss, fever, particularly rising during evening and night sweats. Other symptoms depend upon organs affected, for example swelling with pus discharge if lymph nodes are affected, pain and swelling of joints if joints are affected and headache, stiffness of neck and mental confusion when meninges are affected.

4.5. Diagnostic algorithm



4.6. Treatment

Treatment of tuberculosis under RNTCP depends upon three important aspects i.e. as sputum status of patient, history of previous anti-TB treatment and nature of illness of patient. Patient is classified in one of the three groups (categories) for treatment labeled as CAT-I, CAT-II and CAT-III.(see table next page) Medicines are available in boxes (one box for each patient) with color-coding for different categories, Red for Cat-I, Blue for Cat -II and Green for Cat-III.

4.6.1. Classification of patient

Classify patient into one of the following types on the basis of previous treatment.

- a. New Patient:** A patient who has never had treatment for TB or has taken anti tuberculosis drugs for less than one month.
- b. Relapse:** A patient declared cured of TB by a physician, but

who reports back to health service and is found to be bacteriologically positive

c. Transferred in: A patient, who has been received into a Tuberculosis Unit/ District after starting treatment in another unit, where he has been recorded.

d. Treatment after default: A patient who received anti-tuberculosis treatment for one month or more from any source and who returns to treatment after having defaulted, i.e., not taken anti-TB drugs consecutively for two months or more.

e. Failure: A smear positive patient, who is smear-positive at 5 months or more after starting treatment. Failure also includes a patient who was initially smear-negative but who becomes smear-positive during treatment.

f. Chronic: A patient who remains smear-positive after completing a re-treatment regimen.

g. Others: Patients who do not fit into above-mentioned categories. Reasons for putting a patient in this category must be specified.

4.6.2. Decide the treatment course

Anti-TB treatment under RNTCP has three categories depending upon sputum result and history and outcome of previous treatment. Categorize patients as follows -

- If two or three sputum smears are 'positive' for M. tuberculosis and if patient is 'new' then start 'CAT-I' treatment. Ask patient to come along with contacts at earliest if they have similar symptoms.
- If one sputum smear is 'positive' for M. tuberculosis then refer patient to Tuberculosis Unit or nearest X-Ray facility for X-Ray chest. If X-Ray chest is suggestive of active tuberculosis and patient is 'new' then assume patient as sputum positive and put the patient on CAT-I treatment.
- If all the three sputum smears are negative then start antibiotics for one to two weeks. Care must be taken to prescribe only general antibiotics e.g. Co-trimoxazole which do not have anti-TB activities. Antibiotics of fluoroquinolone group like Ciprofloxacin, Ofloxacin should not

be given as they have anti-mycobacterial action. If symptoms disappears then no further treatment and if symptoms persists, refer patient for X-Ray. If X-Ray is suggestive of active tuberculosis and patient is new, then start 'CAT-III' treatment. Start 'CAT-I' if patient is seriously ill.

- In case of relapse, treatment after defaulter or failure as per definition given above, categorize the patient in CAT-II and start CAT-II regimen.

4.6.3. Treatment of extra pulmonary tuberculosis

- Start CAT-III regimen to extra pulmonary cases.
- Do not start treatment of extra pulmonary tuberculosis on the basis of clinical diagnosis alone. Refer patient to specialist for culture or histopathology.
- If EP patient is seriously ill then start CAT-I. Examples of seriously ill extra pulmonary cases include Meningitis, Spinal TB with neurological involvement, Bilateral pleural effusion, Miliary Tuberculosis, Genito-urinary TB, Intestinal TB, Tuberculosis pericarditis, etc.
- MO should verify once a week whether classification & outcome is correct, complete & up to date.

4.6.4. Treatment schedule

a. Category wise treatment schedule

Table-25: Treatment schedule under RNTCP

Category	Inclusion criteria	Regimen	Duration of treatment	
CAT-I	New sputum + Seriously ill new sputum -ve and seriously ill new EP	2 (HRZE) ³ 4 (HR) ³	2 months (24 doses)	4 months (54 doses)
CAT -II	Relapse/Failure T/t after defaulter Other cases	2 (HRZES) ³ 1 (HRZE) ³ 5 (HRE) ³	2+1months (24+12 doses)	5 months (66 doses)
CAT -III	New sputum -ve cases New EP not seriously ill	2 (HRZ) ³ 4 (HR) ³	2 months (24 doses)	4 months (54 doses)

Note :- All doses in Intensive phase and at least first dose in Continuation phase should be directly observed by DOT provider..

b. Treatment schedule explanations

- 2 (HRZE)³: 2 months INH/Rifampicin/Pyrazinamide/Ethambutol 3 times a week
 2 (HRZES)³: 2 months INH/Rifampicin/Pyrazinamide/Ethambutol/Streptomycin 3 times a week
 1 (HRZE)³: 1 month INH/Rifampicin/Pyrazinamide/Ethambutol 3 times a week
 5 (HRE)³: 5 months INH/Rifampicin/Ethambutol 3 times a week
 4 (HR)³: 4 months INH/Rifampicin 3 times a week.

c. Doses and adverse effect

Sr.No.	Name of drug	Adults	Children	Adverse effects
1	Isoniazid (H)	600mg	10-15 mg /kg	Burning of extremities
2	Rifampicin (R)	450 mg (+150 mg to patient of > 60 kg wt)	10mg/Kg	Red color urine, Jaundice
3	Pyrazinamide(Z)	1500 mg	35mg/kg	Joint pains
4	Ethambutol (E)	1200 mg	30 mg/Kg	Impaired vision
5	Streptomycin(S)	0.75g (0.5g for pt.>50 years and/or <30kg wt.)	15 mg/Kg	Loss of hearing

Note: If icterus is observed, immediately stop anti tuberculosis treatment and refer patient to specialist. Do not give Ethambutol to children of less than 6 years age.

4.6.5. Important aspects of treatment

a. Treatment outcomes

i Cured: Initially sputum +ve patient completed treatment & is sputum-ve at least for 2 occasions, one of which is at completion of treatment.

ii Treatment completed: Smear-ve or EP patient received full course of treatment & has not become sputum +ve during or after treatment. Sputum +ve patient who has completed treatment & became -ve at the end of Intensive Phase but sputum examination is not done at the end of treatment.

iii Died: Patient died during treatment regardless of cause.

iv Failure: Smear +ve case who remains +ve at 5 months or more after treatment & also smear -ve who becomes +ve any time during treatment.

v Relapse: Patient who has been declared cured by a physician, comes back to health system and is found to be bacteriologically positive.

vi Defaulted: A patient who at any time after registration has not taken anti tuberculosis treatment consecutively for 2 months or more.

vii Transferred out: A patient who has been transferred to another TU or district & whose treatment results are not known.

b. Anti TB treatment during pregnancy

Do not give Streptomycin during pregnancy. Other drugs are safe. Breastfeeding should be continued after delivery during treatment.

c. Children staying with smear positive TB family member

- If a smear +ve tuberculosis patient has child below 6 years as a family member, screen child for symptoms. If child has symptoms and is diagnosed to be tuberculosis then should be given full treatment.
- If child does not have symptoms, preventive chemotherapy i.e. 5 mg INH/kg body weight for 6 months should be given.

4.6.6. Organization of treatment cards

Organization of treatment cards is the responsibility of DOT provider. Tuberculosis treatment cards should be organized according to day of scheduled observation and phase of treatment. When patient swallows medication under direct observation, TB treatment card should be placed after divider for next scheduled observation. In this manner TB treatment cards of patient who did not turn out for treatment on day will be apparent on slot of that day facilitating appropriate action for retrieval or patients.

4.7. Follow up of patient

It is essential to collect sputum of patients at fixed interval to assess effectiveness of DOT. Inform these dates to patient at the time of starting of treatment. Instruct DOT provider to remind follow up date to patient once at least one week before and then one day before. Medical Officer must take this chance and cover following important points during follow up visit of patient.

- Review of regularity of patient with help of treatment card.**
- Enquire about any side effects or other problems related to treatment.
- Discuss with patient about convenience of DOT place and change of place if necessary as per patient's convenience. This will improve regularity of patient.
- Enquire whether patient is following any unnecessary dietary restrictions.
- Ask patient to give sputum and inform about next date of follow up.
- Review regularity of each patient by name during monthly PHC meeting.**

Follow up sputum collection and examination dates and action to be taken on findings are summarized in table below -

Table-26: Follow up of DOTS patients

CAT	Follow up sputum	If smear + at the end of IP		Remarks
CAT-I	At 2,4,6 months of treatment	IP for another one month	3,5,7 months of treatment	If sputum +ve at 5 months, declare patient as failure and put on CAT-II
CAT-II	At 3,5,8 months of treatment	If +ve at 3 months then 4 drugs for one more month	4,6,9 months of treatment	-
CAT -III	At 2,6 months of treatment	-	-	If +ve at 2 months of t/t, consider as t/t failure and put on CAT-II

4.8. Defaulter retrieval action

In spite of counseling and health education at the time of diagnosis and follow up by health workers, some patients remain irregular for treatment. Defaulter retrieval action is action taken to bring back patients for treatment who do not take medicines regularly. DOT provider should take defaulter action. Following

actions are suggested under RNTCP for defaulter patients-

- If patient does not come as scheduled during Intensive Phase (IP) then health worker makes home visit immediately next day and brings patient for regular treatment.
- If patient is in Continuation Phase (CP) home visit should

be made and patient should be retrieved within a period of a week after missed dose.

4.9. Monitor success of RNTCP in your PHC

Following are few ways to monitor progress in treatment of TB patients. Medical Officer must understand these indicators that help to monitor and take appropriate action

- Conversion of sputum smears from positive to negative is the best indicator that Intensive Phase (IP) of chemotherapy has been regular & effective. This should be more than 80% at the end of 2 months and more than 90% at the end of 3 months.
- Compare drug intake in IP, drug collection during Continuation Phase (CP) from TB treatment cards with drugs available in respective patient wise boxes. This should tally in 100% of cases.

4.10. Counseling the patient

Good and timely counseling improves regularity of patient. Medical officer should spare at least 10 minutes to newly diagnosed tuberculosis patient and discuss on following points-

- Inform patient about cause of TB, how it spreads and how patient can protect other family members from disease
- Inform patient about duration, regularity of treatment, suitable place for DOTS therapy, treatment availability free of cost and importance of DOT.
- Name, designation and place of functionary who will provide DOTS therapy and how to contact medical officer if there is any problem in delivery of DOTS.
- Inform patient that there is no need of any other treatment when DOTS is started.
- Patient may feel better in one or two months after starting treatment but treatment should be continued till scheduled time.
- Specifically mention to patient that there are no restrictions on diet.
- Whenever you see a patient enquire regularity & duration of treatment.

4.11 Record Keeping

MO PHC must know various types of records kept at PHC under RNTCP. Record keeping depends upon classification of PHC as TU, MC or PHI. Records to be kept at your center are listed below. Information of each register and points to be observed while examining records are also noted. MO must examine all RNTCP registers of his centers once a week.

- TU Tuberculosis register.
- MC TB laboratory register and TB treatment card.
- PHI TB treatment card.

4.11.1. Tuberculosis register (TB register)

- This is the key register from which quarterly reports are prepared and is kept at TU only.
- Duplicate TB register should not be maintained at PHC level.

- Tuberculosis number is assigned to each patient registered in TU area. Serial number of patients starts from 1st January.
- This register is completed by Senior Treatment Supervisor (STS) during visit to all PHIs in his area. This is completed with help of TB treatment card and TB laboratory register.

4.11.2. Tuberculosis laboratory register (Laboratory register)

- Each MC must have tuberculosis laboratory register which should be completely and correctly filled.
- Patient's particulars, sputum collection and result of asputum smear examination etc. are recorded in tuberculosis laboratory register and this information must match on tuberculosis treatment card.
- Laboratory serial number is assigned to a patient & not to a sputum specimen. Therefore each set of sputum samples from a single patient is given single laboratory serial number.
- At the end of month, laboratory technician should summarize information of sputum smear examinations done during the month.
- All positive results should be recovered with red ink in register.
- If patients live outside district, copy of laboratory form with result written on it must be sent to district where patient will begin treatment.
- TB number and category of all positive patients placed on DOT should be mentioned in remarks column. This helps in identification of initial defaulters.

4.11.3. Treatment card

Treatment card is maintained at PHC where patient is diagnosed. If patient is to be treated by DOT provider, a duplicate card will be prepared & given to health worker. Observe following points while examining card-

- Personal identification including complete address of patient and details of contact person is complete.
- Patient is placed on correct treatment regimen as per his/her category and given same treatment.
- Smear positive cases are sent for follow up sputum examination and treatment is extended if required.
- Patients are given drugs on scheduled day.
- Prompt default retrieval action is taken.
- **New** smear positive cases remaining positive at the end of 5 months are referred for re registration under CAT-II.
- Compare number of blister packs from patient wise boxes with number of visits shown in TB treatment card & investigate discrepancy if any-

4.11.4. Reporting

- All PHI and MC will report to TU of area in prescribed format every month.
- Reports from PHI and MC are collected and compiled at TU

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- Compiled reports are forwarded to District Tuberculosis Center.
- Following reports should be kept at various institutes -
 - § Peripheral Health Institutions (PHI): Monthly report on programme management and logistic. Only first page is filled by PHI. This includes report on medication stock and information about staff position & training.
 - § Microscopy Centers (MC): In addition to reports mentioned above, reports like Microscopy activities, laboratory consumables, treatment initiation and condition of microscope are sent by MC
 - § Tuberculosis Units (TU) : Following four important reports are submitted by TU every quarter starting on 1st January (first quarter), 1st April (second quarter), 1st July (third quarter) and 1st October (fourth quarter)-
- **Quarterly reports:**
 - § Quarterly report on programme management & logistics: Prepared from & MC/PHI reports.
 - § Quarterly report on new and re-treatment cases: Includes information about all patients registered in quarter, details of smear positive new cases and category wise patients started DOTS treatment.
 - § Quarterly report on sputum conversion
 - § Quarterly report on results of treatment of tuberculosis patients registered 12-15 months earlier.

5. Important programme indicators and their calculation

5.1. Case detection rate:

5.1.1. Annual total case detection rate

Total Number of cases registered during quarter $\times 4$

Mid year population in lakh

5.1.2. New sputum positive case detection rate

Total Number of new sputum smear positive cases registered during quarter $\times 4$

Mid year population in lakh

5.1.3. Case detection rate

Annual new smear positive case detection rate $\times 100$

Expected case detection rate

Expected case detection rate is 85 new sputum positive cases per lakh population per year

5.2. Ratio of new smear positive cases to new smear negative cases

Total number of new smear positive cases registered

Total number of new smear negative cases registered during quarter

There should be 1 to 1 relationship.

5.3. Positivity rate

This is proportion of smear positive cases among chest symptomatics.

Number of smear positive cases diagnosed $\times 100$

Total number of chest symptomatic examined for sputum

It should be 10%.

5.4 Cure rate

Number of new pulmonary smear +ve cases cured $\times 100$

Number of new smear +ve cases registered during quarter

It should be at least 85%

5.5 Conversion rate

No. of new smear +ve cases converted to smear negative at 3 months of t/t $\times 100$

Total Numbers of new smear positive registered for quarter

The conversion rate should be at least 85%

5.6 Default rates

Number of new smear +ve cases defaulted $\times 100$

All registered new smear +ve cases for quarter

It should be less than 5%

5.7. Failure rate

Number of failures of new pulmonary smear +ve cases $\times 100$

All registered new smear +ve cases for quarter

It should be less than 4%. Similarly death rate & transfer rate for new smear +ve cases is calculated.

6. Important aspects to be observed by MO

- Ensure proper identification of chest symptomatics and their referral for sputum examination. If proper history is taken, usually 2-3% of adult outpatients are chest symptomatics. This should be reviewed periodically.
- Every patient who completes IP should have sputum examined.
- Arrange for immediate retrieval of defaulting patients.
- Patients should be registered only after confirming their residence, where they will receive treatment.
- DOT providers- For providing treatment to all patients as per their convenience DOT providers are to be selected, so that further treatment is administered by them. DOT provider can be anganwadi worker, teacher, depot holder or anybody who is willing for this job and is acceptable and accessible to patient and accountable to health system. They should be properly selected so that no patient has to travel more than 2-3 kilometers.
- MO PHC should investigate cause of death of all tuberculosis patients under treatment.
- MO TU should supervise whether STS & STLS are visiting PHC/MC in their area & supervise their work.

- MO should monitor following important indicators for PHC:

1	Proportion of symptomatic patients who are smear positive	8-12%
2	Number of smear taken from suspected cases	3
3	Percent of smear positives among new TB cases	50%
4	Ratio of sputum positive/sputum negative diagnosed cases	at least 1:1.2
5	Proportion of new smear positive patients found in laboratory register being on treatment (in TB register)	>95%
6	Smear Conversion for new smear positive TB cases at 3 months	>85%
7	Percent of new smear positive patients who are cured	>85%

7. TB and HIV

Tuberculosis (TB) is one of the earliest and commonest opportunistic diseases to develop amongst HIV infected person. Risk of developing Tuberculosis is higher amongst HIV infected person as compared to a HIV non-infected person because of suppressed immunity. Lifetime risk of developing TB is 10% in non-HIV infected persons but in HIV infected person risk increases up to 60%. Risk of recurrent TB is slightly higher in HIV infected persons.

In an HIV-TB co-infected person, immune response to TB bacilli increases HIV replication thereby increasing viral load several folds. There is a rapid decline in CD4 count resulting in rapid progression of HIV infection to AIDS. Thus health of patient who has dual infection deteriorates much more rapidly than with a single infection. Mortality due to TB in AIDS cases is also high; one out of three AIDS cases die due to TB.

Number of people having dual infection with HIV and TB has markedly risen. 4.6% of adult TB patients in India are estimated to have HIV infection.

7.1. Clinical features

- Pulmonary tuberculosis is the most common manifestation of tuberculosis in adults infected with HIV. Clinical pattern of tuberculosis correlates with patient's immune status. If TB occurs in early stages of HIV infection when immunity is only partially compromised, features are more typical of tuberculosis.
- As immune deficiency worsens, HIV-infected patients present with atypical pulmonary disease resembling primary tuberculosis or extra-pulmonary and disseminated disease.
- Amongst HIV infected patients cough and haemoptysis are reported less frequently, probably because there is less cavitation, inflammation and endobronchial irritation as a result of decrease in cell-mediated immunity.
- Main types of extra pulmonary TB seen in HIV-infected patients are lymphadenopathy, pleural effusion and pericardial effusion.

- Presentation of extra-pulmonary TB is generally no different in HIV-infected compared with HIV-negative patients. However, HIV-related TB lymphadenopathy can occasionally be acute and resemble an acute pyogenic bacterial infection. Diagnosis of extra pulmonary TB is same as for HIV negative patients.

7.2. Diagnosis of TB in HIV positive patients

- RNTCP diagnostic algorithm for TB should be followed. Sputum microscopy remains tool of diagnosis of TB even in HIV infected patients.
- Chest X-Ray is needed for persons suspected of having TB who are smear- negative and who do not respond to a course of broad-spectrum antibiotics. No radiographic pattern is diagnostic of TB.
- HIV infected persons with a relatively well preserved immune function will show classical hallmarks of disease like cavitation, apical distribution, pulmonary fibrosis, shrinkage and calcification. However, as immune suppression worsens, chest X-rays more often show atypical findings such as pulmonary infiltrates affecting lower lobes, intrathoracic lymphadenopathy and sometimes a normal chest radiograph.
- Diseases other than TB such as bacterial pneumonia, Pneumocystis carini pneumonia, Kaposi's sarcoma, fungal infections and nocardiosis can cause both classical and atypical chest X-ray findings, and if sputum smears are negative these conditions have to be considered in differential diagnosis.

7.3. Treatment of TB in HIV-infected patients

Early diagnosis and effective treatment of Tuberculosis among HIV-infected patients are critical for controlling disease, minimizing negative effects of TB on course of HIV, and interrupting transmission of tuberculosis to other persons in community. Delays in diagnosis of TB have been associated with worse outcomes, so initiation of treatment as soon as TB is suspected is very important.

- Anti-TB treatment is same for HIV-infected persons as it is for HIV-negative TB patients and is to be treated with RNTCP regimens under DOTS strategy.
- Use of Thiacetazone is contraindicated because it is associated with a high risk of severe and sometimes fatal skin reactions in HIV-infected individuals.
- Adverse effects of anti-TB drugs are more common in HIV-positive than in HIV-negative TB patients.

7.4. How effective is DOTS in TB-HIV?

Direct observation of treatment is even more important for HIV-infected TB patients. Self-administration of treatment is associated with higher case fatality rates. Hence DOT strategy that promotes adherence to therapy should be used for all patients with HIV-related TB.

- Survival rate for DOTS is 85.4% as compared to 56.7% in non-DOTS. Life span is increased by an average of two years.
- Case fatality is less in TB/HIV patients treated with DOTS

than with unsupervised treatment.

- Relapse rate of TB is low in HIV-infected TB patients who complete a directly observed rifampicin containing regimen.
- Treatment interruptions due to drug reactions and inter-current opportunistic infections are associated with an increased risk of relapse of TB.

7.5. Anti tuberculosis therapy and antiretroviral therapy •

- Antiretroviral drugs, Protease Inhibitors and Non-Nucleoside Reverse Transcriptase Inhibitors may alter serum concentration of rifamycins.
- Rifamycin substantially decreases blood levels of

antiretroviral drugs resulting in potential development of resistance.

- Co-administration of Rifampicin with any of protease inhibitors (Ritonavir, Indinavir, Nelfinavir) or non-nucleoside reverse transcriptase inhibitor (Nevirapine, Delavirdine, Thioben) is contraindicated.

WHO recommends that, people with TB/HIV should complete their TB therapy prior to beginning ARV treatment unless there is a high risk of HIV disease progression and death during period of TB treatment (i.e., a CD4 count <200/mm³ or presence of disseminated TB).

8. Summary of responsibilities of health staff under RNTCP

Sr.	Activity	Responsibility of PHC staff	
		Designation	Responsibility
1	Establish and improve disease detection activity for tuberculosis in your area	MPW	Refer chest symptomatic for sputum examination to MC, health education and home address verification.
		HA	Refer chest symptomatic for sputum examination to MC, collection of list of suspected cases from private practitioners and contacting patients, home address verification
		MO	Passive search of chest symptomatic in OPD and their referral to MC for sputum examination
2	Collect Sputum from all suspected cases.	Lab. Technician of MC	Collection of three sputum samples as mentioned and recording in Laboratory register. Refer case to PHI after sputum examination along with lab. form if case is not from your area
3	Sputum examination and recording.		
4	Drug stock management	Pharmacist	Manage drug stock at PHC and ensure continuous supply
5	Diagnosis and starting treatment of tuberculosis	MO	Diagnosis on the basis of clinical examination, sputum negative cases, arrange for proper DOT provision.
		Pharmacist	Address verification of patient before start of treatment. Ear mark box of medicine for patient as per Category and age. Ensure direct observation of treatment at PHC or refer patient to peripheral health worker/DOT provider
6	Counseling patient	MO	Counseling for cause of disease, spread, DOTS, importance of regularity of treatment, follow up etc.
7	Organization of treatment cards	Pharmacist/ Health worker/ DOT provider	Phase wise and day wise organization of cards to know who have missed dose today.
8	Follow up of patient	Pharmacist/ health worker/ DOT provider	Remind patient about follow up visit and arrange for sputum examination
9	Defaulter action	HA/Health worker/DOT provider	Immediately contacting patient if dose is missed.
10	Monitor success of RNTCP in your PHC	MO	Calculate various indicators and take corrective actions.

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7.2. LEPROSY

Leprosy is the oldest disease known to mankind and has been described in various ancient literatures in India. Patients with leprosy have been subjected to worst prejudice compared to any other human ailment. Leprosy has predominant psycho-social aspects/ social stigma due to misbeliefs / misconceptions / taboos / ignorance.

Before the advent of Multi Drug Therapy (MDT), there was no reliable cure and the only available drug against leprosy

was Dapsone which was to be consumed even life-long in several cases. Year 1981 was the turning point in the history of leprosy as MDT was officially incorporated in Anti Leprosy Programmes in several countries world over. MDT provided a certain cure against leprosy, the case load of leprosy dramatically declined since 1981. The case load of the state, nation and the world since 1981 is shown in Table 1. At the end of 2004, there were only 9 countries in the world which had not achieved elimination, of which India contributes largest number followed by Brazil.

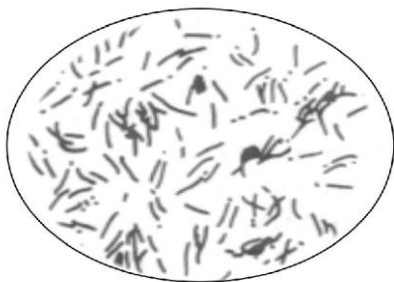
Table -27 : Leprosy Numerology

Geographical Distribution	Registered cases				Prevalence Rate			
	1981-82	2002-03	2003-04	2004- 05	1981-82	2002-03	2003-04	2004-05
WORLD	12 million (1985)	5,23,605*	4,41,992*	2,86,063*	N.A	0.8	0.70	0.45
INDIA	39,53,700	3,45,189	2,65,781	148910	57.7	3.23	2.44	1.34
MAHARASHTRA	3,12,871	29,680	29,497	16513	62.4	2.95	2.87	1.57

Leprosy should not be regarded only as skin disease since it also affects peripheral nerves and involves several organs including mucosa of respiratory tract.

1. Etiologic agent

- Leprosy is caused by an acid and alcohol fast bacillus *Mycobacterium leprae*. Though it is the first organism to be associated with disease in medical history, it is not yet possible to culture the organism in laboratory; there is no potent vaccine against leprosy yet. *Mycobacterium leprae* is an obligate intracellular and one of the slowest growing bacteria of medical importance.
- Mycobacterium leprae* is the only bacillus that can invade nerves causing disabilities and deformities. It does not produce any toxins.
- M. leprae* is an obligatory intra-cellular parasite. It is very slow growing. One bacillus takes 15 to 20 days to multiply. Extremely slow generation time results in:
 - Long incubation period
 - A very slow development of pathology
 - A slow and insidious clinical evolution
 - An unclear epidemiological pattern
 - Low infectivity.



2. Epidemiology

Man is the only host reservoir of leprosy. Leprosy is transmitted from one untreated MB patient to another person via respiratory tract i.e. by droplet infections.. The major sites from which bacilli escape from the body of an infectious patient are nose and mouth. Infectious patient spreads disease through coughing and sneezing.

Leprosy can affect all age groups, however, children are more susceptible. Risk of infection in household contacts of a paucibacillary and multibacillary case in family is two times and four times more as compared to those without a case of leprosy in family. Nearly 95 to 98% of the population have natural immunity & they will not get leprosy even if exposed to infection with *M. leprae*.

Only few of those who are exposed to leprosy develop clinical signs of leprosy. Type of disease which develops in infected person is dependent upon immunity status of person.

The immunological status (resistance) varies from person to person and responds as follows when exposed to infection,

- Natural resistance - No disease will occur.
- High resistance - Localized disease (Tuberculoid)
- Moderate - Disease fairly localized (Borderline Tuberculoid)
- Low resistance - Fairly wide spread (Borderline Lepromatous)

v) No resistance - Wide spread disease (Lepromatous)

3. Incubation period

Incubation period of Leprosy varies from six months to 30 years with an average of 2 - 5 years. Despite harbouring bacilli, affected person feels perfectly fit for a long time, hence delays in seeking medical advice.

4. Diagnosis of Leprosy

A case of leprosy is diagnosed by eliciting cardinal signs (very important signs) of leprosy through systematic clinical examination. Following cardinal signs must be present for diagnosis of leprosy.

- A hypo pigmented patch (skin patch lighter in color than surrounding skin but not de- pigmented completely) or reddish skin lesion(s) with definite loss of sensation over patch and/or
- Involvement of peripheral nerves as demonstrated by definite thickening of nerve with loss of sensation and weakness of muscles supplied by affected nerves.

As per recent WHO guidelines it is not necessary to go for bacteriological examination for diagnosis of leprosy.

5. Leprosy Elimination Strategy

- Early case detection and providing high quality MDT drugs free of cost to all patients.
- Reducing disease burden (prevalence) to very low level will lead in course of time to reduction in transmission of infection and subsequently reduction in disease incidence.
- Number of relapse cases remains low at about 0.1% person years.
- Enabling all health facilities to diagnose and treat leprosy and its complications which will promote early case detection, increase geographical coverage of MDT services, reduce disabilities, improve case management, case holding and cure rate.
- Reducing stigma of leprosy in community through IEC and advocacy.

5.1. Programme Implementation

Prevalence of leprosy has been reduced drastically since introduction of MDT. Effective IEC activities, early case detection through voluntary reporting, prompt and regular treatment, disability prevention, and rehabilitation will improve situation further and ultimately lead to elimination of leprosy.

Steps to be followed for NLEP implementation are as follows -

5.1.1. Implement IEC activities to improve new case detection.

Leprosy survey for few case detection by paramedical staff is now stopped. Patients with skin lesions are expected to report voluntarily to Health Staff or PHC. This is only possible when IEC activities are implemented effectively in PHC area. Thus IEC has become most crucial component for success of programme. Aim of IEC activities should be to dispel social stigma of leprosy and seek participation of community in facilitating early self-reporting.

- MPW and HA should impart IEC to community regarding symptoms of leprosy and encourage patients with skin patches to come forward on their own for examination.
- Most important and effective means of communication is person-to-person communication. Always remember to talk few words about leprosy during home visits and group meetings.
- Special campaigns e.g. Modified Leprosy Elimination Campaigns (MLEC) are organized specifically to boost IEC activities. Take opportunity of such campaigns and systematically implement IEC activities during campaigns.
- Always keep posters, stickers, etc about leprosy in Arogya Seva Satra, health exhibitions, Melas, etc.

5.1.2. Identification of suspected leprosy case

Suspected leprosy case will be reported to health facility as follows -

- Voluntary reporting by patient of skin lesion (most important)
- Identified by MPW/HA during field visit
- Identification of patient in OPD who has come for some other complaints.
- Through active search under SAPEL or LEC.
- Referral from private practitioner

If a patient with skin lesion is detected by MPW or HA, he/she should first examine skin lesion and look for following aspects -

- Skin lesion is hypo-pigmented, i.e. lighter than surrounding skin and/or erythematous i.e. reddish colored patches, but not totally de-pigmented as in case of Leucoderma.
- Skin lesion has loss of sensation (important)
- Duration of skin lesion. It can not be leprosy if -
 - § Lesion is since birth
 - § Lesion is of recent origin - few days
- Ask patient whether lesion comes and goes. If answer is yes then it is not leprosy
- Lesion is itching and patient gets relief with topical application of cream/lotion – lesion can not be leprosy

If MPW suspects that skin lesion is of leprosy, patient should be referred to MO PHC for diagnosis. Even if MPW is not sure about cause of skin lesion, still case should be referred to MO PHC.

5.1.3. Confirmation of diagnosis by MO PHC

Medical officer may get referred cases of skin lesion from MPW/HA or patient may attend PHC voluntarily for treatment of skin lesion.

Leprosy is disease with stigma, so diagnosis of leprosy should be done cautiously and promptly. As per WHO guidelines, it is not necessary to carry out bacteriological examination of suspected leprosy patient to confirm diagnosis routinely. Cardinal signs are sufficient to diagnose a leprosy case. Diagnosis is mainly based on presence of clinical cardinal signs.

If diagnosis cannot be confirmed, refer the patient to specialist.

5.1.4. Clinical examination for diagnosis of Leprosy

Clinical examination of leprosy includes careful interview of patient for detailed history (case history), skin examination and nerve examination. This should be followed by ascertaining presence of any deformities.

a. Case history

Collect case information on following points -

- Name, age, sex, address and occupation of patient.
- Presenting complaints and their duration - a patch of few days or since birth is unlikely to be of leprosy.
- History of recurrence - lesion that “comes and goes” will not be due to leprosy.
- **Any** deformity, its time of onset, and nature of its progress.
- Treatment history – Which medicines and for how long patient has taken for treatment of present complaint. Specifically ask patient whether he has taken any MDT in past. Show a blister calendar pack (BCP) of MDT (MB and PB pack) to patient to ensure that he has understood question well.
- Any other associated illness (jaundice, cough, swelling of feet, etc)
- Any other person in family having similar disease or had disease and was treated. This will give a clue about family history of leprosy.

b. Skin examination

Remember cardinal signs while examination of skin - You are searching for hypo-pigmented or reddish skin lesion(s) with definite loss of sensation.

i. Principles of skin examination

- Patient should be examined in a room where sufficient natural light is available and where privacy can be ensured.
- Examine patient from head to foot completely (Leprosy patches situated on back and on gluteal region are usually missed, especially in case of female patients).
- Use same order of examination every time you examine patient with skin lesion so that you do not forget to examine any part of body.

ii. Examination of skin lesion

Once it is sure that patch is not since birth or not very recent and does not come and go frequently then you must examine patch thoroughly. Following features must be noted when examining patch on skin.

- Site - Note site of lesion, this is useful for follow up. Any new lesion appearing on other sites will not be missed during follow up.
- Number - Number of lesions indicates severity of disease. This is also useful for classification and follow up.
- Colour - Colour of skin lesion may be hypo pigmented (lighter in colour than rest of skin) or erythematous (red). Lesions of leprosy are never de-pigmented. Erythematous

lesions suggest disease activity or reaction, as active lesions or lesions in reaction are often red.

- Sensory loss-Loss of sensation is a cardinal sign of leprosy.
- Tenderness on gentle tapping- This is seen in reactional state.
- Presence of infiltration-This term refers to skin which is thickened, shiny and erythematous. All three features must be present in same area. This may be seen in severe form of leprosy.

iii. How to test for sensation?

Next important step after examination of skin lesion is to test for sensations. It is very important for Medical Officer and PHC staff to acquire skill of eliciting sensory loss in skin patch, as this is the cardinal sign of leprosy.

Following steps should be carried out for testing sensation.

- Use a ball point pen for testing
- Explain what exactly you are going to do and that it causes no harm to patient.
- Touch first normal area of skin with pen while patient's eyes are open and ask patient to count number of times sensations are felt. Do this exercise two or three times till patient has understood procedure.
- Now ask patient to close eyes and repeat procedure, first on normal skin. Once you are sure that patient is responding correctly to your stimulus, start testing sensation of skin patch. Go on alternatively touching normal skin and skin patch.
- If patient is not able to locate stimulus on patch, then loss of sensation is definitely present.

Remember

- Testing sensation is most crucial part of clinical examination of patient in diagnosing leprosy. Do not keep on asking patient hurriedly whether he feels objects e.g. pen or not. Keep patience otherwise you may get misleading results.
- When testing sensation, touch skin lightly. Do not stroke.
- Always proceed from normal to abnormal (except in children).
- Give one stimulus at a time; allow patient to count and then go for another stimulus.

c. Examination of nerves

Once you are sure that skin lesion has definite loss of sensation, examine nerves of patient. Involvement of peripheral nerves is indicated by demonstration of definite thickening of nerve with loss of sensation and weakness of muscles of area supplied by involved nerve, e.g. hands, feet or face.

Nerve examination involves two aspects, palpation of nerves and assessment of nerve function.

i. Palpation of nerves

- While palpating nerves, look for three things- thickening, tenderness and consistency.

- Palpate across course of nerve. Feel along nerve as far as possible in both directions.
- Look at patient's face while palpating nerve to elicit tenderness
- Palpate gently with pulp of finger and not tip.

ii. Nerves to be palpated

Following nerves should be palpated in patients of leprosy, starting from nerve supplying to area of skin lesion.

Ulnar nerve (At elbow joint)

Radial nerve (lower half of Upper arm)

Median nerve

Lateral popliteal nerve (At knee joint in popliteal fossa)

Posterior tibial nerve (Ankle joint)

Greater auricular (On side of neck)

iii. Assessment of nerve function

Nerve function assessment includes testing for sensory loss in area supplied by nerve i.e. Sensory Testing (ST) and involvement of muscles supplied by nerve i.e. Voluntary Muscle Testing (VMT). Both ST and VMT should be done for all patients with nerve thickening and all patients diagnosed as Multi Bacillary (MB) leprosy. Sensory testing is already described in skin lesion sensation testing. Procedure for VMT is described below

d. Voluntary muscle testing (VMT)

i. Principles of VMT

VMT is done by first checking range of movement of muscles supplied by particular nerve to see whether movement is normal, reduced or absent due to paralysis.

If movement is normal, a test for resistance is then done. Press gently in opposite direction while asking patient to maintain position, resisting pressure as long as possible. Then gradually press more firmly and judge whether resistance is normal, reduced or absent.

Do grading of resistance as follows -

S - Strong: Able to perform movement against full resistance

W - Weak: Able to perform movement but not against full resistance

P - Paralysed: Not able to perform movement at all.

Record grading of resistance for all commonly involved nerves.

Always compare side of examination with normal side.

ii. VMT for important and commonly involved nerves

Facial nerve

- Ask patient to close eyes and keep them tightly closed.
- If there is visible gap between upper and lower eyelids, it is called lagophthalmos. Measure gap in millimeters and record.
- If there is no gap try to pull lower lid down and see whether patient can keep his eyes closed against resistance. Grade resistance as shown above. Always grade resistance as P when there is lagophthalmos.

Ulnar nerve

- Ask patient to spread palm and push his little finger outwards in same plane.
- Try to push little finger towards palm while patient tries to hold it in test position.
- Grade power as 'S', 'W' or 'P' as described above.

Median nerve

- Ask patient to hold his thumb at 90° to palm vertically.
- Try to push thumb downwards while patient tries to hold it in testing position.
- Grade power as 'S', 'W' or 'P' as described above.

Radial nerve

- Ask patient to hold hand parallel and facing towards floor.
- Hold wrist of patient firmly with your left hand and ask patient for extension from wrist joint.
- Try to resist movement with your right hand. Grade power as 'S', 'W' or 'P' as described above.

Popliteal nerve

- Ask patient to pull up his foot fully at ankle joint.
- Try to push foot downwards while patient tries to hold it in test position.
- Grade power as 'S', 'W' or 'P' as described above.

e. Examination of eye

Eye can be affected by nerve and muscle impairment that can result in inability to close eye (lagophthalmos) and loss of corneal sensation. Eyes can also be affected during reactions. All this can lead to damaged eyesight.

Examine eye for following conditions

- Loss of eyebrows.
- Unblinking stare.
- Lid gap when patient attempts to close eyes.
- Eyelids turned abnormally outwards or inwards.
- Eyelashes turned inwards and touching cornea.
- Redness around margins of cornea or white spots on cornea.
- Corneal sensation, there will be loss of sensation.
- Decrease in diameter and irregular shape of pupil

If there is eye involvement, refer patient to ophthalmologist.

5.1.5. Classify diagnosed leprosy patients (grouping)

Once you diagnose leprosy by clinical examination, next step is to classify leprosy patient. Treatment of leprosy (MDT) depends upon type of leprosy, so it is essential to correctly classify patient.

Classification of Leprosy has been simplified and there are two types depending upon number of patches and nerve involvement as indicated below –

Paucibacillary (PB) : 1-5 Skin patches with definite sensory deficit and/or one definite thickened or tender peripheral nerve.

Multibacillary (MB) : 6 and above skin patches with definite

sensory deficit and/or more than one definite thickened and tender peripheral nerves.

Note: Patient is no more diagnosed as suffering from Single Skin lesion (SSL) case. All such cases are diagnosed as PB cases and treated accordingly.

5.1.6. Registration of patient

- Ask for h/o previous leprosy treatment and register patient accordingly.
- Registration and treatment course of leprosy patient depends upon h/o previous leprosy treatment.
- After diagnosis is confirmed, MO should clarify from patient (after taking detailed history) whether patient is a new case i.e. reported for first time for treatment or is a defaulter patient who is seeking re-treatment.
- All new cases will be registered in Patient Treatment Register and a proper serial number will be given. (New serial number will start from 1st April)
- Defaulter case is one who has not collected drugs for 12 consecutive months (WHO definition). While this is to be followed for deletion of case from record, for practical purpose, a person will be considered defaulting even if he/she does not collect MDT for one day. Action should be initiated to retrieve patient immediately and motivate him to continue the treatment. If during enquiry, it is learned that reason for defaulting is of permanent nature like death of patient or permanent shifting of residence, patient's name should be deleted from record.

5.1.7. Treatment of Leprosy patient

Following important points should be covered before starting treatment -

Standard Adult Treatment

Table -28 : Multi Drug Treatment for PB leprosy

Drug	Adult	Children 10-14 yrs	Children below 10 years	Frequency
Rifampicin	600 mg	450 mg	Reduce doses appropriately as per weight of child	Once a month
Dapsone	100 mg	50 mg		
Dapsone	100 mg	50 mg	Reduce doses appropriately as per weight of child	Daily

Table - 29 : Multi Drug Treatment for MB leprosy

Drug	Adult	Children 10-14 yrs	Children below 10 years	Frequency
Rifampicin	600 mg	450 mg	Reduce doses appropriately as per weight of child	Once a month
Dapsone	100 mg	50 mg		
Clofazimine	300 mg	150 mg		
Dapsone	100 mg	50 mg	Reduce doses appropriately as per weight of child	Daily
Clofazimine	50 mg (Daily)	50 mg (Alternate day)		Daily/ Alternate day

b. Starting of treatment

- Treatment should always be started at PHC as MO has to diagnose case of leprosy.
- After diagnosing new patient, Medical Officer fills up patient card and initiates treatment with first dose of MDT.
- Send this card to nearest sub center as per convenience of patient.

- Identify any associated conditions which may make patient unfit for treatment, like jaundice or anemia. If patient has jaundice let it subside and then start treatment. If patient has anemia, treat leprosy and anemia simultaneously.
- Identify any other medical complications and treat them first.
- Assure and counsel patient that treatment should be taken regularly for full course. There should be no gap in treatment.
- In case patient is going out of area of health facility and has difficulty in procuring MDT drugs in new area, then he is entitled to collect more than one month's treatment (Accompanied MDT) for period of ABSENCE FROM AREA.
- Patient should even be permitted to collect full course of treatment, with an instruction that in case of any complications, he should contact MO in nearest health facility where he is located. This should be clearly explained to patient so that his treatment schedule is not disturbed.

a. Treatment schedule

Leprosy treatment has been simplified very much. Treatment is in the form of Multi Drug Therapy (MDT), which is combination of two or three drugs. It is highly effective, even one dose makes patient non infectious. Relapse rates are low and there is no reported resistance to MDT. Based on diagnosis, patient can be given any one of the standard MDT regimens mentioned below. Monthly calendar packs are available which makes it convenient for dispensing and consumption by patient.

- Inform patient about name of MPW, place and address from whom he can collect MDT blister packs subsequently.

c. Subsequent doses to patient

- Patient treatment card should be maintained at sub center by MPW (M).
- MPW (M) should indent one-month requirement of MDT blister packs on the basis of number of patients in his sub

center area and collect it during monthly MIS meeting.

- MPW should enter dose collection dates by patient on treatment card.
- MPW should discharge patient after last dose is finished, sign card and keep card at sub center for future reference.

d. Treatment of defaulters (not collecting drugs for consecutive 12 months)

- If patient does not turn to SC or PHC, MPW must visit patient's house and motivate him for taking regular treatment.
- All defaulter patients residing in jurisdiction of health facility will be registered but will not be given a serial number. They can continue treatment after thorough re-examination.

- In case patient resides in some other area but has reported for treatment in this health facility, then he may be given one dose of MDT drug and then advised to report to his respective health facility for further treatment.

e. Important aspects of treatment

- Timely stoppage of treatment is important. Sometimes patients are continued on treatment even after completion of prescribed duration of treatment due to no change in patch. This results in over-reporting of prevalence and prolonging unnecessary work burden.
- Sometimes patient tries to hide the history of previous treatment, more so in case of MB cases. Very careful enquiry with the patient, appraisal of previous records will help MO in such cases.

f. Side effects of anti leprosy drugs

Table -30 : Side effects of Anti Leprosy drugs

Common side effects	Signs and symptoms	What MO should do if side effect appear
DAPSONE		
Anemia	Paleness of lower eyelids, mouth and fingernails. Tiredness, edema of feet and breathlessness	Give anti-worm treatment and iron tablets. Continue Dapsone
Severe skin complications	Extensive scaling, itching, ulcers in mouth and eyes, jaundice, exfoliative dermatitis	Stop Dapsone. Refer to hospital immediately. Never restart Dapsone.
Liver damage	Jaundice, loss of appetite and vomiting	Stop Dapsone. Refer to hospital. Restart after jaundice subsides.
Kidney damage	Edema of face and feet. Reduced urine output	Stop Dapsone. Refer to hospital.
RIFAMPICIN		
Radish coloured urine		Reassure patient
Hepatitis (Liver damage)	Jaundice, loss of appetite, vomiting	Stop Rifampicin. Refer to specialist. Restart after jaundice subsides
Flue like illness	Fever, malaise and body ache	Symptomatic treatment, Stop Rifampicin
Allergy	Skin rash	Stop Rifampicin
CLOFAZIMINE		
	Brownish red coloration of skin, urine and body fluid	Reassure patient, it will go after completion of treatment
Ichthyosis	Dryness and thickening of skin, itching	Apply oil to skin, reassure patient

g. Reactions in leprosy

Leprosy Reactions are acute inflammatory events occurring in course of disease. Reaction can occur at anytime before, during or after treatment. It must be promptly diagnosed and treated to prevent any disability. Leprosy reactions are more likely to develop in case of patients with multiple lesions, lesions close to nerves, lesions on face and in pregnant patients.

There are two types of reactions, viz. Type I and Type II Type I Leprosy Reaction or Reversal Reaction occurs both in MB and PB patients

Type II Leprosy Reaction or Erythema Nodosum Leprosum (ENL) occurs only in severe form of MB leprosy.

i. Features of Lepra Reaction**Table 31 : Lepra reactions**

Features	Type – I	Type-II
Skin	Existing lesions suddenly become red, swollen, warm and tender. New lesions may appear. When subsiding, may show scales on surface	Red, painful, tender, subcutaneous (deep) nodules (ENL) appear commonly on face, arms and legs. They appear in groups and subside within a few days.
Nerves	Nerves close to skin become enlarged, tender and painful with loss of nerve function.	Nerves may be affected but not as common as in Type-I reaction
Other organs	Not common	Fever, joint pains fatigue

ii. Treatment of Lepra Reaction (Type-I and Type II)

In addition to rest, analgesics and other symptomatic treatment, patient will need Corticosteroids. Prednisolone is drug of choice. Suggested schedule is as follows:-

- 40 mg once a day for first 2 weeks, then
- 30 mg once a day for weeks 3 and 4
- 20 mg once a day for weeks 5 and 6
- 15 mg once a day for weeks 7 and 8
- 10 mg once a day for weeks 9 and 10
- 05mg once a day for weeks 11 and 12

Note- MDT should be continued during reaction as it has been shown that MDT reduces severity and frequency of reactions of both types. For a patient who has already completed his course of MDT, no further MDT is necessary.

h. Is MDT safe during pregnancy and lactation?

MDT should be continued during pregnancy and lactation. All evidence so far indicates that MDT is safe during pregnancy. Small quantities of anti leprosy drugs are excreted through breast milk but there is no evidence of adverse reaction except for mild discoloration of infant's skin caused by Clofazimine.

5.1.8. Prevention of disability

Social stigma attached to leprosy is due to development of deformities and therefore prevention of occurrence of deformity and prevention of worsening of existing deformities is important aspect of Leprosy treatment and rehabilitation. Damage to peripheral nerves causes loss of motor, sensory and autonomic nerve functions of affected area leading in turn to deformity. Secondary deformity results from repeated trauma to affected part of body due to loss of sensation. Secondary deformity also results due to dryness and cracking of skin.

a. WHO Grading of disability

Grading	Hands and feet	Eyes
Grade - I	Anesthesia present but no visible deformity	Eye problem due to leprosy but vision not severely affected (Vision 6/60)
Grade -II	Visible deformity or damage	Severe visual impairment (Vision worse than 6/60) lagophthalmos, iridocyclitis, corneal opacities.

b. Prevention of deformity

Educate patient about self care on following points for prevention of deformity

- Inspect daily limbs with sensory and motor impairment for signs of injury and infection.
- Do not ignore injury, immediately start treatment of injuries.
- Regularly exercise to prevent joint stiffness.
- Soak limbs in water for 15 minutes and put oil to minimize drying of skin. Dry skin may crack and lead to infection and ulcer formation.
- Use of protective clothing, adapted tools, use of footwear for individual with sensory impairment of plantar surface of foot.
- Always protect eyes from foreign body, as due to loss of corneal sensation patient may not recognize foreign body and damage to eye may result.
- Think of surgical correction of deformities to improve function.

5.1.9. Rehabilitation

Rehabilitation is classified as physical, economical and psychological.

- Physical - Reconstructive surgery, distribution of MCR chappals, goggles, splints, treatment of trophic ulcers, physiotherapy.
- Economical - Vocational training is given to leprosy patients, which includes - training in dairy, carpentry, cobbler, financial support under Sanjay Gandhi Niradhar Yojana, houses under Indira Awas Yojana etc.
- Psychological/social - Counseling to leprosy patients, their relatives and community

a. Reconstructive surgery

List leprosy patients with deformity from your PHC and inform Assistant Director (Leprosy) of your district to arrange reconstructive surgery camps. Inform patients about camp dates and arrange for their transport if possible. Alternatively you can directly refer patients with deformity to district hospital/ medical college hospital or one of following institutions which is suitable to your patients -

- Acworth Leprosy Hospital, Mumbai
- J.J.Hospital, Mumbai

- Richardson Leprosy Hospital , Miraj, Sangli
- Maharogi Seva Samiti ,Chandrapur.
- Dr. Bandorwala Leprosy Hospital, Kondhwa, Pune.
- **Leprosy** Mission Hospital ,Kothara ,Amaravati.
- Vimala Dermatological Center ,Mumbai.

6. Modified Leprosy Elimination Campaign (MLEC)

MLEC's were held every year in the state during month of December to March.

6.1. Objectives of MLEC

- To detect hidden leprosy cases in community.
- Educating general health staff in leprosy diagnosis and treatment so as to facilitate integration of leprosy.
- To implement IEC activities in community on large scale to facilitate voluntary reporting by patients.

6.2. Implementation of MLEC

- **Intensive IEC campaign:** Effective IEC activities have to be planned and implemented in all villages with help of all possible media. Messages should include symptoms of leprosy, leprosy to be considered on par with any other infectious disease, being curable, availability of effective treatment and places to report skin symptomatic, etc.
- **Voluntary Reporting Centres:** Voluntary Reporting Centers are established at each PHC so that suspected patients with skin lesion will voluntarily report to VRC for examination and diagnosis because of intensive IEC.
- **Diagnosis and treatment:** Suspected patients are thoroughly examined by MO and if diagnosed, Leprosy treatment is started.
- **Rehabilitation camps:** Special rehabilitation camps are also conducted during campaigns.

7. SAPEL (Special Action Plan for Elimination of Leprosy), LEC (Leprosy Elimination Campaign).

Main objective of SAPEL is to detect cases in difficult to reach rural population like remote area, slum area, tribal area, hitherto unreached groups viz. brick kiln workers, fishermen etc. LEC is planned for urban and peri-urban slums to detect hidden leprosy cases and to bring them under MDT.

8. Integration of NLEP in General Health Services

Reasons for integration of leprosy activities in general health care services:-

- There is drastic reduction in prevalence of leprosy, so caseload for vertical leprosy staff is minimum.
- Non-implementation of leprosy elimination through general health services has resulted in limited geographical coverage, causing limited access to MDT, unsatisfactory compliance with treatment and subsequently re registering these cases as new.
- GHS staff is relatively more widely distributed and has closer and more frequent contacts with local community. Thus integration will help to demystify disease as well as promote increased awareness about disease in community leading to improved case finding and case holding.

- There is lack of awareness about nature of disease, availability of free and effective treatment, which has resulted in pockets of high prevalence or residual backlog of untreated cases. Therefore best way to raise community awareness is by involving existing PHCs instead of specialized centers.

Integration with GHC will help in following way:

- New case detection will improve; access to MDT coverage will improve.
- Overall disability burden will be reduced due to early detection
- General health services staff will be trained to provide leprosy services.
- Increased public awareness will lead to early voluntary reporting.
- Apprehension of leprosy and stigma will decline.

8.1. Important job responsibilities under integration

8.1.2. MPW (M/F)–

- Impart IEC activities in sub center area and suspect leprosy cases during home visit.
- Include leprosy work in his daily activities with emphasis on IEC, identification of suspect cases, defaulter identification and advice about Prevention of Deformity (POD) services.
- Treatment, follow up will be carried out every month at village and sub center level.

8.1.3. Health Assistant (M + F)

- Monitor above stated activities during field visit and implement.
- Collecting information on suspected cases and referring to M.O PHC.

Para Medical Worker and Non Medical Supervisor from vertical programme will be appointed in blocks with high endemic pockets for guidance and support.

8.1.4. MO PHC

- MO PHC will diagnose and treat leprosy patients attending health centers on daily basis.
- Counselling of patients and their family members.
- MO will also diagnose and manage patients presenting with lepra reaction and relapse cases.
- Training and retraining of MPWs about suspecting cases, assessing regularity of treatment, IEC, etc.
- Plan and implement POD and Rehabilitation activities in PHC area.
- Develop IEC Plan for the entire PHC and implement it involving health workers, NGOs, local leaders etc.
- Maintenance of quality records and reports.

9. Records and Reports

Records and reports to be maintained under National Leprosy Eradication Programme have been simplified in recent years. New record system is easy to understand and has been

devised considering integration of leprosy programme into general health services.

9.1. Records under NLEP

Maintenance of correct data is most essential element of a sound information system. Three records are to be maintained under Simplified Information System under NLEP. These are -

L.F. 01 - Patient Card

L.F. 02 - Treatment Record

L.F. 03 - MDT Drug Stock Register

9.1.1. Patient Card

- This card includes clinical and treatment information of diagnosed leprosy patient.
- Leprosy Patient card is to be filled by MO immediately after diagnosis of leprosy patient. Treatment Record register should also be filled up and card is given serial number as per register. New number on treatment register should start from 1st April of year.
- After completing card, MO should initiate treatment with 1st dose of MDT to patient and hand over one month medicine to patient. Decide by discussion with patient about subcenter MPW from whom subsequent doses are to be collected.
- MO should put his signature on card and send card to concerned MPW(M) for further recording of treatment and any other significant finding.
- Leprosy Patient Card should be maintained at sub center, where MPW will enter subsequent monthly doses collected by patient, till last dose is consumed.
- After completing treatment, MPW should discharge patient from treatment and note treatment completion on card, sign patient card and preserve card at Sub Center for future reference.
- MPW (M) should also keep informing about treatment progress of patients from his area to MO indicating due date of monthly dose, date of actual collection of MDT drugs and date of completion of treatment.
- Treatment register at PHC should be completed by HA(M) on the basis of information received from MPW(M).

a. Guidelines to fill up Patient Card

Registration number:	Running number of treatment register starting from 1 st April of year.
Classification:	PB - 1 to 5 patches and/or 1 nerve affected. MB - 6 and more patches and /or 2 or more nerves affected.
New case:	Leprosy patient who has not taken MDT drugs anytime earlier
Other type	Immigrant, Relapse, Referral or Restart of treatment
End Status	RFT - Release From Treatment

9.1.2. Treatment Record Register

Treatment record of all patients from PHC should be kept

in a register and labelled as Treatment Record Register.

- After filling up of Patient Card, MO should enter patient information in Treatment Record Register. Annual serial number should be given only to new cases. For other cases, record name and details of patient but do not give serial number ('0' no. cases). Name of new patient written once must not be repeated in the treatment register.
- Monthly abstract must be calculated in the format provided by ADHS Leprosy.
- HA(M) should be given responsibility of updating register. He should get information of all patients (treatment and RFT) from MPW(s) and update register.
- MPW(M) should immediately inform HA(M) about default of leprosy patient. HA should visit leprosy patient's house and take corrective action, should also inform MO about treatment default and ensure record updating.
- Treatment Record Register is retained at PHC for further reference.

9.1.3. Leprosy MDT Drug Stock Record

- MDT drug stock record should be maintained at all PHCs by Pharmacist.
- Information regarding supply, expenditure and balance of MDT drugs should be maintained in this register and updated immediately after every transaction.
- Separate pages should be used for each of the four types of blister packs supplied, viz. MB(Adult), MB(Child), PB(Adult), PB(Child). Drug expiry dates should be monitored regularly to avoid wastage. Expired drugs with justification should be handed over to DLO.
- Drug stock register is important document and should not be changed annually. Same register should be used till it is completely used.
- It should not be used for any other purposes.
- Drug stock record should be retained at PHC.

9.1.4. Suspect Case Register: In addition to above, entries of all suspect cases of leprosy sent by health workers are to be made and monitored worker wise in the suspect case register. This register should be maintained worker wise and no. of cases referred by every worker should be reviewed at every meeting with the workers. All suspect cases of leprosy must be examined within a week by MO to confirm the diagnosis of leprosy or otherwise.

9.1.5. Cleaning of records

New leprosy cases are registered immediately after diagnosis. When last dose of MDT is handed over to patient (6th dose in PB and 12th in MB), such a case should be deleted from registers by encircling the sr.no. and a line to scratch his details by red ball pen only once. In practice, it has been observed that such cases are not deleted for months together which results in stagnation of cases and calculation of high prevalence rate. Medical officer should check records of all sub centres monthly and ensure deletion of cases to whom last dose has been given. Instead of periodical 'cleaning of registers' practice of regular maintenance of clean records should be owned and practised at

sub center and PHC level.

To assist PHC staff in making right decisions and keep records clean, frequently raised issues are clarified below -

a. New leprosy case

Only new leprosy case(s) should be registered. Definition of new case is “ A patient with skin patch(es) with definite sensory deficit and /or definite thickened and tender nerve(s), who never received any leprosy treatment (including dapsone monotherapy anywhere in past”. This definition of new leprosy case should be strictly followed.

b. Not leprosy case

Patient having patch(es) without definite sensory deficit , no definite thickened and tender nerve(s) is not likely to be a case of leprosy. Such “not leprosy cases” are likely to be wrongly labelled as leprosy. Sensory (touch, pain and temperature) deficit may be either partial (hypoesthesia) or total (anesthesia) and should be properly elicited as per prescribed procedure before coming to final conclusion about diagnosis.

c. Grouping of leprosy cases

Diagnosed leprosy case should be grouped only as Paucibacillary (PB) or Multibacillary (MB).

d. Treatment completion

For PB cases, 6 Blister Calendar Packs (BCPs) should be taken in six months and for MB cases 12 BCPs should be taken in 12 months.

e. RFT(Released from treatment): Earlier cases were released from treatment on treatment completion only. But from January 2005 as per Kathmandu Recommendations, patients are to be released from treatment at the time of giving 6th dose in PB and 12th dose in MB.

f. Defaulter case

WHO definition of defaulter case is one who has not collected treatment for 12 consecutive months. While this is to be followed for deletion of case from record, for treatment purpose a person will be considered defaulting even he/she does not collect MDT for one day. Action should be initiated to retrieve patient immediately. If during enquiry, it is learnt that reason for defaulting is of permanent nature like death of patient or permanent shifting of residence elsewhere, patient should be deleted from record.

g. Restart of treatment

Defaulter case returning at any time to health center for treatment need to be reassessed and on seeing signs of active leprosy lesions only, a new course of MDT should be restarted. For registration purpose, returning defaulters are not considered as new cases.

h. Re-registered case

Any patient who was registered earlier anywhere in country and received a full course of treatment with MDT, if registered again for same complaints.

i. Relapse case

Some patients may have relapse of disease after some months or years of RFT as cured. In such cases, if type (PB/

MB) is same as earlier, restart appropriate treatment (MDT) for another course but do not register the patient as a new case. In case disease is of other type, case should be registered as new case.

j. Referred case

Any patient who has been sent by any other health center of any district/state, along with referral slip, should be given treatment for remaining period. Such case will not be registered as a new case again.

k. Migratory patient

A patient who is not likely to be available in place of treatment for duration of course, should be given full course of Accompanied MDT (A-MDT) with a written guidance about drug intake, likely problems, action to be taken by patient in case of any such problem and to report back at the end of treatment. Such patient should be made RFT at the time of giving accompanied treatment if last dose is also given as AMDT.

9.1.6. Updating of records

PHC treatment should be updated every month with inputs provided by sub center staff on their visit(s) to PHC. Updating record has a direct bearing on monthly reports prepared at PHC and therefore should be carried out without fail.

9.1.7. Deletion from records

Any patient who does not qualify to remain on record after considering abovementioned issues, should be immediately deleted. MO PHC is authorized to make deletion under his signature at any time whenever deficiency comes to his/her notice.

9.1.8. Reports under NLEP

Data recorded in patient cards and registers is periodically updated and submitted to DHO in prescribed formats called reports. Formats prepared for reporting are called reporting formats. Under Simplified Information System one form called as L. F. 04 - NLEP Monthly Reporting Form: PHC information should be filled in the form. This form should be filled up on the basis of data available in Treatment Record Register and MDT drug stock record register.

10. MDT Stock in health facilities

Medical officer should keep a total of two months stock of MDT drugs, for the types of patients under treatment at PHC should be maintained at PHC. MDT drug stock calculation and keeping sufficient stock is responsibility of Pharmacist of PHC. If MDT drugs are provided at Sub Center, only one-month requirement should be kept at Sub Center. Medical Officer must keep in mind that there should not be any chance for discontinuation of treatment by patient due to unavailability of MDT blister packs.

In PHCs where no patients are registered for continuous six months, no MDT stocks should be kept and MOs should ensure that balance MDT stocks are immediately returned to Dist. Stores.

10.1. How to calculate MDT blister pack requirement for PHC

There should be sufficient stock of MDT drugs so as all patients will get treatment without interruption. At the same time there should not be overstock as these costly drugs have expiry dates and it will cause unnecessary wastage of scarce resources.

MO PHC should follow instructions given below carefully and calculate demand properly as mentioned below (modified in October 2005 and then send indent.

Table - 32: Calculation of the monthly MDT requirement at the health facility level

Sr.	Steps in calculation	MB(A)	MB(C)	PB(A)	PB(C)
1	No. of cases under treatment at PHC				
2	Stock of MDT BCPs available at PHC				
3	Availability of MDT BCP in patients months at PHC (2/1)				
4	Total MDT BCP requirement to maintain 2 months stock at PHC(1X2 month)				
5	Net requirement of MDT drug as on date (4-2)				
6	Quantity of MDT Drugs stock expiring in next 2 month				

If MDT stock is calculated and demanded monthly in this manner there should be neither shortage nor excess of MDT

drugs at any time. This is common lapse noted in most of health facilities. MOs somehow miss this issue totally, resulting in situations where patient goes without MDT drugs due to mismanagement of MDT stock or the stock unnecessarily expires.

11. Essential indicators and their significance

Essential indicators should be calculated every month in each health facility so that MO PHC knows as to which way disease is heading and what corrective measures should be taken. Suitable graphs should be prepared in health facility to understand situation properly. Essential indicators are:-

11.1. Prevalence Rate or PR

It is total number of cases on record at a given point of time in an area.

Total number of cases on record 10,000

Total population in given area

Interpretation: Elimination target is defined as prevalence rate below one per 10,000 population. High prevalence may indicate high transmission in area. High prevalence can also be as a result of intensified elimination activities viz MLEC, BLAC etc. or due to over-diagnosis of patients or as a result of recycling of patients.

If data for prevalence of past years are available, see the

trend to assess progress being made towards leprosy elimination. If PR is increasing then some intensification of NLEP activities will have to be taken in villages/sub centers from where maximum number of cases are reported.

11.2. Annual New Case Detection Rate

Total number of cases newly detected (and never treated before) at a given point of time in an area

Total Number of cases newly detected 10,000

Total population in a given time in a given area

A high new case detection rate indicates

- High transmission in the given area
- Result of intensified elimination activities
- Result of over diagnosis
- Result of recycling of old patients
- Increasing community awareness

If data are available for past years, trend should be analyzed. This will help to measure impact of special activities such as MLECs, SAPELs etc.

Decreasing trend can indicate following possibilities:-

- Transmission is decreasing
- New case detection services are becoming less active
- **Community** participation in leprosy needs improvement

11.3. Proportion of Child cases among New Cases Detected

Proportion of new leprosy patients, up to 14 years of age, among newly detected patients.

Total number of 0-14 years new leprosy cases in year 100

Total number of newly detected cases during same period

A high proportion can be as a result of elimination activities targeted to this age group, such as school surveys and IEC in schools or high leprosy transmission in area.

- A low proportion can be as a result of low awareness among population or low transmission in recent areas

11.4. Proportion of Visible Deformity among New Cases Detected

Number of newly detected cases with deformity in year 100

Total number of newly detected cases in same year

It should be close to zero. If it is higher it may be due to low community awareness and late reporting of cases. IEC activities should be strengthened to reduce proportion of deformity in newly detected patient.

11.5. Proportion of MB case among New Cases Detected

Number of MB patients among new cases detected 100

Total number of cases among whom grouping has been recorded

A high MB rate indicates delay in diagnosis, lack of awareness

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among community or wrong grouping or re registration of cases.

11.6. Proportion of Females among New Cases Detected

Total number of new female patients in year 100

Total number of newly detected cases in same year

This should be close to 50%. If less than 50% it indicates that coverage of female population is inadequate. To improve new case detection among females, intensify IEC to this segment of population and involve female workers/women group in programme.

11.7. SC New Case Detection Rate (SC NCDR)

Total Number of Leprosy cases detected among Scheduled Caste population in a given time in an area.

Total number of SC cases newly detected 10,000

Total SC population in an area

11.8. ST New Case Detection Rate (ST NCDR)

Total Number of Leprosy cases detected among Scheduled Tribes population in a given time in an area.

Total number of ST cases newly detected 10,000

Total ST Population in an area

NCDR among SC and ST population should be close to NCDR among general population. If it is less, it may indicate inadequate coverage of this population. Special efforts like IEC, SAPEL may be implemented in such communities.

11.9. Patient month BCPs Stock: Stock of BCPs in months, according to the number of patients expected to be treated in the next quarter.

Calculation =

No. of Blister Packs of each category [PB(A/C),MB(A/C)]

No. of cases detected during the previous 3 months, in each category [PB(A/C),MB(A/C)]

11.10. Proportion of Health Sub Centre providing MDT: Proportion (%) of Health SubCentres providing MDT treatment, among all functional Health Sub Centres in a given area.

Calculation =

Functional Health Sub Centres providing MDT
Treatment x 100

Total no. of functional health sub centres in a given area

11.11. Absolute No. of Cases released from treatment: Total no. of cases released from treatment every month.

11.12. In addition to above 11 SIS indicators, following indicator needs to be monitored at PHCs

a. Prevalence/Case detection or P D Ratio

Prevalence Rate

Annual New Case detection Rate

Interpretation: This ratio should be less than 1

PD ratio more than 1 indicates:-

- That patients are on register for more than prescribed period
- Or there is re-registration

This will require cleaning of registers to remove all cases who have completed treatment so that they should no more be accounted for.

12. Summary of responsibility of health staff under NLEP

Sr.	Activity	Responsibility of PHC staff	
		Designation	Responsibility
1	New case detection through IEC activities and encouraging voluntary reporting.	MPW/HA	Health education and active search for patients of skin patch.
		MO	Passive search of skin patch patient in OPD.
2	Drug stock management	Pharmacist	Calculate MDT blister pack requirement, indent drugs, stock at PHC and issue to SC and ensure continuous supply. Keep record.
3	Diagnosis, prepare treatment card and start treatment	MO	Diagnosis on the basis of clinical examination. Prepare treatment card, arrange for MDT and refer to SC for subsequent doses.
4	Treatment Card	Pharmacist	Send treatment card to concerned MPW(M)
		MPW(M)	Keep treatment card at SC, give subsequent doses to patient, complete card regularly and store card at SC after completion of treatment (RFT).
5	Counseling patient	MO	Counseling for cause of disease, spread, MDT, importance of regularity of treatment, follow up etc.
6	Follow up of patient	MPW(M)	Follow up patient for regularity of treatment, adverse effects of MDT drugs and lepra reaction. In case of complications, refer patient to MO.
7	Defaulter action	MPW(M)	Immediately contacting patient if he/she does not attend SC for next blister pack.
8	Records and reports	HA(M)	Treatment card, patient register, receiving reports from MPW (M) and monthly report preparation.

		MPW(M)	Maintenance of treatment card, submitting information of treatment to PHC.
9	Review	MO	Review leprosy activities during monthly meetings.
10	Data Analysis	MO	Analyze collected data of PHC, calculate important indicators, study progress of indicators and formulate strategy on basis of this finding.
11	Continuing Medical Education	MO	Training, retraining of PHC staff, diagnosis, treatment of leprosy cases, IEC.
12	Monitor success of NLEP in your PHC	MO	Calculate various indicators and take corrective actions.

13. Job responsibilities of LT/NMS after integration:

After integration of NLEP into General Health Care it is expected that the routine programme responsibilities shall be discharged by G H C staff and the existing vertical staff viz. LT, NMS shall be utilized for capacity building of GHC staff, IEC, special activities under NLEP viz. MLEC, SAPEL, BLAC etc along with responsibilities of other health programmes.

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8. SEXUALLY TRANSMITTED AND BLOOD BORNE INFECTIONS

8.1. HIV INFECTION AND AIDS

AIDS, the acronym of Acquired Immune Deficiency Syndrome has now spread throughout the country. Indian scenario shows that there are about 5.1 million HIV positive persons in country. In Maharashtra, as per estimates of 2005, there are approximately 6.5 million HIV positive persons. Thus around 1% population of 15-49 age group in Maharashtra is infected with HIV. Sentinel surveillance reports of 2005 indicates that prevalence of HIV infection is increasing in rural areas of the state.

1. Etiologic agent

Human immunodeficiency virus is a lentivirus, one of a sub family of retroviruses. Two types are recognized, HIV-1 and HIV-2. These viruses store their genetic information as ribonucleic acid (RNA). This RNA is converted into DNA by special enzyme called as Reverse Transcriptase, which is special feature of HIV virus.

2. Epidemiology

2.1. Mode of HIV transmission

2.1.1. Sexual intercourse

Sexual intercourse is major route of transmission, whether heterosexual or homosexual. Risk of becoming infected through an act of unprotected sexual intercourse depends upon whether sex partner is infected, type of sex act (receptive partner has greater risk than insertive partner), amount of virus present in sexual secretions of infected person and presence of other sexually transmitted diseases in either partner. Overall infectivity of sexual route is 0.1-0.5%.

2.1.2. Blood-borne infections

HIV infected blood, blood products, transplanted organs or tissues can transmit HIV. This is most efficient way of HIV

infection. Transmission potential of HIV virus through blood borne route is more than 90%.

2.1.3. Use of un-sterilized needles and equipment

When needles, syringes and equipment come in contact with body fluids of HIV infected persons, they can become potential source of HIV transmission if not sterilized properly. Needle prick during procedure has also risk of transmission of HIV virus. Possibility of infection from needle prick is estimated at the level of 0.03%.

2.1.4. From HIV infected mother to fetus before, during or after birth

HIV infected pregnant mother has approximately 30% chances of transmitting virus to her fetus, out of which, 60% are in utero or during delivery and 40% are through breast feeding

2.2. Efficiency of transmission

Table below indicates efficiency of various routes of transmission

Table - 33 : Efficiency of various routes of HIV/AIDS transmission

Sr.	Mode of transmission	Efficiency	Contribution to total infections in India
1	Sexual intercourse	0.1-1%	84.6%
2	Blood transfusion	90-95%	3.2%
3	Perinatal	20-40%	2.4%
4	Intra venous drug use	1-10%	3.2%
5	Needle stick injury, tattooing, etc.	0.03-0.5%	Data not available

3. Clinical manifestations

HIV infection and AIDS are two different stages in life of infected person. When someone is infected with HIV virus, he/she goes through four stages of illness.

3.1. Stage - I: Acute retroviral illness

This stage usually starts from 8-12 weeks after entry of virus. Body's immune system produces antibodies against invading virus and results in hypersensitive reaction known as acute retroviral illness. This stage is manifested by fever, lymphadenopathy, malaise, rash, etc. These symptoms last for 10-12 days, are usually self-limiting, and are seen only in 60% of cases. CD4 count is normal.

3.2. Stage - II: Early stage of immune deficiency

Patient looks healthy and unless blood is tested, he/she is not even suspected to be suffering from HIV infection. Virus is fast multiplying in body but killed by immune system. HIV

replication is mostly taking place in lymph nodes and CD4 count is between 500-800 cells/cu dl. Many of patients suffer from autoimmune diseases during this stage.

3.3. Stage - III: Intermediate stage of immune deficiency

CD4 count has now dropped between 200-500 cells/cu dl. Patient experiences less severe infections, particularly of skin and mucus membrane. In India this stage is very important as most of patients get reactivation of tuberculosis at this stage and they respond well to treatment. Reactivation of herpes simplex or herpes zoster occurs during this phase with prompt resolution and response to treatment.

3.4. Stage - IV: Advance immune deficiency

CD4 count is now less than 200 cells/cu dl. Advanced immune deficiency leads to high risk of developing AIDS defining opportunistic infections or malignancy.

Increased concentration of virus in blood or semen is associated with high risk of sexual transmission in men and women.

4. Diagnosis of AIDS

4.1. Clinical case definition of AIDS for persons above 12 years of age

Three positive tests for HIV infection (ELISA – Rapid and simple)

and

Any one of following –

- Significant weight loss (10% or more in one month) and/or cachexia and chronic diarrhea (intermittent or continuous) or prolonged fever
- Tuberculosis (all types)
- Neurological impairment preventing independent daily activities, not known to be due to conditions unrelated to HIV infections (e.g. trauma)
- Esophageal candidiasis
- Clinically diagnosed life threatening or recurrent episodes of pneumonia.
- Other conditions like Cryptococcal meningitis, Recurrent Herpes Zoster, etc.
- Kaposi's sarcoma

4.2. Case definition of AIDS for children upto 12 years of age

Three positive tests of HIV infection among children 18 months or older, or confirmed maternal HIV infection for children <18 months,

and

Presence of at least two major signs and two minor signs in absence of known cause of immuno-suppression

Major signs

- Loss of body weight or failure to thrive
- Chronic diarrhea
- Prolonged fever

Minor signs

- Repeated common infections
- Generalized lymphadenopathy
- Oropharyngeal candidiasis
- Persistent cough for more than one month
- Disseminated maculo-papular dermatitis

5. Management of AIDS patients

HIV infection results into progressive depletion of immune system making host susceptible to various infections, including opportunistic infection and other AIDS related illnesses. Though the process cannot be completely stopped, it can be slowed down, which would improve quality of life. Therefore, essential features of management plan for AIDS patient include preventive, therapeutic, and supportive measures.

5.1. Aims of management

Following supportive measures should be advised to AIDS patients

- Prevention of repeated STIs
- HIV reactive person should use condom in sexual practice even if both partners are HIV reactive. This will prevent STDs, which acts as co-factor in transmission of HIV.
- Change in lifestyle. Patient should be counseled for positive way of life and should avoid drinking, smoking, and late nights as all these activities depress immunity.
- Some amount of physical exercise enhances immune function of body. CD4 cell count goes up in people who do simple, consistent exercise. Exercise also gives energy, increases appetite and sense of wellbeing.
- Anxiety and tension are very common in AIDS patients. They have detrimental effect on patient's ability to fight diseases and maintain good health. Reassurance and psychological support by PHC staff is necessary to help HIV-AIDS patients to overcome periodic bouts of severe depression.

5.2. Therapeutic management

AIDS is a disease for which no effective cure is available yet. Anti-Retroviral drugs only improve quality of life but offer no cure. PHC has limited role in therapeutic management of AIDS patient. Presently Anti Retroviral Therapy is available in Medical College Hospitals.

5.2.1. Opportunistic infections

Opportunistic infections are most important clinical manifestations of advanced immunodeficiency of HIV reactive persons. In immuno-compromised host, opportunistic infections are usually reactivation of previous infections that may not have produced symptomatology till immune system is deteriorated. Important opportunistic infections are as follows –

5.2.2. Tuberculosis

Tuberculosis is most common opportunistic infection amongst AIDS patients in India. DOTS therapy can cure TB of AIDS patient and improve quality of life. Refer TB patient with

high risk behavior to nearest Voluntary Counseling and Testing Center (VCTC).

5.2.3. Respiratory infections

Up to two third of HIV reactive persons have respiratory infections as opportunistic infections. Presence or worsening of cough and or chest pain, dyspnoea are indications of respiratory disease.

For management of respiratory infections, first rule out TB. Start broad spectrum antibiotics. If possible, send sputum sample of patient for gram staining and culture sensitivity. You can change antibiotics as per laboratory results. If patient does not get relief within five days from starting of antibiotics, refer to District Hospital.

5.2.4. Chronic diarrhoea

Diarrhoea is most common gastrointestinal symptom among HIV reactive persons. Diarrhoea affects up to 90% of patients and becomes more frequent as immune deficiency progresses.

Assess type of diarrhoea and dehydration status of patient. Management of dehydration is similar to other patients. Start Nalidixic Acid (500mg for 5 days) or Norfloxacin (400 mg BD for 5 days). If you suspect amoebic dysentery, start Metronidazole (400 mg TDS for 7 days). Symptomatic treatment of diarrhea is also indicated in HIV reactive patients. Dyphenoxilate hydrochloride, Loperamide or Oxycodone can be tried. If there is no difference then refer patient to specialist.

5.3. Home based care

HIV/AIDS has long incubation period. People suffering from this condition require a long continuous treatment. Such patients cannot be kept admitted to hospital throughout their illness. So home based care is important. MO PHC and staff can help such patient and relatives in home based care by helping to complete ant-retroviral therapy, early diagnosis of opportunistic infections, treatment of minor ailments, psychological support to patient and family, etc.

6. Prognosis of AIDS patient

Period between infection and development of AIDS symptoms is long and variable. Mean incubation period in adults is 8-10 years. Twenty percent of infected people develop AIDS in next 5 years and 50% in successive 10 years. There is no cure for AIDS and no anti-retroviral agent or any other modality or therapy is capable of completely eliminating HIV from body. Thus prognosis of infected person, particularly with any of symptoms from Stage-III or Stage – IV is grave. Average life span of AIDS patient without ART is 18 months.

NATIONAL AIDS CONTROL PROGRAM

Considering seriousness of problem, comprehensive AIDS control program has been developed in 1992. NACP is completing it's second phase in March 2006 and will enter in third phase in April 2006.

1. Objectives of Program

Objectives of National AIDS Control Program are -

- To reduce spread of HIV infection

- To attend HIV/AIDS awareness level not less than 90% among youth and other reproductive age group
- To achieve condom use of not less than 90% among high risk category and Commercial Sex Workers (CSW)
- To reduce blood-borne transmission of HIV to less than 1%.

2. Activities

To achieve objectives laid down under National AIDS Control Program, following HIV AIDS control activities should be implemented in PHC.

- Referring persons with high-risk behavior to VCTC
- Information education and communication
- Condom promotion
- Hospital infection control measures
- **Family** health awareness campaign

Actions to be taken for each of activities are given below-

2.1. Referring persons with high risk behavior to VCTC

- Voluntary Counseling and Testing Centers are now available at all District Hospitals and Sub-District/Rural Hospitals. Pre and post test counseling of referred patients is conducted by qualified counselors and HIV testing is carried out. Anybody can avail this service by paying Rs. 10/- counseling fees. Persons with high risk behavior and having sexually transmitted infections should be advised to avail VCTC services.

2.2. Information, Education and Communication

HIV/AIDS does not have permanent cure. There is no possibility for development of vaccine in near future. Thus health education is most effective tool available to prevent spread of HIV infection. Following points should be considered during IEC activities:

- HIV infection spreads when there are multiple sex partners, use of infected blood/needles and from HIV infected mother to child.
- HIV infection does not spread by sharing water, food, utensils, clothes, etc. and by hugging, shaking hand, sneezing, etc.
- Immediately contact doctor if there is genital ulcer, urethral discharge, swelling in genital area, etc. and get complete treatment as per advice.
- Condom helps to prevent HIV infection. It is available free of cost at all government health institutions.
- Never discriminate HIV reactive person or AIDS patient.
- In case of doubt, avail services of nearest VCTC.

2.3. Condom use

Condom use physically prevents contact of sexual secretions and thus prevents spread of HIV infection. Condoms are extremely important for persons having high-risk behavior. Following points should be considered for promotion of condom use:

- Increase access of condom by providing depot holders at each village, pada or wadi.
- All persons in sexually active age group must know depot holder. Always keep sufficient stock of condoms with depot holder. Give this responsibility to MPW(M) of area.
- Increase awareness, knowledge and skills regarding use of condom among men and women in rural areas, especially those at high risk.

2.4. Prevention of Parent to Child Transmission(PPTCT)

All pregnant women attending ANC clinic are counselled for HIV testing. HIV positive mother is identified and given ART to prevent mother to child transmission. MO should inform about PPTCT services to all MPW (F) and HA (F). All the pregnant women in PHC should be informed to avail PPTCT services at nearby PPTCT centre.

2.5. Hospital infection control measures

HIV infection can be introduced through infected blood, improperly sterilized needles and syringes or through contact with body fluids of infected patient. Importance of hospital infections and how to prevent them is discussed with details in chapter of infection control measures.

2.6. Family health awareness campaign

Awareness which can lead to attitudinal and behavioral changes in an individual and society towards safe sexual and other healthy practices is one of the most effective weapon we have presently against HIV/AIDS.

Relationship between RTI/STD and HIV infection is due to unprotected sexual intercourse with multiple partners. Presence of RTI/STD facilitates acquisition and transmission of HIV infection by 2-10 times. Thus early diagnosis and effective treatment of RTI/STD can significantly reduce HIV transmission.

Family Health Awareness Campaign is a strategy through which target population (15-49 years) is sensitized towards RTI/STD, risk they posed and their modes of transmission. All efforts would be made to encourage early detection and prompt treatment of RTI/STD by fully involving community.

2.6.1. Objectives

- To raise level of awareness among general population as well as vulnerable segments of population about RTI/STD and HIV/AIDS in rural areas and urban slums.
- To encourage health seeking behavior in general population for RTI/STD.
- To make people aware about services available in public health system for management of RTI/STD.
- To facilitate early detection and prompt treatment of RTI/STD by mainstreaming program with infrastructure available under primary health care.
- To implement a focused IEC strategy for general population and especially for youth.

2.6.2. Strategy

a. Inter-sectoral coordination

All available field level machinery would be utilized for intensive campaign to mobilize people to seek diagnosis and treatment of RTI/STD during and after FHAC.

b. Interpersonal communication

- Two rounds of house-to-house contact will be carried out prior to commencement of FHAC and each individual belonging to target group (age 15-49 years) would be provided FHAC card. Person with symptoms of STI will be given Red-Card with information about place and date of camp in the area. MPW Male and Female will carry out these rounds. Special focus will be to encourage greater participation of male population in campaign.
- Camps will be organized at Sub-Center for treatment of STI/RTI by syndromic approach.

c. Training

- MO PHC will be trained in syndromic management of RTI/STD.
- Training of paramedical staff is organized in communication strategy, recognition of RTI and referral to Sub-Center camp.
- Conduct sensitization training of all functionaries of government department about FHAC strategy and their help required to make campaign successful.

d. Treatment

- Treatment on the basis of syndromic approach to RTI/STD treatment.
- Lady medical officers will be involved in all camps for examination and treatment of female patients.
- Follow up of RTI/STD cases and their referral if required.

e. Monitoring and evaluation

- Campaign will be monitored constantly by senior officers. Evaluation will be carried out by independent agencies/institutions.

f. Reporting

- Printed reporting formats are provided to all PHCs for FHAC reporting. PHC report should be submitted in given format only.

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8.2. VIRAL HEPATITIS

Presently five viruses are responsible for viral hepatitis as they have common characteristics as primary replication in liver. Each virus belongs to different taxonomic family. Amongst these, Hepatitis B virus (HBV), Hepatitis C virus (HCV) and Delta Hepatitis virus (HDV) are transmitted by blood and body fluids

and have ability to produce a persistent infection and chronic liver diseases. They rarely present in epidemic form.

Clinical symptomatology does not distinguish between different types of viral hepatitis. Therefore clinical symptoms alone should not be used to establish etiologic diagnosis in jaundice patients.

Characteristics of Viral Hepatitis

1. Hepatitis-B

Acute HBV infection can be asymptomatic or cause clinically evident hepatitis or result into fulminant hepatitis and death. Acute hepatitis B cannot be differentiated from other types of viral hepatitis on the basis of signs and symptoms, correct diagnosis being only made by serological testing.

1.1. Mode of transmission

Hepatitis-B is transmitted by blood transfusion, use of contaminated needles or medical instruments, conjunctival/mucosal contamination with infected blood or body fluids, sharing razors/toothbrush with infected persons, sexual contact, etc.

1.2. Clinical characteristics

Clinical onset of Hepatitis-B is usually insidious with malaise, weakness and anorexia being most common findings. Liver enzyme elevation occurs usually prior to appearance of jaundice. Incubation period is 6 weeks to 6 months.

1.3. Control of Hepatitis B

1.3.1. Immunization

Routine vaccination against Hepatitis-B is the only control measure available at present.

Immunization schedule of Hepatitis-B vaccine-

- Schedule for primary immunization in children is given in chapter on immunization, which has been initiated in Maharashtra in phased manner.
- For general population, immunisation schedule is as below:

1st dose	1ml intramuscularly	any time
2nd dose	1ml intramuscularly	1 month after 1st dose
3rd dose	1ml intramuscularly	6 months after 1st dose

a. Post exposure administration

Hepatitis-B vaccine should be given immediately after exposure in following conditions -

- To newborns of Hepatitis-B carrier mothers (half the adult dose)
- Accidental exposure to HBV infection due to transfusion, cuts, injuries or needle sticks. This is important in case of occupational risk in case of health care personnel.

1.3.2. Hepatitis-B Immunoglobulin (HBIG)

HBIG should be given in following conditions

- Health personnel exposed to HBV infectious blood
- Newborn infants of carrier mothers
- Sexual contact of acute Hepatitis-B patients

Recommended dose is 0.05 to 0.07ml/kg body weight.

Two doses should be given 30 days apart. HBIG provides short-term passive protection, which lasts for approximately 3 months.

2. Hepatitis-C

Hepatitis-C virus has been shown to be primary etiologic agent of parenterally transmitted non-A, non-B hepatitis worldwide.

2.1. Important aspects

Spectrum of infection ranges from an asymptomatic infection (most common) to acute fulminant hepatitis (very rare). Average incubation period is 6-7 weeks. Most patients with acute HCV infection are asymptomatic and only 15-30% develop jaundice. Clinical illness in persons with acute hepatitis-C is similar to that observed in hepatitis of other viral etiologies and diagnosis of Hepatitis-C can be made only with appropriate serological testing.

Striking feature of acute HCV infection is that a persistent infection develops in more than 85% of adults and children and may occur with or without evidence of chronic hepatitis. Of persons with chronic HCV infection, an average of 67% develop chronic hepatitis with elevated enzymes within 6 months after onset of acute infection and no clinical and epidemiological features of patients appear to be predictive of progression to chronic infection or hepatitis.

2.2. Prevention

Presently no vaccine is available against Hepatitis-C infection. Only preventive measure that can be adopted is screening of blood and donor organs for HCV infection.

3. Delta Hepatitis (HDV)

Delta hepatitis virus is small, circular, single stranded RNA, delta antigen and an outer coat of HBsAg.

There are three forms of HDV infection

- An acute co-infection that occurs with HBV
- Super infection of a person with chronic HBV infection
- Latent infection in persons who receive liver transplant for HBV-HDV disease.

Spectrum of clinical disease in acute HDV co-infection or super infection varies from no illness to fulminant hepatitis. In general HDV infection augments severity of both acute and chronic HBV infection, with 50-70% of acute infections (co infection or super infection) resulting in an episode of clinical hepatitis with jaundice, compared with 30% of HBV infections.

4. Investigation and control of Hepatitis outbreak

Hepatitis-B, Hepatitis-C and Delta Hepatitis are transmitted through parenteral route. They spread primarily through blood transfusion, sexual contact and improper sterilization of needles, syringes, instruments and equipment. Parenterally transmitted hepatitis rarely develop into epidemic form.

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9. OTHER DISEASES OF PUBLIC HEALTH IMPORTANCE

9.1. YAWS

Yaws is a chronic contagious non-venereal disease characterized by a primary skin lesion followed by a late stage of destructive lesions of skin, bone and cartilage which makes a person disabled. In India, disease has been reported from communities living in hilly, forest tribal pockets. In Maharashtra State only two districts Chandrapur and Gadchiroli are known to have Yaws cases in tribal population.

1. Agent

Organism responsible for yaws is *Treponema pertenue*. It is identical in appearance to *T. pallidum* (organism that causes venereal syphilis).

2. Disease

- Early yaws is primarily a disease of children and adolescents in endemic situation. Man is only reservoir of infection
- Incubation period is 9-90 days (average 21 days)
- Yaws is transmitted by direct (person-to-person) contact with exudates or serum from infectious yaws lesions.
- Clinical manifestations are in two phases:
 - § Early or infectious yaws: Lesions are characterized by exudates which may dry up to form scabs with yellow, large crusted granulomatous eruptions on skin of legs, arms, buttocks or face. Early lesions are highly infectious.
 - § Late yaws: Usually after five years of onset of illness, destructive and often deforming lesions of skin, bones and periosteum may appear. Late lesions are non-infectious. Different late yaws lesions are hyperkeratotic lesions, chronic ulcers, scars from deep ulcerated nodular lesions, multiple pathological fractures, ulcerated nodules etc.
 - Laboratory diagnosis is made by Venereal Diseases Research Laboratory (VDRL) test and rapid plasma reagin (RPR) test.

3. Treatment

Drug of choice - Inj. Benzathine penicillin

Age	Dose	Route	Duration
< 10 Yrs	0.6 million units	IM	Single dose
> 10 Yrs	1.2 million units	IM	Single dose

In patients allergic to penicillin, alternate drugs like Tetracycline/Erythromycin may be used.

4. Yaws eradication programme

As per guidelines and financial assistance from Government of India Yaws eradication programme was launched in Maharashtra from 1998.

Under the programme, surveillance activities in form of two active searches are carried out in every year.

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9.2. FOOD POISONING

Although expression of food poisoning is generally applied to any disease caused by food, this term is used for acute diseases caused by consumption of food contaminated by microorganisms or their metabolic products.

It is common practice in our state to offer meals by organizers to all those who attend ceremonies like marriages, cultural gatherings, religious functions, etc. Preparation, storage and serving food to large gathering with inadequate resources and untrained food handlers are root causes of majority of food poisoning episodes.

1. Common causes of food poisoning

Common causes of food poisoning are as given below –

- Food is prepared by local people who are not trained in hygienic food preparation and handling.
- Utensils, water and raw food items used for food preparation may be contaminated.
- After preparation, food is kept at room temperature and in unhygienic condition for long time (overnight).
- Food handlers are not checked for infection or diseases.
- Instead of discarding, unused food is distributed among poor people, sometimes after more than 24 hours of preparation which is consumed after variable period from distribution.

2. Frequently encountered food-borne diseases in Maharashtra state

Most frequently encountered food-borne diseases in Maharashtra state, their incubation period and duration of illness are given in following table.

2.1. Staphylococcal food poisoning

2.1.1. Characteristics

- Staphylococcal food poisoning is generally suspected when a large number of people develop acute, predominantly upper gastrointestinal tract symptoms a few hours after consumption of some common food.
- Symptoms usually appear 2 to 6 hours after ingestion. Onset is generally abrupt and violent. Salivation, nausea, vomiting, abdominal cramps, diarrhoea (less often than vomiting) and occasionally hypertension occur.
- Acute gastrointestinal symptoms generally last for less than one day, weakness may persist for another one to two days. Death in otherwise healthy individual is rare.

2.1.2. Source of contamination

Staphylococci are widely distributed in nature, and man is natural reservoir. Organisms are abundant in purulent discharge of infected finger, cut, burn or chronic infections of nasal sinuses. Persons with boils, carbuncles and common colds are heavy shedders as well. Foods implicated in Staphylococcal food poisoning generally require much handling and are always rich in protein.

2.1.3. Prevention

Three principal requirements for production of sufficient enterotoxin to cause diseases are –

Table - 34 : Incubation period and duration for common food poisoning

No.	Type	Incubation period in hours	Duration
1	Staphylococcus aureus (Toxin)	2 to 6	6 to 24 hours
2	Salmonella (Infection)	6 to 48	1 to 7 days
3	Clostridium botulism (Toxin)	12 to 96, usually 18 to 36	Slow convalescence over 6 to 8 months or death in 24 hrs to 8 days
4	Clostridium perfringens (Toxin)	8 to 22	24 to 48 hours
5	Bacillus cereus (Toxin)	1 to 16	12 to 24 hours

- Food must be contaminated with enterotoxin producing staphylococci.
 - Food must be a good growth medium.
 - Food must be kept at room temperature for several hours.
- Prevention depends upon following important actions:

- Eliminating sources of contamination and practicing safe food handling; workers with purulent discharge, running nose should be excluded from food preparation.
- Food handling should be minimum possible.
- Food storage temperature should be less than 4°C or more than 60°C.

2.2. Salmonella infection

2.2.1. Characteristics

- Salmonella are most prevalent zoonotic infectious agents.
- Incubation period is between 6-48 hours.
- Frequent symptoms of salmonellosis are diarrhoea, abdominal cramps, pain, fever, headache, nausea and vomiting.
- For severe salmonellosis most effective antibiotic is fluoroquinolone, such as ciprofloxacin.
- Case fatality rate is usually low, but infants, aged and immune suppressed often become seriously ill.

2.2.2. Source of contamination

- Milk and Poultry products frequently harbour salmonella.
- Temperature used in routine pasteurization of milk destroys Salmonella. However Salmonella within meat or poultry products may survive if cooking temperature and time of cooking are not adequate.
- Refrigeration does not destroy salmonella which necessitates reheating of refrigerated food.

2.2.3. Prevention

- Food borne salmonella infection can be prevented by adequate heating to destroy these pathogens and avoidance of cross contamination after heating.

2.3. Botulism

2.3.1. Characteristics

- Food borne botulism results from ingestion of preformed botulinal toxin in improperly preserved food.
- Signs and symptoms appear after 12-48 hours after

ingestion of contaminated food.

- Initial symptoms are ptosis, blurred or double vision and dry or sore throat. Progressive descending paralysis may then develop.
- Case fatality ratio is more than 30% and respiratory paralysis is generally immediate cause of death.
- Most notable effect of botulism is flaccid paralysis because of interruption of nerve impulses at myoneural junction.
- Treatment of botulism requires high quality supportive care with immediate access to intensive care unit so that respiratory failure can be anticipated and promptly treated. Therefore if MO suspects botulism poisoning, patient should be referred to hospital where MICU facility is available. Antitoxins are available but are not supplied to PHC.

2.3.2. Source of contamination

- Most cases of food-borne botulism are caused by home-made and preserved foods that have received some preliminary heat treatment as by canning or smoking.

2.3.3. Prevention

- Botulism toxin once formed is readily destroyed by boiling; however most of botulism spores require very high temperature 116°C to destroy.

2.4. Clostridium perfringens

2.4.1. Characteristics

- Organism has been found in faeces of humans, animals and in soil, water and air.
- Majority of outbreaks have been associated with ingestion of meat, meat dishes, and poultry.
- If food is not cooled adequately, spores germinate and multiply and produce variety of toxins.
- Usual history is that, food has been prepared and cooked 24 hours or more before consumption, and allowed to cool slowly at room temperature and then heated immediately prior to serving.
- Common symptoms are diarrhoea, abdominal cramps, low or no fever occurring 8 to 22 hours after consumption of food. Recovery is rapid and no deaths occur.

2.4.2. Prevention

- Cooking food just prior to its consumption.

- If it has to be stored, follow rapid and adequate cooling.

2.5. **Bacillus cereus poisoning**

- Organisms are ubiquitous in soil and in raw dried and processed food. Spores survive cooking. Spores germinate and multiply at a favorable temperature.
- Symptoms are due to enterotoxins produced.
- Vomiting followed by diarrhoea, abdominal pain, nausea are seen.

2.5.1. **Prevention**

- Cooking food just prior to its consumption.
- If it has to be stored, follow rapid and adequate cooling.

3. **Investigation of food poisoning**

Investigation of food poisoning should start as early as possible. This is important because, memories fade, people scatter and suspected food may be discarded and unavailable for investigation or in worst case sometimes it may be consumed by others in course of time.

In relatively small outbreak, an effort should be made to question all who were exposed, whether ill or not, for symptoms and food consumption history.

To identify causative food(s), a retrospective cohort study design is commonly used. Rates of illness in those who ate specific food items are calculated and compared with rates of illness in those who did not eat those items. Implicated foods generally have highest attack rates. More importantly, there is greatest difference in attack rates of eaters and non-eaters of implicated food. Difference is called attributable risk or rate of disease that can be attributed to food under consideration. Following steps should be carried out in investigation of food poisoning outbreak -

3.1. **Collection of samples**

3.1.1. **Collection of food samples**

Collection of adequate and appropriate samples is essential for investigation. Important aspects about collection of food samples are -

- Samples should be collected in sterile container. Container can be sterilized by complete immersion of container in boiling water for at least 30 minutes. Container should be allowed to dry before collection of sample. Do not use cloth for drying container.
- Food sample or all left over prepared food or drink along with kothimbir, chatni, curd, water etc. served should be collected in sterile containers.
- Raw material such as food grains, pulses, atta, chilli powder, turmeric powder, whole spices need not be collected routinely unless there is reason to believe that they are contaminated with pesticides, organic chemicals or any other material. Sample required to be collected is 500 gms.
- Food sample must reach laboratory within 24 hours, preferably in cold chain by special messenger.
- Label of sample should indicate place, date and time of

collection and approximate weight of sample.

- Send following information along with samples to laboratory. This will help in isolation of causative organism.

§ Date and time of food preparation, food storage time and when food was actually served

§ Number of persons consumed food and Number of persons affected

§ Symptoms reported , date and time of onset of symptoms

§ If death; number of deaths. Condition of recovering patients

§ Reasons for suspecting food causing poisoning

This information will guide in examining food samples in laboratory.

3.1.2. **Collection of specimen from human sources**

- Specimens may be obtained from patients suffering from food poisoning like rectal swabs or stool and vomit for examination.
- Rectal swabs, swabs from nose or throat or from skin lesions of food handlers to detect carriers and to identify cases of illness.

3.2. **Steps to be carried out to investigate food poisoning**

3.2.1. **Confirmation of food poisoning incidence**

- **Immediately** rush to affected village along with PHC team.
- Team should have Gastro Epidemic Kit, 10 plastic bags of at least 250-500 grams capacity, clips, marker pen and plain paper for labeling.
- Once food poisoning is confirmed, inform police in writing about incidence. In case of death, information to police should be conveyed through special messenger.
- Inform organizers of ceremony about not to serve food to anybody and also not to destroy remaining food.

3.2.2. **Treatment of affected persons**

- Examine all patients for symptoms and dehydration status, start ORS or Ringer's Lactate as per severity of dehydration.
- If any patient shows signs of neurological involvement e.g. ptosis, weakness of limbs, etc, then refer all cases with neurological involvement to nearest specialty hospital with facility of medical ICU.

3.2.3. **Investigate for causative food**

- Collect history of food consumption as given in table below.
- First list all food items prepared for ceremony. Write down food items on each column of form. Separate forms should be used for affected and not affected persons.
- Start with affected persons. Ask person which food items he/she has consumed on that occasion. Tick-mark the items consumed. Read remaining items from list and ask affected person whether he/she has consumed these items also. If

yes tick-mark these items also.

- Complete survey of all affected persons available at the time of investigation.
- Ask similarly to all the non-affected persons and collect information of food consumption in non-affected persons in separate form.

persons who eat specified item and who did not. Attack rate is calculated by following formula.

$$\frac{\text{No. of affected persons} \times 100}{\text{Total number of persons}}$$

Total number of persons

To calculate difference in attack rate, subtract attack rate of persons who eat specified food from persons who did not.

a. Calculation of attack rate

Calculate attack rate for each food item separately for

FOOD POISONING INVESTIGATION SURVEY FORM

Village

Affected/Non-affected*

Sr.	Name of the person	H/o consumption of food item					
		Item 1	Item 2	Item 3	Item 4	Item 5	Item 6
1							
2							
3							

*Use separate forms for affected and non-affected persons

3.2.4. Analyze the information

Once survey is complete, compile information in the form of table given below -

Food item	Persons who ate specified food				Persons who did not eat specified food				Diff.in attack rate
	Affected	Well	Total	Attack rate	Affected	Well	Total	Attack rate	
Item-1									
Item-2									
Item-3									

3.2.5. Interpretation of results

- Implicated food generally has highest attack rate.
- Difference between attack rates is called attributable risk, i.e. illness that can be attributed to food item under consideration.
- It is common belief of MO that, association of illness with a particular implicated food should be perfect i.e. all those who ate must become sick and those who did not eat should not get sick. However there are several reasons because of which such things rarely happen in practice, some of them are mentioned below.
 - § Implicated food may not be contaminated throughout. This possibility is more for solid or semisolid food.

- § Host susceptibility to particular pathogen or toxin varies
- § Doses (quantity consumed) may vary from person to person
- § Food histories may contain reporting errors through faulty records, lying by patient or there may be errors in recording.
- § Some persons who did not eat specific food also develop symptoms due to cross contamination because of use of same serving utensils.

If food poisoning outbreak is large i.e. more than 100 persons are involved, patients can be selected randomly and questioned for symptoms and food exposure history.

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SECTION - V

REPRODUCTIVE & CHILD HEALTH PROGRAMME (MATERNAL HEALTH)

Delay the first, postpone the second & prevent the third

1. INTRODUCTION

In 1952, India became the first country in the world to launch Family Planning Programme to check population growth. Since then, the population programme in India has undergone many changes. The passive, clinic-based approach of the 1950s gave way to a more proactive, extension approach in the early 1960s. The late 1960s saw the emergence of a 'time-bound', 'target-oriented' approach which was followed by even more forceful 'camp approach' to promote male sterilization in the 1970s. These campaigns lead to a severe backlash and it was re-named as Family Welfare Programme in 1977.

In 1970s maternal and child health services began to receive greater attention as poor health status of women and children in terms of high mortality and morbidity was also perceived as important problem. Health facilities and hospitals started providing antenatal, intranatal and postnatal services. Number of special programmes like immunization against vaccine preventable diseases, nutritional interventions, diarrheal diseases control Programme, Acute Respiratory Infection control Programme were implemented independently. In order to provide maternal and child services in integrated manner the Child Survival and Safe Motherhood Programme was introduced in 1992.

In the Family Welfare Programme, the main stress was on achieving the contraceptive targets, with major emphasis on sterilization and monetary incentive to acceptors as well as providers. The target-driven, incentive-based family welfare services were insensitive to the needs and the sensibilities of the individuals resulting in poor acceptance of the programme. The prevailing services lacked quality and hence had poor credibility among communities. Centralized planning ignored the need of the individual areas and evoked inadequate participation of the peripheral health care managers and grass-root workers.

In addition to this, above programmes did not take into account gender issues as well as the problems of reproductive tract and sexually transmitted infections adequately although they have a considerable effect on the health of women and children.

Considering these issues, during the 1990s the International Conference on Population and Development (ICPD), Cairo recommended initiation of National Reproductive & Child Health Programme with the advocacy of a need based, client-centred, quality-oriented, demand driven reproductive health approach.

The principal goal of a reproductive health programme was envisaged to reduce the unwanted fertility safely and to provide high quality health services, thereby responding to the broad reproductive needs of individuals, as well as to concerns

regarding population stabilization.

The Government of India accepted the ICPD Programme and agreed to orient the National Family Welfare Programme towards the Reproductive and Child Health approach. The first phase of the Reproductive and Child Health Programme was launched in 1997, in which National Family Welfare (FW) Programme and the National Child Survival and Safe Motherhood (CSSM) Programme merged into the Reproductive and Child Health (RCH) Programme. In addition to the family planning and MCH services, the RCH programme includes strategies for prevention and management of reproductive tract and the sexually transmitted infections (RTIs/STIs). Phase II of RCH Programme started from April 2005.

1. Definition of Reproductive Health

- People have the ability to reproduce and regulate their fertility.
- Women are able to go through pregnancy and childbirth safely.
- The outcome of pregnancy is maternal safety, infant survival and well being.
- Couples are able to have sexual relation free of fear of pregnancy and contracting disease.

2. Community Needs Assessment Approach (CNA)

The Family Planning Programme revolved around achieving numerical, method-specific targets. The target-orientated policies are detrimental to the client-concerns because provider's achievement and not the satisfaction of individuals is the driving principle in this approach. The obsession with FW targets also severely undermined the commitment of the health care delivery system to other national programmes.

In the RCH programme, emphasis shifted to decentralized planning based on community needs assessment, envisaging target-free implementation of the activities.

Bottom- up- planning: Previously planning for the services was centralized with top down approach, which did not reflect the needs of individuals or communities. In RCH programme focus is shifted to bottom up planning, based on community needs assessment exercise conducted in each sub-center area.

Steps for preparation of sub center action plan:

- Assess programme needs as per the norms for various beneficiaries based on the birth rate and the population of each village (e.g. norms for number of ANC's, 0-1 yr., 0-5 years children in population based on birth rate etc.)
- Assess the community needs by Participatory Rural Appraisal (PRA) methods and by household survey.
- Consider performance for last year (Capacity of health infrastructure).

Sub center plan is prepared by taking into consideration above three factors for each village in the subcenter area. The aggregated needs of all the sub centers will make up the PHC plan. Likewise the planning for the district will be aggregation of the PHC plans plus the requirements of the First Referral Units (FRUs) and the district hospitals. The district plans together constitute the State plan.

3. Major emphasis in RCH is on

- Gender sensitivity
- Informed choice and safety
- **Community** mobilization
- Quality of care
- Client centered services as per the demand
- Male participation
- A comprehensive view of sexuality
- Multi-sectoral efforts

4. Objectives

- Reduce maternal mortality ratio to 200 per 1,00,000 live births by the year 2007 and 150 by 2009 from the current level of 407.
- Reduce post-neonatal mortality rate to 19 per 1000 live births by 2007 and 15 by 2009 from the present level of 28 (SRS 1998).
- Ensure 100% coverage of immunization for all children with the six vaccine preventable diseases.
- Eradicate poliomyelitis by 2005.
- Eliminate neonatal tetanus by 2005.
- Reduce deaths due to measles by half by 2007.
- Reduce deaths due to diarrhoea by half by 2007.
- Reduce deaths due to ARI by one third by 2007

5. Important Reproductive and Child Health services

- Adolescent health
- Prevention and management of unwanted pregnancy
- Antenatal services
- Intranatal services
- Postnatal services
- Child survival interventions
- Management of RTI/STIs
- Forty plus care

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2. SAFE MOTHERHOOD

While entering the 21st century, India has made significant progress in many fields. However the Maternal Mortality Ratio and Infant Mortality Rate has not shown an expected decline over the years. Safe motherhood interventions are important components of the Reproductive and Child Health programme,

which aims at reducing maternal morbidity and mortality substantially in near future by giving skilled health care to all pregnant women throughout their pregnancy, childbirth, and puerperium.

1. Maternal mortality

Maternal mortality is one of the important indicators, which helps to assess the effectiveness of maternal services received by pregnant women. Globally, every year nearly 6,00,000 women die due to pregnancy complications which is one maternal death every minute, whereas 1,20,000 mothers die in India alone which is one maternal death every 5 minutes. Unfortunately, most maternal deaths remain under reported. In Maharashtra about 2 to 3 maternal deaths occur per 1000 live births per year. However in reality the figure may be more than this.

- Maternal death is a death of a woman while pregnant or within 42 days of termination of her pregnancy by conditions related to or aggravated by pregnancy.
- Maternal mortality ratio is number of maternal deaths per 1,00,000 live births per year.

If we take example of PHC having 30,000 population and CBR of 21 per 1000 population, there will be approximately 1 or 2 maternal deaths in that PHC area during one year.

PHC staff must record each and every maternal death and MO should investigate its cause. MO must know number of maternal deaths that occurred in a year in PHC area.

1.1. Common causes of maternal mortality

Table - 1: Direct and indirect causes of maternal mortality

Direct causes	Indirect causes
Hemorrhage (APH and PPH)	Severe anaemia
Sepsis (puerperal and post abortion)	Hepatitis
Hypertensive diseases	Malaria
Eclampsia	Heart disease

It is evident from the table that; most of the causes of maternal deaths are avoidable. These conditions can be avoided by providing quality care to all pregnant women (total coverage), which is the key to success of Safe Motherhood Programme.

2. Components of maternal services

To achieve the objective of reducing maternal mortality and morbidity, it is essential to strengthen the maternity care services, which include:

- Adolescent care
- Antenatal care including referral for obstetric complications and emergencies
- Care during childbirth
- Postnatal care
- Provision of contraception including emergency contraception
- Safe abortion services
- RTI management

3. IEC activities

In addition to above services, IEC activities are important as they help to improve the knowledge of the community, improve utilization of health services & ultimately lead to healthy behaviour. Group meetings of newly wedded couples, pregnant and nursing mothers should be planned at sub centre level. About 10 marriages occur for every 1,000 population. Many women marry at young age. It is therefore extremely necessary to impart knowledge about the parenthood to newly wedded couples as early as possible. Similarly, group meetings of pregnant and nursing mothers should be arranged to provide them information about maternal and child health care and contraception.

After the MCP session, ANMs with the help of HA (F) should organise group meetings of newly weds, pregnant and nursing mothers. ANMs will impart knowledge about prenatal, natal and postnatal care of women, new-born care, child immunization, virtues of small family size, interval between births, methods of contraception and abortion, STI/RTI including HIV/AIDS. Use of appropriate AV aids will improve the effectiveness.

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3. ADOLESCENT HEALTH

Adolescents (age 10-19) constitute over 23% of the total population. Adolescence is a phase of rapid physical growth, psychosocial development and sexual transformation. Adolescents are not a homogenous entity but, depending upon the region, culture, socio-political and economic background, have diverse educational career, social, behavioral, developmental and health needs. A large number of adolescents lack formal or informal education..

- **Many** adolescents suffer from malnutrition and anaemia.
- Risk taking behavior, substance abuse, food fads, rebellious attitude, cynicism are common problems in adolescents.
- Adolescents are exposed to peer pressure for initiating tobacco or alcohol use that increase the problem of substance abuse.
- Sexual relations in adolescents may occur before they acquire skills in self-protection as their knowledge regarding conception and contraception is poor. This increases risk of RTIs and HIV among adolescents.
- Early marriage and early pregnancy in teens before 16 years is associated with an adverse effect on mother as well as fetus as below

- § The extra nutritional requirements of pregnancy as well as of growth spurt if not fulfilled, contribute to the poor nutritional status of girls enhancing the risk of fetal growth restriction and low birth weight.
- § Anaemia during adolescence can worsen during pregnancy, again contributing to fetal growth restriction and predisposition to maternal morbidity, mortality and also infant mortality.
- § Other risks like PIH, pre-eclampsia, eclampsia, CPD etc. are prevalent in adolescents, which have additive effect on adverse maternal outcome.
- § The ill health during adolescence has profound implications for maternal, perinatal, neonatal and infant mortality.

Adolescents avoid visiting public health facilities. MO and health staff must have orientation about needs of the adolescents. Services for adolescents cannot be provided on the basis of 'one size fits all'. In addition to curative services, needs of adolescents for information, counseling and specified services (contraceptive, IFA etc) should be considered.

1. Adolescent health services

Comprehensive health services for adolescents are being planned and will be initiated in a phased manner in RCH II programme during 2005-10. The services will be given by involving various departments like health, education, social welfare departments, ICDS, NGOs, youth organizations, local chapters of Indian Academy of Pediatrics, Associations of Obstetricians and Gynecologists. Adolescent Health Clinics will be conducted at least once every week at PHCs to provide following clinical and counseling services:

- General examination
- Nutrition advice, detection and treatment of anaemia
- Easy and confidential access to Medical Termination of Pregnancy
- Antenatal care and advice regarding child birth
- RTI / STI detection and treatment
- HIV counseling
- Risk reducing counseling
- Treatment of psychosomatic problems and de-addiction
- Other health concerns

2. Communication package for target adolescents

Although adolescent age group includes 10 to 19 years, the educational package will be different for age groups 10-14 years and 15-19 years as below:

Table - 2: Targeted package for adolescents

Domain	Age group 10-14 years	Age group 15-19 years
Growth and development	- Understanding and coping up with changes during puberty: physical, emotional, sexual - Anatomy / physiology of reproductive system, menstrual system & hygiene - Gender issues, roles and rights	Reinforce contents for age 10-14 years, plus: - Legal rights - Conception, pregnancy and child birth
Nutrition	- Balanced food - Iron/folic acid supplementation	Reinforce contents for 10-14 years.
Reproductive and sexual health	Healthy sexual attitudes	Reinforce contents for 10-14 years, plus: - Contraception and safe abortion - Abstinence - Problems of adolescent pregnancy - Prevention of RTI / STI / HIV
Marriage and parenthood	-	- Legal age of marriage, appropriate age for child birth, birth spacing - Care during pregnancy, birth preparedness, skilled attendance at birth, post-partum care - Newborn and child care (breast feeding, immunization, complementary feeding, care during sickness)
Life skill education habits	- Self help skills - Negotiation, decision making - Healthy and positive - Dangers of substance abuse - Exercise	Enforce content for 10-14 years, plus: - Negotiating skills - Stress handling skills

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4. ANTENATAL CARE

Antenatal period is the most crucial period as the services provided during this period affect both health of the mother and her child. This is the key area, which needs to be monitored by MO.

1. Activities to be performed by MO regarding antenatal care

1.1. Estimate expected ANC

For planning and delivering maternal services in PHC area, first step is to know number of antenatal mothers in PHC area. Expected level of ANC registration is communicated by DHO to all PHCs during the month of April every year. However MO should be able to calculate number of expected ANCs in each sub-center within PHC.

Expected antenatal registration

- Expected number of ANCs in one year = (Birth rate
Population 1000) + 10% (pregnancy wastage)
Example : Estimate number of ANCs for 5000 population assuming BR of 20 per 1000
= $20 \times 5000 \div 1000 = 100$
 $100 + 10 = 110$
At any given point of time, MPW (F) should have 50% of annual expected numbers of pregnancies in her area, as

pregnancy is a 9-month event & most women acknowledge their pregnancy only around third month.

- High risk ANCs (Norm) = 15% of total ANCs
= $(110 \times 15) \div 100 = 17$, i.e. total high risk ANC in sub-center will be 17 during the year.
- Anaemic ANCs (Norm) = 50% of total ANCs
= $(110 \times 50) \div 100 = 55$, i.e. total anaemic ANC in sub-center will be 55 during the year.

1.2. Ensure 100% registration of pregnant women

Registration of pregnant women is entry point for service delivery. All registered ANCs should be monitored for service delivery.

- Registration of all pregnant women before 12 weeks is the most important activity of ANM. Ensure 100% registration of ANCs by all sub-centers in PHC area. Keeping touch with recently married women and couples not using contraceptives will help in early registration.
- Register name of ANC in R-15 register serially. Give yearly and monthly number to ANC. Yearly number starts from 1st April of year and monthly number from 1st of every month.
- Inform each pregnant woman about her yearly registration number, place and date of next ANC clinic and importance

of regular check up at the time of registration.

- If any ANC from outside sub-center area attends ANC clinic, she should be encouraged and provided with all the check ups. However, while registering, such ANC should be given '0' number in R-15 register.
- HA (F) should help ANM in early registration, ANC check up and management of difficult cases referred by ANM.
- MO should take sub-center wise and village wise review of ANC registration against expected ANCs and week of registration of each ANC in the monthly meeting. Find out reasons for less registration / late registration and try to rectify them.

2. Examine all pregnant women at antenatal clinic

Table - 3: Examinations during pregnancy

- Height and weight	- Systemic Examination
- Pallor	- Fundal height
- Oedema over feet, hands, face	- Fetal presentation and position
- Blood pressure	- Fetal heart rate

2.1. Schedule of examination

- Most important aim of antenatal examination is recognition and management of any complication of pregnancy at early stage so that there will be safe delivery for mother and birth of healthy child.
- Frequency of examination and test to be carried out are such that all the common complications are detected early and corrected in time.
- Ideally all ANCs should be examined monthly after registration in Arogya Seva Satra or PHC. Therefore insist all ANCs to attend clinic monthly for check up.
- If it is not possible to attend ANC clinic monthly, then ANC should get checked at least five times during pregnancy as per schedule given below -

Table - 4 : Ideal schedule suggested below is of five visits

Period of examination	Services to be rendered
12-16 weeks	Registration, examination, risk screening, TT first dose, IFA tablets, referral for HIV test.
4 weeks after registration	TT second dose, IFA tablets
4 weeks later	IFA tablets, risk screening
32 weeks	Presentation, fetal growth, complication if any
36 weeks	Presentation, fetal growth, complications if any, vaginal examination for excluding CPD in a primipara.

- Few ANCs may not even be able to attend the ANC clinic for five times. Such ANCs should have minimum three check ups. These three check ups should be other than registration. First check up before 16-20 weeks, second at 32 weeks and third at 36 weeks.
- Most important part of schedule of ANC examination is that, all ANCs should be checked at 32 and 36 weeks irrespective of number of previous examinations. Because most of the complications of pregnancy are detected during last trimester. If the ANC is going to her parent's house for delivery, ANM should give letter to concerned sub-center ANM and advise ANC to attend clinic there along with ANC card.
- For 'high risk' mothers more frequent examinations will be required as per clinical situation.

2.2. Examinations during ANC check up

Height of ANC should be recorded at the time of registration or during first ANC check up if registration is done at home. Other examinations should be carried out every month at the time of monthly check up. List of examinations and actions to be taken on common findings are given in table below -

Table - 5 : Examination and action to be taken during ANC check up

No.	Examination	Action
1	Oedema	• Examine whether oedema is on one leg or both legs. If oedema is on one leg mother may have some surgical problem, refer her to specialist. • Ask mother if she has history of kidney or heart disease, if yes refer to specialist. • If mother has oedema + albuminuria + high blood pressure, refer to specialist as she is having pre-eclampsia. • If bilateral oedema without albuminuria and high BP (most common): Reassure mother, give IFA tablets in therapeutic doses if mother is anaemic, advise for salt restriction and elevation of legs during rest at night & afternoon.
2	Weight gain	• Record monthly weight gain on ANC card of mother • Weight gain more than 3 kg. in a month: Suspect pre-eclampsia • <u>Weight gain less than 1 kg. in a month: Suspect fetal growth restriction</u>
3	Blood Pressure	• If more than > 140 / 90 mm of Hg, advise mother to rest for half hour and repeat BP recording • If systolic more than 160 or between 140-160 associated with albuminuria & oedema: Refer to specialist • If systolic between 140-160 and or diastolic 90 or above : advise salt restriction and refer mother to MO for further advice.

4	Fundal height	- Examine fundal height in weeks and compare with LMP - If the difference is more than 4 weeks (more or less) refer to specialist - Causes of fundal height less than period of amenorrhea may be due to wrong date, infrequent periods prior to conception, IUGR, oligohydramnios, IUFD. - Causes for greater fundal height are wrong dates, poly hydramnios, twins, big baby, hydatidiform mole, uterine fibroids.
5	Fetal Presentation	Noncephalic (Significant after 34 weeks): Refer to MO for confirmation & then to specialist.
6	Fetal Heart Rate	FHR < 120 or > 160 /minute : Refer to specialist
7	Hemoglobin %	- For Hb less than 7 gm % (severe anaemia) : Refer to a specialist where blood transfusion facility is available, start IFA while referring - For Hb between 7-11 gm% : Start IFA as therapeutic dose (2 tablets/day) and reexamine after one month - If improvement of Hb by more than 1gm%, continue IFA - If improvement less than 1gm%, give Mebendazole (except first trimester) and observe for another 3 weeks, if no improvement refer to specialist
8	Proteinuria	If proteinuria present suspect pre-eclampsia and refer to specialist
9	Risk factors	- ANM should look for any risk factor associated with pregnancy during every check up. List of risk factors to be looked for is given on next page. - All high-risk pregnancies should first be checked by MO and then referred to specialist if necessary for further check up depending on the risk factor.

3. Perform following investigations during ANC check up

Essential investigations e.g. Hemoglobin estimation and urine examination for albumin and sugar should be done for all ANCs during check up every month. Other investigations (shown in table below) may be performed whenever facilities are available.

Essential investigations	Desirable
Hemoglobin estimation	Rh typing
Urine analysis: Protein and sugar	VDRL Voluntary HIV testing Ultrasonography when required. This facility is available at Sub District Hospital or District Hospital

4. Give following advice about care to be taken during pregnancy

ANM should give at least one home visit to all ANCs from her area every trimester. This will help in giving important messages to mother regarding care during pregnancy. Following topics should be covered during the home visit -

4.1. First and second trimester

- Diet: One more meal a day and evening snacks (most important), inclusion of sprouted legumes, pulses, green leafy and other vegetables, seasonal fruits.

- Rest: 2 hours in afternoon and 8 hours at night preferably in lateral position
- Exercise: Walking
- Habits: Avoid tobacco in any form, avoid alcohol
- Self-reporting of danger signals, e.g. severe headache, giddiness, severe oedema, bleeding, etc.
- Consumption of Iron and Folic Acid 100 tablets for prophylaxis of anaemia and 200 for therapeutic dose.
- Tetanus Toxoid 2 doses
- Calcium through diet and tablets.

4.2. Third trimester

All above plus

- Avoid heavy work and jerky travel on bad roads. This may lead to pre-term labour, fetal growth restriction and premature rupture of membranes.
- Plan for place of delivery, preparation for delivery, use of DDK if home delivery is planned, importance of exclusive breast-feeding, child immunization and contraception.

5. Identify high-risk mothers

From registration, at each antenatal visit, ANM should screen all pregnant women for presence of any risk factor.

5.1. Actions to be taken for high-risk pregnancy

5.1.1. For high-risk pregnancies which can be managed at PHC

Table - 6 : High risk factors & actions suggested for

High risk factor	Actions suggested
Primi age < 20 years or > 35 years	Regular ANC check up at PHC, refer to specialist if abnormal findings during check up, can be delivered at PHC if no other risk.
Primi of height less than 145 cms	Regular ANC check up at PHC. Assessment of place of delivery by MO or specialist. Keep transport facility ready if decided for delivery at home/PHC
Primi having vertebral /limb deformity	Regular check up at PHC, assessment by specialist for place of delivery. Can be delivered at PHC if suggested by specialist
Para 4 and above	More frequent check ups at PHC, evaluation by specialist once during pregnancy. Can be delivered at PHC.
Prior history of mid trimester abortion	Refer to specialist immediately after registration. Regular check up by specialist necessary. Give supportive care. Can be delivered at PHC
Anaemia at the time of delivery	Mild anaemia (Hb : 10-11 gm%) - Can be delivered at PHC. Moderate anaemia (Hb: 7-11 gm%) - Delivery at PHC in presence of MO, refer case to center with blood transfusion facility if PPH is suspected Severe anaemia (Hb : < 7 gm%) - Delivery at speciality hospital with blood transfusion facility.
Hypertension	Hypertension without proteinuria - Prescribe anti-hypertensive and if under control delivery at PHC

5.1.2. For high-risk pregnancies that should be delivered under specialist care

High risk factor	Actions suggested
Post caesarean pregnancy	Refer to specialist during third trimester for evaluation. Should be delivered under specialist care. Do not advise for home delivery.
Hypertension with proteinuria	Refer to specialist for delivery
Prior history of medical diseases - Heart disease, diabetes mellitus etc.	Refer to specialist immediately after registration. Regular check up by specialist necessary. Give follow up care at PHC.
Previous history of pre-term labour, stillbirth, early neonatal death, congenitally malformed child	Refer to specialist immediately after registration. Regular check up by specialist if necessary. Give supportive care.
Malpresentation persisting at 36 weeks	Refer to speciality hospital with facility of caesarean section and blood transfusion.
Pregnancy beyond 41 weeks	Confirm the LMP first. If LMP is correct and pregnancy is exceeding 41 weeks, refer to specialist.

Common problems in high risk women and required actions should follow these instructions during management of high-risk pregnancies. Common problems in pregnant women & actions that can be taken by health workers & MO are enumerated below. MO

Table -7 : Common problems & actions to be taken

RISKS	ACTIONS
1. Elderly Primi	
- Pregnancy induced hypertension - Gestational diabetes - Difficult labour - Chances of caesarean delivery are higher - Fetal abnormalities.	- Regular antenatal check up - B.P. and urine analysis every month - Refer to SDH for USG around 18-20 week to exclude fetal anomalies - Pelvic assessment at or after 36 weeks. - Institutional delivery under care of specialist.
2. Teenage primi	
- Pregnancy induced hypertension - Anaemia - Pre-term labour	- Regular antenatal care - Hb%, BP, urine analysis more frequently - Adequate rest

- Fetal growth restriction - Difficult labour	- IFA tablets, nutrition advice - Pelvic assessment at 36 weeks - Hospital delivery.
3. Grand multipara (para 4 and more)	
- Anaemia - Malpresentation - Atonic PPH - Uterine rupture	- Antenatal care - Supplement IFA, nutrition guidance - Examine P/A at 34 and 36 weeks to look for fetal malpresentation - Hospital delivery - Avoid injudicious use of oxytocics, - Active management of 3rd stage of labour - Keep IV line ready, give IV methergine 0.2 mg diluted, slowly at the delivery of anterior shoulder - Clamp the umbilical cord soon after birth of baby - Deliver the placenta by controlled cord traction
4. Breech presentation after 34 weeks	
- Pre-term labour - Premature rupture of membranes (PROM) - Cord prolapse leading to fetal asphyxia - Fetal abnormalities	- Refer to SDH for USG to confirm presentation, gestational age, type of breech, placental location and to exclude twins and congenital malformations. - Refer to specialist
5. Transverse lie beyond 34 weeks	
- Preterm labour - PROM with cord prolapse, hand prolapse - Fetal asphyxia, fetal death - Obstructed labour, uterine rupture.	- USG at SDH to exclude placenta previa and other abnormalities - Referral for Caesarean Section.
6. Post caesarean pregnancy	
- Requirement of caesarean section again - Scar dehiscence during labour.	- Regular antenatal care - Refer to specialist at 36 weeks
7. Prolonged pregnancy beyond 42 weeks	
- Fetal distress, difficult labour	- USG at SDH - Vaginal examination to assess condition of cervix (ripe/ unripe) and pelvic assessment - Referral at 41 weeks to specialist
8A. Uterine over distension: May be due to twins	
Fundal height greater than period of amenorrhea, abdomen over distended	
- Anaemia, PIH, APH, malpresentation causing dystocia, pre-term labour - Fetal malformation - Atonic PPH	- Extra diet- Extra nutrition and IFA tablets - Look for anaemia and PIH periodically
8B. Uterine over distension: May be due to polyhydramnios	
- Can be associated with twins, fetal malformation, maternal DM	- USG to exclude twins, fetal malformation - Referral to specialist

6. Assess the risk during third trimester of pregnancy

Look for:

- 1 Uterine overdistention
- 1 Fetal mal-presentation persisting beyond 34-36 weeks
- 1 Pregnancy continuing beyond 41 weeks

7. Common complications during pregnancy and their management

Medical officer can manage some of the pregnancy related complications at PHC level. Management of such complications will minimize unnecessary referral and will increase the credibility of PHC and medical officer in the community. However for correct management, it is important to recognize

the complications and to have correct knowledge of management. Important complications and their PHC level management are given below -

7.1. Anaemia

7.1.1. Detection: Clinically pallor, oedema, dyspnoea

Hb < 11gm% (Severe anaemia Hb < 7gm%)

7.1.2. Risks: Cardiac failure

Inability to withstand blood loss during third stage labour

Puerperal sepsis.

Fetal growth restriction, prematurity.

7.1.3. Causes: Nutritional deficiency (Iron and folic acid)

Worm infestation.

Malaria, sickle cell disease, chronic blood loss.

7.1.4. Action to be taken at PHC

- Give oral Iron Folic Acid tablets in therapeutic doses, ensure compliance
- **Deworming** with tablet Mebendazole (not in first trimester)
- Nutritional advice for iron rich food.
- Repeat Hb estimation after 1 month
- Refer if
 - Hb < 7 gm% at any time
 - No response after IFA supplementation.

7.1.5. Assess response to Iron and Folic Acid

- Subjective well being within few days
- Hemoglobin starts increasing after 2-3 weeks.
- Rate of increase in Hb concentration is 1 gm% every week thereafter.

7.1.6. Points to be remembered

- Very severe anaemia (Hb 5 gm% or less) carries a very high risk of maternal mortality for which blood transfusion and institutional care is required.
- Anaemia, pyrexia and icterus should raise suspicion regarding malaria.
- Delivery of anaemic woman should be done under supervision of MO and it requires -
 - Strict aseptic precautions
 - Prophylactic antibiotics
 - Active management of 3rd stage of labour to reduce blood loss

7.2. Pregnancy Induced Hypertension (PIH)

7.2.1. Diagnose PIH and severe pre-eclampsia

- PIH: Sustained rise of BP at 140/90 mm of Hg or more after 20 weeks of pregnancy without history of high BP before pregnancy is called as PIH.
- Severe pre-eclampsia: When ANC has following signs and symptoms along with high BP (B.P. > 160/110 mm of Hg) patient is in severe pre-eclampsia
 - Proteinuria ++ or more
 - Reduced urinary output
 - Symptoms and signs suggestive of impending eclampsia like severe headache, blurring of vision, vomiting, epigastric pain, oliguria, hyper reflexia (brisk knee jerk)
- PIH and Pre-eclampsia has adverse effect on mother and fetus. Important effects are given in table below -

Table - 8 : Adverse effects of PIH and pre-eclampsia

Mother	Foetus / Neonatal
Eclampsia	IUGR
Cerebral hemorrhage	Intrauterine fetal death
Acute Renal Failure	LBW

Hemorrhage due to coagulation failure	Prematurity
Liver failure	Asphyxia
Pulmonary oedema	
Cardiac failure	
APH due to abruptio placentae	

- Maternal, fetal and neonatal complications are mostly seen in severe and proteinuric hypertension, early onset hypertension, women with multiorgan dysfunction and women developing eclampsia.

7.2.2. Difficulties in management

- In PIH, symptoms appear very late in the course of disease. Hence diagnosis can be made only on clinical examination and urine analysis carried out during monthly ANC check up.
- The disease continues to remain in the same state or worsens and the condition improves only after termination of pregnancy.
- Some patients may need critical care in Intensive Care Units with sophisticated equipment. Therefore PIH cases should be evaluated by specialist before taking decision about place of delivery.

7.2.3. Principles of care

- Pregnancy induced hypertension (PIH) without proteinuria and oedema should be managed at PHC with appropriate anti-hypertensive as described below. Call such ANCs every 15 days, record BP and examine urine for protein and oedema over legs. Continue PHC level management till urine examination is normal and there is no detectable oedema.
- PIH with proteinuria and oedema requires investigations and specialist care that are not available at PHC. Do not wait till symptoms of pre-eclampsia occur. Start first dose of anti-hypertensive and refer to specialist for further management.
- Follow up check up, BP monitoring and dose adjustment of PIH cases referred to specialist can be managed by MO under supervision of specialist. This will save time and money of poor rural patient and will also increase confidence of MO and PHC staff in management of PIH.

7.2.4. Anti-hypertensive treatment

a. Drug treatment

- Give anti-hypertensive drugs if diastolic BP remains 110 mm of Hg. or more. Goal of therapy is to keep the diastolic BP between 90 to 100 mm of Hg.
- Nifedipine and Methyl Dopa are safe drugs for PIH.
- **Do** not give diuretics except in cases of pulmonary oedema.
- Do not give sedatives, as they do not offer any benefit in PIH.

i. Nifedipine

- Nifedipine is a Calcium channel blocker. It directly acts on the blood vessels and relaxes the arterial smooth muscles.

- Dose is 10 - 20 mg orally or sublingually every 6 - 8 hours. Peak action is achieved in 1-3 hours.
- Side effects include headache, dizziness
- Advantages: Does not affect the perfusion of vital organs and cardiac preload.

ii. Alpha Methyldopa

- It acts centrally, reduction in BP is seen in four to six hours
- Dose is 250 mg thrice a day, which can be increased up to 500 mg 6 hourly depending upon response of the patient
- Advantage: Does not affect circulation to vital organs.
- Side Effects include sedation, vertigo and depression in mothers and reduction in birth weight of the fetus.

b. Obstetric management

- Record blood pressure and urine for proteins of all the mothers attending PHC for delivery.
- In mothers with PIH, carefully record diastolic BP. If diastolic BP is less than 110 mm, delivery can be conducted at PHC as like any other deliveries.
- Mothers with PIH and proteinuria should be referred to specialist for delivery. However if such patient is directly brought to PHC in labour, follow the guidelines given below for delivery -
 - Monitor Fetal Heart Rate (FHR) and colour of liquor for detection of fetal distress
 - If progress of labour is slow, hasten by artificial rupture of membrane (ARM) followed by oxytocin infusion if required.
 - Give Episiotomy to cut short second stage of labour.
 - Do not give Inj. methergine after delivery.
 - Oxytocin is safe when required.
- In mothers with severe PIH (diastolic BP more than 110 mm) refer the mother irrespective of urine analysis to specialist for delivery.

7.3. Eclampsia

Eclampsia is an important cause of maternal death. MO and nursing staff must have ability to recognize the eclampsia and give primary treatment before referral to specialist. This is important, as most common reason for death in eclampsia is improper or late management.

7.3.1. Management of eclampsia

- First assess the seriousness of eclampsia by following examination
 - Severe hypertension (>110 diastolic)
 - Proteinuria (+ + more)
 - Number of fits (5 or more)
 - Diminished urine output (< 30 ml/hour)
 - Altered consciousness (coma)
 - Icterus
- Patient with eclampsia is presented with severe hypertension, blurring of vision, convulsions, diminished

urine output and altered consciousness. On urine examination, patient has proteinuria. Onset of convulsions can be ante-partum, intra-partum or post-partum

- Do not try to manage the case of eclampsia at PHC. Refer the case to speciality hospital where 24 hours specialist services are available, as early management is life saving. When condition indicates serious maternal deterioration, refer urgently to a tertiary care center. Give primary treatment till the arrangement of transport is made by relatives.

7.3.2. Primary treatment includes following important points

- Clear airway: Clear airway by cleaning mouth and throat by suction of secretions, turning head of patient to side and by inserting airway. Oxygenate the patient if required.
- Control of fits: Control fits by giving Magnesium sulfate (doses given below) or Injection Dizepam 10 mg IM. Giving anticonvulsant prior to referral is very important, as it will help in preventing further deterioration of the patient. Magnesium sulphate is drug of choice as it effectively controls convulsions, patient remains conscious and alert and there is no adverse effect on fetus.
- Control of high BP: If diastolic BP is more than 110 mm of Hg, give Nifedipine 5 mg sublingually and record BP every five minutes. Maintain diastolic BP around 90-100 mm of Hg. Note down timing of Nifedipine administration & BP on referral chit.
- Monitor urine output: Insert Foley's catheter and connect it to uribag. Note the timing on the uribag and referral chit; this will facilitate monitoring the urine output and assessing the general condition at referral center.
- Maintain hydration: Start IV line. If diastolic BP drops to below 90 mm give 500 ml of IV fluids. This will help in maintaining perfusion of vital organs and will prevent patient going in renal failure.
- If patient of eclampsia has arrived in labour and it is not possible to refer, augment labour by artificial rupture of membrane and oxytocin drip. Do not give Inj. Methergine after delivery.

a. Dose and administration of Magnesium Sulfate

- Initial loading dose: 20 ml of 20% (4 gms) MgSO₄ to be given intravenously over period of 3 minutes.
- This is immediately followed by: 20 ml of 50% (10 gms) MgSO₄ intramuscularly in two divided doses one on each buttock to be given one after the other.
- Maintenance dose: 10 ml of 50% (5 gms) every four hours on alternate buttocks. Continue the treatment until 24 hours after the last convulsion.

b. Prevention of hypermagnesemia

To avoid hypermagnesemia, ensure the following -

- Knee jerk must be present.
- Urine output should be 100 ml in previous 4 hours
- Respiratory rate should be about 16/minute. If there are

signs of respiratory depression, the next dose is withheld and respiratory depression is treated by 10 ml intravenous injection of 10% Calcium gluconate.

7.4. Bleeding in early pregnancy

A woman may present with history of a short period of amenorrhea followed by vaginal bleeding. Abortion, vesicular mole and ectopic pregnancy are the common conditions underlying, while an occasional woman may simply have a delayed menstruation. Medical officer must be able to differentiate between early pregnancy bleeding and delayed menstruation.

7.4.1. Differentiate between menstruation & early pregnancy bleeding

- Ask patient following:
 - Period of amenorrhea, LMP, previous menstrual cycles or any symptoms suggestive of pregnancy
 - Amount and duration of bleeding, it may be scanty in delayed menstruation and profuse in abortion.
 - Whether there is any significant history of abortions, surgery for ectopic pregnancy
- If possible arrange for pregnancy test of patient
- Arrive at the diagnosis with the help of following chart. If the signs and symptoms indicate that it is early pregnancy bleeding, refer ANC to specialist.

Table - 9 : Causes of early pregnancy bleeding

Particular	Threatened abortion	Incomplete abortion	Missed abortion	Vesicular Mole	Ectopic pregnancy	Delayed menstruation
Uterine Size	Equal to POA	Smaller	Smaller	Bigger	Smaller	-
Vaginal bleeding	Slight	Profuse	Absent or brownish discharge	Recurrent small	Slight	Moderate
Pain	Absent	Cramping pain significant	Absent	Absent	Severe, continuous	Absent
G.C., pallor, tachycardia	Fair	Proportional to blood loss	Fair	Fair	Out of proportion to visible blood loss	Fair
Tenderness Abd/vag	Absent	Absent (Unless infected)	Absent	Absent	Marked	Absent
USG	Intrauterine viable pregnancy	Some products in uterine cavity	Nonviable pregnancy	Snowstorm appearance	Empty uterus, pelvic / adnexal mass	No pregnancy, normal findings
Management	Expectant	Surgical evacuation	Termination of pregnancy	Suction evacuation with blood transfusion if required	Laparoscopy or Laporotomy, blood transfusion	Medical

7.5. Ante-Partum Hemorrhage (APH)

Vaginal bleeding during pregnancy generally from 28 weeks onwards to before birth of baby is called as ante-partum hemorrhage.

7.5.1. Causes

- ▮ Placenta Previa
 - ▮ Abruptio placentae
 - ▮ Heavy show
 - ▮ Local cervical pathology like carcinoma, polyp etc
 - ▮ During labour can be due to uterine rupture
- (Vasa previa is a rare condition when bleeding is fetal in origin)

Most common causes of APH are placenta previa and abruptio placentae. When patient of ante-partum hemorrhage

attends PHC, assess patient first, examine, search for cause of APH and advise accordingly. Steps in management of APH are described in detail below -

7.5.2. Assess the patient on following aspects

- Time of onset of bleeding, amount
- Abdominal pain present or absent, its time of onset
- Prior h/o warning hemorrhage
- Perception of fetal movements
- Period of amenorrhea
- When did she pass urine
- Reports of prior USG if available

7.5.3. Examine the patient to see

- Pallor, tachycardia, general condition, blood pressure
- Uterus relaxed/hard/tender
- Presentation normal/abnormal/uncertain

7.5.4. Differentiate between Placenta Previa and Abruptio placentae as follows

Particular	Placenta previa	Concealed or mixed abruptio placentae
Pain	Painless recurrent vaginal bleeding	Painful bleeding
General condition	Pallor, tachycardia, restlessness proportional to visible amount of blood loss	Pallor, tachycardia disproportionately more than the visible amount of vaginal bleeding
Uterus	Relaxed, non tender, fetal parts felt well	Tense, tender, woody hard, fetal parts cannot be felt
Presentation	May be abnormal or head may be high floating	Presentation cannot be made out
Fetus	Fetal condition usually well if mother not in shock	Fetus often distressed or dead. FHS may not be heard
Maternal dangers	Hypovolemic shock	Shock, acute renal failure, DIC
Action	No P/V examination. Give IV fluids, referral	IV fluids, referral, monitor

- FHS heard/not heard
 - Uterus contracting and relaxing or tonically contracted
- Do not conduct vaginal examination until placenta previa is ruled out. Table below will help in differentiating placenta previa from abruptio placentae.

7.5.5. Take the action as per the guidelines given below

- Refer the patient of APH to a specialist or a center where facilities for USG, blood transfusion and operative delivery are available.
- Until referral is executed give at least one litre of I.V. fluids.
- Convince the relatives for urgent referral after explaining the seriousness of the condition, if there is significant pallor (Hb < 7 gm %), PR > 100/min, restlessness, systolic BP < 90 mm. of Hg, fetus distressed/dead (indicating massive hemorrhage requiring blood transfusion.)

7.5.6. Start emergency care of a patient of concealed abruptio placentae that cannot be referred immediately.

- Give IV fluids and plasma volume expanders if required and available.
- Monitor urine output and clotting time every 2 hours.
- Hasten delivery by Artificial Rupture of Membrane (ARM) and oxytocin infusion through other vein.
- Weigh the retro-placental clot after delivery.
- Repeat hemoglobin estimation.

7.6. Cephalo Pelvic Disproportion

7.6.1. Suspect CPD in following conditions

- Teenage and elderly primi
- Short primi
- Floating head at term in a primi
- Baby appears big clinically
- Vertebral/limb deformity.

7.6.2. Diagnosis

- Clinical assessment of pelvis
- Clinical test for CPD
- Unsatisfactory progress of labour

7.6.3. Action

- Refer all teenage and elderly primis with height less than

145 cm, and other cases you suspect as of CPD clinically to specialist at 36 weeks to decide the place of delivery.

- Advise primi with less than 145 cm height for delivery at center where caesarean facility is available.
- When you detect floating head in term primi or suspect big baby clinically, refer the mother to speciality center with caesarean facility.
- Keep transport facility ready for speedy transfer of patient to higher center if you suspect CPD.

7.7. Leaking (PROM)

Premature rupture of membranes (PROM) is discharge of amniotic fluid per vaginum before the onset of labour pains.

7.7.1. Dangers

- Infection – chorioamnionitis
- Fetal infection
- Prolonged labour
- Dry labour
- Fetal asphyxia

7.7.2. Causes

- Contracted pelvis and CPD
- Mal-presentations
- Occipitoposterior position
- Infection of fetal membranes

7.7.3. Actions by MO

When a patient with h/o involuntary leakage of clear fluid per vaginum soaking her clothes comes to a PHC do the following:

- Perform per abdominal examination. If uterus is smaller than period of amenorrhea and on per speculum examination, fluid is coming through cervix, more on coughing or pressure on abdomen diagnose a case of PROM.
- Perform a simple test (Fern test): Prepare a smear of drop of fluid from cervical canal on a clean glass slide, dry and examine under microscope. If there is ferning, it indicates rupture of membranes and helps for confirmation.
- Perform minimum number of vaginal examinations under

strict aseptic precautions.

- Refer the patient to specialist if -
 - § PROM > 12 hours and no labour pains
 - § Pre-term gestation
 - § Malpresentation
 - § Signs of infection
 - § Fetal tachycardia
- Observe the patient if she is now in labour with no signs of infection and pregnancy is full term pregnancy.
- If progress of labour is satisfactory, monitor and conduct delivery. If unsatisfactory progress refer the patient.

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5. NATAL CARE

Natal care is important, as safe delivery is the right of every woman. Efforts should be made to promote institutional deliveries. In PHC areas where proportion of home deliveries is more, ensure that they are attended by ANM or trained dai.

Adapt five clean practices (i.e. clean surface, clean hands, clean thread, clean new blade, and clean umbilical stump).

At PHC, pregnant women are admitted for delivery and MO has to assess them correctly, give primary management to the complicated cases and has to take decision of referral at appropriate time.

When a woman is admitted for delivery, perform complete examination which includes following

1. General examination of mother

- Pulse, temperature, blood pressure
- Urine examination for protein, sugar and volume

2. Obstetric examination per abdomen

- Uterine contractions: Frequency, duration and intensity
- Fundal height: Proportionate to POA (Period of Amenorrhea) or greater or lesser than POA
- Presentation :Cephalic or noncephalic
- Engagement of head: Fetal head felt 2 fingers or less in suprapubic region indicates engagement of fetal head
- Fetal heart rate: Normal FHR 120-160/min, regular.

3. Vaginal Examination

Take adequate aseptic precautions when performing vaginal examination of a woman in labour. During examination note following:

- Cervical dilatation and effacement
- Bag of membranes intact or ruptured, if ruptured, since how many hours?
- Note colour of liquor as clear or meconium stained.

- Presenting part: Vertex or other than vertex.
- Position: Occiput anterior or posterior
- Head is well flexed or deflexed
- Station of presenting part in relation to ischial spines
- Presence of caput or moulding
- Assessment of pelvis and CPD

4. Periodicity of these examinations/observations

Examination / Observation	Periodicity
Maternal pulse and FHR:	Every 30 minutes
Uterine contractions and descent of fetal head:	Every one-hour
Maternal temperature, BP and urine output:	Every four hours
Vaginal Examination:	Every four hours

5. Pelvic assessment

Parameter	Adequate	Suggestive of abnormality
Sacral promontory	Not felt	Felt easily
Sacro public diameter	>11.5 cms	< 11.5 cms
Sacral curvature	Well curved	Flat
Lateral pelvic	Parallel	Converging
Ischial spines	Both cannot be palpated simultaneously	Both spines can be palpated simultaneously
Subpubic angle	85°	Acute
Inter tuberos diameter	Accommodates closed fist (4 Knuckles)	Cannot accommodate 4 knuckles

5.1. Clinical examination for CPD

- Let the woman lie in dorsal or exaggerated lithotomy position.
- Hold the fetal head by left hand.
- Place two fingers of gloved right hand into vagina at the level of ischial spines.
- Place thumb of right hand on pubic symphysis.
- Push the head into pelvic inlet and note whether it descends into the pelvis (felt by fingers in vagina) or overhangs on the public symphysis.
- If head descends with no overlap at pubic symphysis then there is no inlet CPD.
- If head is engaged it indicates that the pelvic inlet is adequate.

After complete examination, decide whether woman can be delivered at PHC or requires referral.

6. Assess and monitor the progress of labour

6.1. Partograph

Partograph is a graphic record of the events in labour indicating maternal health, fetal health and the progress of labour. MO should train the nursing staff for using partograph, so that

they can monitor the progress of labour systematically and can take the decision to refer the patient in time.

6.1.1. Points to remember

- This graph is used only during labour
- Complications requiring immediate interventions need to be excluded first.

The WHO partograph is designed to record cervical dilatation and other parameters like FHR, descent of head, liquor, moulding, uterine contractions, oxytocin drip, pulse, BP, temperature and urine output. Monitoring and recording all these parameters may become difficult for PHC staff. Therefore simplified cervicograph may be used at PHC in which cervical dilatation is monitored and plotted on the graph.

6.1.2. Simplified Cervicograph

The section of partograph in which cervical dilatation is plotted is called as cervicograph. On this graph, one square represents one hour on horizontal axis. On vertical axis, one square represents cervical dilation of one centimeter.

Details about cervicograph:

a. Latent and active phase

Latent phase is the initial period during which cervix dilates very slowly up to 3 centimeters. It may take up to eight hours for this.

Active phase is the period after latent phase during which cervix dilates rapidly. During active phase the rate of cervical dilatation is about 1 centimeter per hour. The active phase should be over by seven hours.

b. Recording on cervicograph

Whenever woman in labour comes to PHC, record her findings and the time of examination on the graph as below:

- Record the time of the first examination on the horizontal axis.
- Cervical dilatation corresponding to that time is noted on the vertical axis by putting a cross.
- Thereafter every 4 hours vaginal examination is performed and the cervical dilatation is noted and marked on the graph.
- The points are joined and interpretation is made.

c. Interpretation of cervicograph plotting

- During active phase, a line is seen on the graph from 3 to 10 centimeters progressing at the rate of 1 centimeter per hour. This is Alert Line.
- Four hours to the right of alert line another parallel line is seen which denotes Action Line.
- When the line of cervical dilatation of patient lies on left side of alert line, it indicates satisfactory progress.
- If the line falls on the right side of alert line, it indicates slow progress and requires careful monitoring to note the progress.

- If the progress reaches or crosses the action line, careful review of the case is necessary to find the cause for delay followed by prompt decision regarding further management

In summary -

- Line of progression to the left of alert line: Satisfactory progress
- Progressing on Alert line, Alert line crossed: Need to prepare for referral
- Action line crossed: Executing referral

d. Limitations of partograph

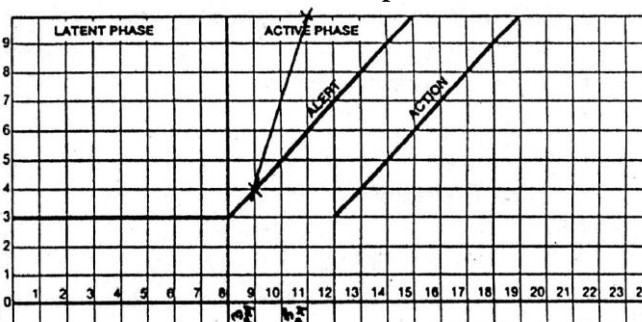
The limitations of this graph include:

- It can be used only for the first stage of labour
- It does not indicate the cause for delay, which has to be detected by the reviewing person.

6.1.3. Cervicographs showing satisfactory progress

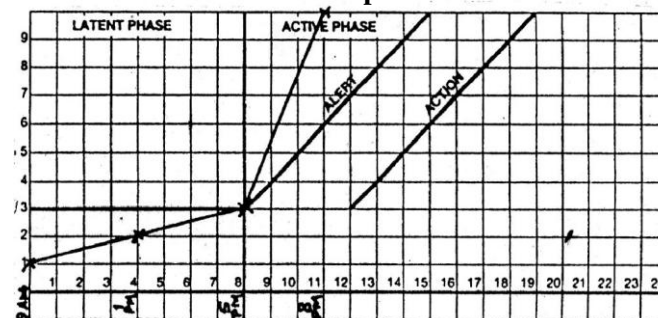
On admission to labour ward, different women can have different cervical dilatation and their rate of progress also differs. Following example depicts clinical situations indicating satisfactory progress of cervical dilatation.

a. Woman admitted in Active phase



At 3 pm the cervix was 4 centimeters dilated, at 5 pm the cervix became fully dilated

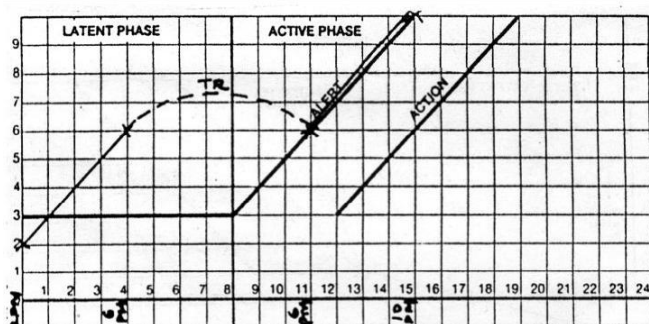
b. Woman admitted in latent phase



At 9 am cervix was just one centimeter, at 1 pm cervix was two centimeters dilated. At 5 pm cervix was three centimeters dilated, at 8 pm cervix was fully dilated.

Duration of Latent phase was 8 hours and Active phase was three hours

c. Woman admitted in latent phase and progressing rapidly to active phase

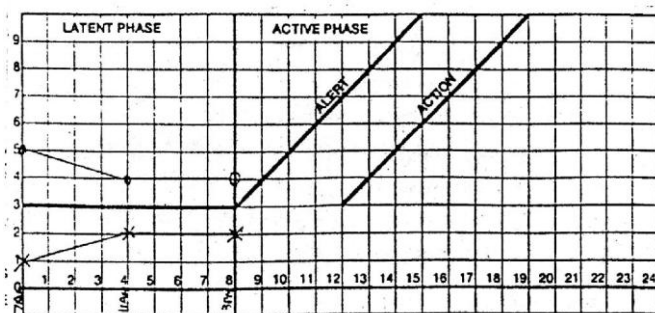


At 2 pm the cervix was 2 cms dilated, at 6 pm the cervix was 6 cms dilated. These records of time and cervical dilatation are now taken to active phase on alert line by a dotted line. At 10 pm the cervix was fully dilated. Total duration of labour was eight hours.

6.1.4. Cervicographs showing unsatisfactory progress

a. Prolonged latent phase

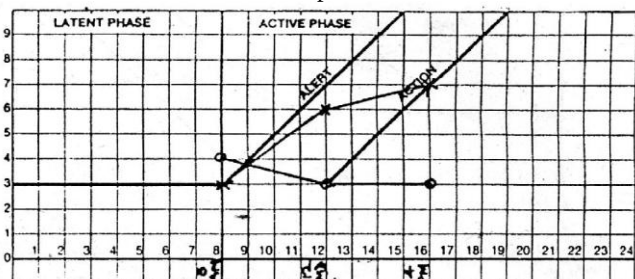
A woman attending PHC at 7 am had cervical dilatation at that time, 1 cm, at 11 am 2 cm & at 3 pm 2 cm.



Some women remain in latent phase for more than eight hours. The causes could be firm cervix, occipitoposterior position of vertex, excessive use of sedatives etc. Such slow progress usually does not result in serious maternal or fetal complications. However, it may warn about possibility of subsequent slow progress. Such women may need oxytocic augmentation.

b. Abnormal Active Phase

A woman in labour had cervical dilatation at 8 am 3 cms, at 12 noon 6 cms & at 4 pm 7 cms

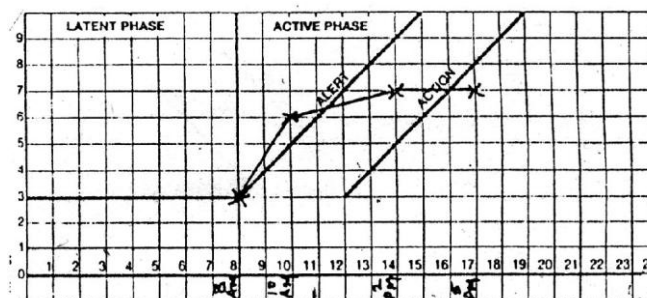


Causes of such slow progress include, hypotonic uterine action, occipito posterior position, deflexed head, CPD etc.

Interventions required include amniotomy and oxytocin infusion as per the clinical situation. If there is no progress after augmentation or if signs of fetal distress develop, an emergency caesarean section might be required. Hence such a woman should be referred to a well-equipped maternity unit.

c. Secondary arrest of cervical dilatation

Following graph shows secondary arrest of cervical dilatation.



Pregnant woman had cervical dilatation at 8 am 3 cm, at 10 am 6 cm, at 2 pm 7 cm & at 5 pm 7 cm.

In this case, the initial progress was satisfactory up to 6 cms of cervical dilatation. Thereafter there is significant slowing and cessation of cervical dilatation at 7 cms.

Causes of secondary arrest of cervical dilatation include CPD due to large head, deflexed head or contracted pelvis. Such patients need careful review for the cause of delay. Chances of requiring caesarean section are fairly high in them. An urgent referral to specialty hospital is therefore indicated.

6.2. Assess and monitor the progress of labour as given below

6.2.1. First stage of labour: Satisfactory progress

- Latent phase less than 8 hours - (Time of admission to 3 cms cervical dilatation)
- Active phase progression 1 cm/ hour or more
- On cervicographic record, cervical dilatation progress is to the left-of Alert line
- Continue observation till second stage starts.

6.2.2. Second stage of labour

- Mother starts pushing (bearing down effort). Perineum bulges, anus gapes and cervix is fully dilated
- Monitor progress and fetal well being during second stage by:
 - FHR every 15 minutes
 - Assessment of descent of station every 15 min.
 - Presence of caput and moulding
 - Meconium staining of liquor.
- Give mediolateral episiotomy under local infiltration anesthesia, if mother is unable to push or if there is undue delay.
- Delivery of head takes place usually within 30 minutes in a multi and 60 minutes in a primi para.
- Conduct delivery with strict aseptic precautions. Follow universal biosafety precautions.

6.2.3. Third stage of labour - Delivery of placenta

- Routine management: Look for signs of placental separation and allow spontaneous expulsion.
 - This method is safer in the hands of paramedics
 - Usual blood loss is around 300 ml.

- n Time taken is around 10-15 minutes
 - n Give Inj. Methergine 0.2 mg. IM after delivery of placenta
 - Active management: Active management of third stage of labour reduces blood loss and prevents PPH. This includes:
 - n Early clamping of umbilical cord
 - n Prophylactic use of oxytocics
 - n Controlled cord traction
 - After delivery:
 - n Examine placenta carefully for completeness and any abnormality
 - n Observe mother for two hours for TPR, vaginal bleeding, pallor, uterine retraction
 - n Encourage mother to breastfeed the baby within ½ hour of delivery.

7. In case of unsatisfactory progress of labour take actions as below

- If latent phase more than 8 hours: Review the patient to find whether she is in true labour, if so then consider augmentation of labour.
- In case of slow progress i.e. in early active phase, cervical dilatation rate is less than 1cm/hour. If vertex is engaged and cervix is well applied to the vertex then controlled amniotomy (ARM) can be performed to hasten the progress.
- After ARM, review progress after two hours. If progress is still slow, assess uterine contractions.
- If uterine contractions are weak, consider oxytocin augmentation.
- Secondary arrest of cervical dilatation: If after initial satisfactory progress, cervical dilatation does not progress for two hours or more in established active phase of labour, review for referral. This could be due to cephalo-pelvic disproportion, large head with deflexion is a possibility. Refer such patient to higher facility, as she may need operative intervention.
- If second stage is prolonged for more than 2 hours in primi and for more than 1 hour in multi, then:
 - n Assess size of baby and pelvis again.
 - n See whether fetal head is still palpable in suprapubic region

7.1. Refer the case if

- Failure of fetal head to descend (station fails to advance)
- Increasing caput or moulding
- Suspected mid pelvic and outlet contraction
- Occipitoposterior / occipitotransverse position with deflexed head
- Maternal exhaustion
- Fetal distress

Full dilatation of cervix does not assure a vaginal delivery

8. Management and appropriate referral of emergency situations

Many times emergency cases come to PHC, which require special attention. Some of these cases may not be managed at primary level. In such situation examine the mother thoroughly, give her primary treatment and then refer. The conditions are as below:

8.1. Obstructed labour

8.1.1. Causes

- Contracted pelvis and CPD
- Transverse lie, brow presentation, mento-posterior face presentation
- Deep transverse arrest of fetal head.

8.1.2. Diagnosis

- Non progressive labour, prolonged labour.
- Signs of maternal exhaustion
- Tachycardia, restlessness, sweating, mild fever, signs of dehydration
- Signs of fetal distress or death.

8.1.3. Signs of obstruction

- Lower uterine segment over stretched
- Bantle's ring seen which is rising progressively towards umbilicus.
- Suprapubic bulge - Oedematous bladder
- Presenting part - High, abnormal or showing excessive moulding
- On catheterization, scanty high colored urine which may be blood stained

8.1.4. Action

- Urgent referral
- IV infusion during referral will help in correcting dehydration.

At the institution, patient will be delivered mostly by caesarean section.

Delay in referral can result in uterine rupture, infection due to prolonged labour, fetal death, vesico vaginal fistula if presenting part is deep in the pelvis for prolonged period as in deep transverse arrest.

8.2. Uterine rupture

8.2.1. Causes

- Scarred uterus (previous caesarean section, uterine perforation etc.)
- Obstructed labour
- Incorrect use of oxytocic agents like Oxytocin, Prostaglandins
- Intrauterine manipulations such as internal podalic version and manual removal of placenta.

8.2.2. Diagnosis

- Cessation of uterine contractions after prolonged

obstructed labour

- Continuous pain in abdomen.
- Maternal tachycardia, restlessness, increasing pallor, hypotension, fresh vaginal bleeding, hematuria
- Fetus dead
- Abdomen distended, tender all over, fetal parts may be felt easily
- Signs of free fluid in abdomen
- In labour, presenting part may recede upwards

Dangers: Maternal shock and death due to severe internal hemorrhage

8.2.3. Action

- Urgent referral
- IV infusion of 1 litre of fluids will combat hypotension
- At the institution, patient will undergo exploratory laparotomy along with arrangements to replace blood volume lost.

8.3. Primary Post Partum Hemorrhage

8.3.1.

Blood loss > 500ml, tachycardia, pallor within 24 hours of delivery

Palpate fundus of uterus

Flabby uterus

Atonic PPH

- 1 Uterine massage
- 1 IV methergine 0.2 mg
- 1 IV oxytocin infusion - 20 units in 500 ml of Ringer lactate at 40 drops / min
- 1 Bimanual compression of uterus
- 1 If uterus still flabby IM carboprost tromethamine 250 mcg, can be repeated after 15 minutes
- 1 I. V. Fluids
- 1 Refer

Hard uterus

Traumatic PPH

- 1 Explore lower genital tract with Sim's speculum and sponge holding forceps
- 1 Look for cervical tears, vaginal tears or episiotomy extension
- 1 Suture the tears with catgut
- 1 Keep tight pack in vagina if oozing continues
- 1 IV fluids
- 1 Refer

8.3.2. Resuscitate the patient who is in shock as follows

- Place preferably no 18 needle or cannula & infuse at least one litre of Ringer's lactate.
- Give plasma expanders if available.
- Place a Foley's catheter in bladder to monitor urine output.
- Arrange for transportation to institution.

8.4. Retained placenta

(Placenta undelivered for 30 minutes)

Retained placenta

No vaginal bleeding
Usually placenta not separated

Refer urgently to specialty hospital
I V infusion

Profuse vaginal bleeding
Partially separated placenta

I. V. oxytocin infusion
I V. methergine
Refer urgently to SDH/DH.
Manual removal of placenta under sedation as a life saving measure only if, referral cannot be executed soon.

8.5. Meconium stained liquor

- If colour of liquor is meconium stained, or liquor is scanty and thickly stained, assess station and cervical dilatation.
- If delivery not imminent or FHR abnormalities or growth retarded fetus, refer the patient.

8.6. Cord prolapse

- Urgent referral by reposing the cord in vagina
- During referral give head low position and push the vertex upwards by fingers to avoid compression of cord.

8.7. Hand prolapse

- Urgent referral is required.
- Transverse lie with shoulder presentation results in premature rupture of membranes with hand prolapse and/or cord prolapse.
- The dangers are fetal death, obstructed labour and uterine rupture.
- With an average size baby such patient is usually delivered by caesarean section even if the baby is dead.

8.8. Compound presentation

Sometimes hand is felt by the side of vertex. After rupture of membranes, if the hand can be pushed above the vertex then the head descends and delivery may occur. If this cannot be done easily the patient requires to be referred.

8.9. Brow presentation

- On vaginal examination forehead, anterior fontanelle, part of upper face is felt.
- This patient requires urgent referral, as full term baby in brow presentation cannot deliver vaginally. It is delivered by caesarean section.

8.10. Face presentation

- On vaginal examination chin and face felt

- Assess position - Mentoanterior or mentoposterior
- Mentoposterior delivery is difficult and often caesarean section is required.
- In multiparous woman having small baby with mentoanterior face and good uterine contractions delivery is possible mechanically. Hence during referral a midwife must accompany with a delivery tray.

8.11. Breech delivery

Breech presentation is the commonest malpresentation seen in around 3-4% cases. Baby is at risk of birth asphyxia and birth trauma. Risk is high if baby is large, pelvis borderline, footling breech and birth attendant is unskilled.

If any pregnant woman arrives for delivery at PHC, following steps should be carried out for safe breech delivery -

- Keep neonatal resuscitation tray ready and take the woman to the edge of delivery table.
- Keep episiotomy tray ready. Give episiotomy when buttocks are on perineum
- Allow the baby to deliver spontaneously till umbilicus is born and note the time. Head should be delivered within eight minutes once it is born up to umbilicus.
- Keep a loop of umbilical cord aside
- Look for winging of scapulae and look for arms across the chest
- Deliver the anterior arm followed by posterior arm.
- Allow the baby to hang by its own weight until the nape of neck is seen
- Hold the feet of baby in right hand and turn the baby gently towards the mother's abdomen while assistant is giving suprapubic pressure.
- If the head fails to descend within 2-3 minutes then take the baby on your left forearm, put the finger of your left hand into the mouth of baby or keep two fingers on malar bones. Keep the fingers of right hand on the shoulders and perform jaw flexion and shoulder traction maneuver.

8.12. Twin delivery

At times MO or nursing staff may detect a case of undiagnosed twin pregnancy only after delivery of the first baby.

- Do not give Inj. Methergine
- Perform per abdominal examination to note the lie and presentation.
- If cephalic presentation, do vaginal examination. Rupture the membranes after fixing the head and monitor uterine contractions. If inadequate, start oxytocin infusion slowly.
- If breech with good-size baby and uterus contracting well, conduct breech delivery.
- If second twin is in transverse position refer urgently to FRU. Such patient with a good sized baby is mostly delivered by caesarean section.
- If you deliver second baby, prevent PPH by active management of third stage.

8.13. Polyhydramnios

A case of significant overdistention delivering at PHC requires attention to following points:

- Risk of placental abruption is high when the membranes rupture and a large volume of amniotic fluid is drained suddenly.
- Possibility of cord prolapse is high.
- There is a risk of atonic PPH, hence third stage should be managed actively.
- Baby should be examined carefully for excluding congenital malformations (Oesophageal atresia or tracheo oesophageal fistula should be remembered)

9. Important aspects about referral of any obstetric emergency

Follow the guidelines as below when referring any case to the higher referral center

- Counseling of the patient and relatives.
- Before referring, give the medication appropriate for the condition as given above.
- Give the referral note indicating salient points about history, clinical findings, medication given etc.
- Advice to family members regarding specific referral institute where the management required is available, importance of blood donors if blood transfusion is needed to the patient. Help the patient and relatives for arranging transport.

10. Guidelines for use of Oxytocin

Oxytocin can be used for augmentation of uterine contractions at PHC level. It enhances the normal pattern of uterine contractions with intermittent relaxation. Following are the guidelines for judicious use at PHC level:

10.1. Dose and administration

Add 2 IU to a bottle of normal saline or Ringer's lactate. Infuse 8 drops/min (2mIU/min) initially. Increase infusion rate by 8 drops/min. every 30 minutes.

Escalating technique: Dose is increased every 30-40 min. until optimum response is achieved, which is 3 contractions in 10 minutes, each lasting for 45 seconds.

10.2. Contraindications

- CPD
- Fetal distress
- Grandmultiparity
- Malpresentations
- Scar on the uterus

10.3. Monitoring

Monitor following parameters every 15 minutes -

- Drip rate
- Uterine contractions - frequency and intensity
- FHR and maternal pulse
- Check the progress of labour periodically.

10.4. Complications

- Hypertonic uterine contractions - 6 or more uterine contractions / 10 minutes
- Uterus failing to relax between the contractions
- Uterine rupture - if drip is not supervised vigilantly.
- Water intoxication if too much of electrolyte free infusion is administered.
- Neonatal hyperbilirubinaemia
- Fetal bradycardia (distress)

10.5. Caution

- If hyper stimulation, discontinue the drip & start oxygen to mother.
- Oxytocin should never be given intramuscularly
- Maximum drip rate should not exceed 60 drops/min, otherwise it may lead to the risk of water intoxication.
- Cautious use in multiparous women.

10.6. When to discontinue the drip

Monitor progress of labour partographically. After getting optimum uterine response, if labour progress is unsatisfactory, refer her.

10.7. For treatment of PPH

Oxytocin 10-20 IU in a bottle of one-pint normal saline can be given at the rate of 40 drops/min for prevention or control of atonic PPH.

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6. POSTNATAL CARE

Postnatal period is important for mother as some important complications during this period may require immediate attention. Puerperium is a period of 42 days following delivery. Complications occur mostly in first 10 days. Therefore all delivered cases should be visited by ANM within 48 hours. MO should ensure that the cases are examined by ANM.

1. Advice and examination required during postnatal period

- Examination of mother for postnatal complication if any
- Recording birth weight of newborn child
- Advice mother regarding exclusive breastfeeding
- Advice about first dose of immunization, date of immunisation.
- Rest & diet of mother during postnatal period.
- Counseling regarding contraception
- Iron folic acid supplementation

1.1. Postnatal examination

All postnatal mothers should be examined within first 24 hours of delivery either in PHC or at home by ANM in case of home deliveries. During this check up

- Examine whether mother has excessive vaginal bleeding indicating PPH (atonic or traumatic)

- Examine for pallor, restlessness, tachycardia, uterus retracted or flabby.

During the subsequent postnatal visits examine as below:

Examination	Abnormality
Temperature	Puerperal pyrexia
Pulse	Tachycardia
Breast	Engorgement, mastitis
Uterus	Soft, tender, sub involuted
Lochia	Foul smelling, profuse

2. Management of important postnatal complications

Main post partum complications are:

- Postpartum hemorrhage - Primary and secondary
- Puerperal sepsis - Genital sepsis, peritonitis, septicemia
- Mastitis leading to breast abscess
- Thrombophlebitis, deep vein thrombosis

2.1. Secondary PPH

Secondary PPH is profuse vaginal bleeding (>500ml) beyond 24 hours after delivery. It is usually associated with retained lobe of placenta, clots or uterine infection.

- Look for signs of infection and uterine sub involution
- If uterus empty, give antibiotics
- Refer the patient with shock for blood transfusion.
- In case of retained products, patient needs uterine exploration under anesthesia, blood transfusion and antibiotics. Hence refer to higher facility for these interventions.

2.2. Puerperal pyrexia

Puerperal pyrexia is suspected when temperature of mother is 38° C (100 .4° F) on 2 consecutive days excluding first 24 hours.

Causes of puerperal pyrexia

- Puerperal sepsis
- Mastitis
- Thrombophlebitis
- **Urinary** Tract Infection
- Malaria
- Other causes

2.2.1. Risk Factors

- Prolonged labour
- PROM
- Unclean delivery
- Anaemia, under nutrition
- Diabetes Mellitus
- HIV infection

Manage puerperal pyrexia due to various causes as given below

2.2.2. Genital sepsis

- On examination patient has pallor, tachycardia, soft uterus,

tender, sub involuted (i.e. large for the day of puerperium), abdomen soft, non-tender.

- Get Hb estimation done.
- Treat by giving oral antibiotics for 7 days.
- Review after 48 hours. If response is seen, continue treatment and in case of nonresponse, refer the patient.

2.2.3. Pelvic peritonitis

If P/A examination reveals tenderness in lower abdomen (iliac fosse) with or without distention and guarding, suspect pelvic peritonitis and refer to FRU

This patient needs hospitalization and parenteral antibiotics.

2.2.4. Generalised peritonitis or septicemia

If a patient of puerperal pyrexia is looking very ill, restless, has marked tachycardia and has distention of abdomen, guarding, tenderness over abdomen, sluggish or absent peristalsis, then such patient is having generalized peritonitis or septicemia. Refer her to tertiary care center, as she requires special care in critical care unit. There is risk of death due to endotoxic shock, renal failure, DIC.

Any degree of puerperal sepsis when associated with severe anaemia, there is risk of rapid deterioration. Hence refer such patient to a specialist at district hospital.

2.2.5. Puerperal sepsis

Clinical Presentation	Place of care	Principles of care
Perineal wound infection, uterine infection	PHC	*Oral antibiotics, hematinics. Review after 48 hrs. No response - Refer
Pelvic peritonitis	FRU	**Hospitalization. Parenteral antibiotics for 7 to 10 days.
General peritonitis Septicemia	Tertiary care center	Critical care, higher antibiotics, evaluation to explore need for surgical intervention

* Cap Ampicillin / Amoxycillin 500 mg 6 hourly for 7 days.

** Inj. Ampicillin 1 gm IV followed by 500 mg 6 hourly

Inj. Gentamycin 80 mg twice a day I.M.

IV Metronidazole 500 mg 8 hourly

IV fluids.

After 48 hours if patient improves and resumes oral intake, cap Ampicillin and tab Metronidazole can be given orally.

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7. REPRODUCTIVE TRACT INFECTIONS1. Reproductive Tract Infections (RTI)

(RTI) SEXUALLY TRANSMITTED DISEASES (STDS)

The infections of genital organs are polymicrobial and mostly preventable, forming a major disease burden amongst women from reproductive age groups.

1.1. Etiology

- Postpartum, postabortal, postoperative infections, infection following IUD insertion
- Endogenous
- **Sexually** transmitted

1.2. Consequences

- Chronic pelvic pain
- Infertility
- Increased risk of HIV transmission.

1.3. Clinical profile

Clinical profile	Symptoms	Signs	Common organisms
Vulvovaginitis	Vaginal discharge, pruritus vulvae, dysuria	Inflamed vulva and vagina, discharge	Trichomonas vaginalis, Candida albicans, Gardinerella vaginalis and anaerobes.
Cervicitis	Mucopurulent discharge, dysuria, low backache	Inflamed cervix, mucopus from cervical os	N.Gonorrhea, Chlamydia
Endometritis	Foul smelling vaginal discharge, hypogastric pain, fever.	Suprapubic tenderness, purulent discharge from cervix	Gram negative & positive organisms, anaerobes.
PID presentation may be acute, sub acute, chronic	Lower abdominal pain, low backache, dysparunia, vaginal discharge, fever, menstrual problems (menorrhagia, congestive dysmenorrhoea, polymenorrhoea) and infertility. Often seen as postpartum, postabortal, postoperative infection.	Lower abdominal tenderness, cervical motion tenderness, uterine tenderness, fixity, fomicial tenderness, adnexal mass	Polymicrobial

1.4. Diagnostic evaluation

- History for risk assessment
- Complete physical examination
- Evaluation of vaginal discharge (pH, wet-mount, KOH mount, Gram Stain)
- USG for adnexal mass

1.5. Treatment guidelines

- Postpartum / Postabortal sepsis: Antibiotics for 10 days
- STD: As per syndromic management guidelines

2. Sexually Transmitted Diseases (STDs)

STDs are a group of communicable diseases, which are transmitted from an infected person to another individual predominantly through sexual contact. More than 20 microorganisms are known to be transmitted through sexual contact. Some of the important STDs are as follows:

Bacterial : Chlamydia, Gonorrhoea, Syphilis, Chancroid, Lymphogranuloma venereum (LGV), Granuloma Inguinale, Bacterial vaginosis.

Viruses: Herpes Simplex, Human papilloma, Molluscum Contagiosum, Hepatitis B, HIV 1 & 2

Fungi: Candida albicans

Protozoal: Trichomonas vaginalis

Parasites : Scabies, Pediculosis

3. Complications and consequences of STDs

- Pelvic Inflammatory Disease (PID) leading to infertility, ectopic pregnancy and chronic pelvic pain.
- Increased risk of HIV transmission
- Cervical cancer (HPV)
- Adverse outcome of pregnancy
 - Spontaneous abortions, stillbirths due to syphilis
 - Congenital Syphilis
 - Ophthalmia Neonatorum (Gonorrhoea, Chlamydia)
 - Prematurity, Low birth Weight,
 - Premature rupture of membranes
 - Neonatal infections

4. Diagnosis of STDs at PHC

4.1. Examination of women

- Abdominal examination: Look for tenderness, mass, inguinal lymph nodes
- Local examination: Genital lesions.
- Speculum examination: Vulva, vagina, cervix for inflammation, discharge, ulcers, warty lesions
- Vaginal examination: Cervical motion tenderness, fornical tenderness, adnexal mass, uterine retro-version, and restricted mobility.

4.2. Examination of men

- Local Examination: Genital lesions
- Palpation:
 - Look for urethral discharge (milking the urethra if necessary)
 - Groin: Enlarged lymph nodes
 - Scrotum: Testes, epididymis for tenderness or swelling
 - Ulcers: Painful / painless, indurated

5. Syndromic Management of STDs

Evaluation of STD patient to find the etiological agent for giving anti-microbial treatment requires more time, multiple visits, laboratory facilities, greater expertise of clinician, which are unavailable at PHC. Therefore currently syndromic management which is cheap, simple, effective, less time consuming, requiring single visit for diagnosis/treatment and no laboratory tests is recommended for use in PHC.

Commonly occurring STD syndromes (groups of symptoms and signs) in men and women are identified. Treatment guidelines are formulated for each syndrome after considering all possible microorganisms responsible for that clinical syndrome, current antibiotic sensitivities and the flow charts or treatment algorithms are developed.

5.1. Clinical syndromes in women

- Vaginal discharge
- Genital ulcer disease
- Inguinal bubo
- Lower abdominal pain.

5.2. Clinical syndromes in men

- Urethral discharge
- Genital ulcer disease
- Inguinal bubo
- Scrotal pain or swelling

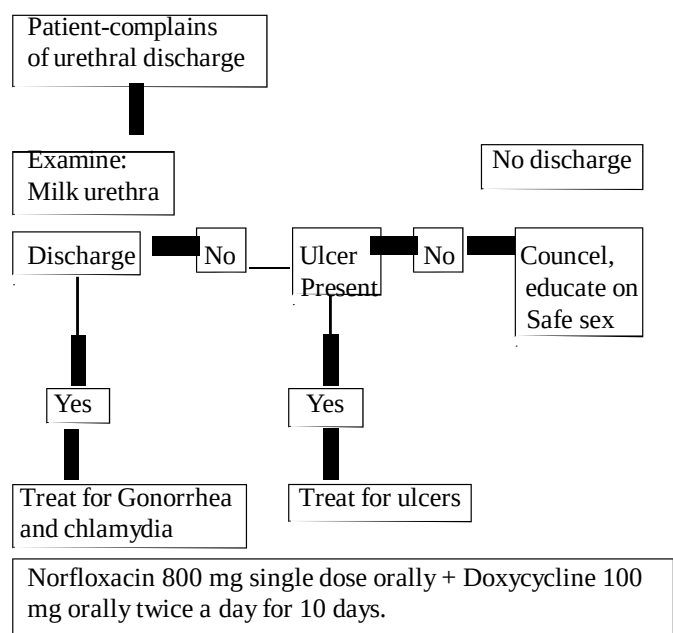
5.3. Comprehensive care of STD patients

Along with clinical care and prescribing drugs, STD patients need to be given health education for understanding mode of spread of disease and their consequences on general health, reproductive health, fertility and pregnancy outcome. They should be counseled for behavioral change as below:

- Complete your treatment and get yourself cured.
- Follow up is essential to ensure that you are cured.
- Examination and treatment of sexual partner / partners is essential.
- Follow safer sex practices

5.4. Urethral Discharge

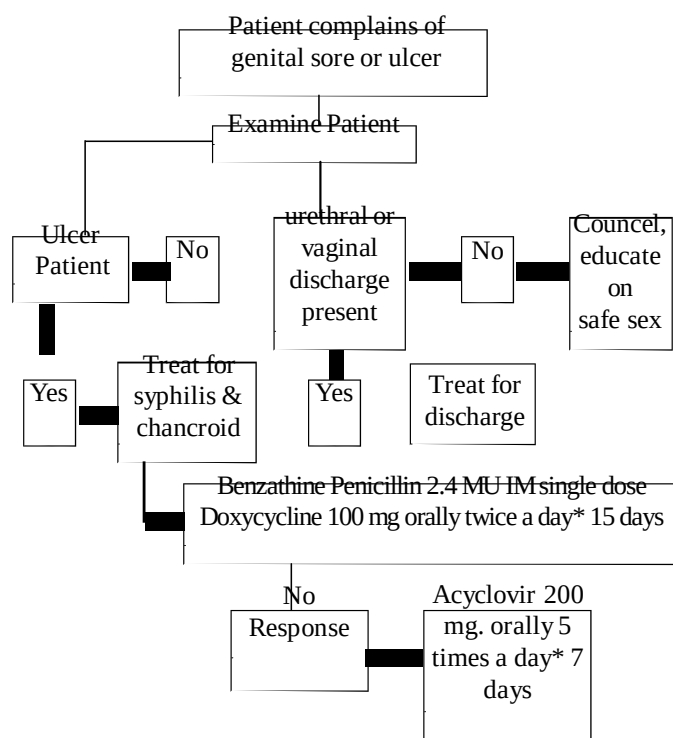
Common causes for urethral discharge are Gonorrhea, Chlamydia.



- Drugs of choice for Gonorrhoea are Ciprofloxacin, Azithromycin, Ceftriaxone
- Drugs of choice for Chlamydia are Doxycycline, Azithromycin
- If persistent / recurrent urethral discharge is noted in men, causes may be
 - Re infection / poor compliance to treatment ■■■ Repeat treatment
 - Non-response to treatment ■■■ Treat for Trichomoniasis

5.5. Genital Ulcer (Both sexes)

Causes may be Syphilis, Chancroid, Granuloma inguinale, LGV, herpes genitalis

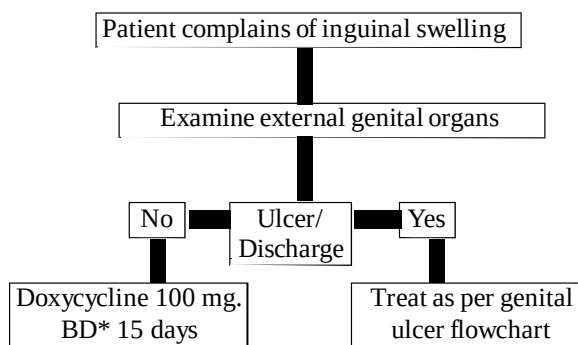


Treatment Options

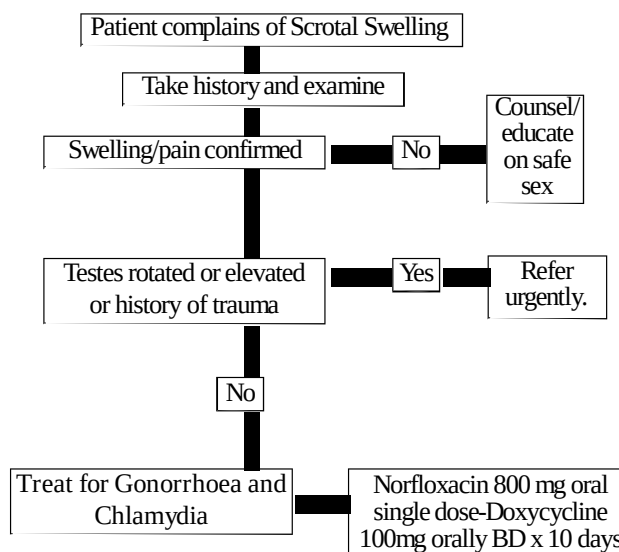
- Syphilis: Benzathine Penicillin/ Procain Penicillin.
For penicillin allergy and for non pregnant women Doxycycline/Tetracycline
- Chancroid: Ciprofloxacin / Erythromycin / Azithromycin
- Granuloma: Azithromycin / Doxycycline
- LGV: Doxycycline/Erythromycin.

5.6. Inguinal Bubo

Common causes are LGV, Chancroid



Remember: Infection of lower limb can also cause Inguinal bubo

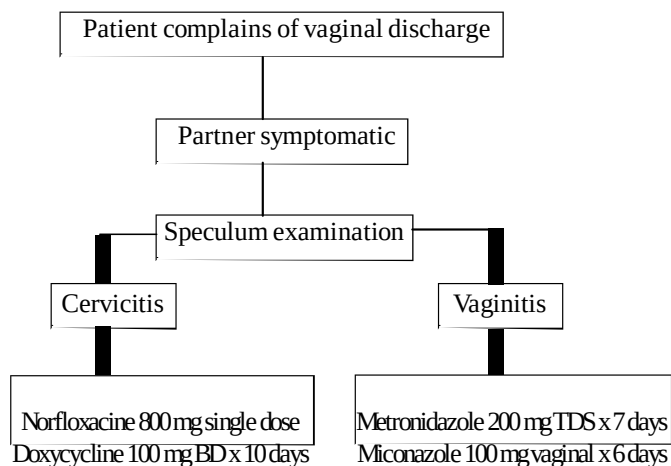


5.7. Vaginal discharge

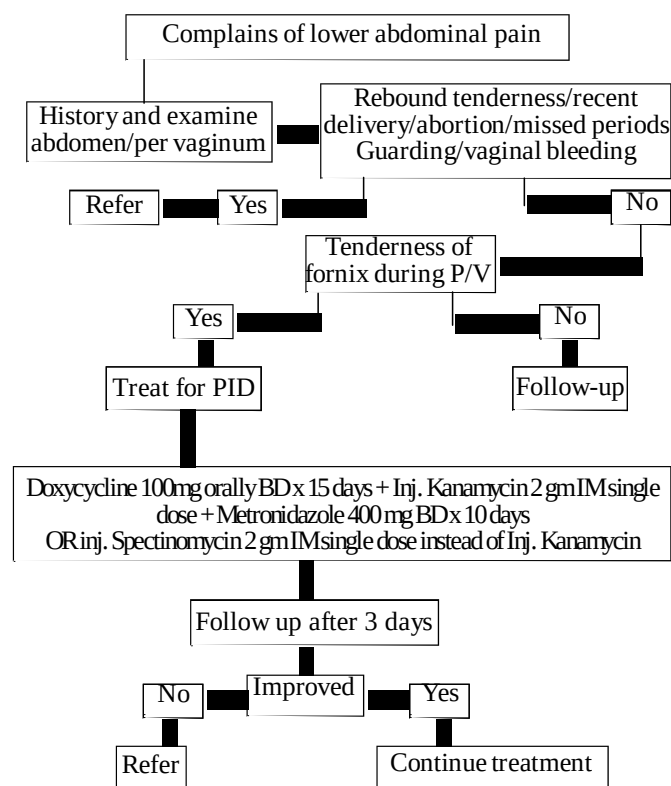
It may be due to mucopurulent cervicitis, Bartholinitis, PID
Causes may be Gonorrhoea, Chlamydia

Vaginitis

- Causes may be bacterial vaginosis, Trichomonas vaginalis.
- Drug of choice is Metronidazole.
- For Candidiasis drugs that may be used are Clotrimazole, Miconazole, Fluconazole, Nystatin.



5.8. Lower abdominal pain



5.9. Limitations of syndromic management

- Asymptomatic individuals cannot be treated.
- Over treatment may result in increased cost.
- Side effects of drugs and possible development of drug resistance.

6. Role of Medical officer in RTI/STI

- Treatment of RTI/STI should be given as regular OPD treatment for the cases attending OPD. However campaign approach is used presently for treatment of RTI/STI.
- Continuous training of health workers so that they will identify the syndromes correctly and refer these cases to PHC or get them examined.
- Display the management charts of syndromic management in OPD room so that they can be used as a ready reckoner.

- During the management of cases give emphasis on following
 - Ensure confidentiality
 - Health Education
 - Counseling
 - Promotion and availability of condoms
 - HIV counseling and referral to Voluntary Counseling and Treatment Center.
- **Family** Health Awareness campaign is organized at PHC. Detailed guidelines of this campaign are given in Chapter on HIV/AIDS.

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8. POPULATION POLICY

1. National Population Policy 2000

Population of India as per Census 2001 is 102.7 crores i.e. 16% of the world's population on 2.4% of the globe's land area. While global population has increased three fold during this century from 2 billion to 6 billion (3 times), population of India has increased nearly five times from 238 million to 1.02 billion (4 & ½ times) in the same period.

1.1. Objectives

- Immediate objectives: To address unmet need for contraception, health care infrastructure and health personnel and to provide integrated service delivery for basic reproductive and child health care.
- Medium term objective: To bring TFR to replacement levels by 2010, through vigorous implementation of inter-sectoral operational strategies.
- Long-term objectives: To achieve a stable population by 2045 at the level consistent with the requirements of sustainable economic growth, social development and environmental protection.

1.2. National social demographic goals for 2010

- Address unmet needs for basic RCH services, supplies and infrastructure.
- Make school education up to the age of 14 years free and compulsory and reduce dropouts at primary & secondary school levels to below 20% for both boys and girls.
- Reduce IMR below 30/1000 live births.
- Reduce maternal mortality ratio to below 100/100,000 live births.
- Achieve universal immunization of children against all VPDs.
- Promote marriage for girls not earlier than age 18 & preferably after 20 years of age.
- Achieve 80% institutional deliveries and 100% deliveries by trained persons.
- Achieve universal access to information / counseling and

services for fertility regulation and contraception with a wide basket of choices.

- Achieve 100% registration of births, deaths, marriage and pregnancy.
- Contain the spread of AIDS and promote greater integration between management of Reproductive Tract Infections (RTI), Sexually Transmitted Infections (STI) and HIV/AIDS.
- Prevent and control communicable diseases.
- Integrate Indian Systems of Medicine (ISM) in the provision of RCH services and in reaching out to households.
- Promote small family norm vigorously to achieve replacement levels of TFR.
- Bring about convergence in implementation of related social sector programmes so that family welfare becomes a people centered programme.

2. Population policy of Maharashtra (2000)

Population policy of Maharashtra state is formulated on the basis of National Population Policy.

2.1. Goals

- Reduction of TFR from 2.5 to 2.1 by 2004
- To reduce IMR and MMR
- To improve health status of family
- Improve accessibility of health services to small villages, tribal area and slum population.

Goals for some important indicators

Indicator	2004	2010
Crude Birth Rate	18	15
Crude Death Rate	6.4	5
Total Fertility Rate	2.1	1.8
Infant Mortality Rate	25	15
Neonatal Mortality Rate	20	10
Maternal Mortality Rate	150	100

2.2. For achieving these goals emphasis is given on following:

- Improvement in management of RCH services through quality monitoring and supervision.
- Increase availability and accessibility of services.
- Creating community awareness about available services and improve health services utilization.
- Health education to community about age at marriage, son preference, safe delivery etc.
- Health services and counseling services for adolescent boys and girls.
- Inter departmental co ordination.

2.3. Specific interventions proposed

- Small family norm (2 live children).
- Personal benefits only for small families e.g. getting benefits of subsidies to only those families having two

children.

- Achievements related to population policy will be included in confidential reports of all concerned officers.
- Improving availability of health services: Strengthening laparoscopic sterilization services, improving transport services for emergency obstetric care in difficult area.
- Arranging camps with the help of NGOs e.g. MCH, RTI/STI diagnosis and treatment, sterilization camps.
- Strict implementation of following laws and policies:
 - Child marriage restraint act 1978.
 - Free education for girls.
 - Women policy.
 - Birth, Death and Marriage registration
 - Pre conception & Prenatal Sex Determination Act.
 - Small family norm for elections of local self-government.
- To improve quality of services. Prize scheme for best performing government hospitals:
 - Best District Hospital and Women Hospital (State)
 - Best RH (Regional level)
 - Best PHC and SC (District)
 - For FRU-Best worker / Doctor / Hospital
- For safe delivery and reducing maternal / infant mortality, training will be given to untrained dais at village level.
- Improving health services in urban area especially concentrating on improving health status of women and adolescent girls.
- MCH service centers - To make available safe delivery service as well as MCP sessions for villages which are not headquarter villages of PHC / SC.
- Savitribai Phule Yojana - for Below Poverty Line eligible couples.
 - If eligible couple undergoes sterilization operation on 1 female issue & no son - Rs.10,000 deposit is kept in daughter's name which will be payable to her at the age of 18 years. In addition to this, after she completes her 10th std. Rs. 5000 deposit will be kept on her name which will be payable if she marries after 20 years.
 - If eligible couple undergoes sterilization operation on 2 female issues & no son - Rs. 5000 deposit on name of both daughters is kept which will be payable to them at the age of 18 years. In addition to this, after daughters pass their 10th std. Rs. 5000 deposit will be kept in the name of each daughter which will be paid if they marry after 20 years.
 - For getting the benefit of this scheme following information has to be sent to DHO:
 - a. Certificate indicating sterilization performed on one or two female issues, giving R3 number.
 - b. Yellow card as a proof for client being BPL.
 - c. Application of client.

3. Child marriage restraint act 1978

- Marriage of boys less than 21 years and of girls less than 18 years is legally banned.
- Those who are concerned with deciding, performing such marriages will be punished by 3 months imprisonment and fine.
- If a boy who has completed 18 years but is below 21 years marries a girl less than 18 years, then he will have 15 days imprisonment or 1000 Rs. fine or both and if he is more than 21 years then 3 months imprisonment.
- In case of child marriages, if their parents, caretakers do not try to prevent such marriage, they can have 3 months imprisonment or fine.

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9. FAMILY WELFARE PROGRAMME

Family planning means not only sterilization but it refers to practices that help individuals or couples to attain broader objectives as included below:

1. Objectives

- To avoid unwanted births
- To bring about wanted births
- To regulate interval between pregnancies
- To control the time at which births occur in relation to the ages of the parent
- To determine number of children in the family

Correct advice to the couples with infertility is also one of the important aspects of FP. Presently the services under family welfare are incorporated in Reproductive and Child Health Programme.

Contraception means prevention of conception. With the help of various birth control measures, couple can avoid pregnancy, can regulate (decide) interval between pregnancies and can also determine their family size.

Various surveys have shown that many women really want to avoid pregnancy but do not have knowledge of contraceptive, how to use them and from where to obtain. Such women may become pregnant and face complications during pregnancy and delivery or may go for MTP by untrained person under unhygienic conditions that may lead to complications and even death. This unfulfilled need of contraception is called as 'unmet need' for contraceptives. MO and PHC staff should be aware of the fact that providing contraceptive services to all needy and willing couples will not only prevent pregnancy but also prevent childbirth related mortality and morbidity. Although some of the contraceptives have a few side effects, risk associated with this is much less than risk of pregnancy, MTP and childbirth.

It is now accepted fact that easy accessibility to good quality family planning services is basic right of all women, which helps to prevent pregnancy, unsafe abortion and childbirth

related deaths and long term morbidity.

Family planning programme services in PHC should be planned and managed in such a way that unmet needs of all women from PHC area are fulfilled. Regular contact between client and health workers is very essential for satisfactory use and continuation of contraceptive methods.

2. Activities to be followed for systematic implementation of family welfare programme

2.1. Eligible couple (Married Women in Reproductive Ages-MWRA) survey

The term eligible couple is now substituted as Married Women in Reproductive Ages (MWRA). Married Women in Reproductive Ages (Eligible couple) survey provides village wise information about total couples and couples requiring spacing/permanent methods of contraception. This will help in planning the programme of PHC.

MWRA (Eligible couple) survey is carried out in the month of April every year and information is entered/updated in Eligible Couple Register (R-14 register). MWRA (Eligible couple) means couple in which age of a wife is between 15 to 44 years. Couples who have accepted permanent methods of contraception are also considered as eligible couples. There are 160-170 eligible couples per thousand population.

2.1.1. Planning of the survey

MO should plan MWRA survey with the help of HA male and female. Steps for planning survey are -

a. Prepare map of PHC & distribute villages

- Make map of PHC. Show all villages, vadi-vastis along with roads. Do not forget to show lonely farmhouses.
- Distribute all villages among health workers M and F with the help of this map.

b. Prepare day wise programme

- Prepare day wise programme of survey. One MPW must survey 500 population daily. Remote areas, lonely farmhouses should preferably be given to MPW (M).
- Identify daily starting house and last house by M number and make chart of daily survey area, population, M number wise starting point and end point for each MPW.
- Add other important activities to the survey if required like enumerating child deaths which were missed, M numbering, cataract survey etc.

c. Provision of formats

- Provide sufficient copies of formats to each worker for the survey. OPD fund can be utilized for purchase of stationary required for survey by going through the required procedure. MWRA (Eligible couple) information should be collected as per format of R-14 register.

d. Plan for supervision

- Divide all workers among Health Assistants for supervision. Health Assistant should verify 10% of survey carried out by MPWs. HA must visit few houses along with MPW and should also check the survey

independently. If there are some mistakes, HA should report this to MO. Survey should be repeated if necessary.

- MO should verify 1-2% of all the houses surveyed. One MO should fully supervise the survey.
- Summary of survey should be prepared by health workers under supervision of HA (M and F) and MO. There are total twelve formats in which summary is drawn. MO should check correctness; crosscheck the information given in various formats.

2.1.2. Verification of quality of survey

Quality and completeness of survey can be judged with the help of following points.

- First tally the surveyed population with estimated population of that area. If survey population is less, some areas must have been missed. If it is more, then the worker has not deducted the deaths and out-migration and simply added new births and in-migration to old population.
- As per norms, there are 160-170 eligible couples per 1000 population, check this norm for survey reports of each MPW. If couples are less, then health worker has missed some of the couples; most probably newly married couples and if couples are more, higher age group couples may not have been deducted by MPW.
- Get independent information of few newly married couples in the area. This information can be obtained from marriage invitations cards sent to MO and PHC staff. Check whether these couples are included in survey.
- Check proportion of EC according to number of issues: The norm or approximate proportion of MWRA (eligible couples) as per number of issues is as below:

Issues	% of MWRA
No issues	10%
1 issue	25%
2 issues	27%
3+ issues	38%

If the proportion is not more or less as above, then possibility of entry of incorrect information should be ruled out.

- Similarly check whether MWRA (eligible couples) are correct as per the norm according to age of wife as given below:

Age group	% of MWRA
15 - 19 years	11%
20 - 24 years	20%
25 - 29 years	22%
30 - 34 years	19%
35 - 39 years	15%
40 - 44 years	13%

- If there are fewer couples in 15-19 age group, possibly newly married couples have been missed and if more couples in 40-44 age group then over-age couples are included.

- Examine number of ANC identified in survey. At any given time, there should be 15-18 ANCs per 1000-surveyed population. If total ANCs enumerated as per survey are approximately within this range, then survey is correctly done. If less ANCs are identified, some houses (most probably remote houses) have been missed.

2.1.3. Use of survey and R-14 register for MO

- To know exact population of PHC and also village wise population.
- To know total number of MWRA (eligible couples) in PHC area.
- To know total protected and unprotected MWRA (eligible couples) from area.
- To calculate village wise couple protection rate (CPR).
- To identify villages with lower CPR and take actions accordingly to fulfill unmet needs of couples.

2.1.4. Calculate couple protection rate for each village

Couple Protection Rate (CPR)

CPR is proportion of couples protected by using particular temporary or permanent family planning method. Calculate Couple Protection Rate (CPR) for PHC as well as for each village with the help of following formula -

$$\text{CPR} = \frac{\text{No. of eligible couples using any FP method} \times 100}{\text{Total number of eligible couples in the area}}$$

Calculate CPR of each village and CPR for whole PHC as below:

- All the methods (Permanent and temporary): Total CPR
- Each method i.e. method specific CPR
- For all permanent methods
- For all temporary methods

Village wise comparison of CPR will give information about villages with low CPR that need to be paid more attention. MO should try to find out reasons for low use of FP methods in that village and take actions accordingly.

As the state Population policy emphasizes 'two child norm', MO should calculate CPR for couples with 2 issues. This will help to know proportion of EC yet to be protected and therefore needing attention.

3. Know available contraceptive methods that can be offered through PHC staff.

3.1. Temporary (Spacing) methods: These are for delaying first pregnancy or for spacing between two pregnancies for desired period. This includes natural methods of contraception like breast-feeding and safe period. Contraceptives available for spacing through PHC are, Intra Uterine Contraceptive Devices (IUCDs), Condoms (Nirodh) and Oral pills (Mala - N). Emergency contraception is also recently introduced in the programme.

3.1.1. Natural methods of contraception

Two important natural methods advisable to clients are:

- Breast-feeding
- Calendar (Safe period) method

a. Breast-feeding

Breast-feeding is most widely used natural method of contraception. Breast feeding is effective method of contraception till the child is exclusively breast fed or for six months, whichever is earlier. To be effective, there should not be gap of more than six hours between any two feeds throughout day and night.

i. Mechanism of action

Frequent breast-feeding causes high level of prolactin secretion in the mother, which suppresses the ovulation. After six months following delivery, many women begin to ovulate without starting menses. Hence breast-feeding may not be effective after six months postpartum.

ii. Advantages

- This is most economical, effective and safe method.
- Only method that benefits both baby and mother at the same time.
- It is independent of service delivery.
- It also promotes bonding between mother and child.

b. Calendar (Safe period) method

There are several methods where women learn to identify the fertile days (days around ovulation) of the menstrual cycle and avoid intercourse or use conventional contraceptive during ovulation period. Most practical and simple amongst all is calendar method.

i. Calculation of safe period

Ask the client to keep the record of consecutive six menstrual cycles.

Identify the longest and the shortest menstrual cycle.

Shortest cycle minus 18 days gives the first day and longest cycle minus 10 days gives last day of fertile period. For example, if menstrual cycle of a woman varies from 26 days to 31 days, fertile period in which she should not have unprotected intercourse would be from 8th to 21st day of menstrual cycle, counting day one as first day of menstrual period.

ii. Advantages

- Most important advantage is that, couple understands the physiology of conception by which it increases confidence of the woman about her own control over pregnancy.
- System independent, thus no need to depend on supply from MPW or no purchase required.
- No need of storing contraceptive devices.
- Useful in clients who do not want to use contraceptives due to any reason.
- Can be combined with other method of contraception particularly the condoms. This combination increases effectiveness of both the contraceptive methods.

iii. Disadvantages

- This method should not be recommended to clients when

difference between minimum and maximum duration of menstrual cycle is more than seven days.

- Family must have monthly calendar and should understand simple calculations of addition and subtraction.
- Period of abstinence is about two weeks, which may be difficult for some couples.

iv. Recommendations

Calendar method should be recommended to couples with high level of understanding and wife having regular menstrual cycle. Always give information of calendar method to the users of temporary methods, which will increase effectiveness of temporary methods.

3.1.2. Condoms (Nirodh)

Condom is most widely used barrier method. Large numbers of commercial condom brands are also available in the market.

a. Mechanism of action

Condom acts as a physical barrier method & prevents deposition of sperm in vagina by collection of semen in condom.

b. Effectiveness

Failure rates vary from 2-3 per 100 woman-years to more than 20. Most failures are due to incorrect use.

c. Advantages

- Easily available and easy to carry.
- No side effects.
- Prevents spread of HIV/AIDS and other STDs
- Prevent cancer cervix in female partners

d. Disadvantages

Except for complaint of decrease in penile sensitivity by few clients, there are no major disadvantages for condoms.

e. Recommendations

- Condom is best recommended method for newly married couples. Another important group is partners at high risk of STDs.
- Condoms are routinely recommended as back up method to couples after vasectomy and when pills are forgotten for two or more days.
- Recommended when other methods like Oral Pills, sterilization are contraindicated for medical reasons.
- Condom is best choice for newly married couples as well as breast-feeding women.

f. Special precautions

Few people may have allergy to latex or lubricant used for condoms leading to irritation and itching. In such cases advise client to discontinue use of remaining condoms and try another brand. If irritation persists then advise other method.

3.1.3. Combined Oral Contraceptives (Oral Pills)

Oral contraception is safe, effective and reversible method for women desiring to delay their first pregnancy or space the next child. These are called Combined Oral Contraceptives as they contain two types of hormones in low dose. Oral pills are

available in two brand names in government distribution system : Mala - N under free distribution scheme and Mala - D at subsidized price under social marketing scheme. Large number of commercially available combined OP preparations are also available in market. OPs are available in packet of 28 tablets; first twenty one white tablets are hormonal tablets and remaining seven colored tablets are iron tablets for maintaining the continuity.

a. Contents of oral pills

Estrogen in the form of Ethinyl Estradiol - 0.03 mg

Progestogen in the form of Norgestrel - 0.3 mg

b. Mechanism of action

Oral pills provide effective protection by:

- Inhibition of ovulation by suppressing release of ovum from ovaries.
- Preventing implantation by altering endometrium so that it is not conducive for implantation.
- Reducing transportation of sperms by making cervical mucus thick.

Continuous taking of OP for seven days is critical for suppressing the ovulation.

c. Effectiveness

It is very effective when taken correctly and consistently and the failure rate is 0.2 - 1 per 100 women years.

d. When to start OP

- On 5th day of menstruation to be sure about not being pregnant.
- **Immediately** after abortion.

e. Selection of client (Checklist to be followed)

As OP is scheduled drug and can cause serious adverse effects, few precautions must be taken before starting OP. MPW (F) must ask following questions to client before starting the OP -

- Whether age of client is more than 40 years?
- Is the woman pregnant or breast feeding?
- Does she has habit of smoking or using tobacco in any form?
- Does she have complains of headache off and on?
- Is the client having yellow eyes (Jaundice) or obesity / malnutrition?
- Is there h/o convulsions, hypertension, heart diseases or diabetes?
- **H/o** inter menstrual bleeding or bleeding after intercourse
- Is patient taking OP since last 5 Yrs?
- Whether client has oedema over feet?
- Whether client has breast lump?

If answer to any question is yes then do not start OP and recommend other method of contraception. If client still insists for OP then refer to MO.

After starting OP to any client by MPW(F) or HA(F), MO

must examine the client within three cycles of OP and at least once a year thereafter.

f. Advantages

i. Contraceptive benefits

- Very effective when taken daily and protects against both uterine and ectopic pregnancy as it inhibits the ovulation.
- Safe for most women and easy to use.
- Unrelated to sexual activity.

ii. Health benefits

- Decreases menstrual blood loss, menstrual cramps and regularizes menstrual cycle.
- Protects woman against anaemia by minimizing blood loss.
- Protects from cancer of ovary, uterus and benign breast tumors.

g. Disadvantages

- Needs to be taken every day and if pills are missed then no protection against pregnancy.
- Does not protect against STDs and HIV/AIDS.
- Not appropriate for mothers who are breast feeding less than six months old infants.

h. Side effects

- Minor side effects like amenorrhea, intermenstrual bleeding, spotting, nausea, headache, high blood pressure, weight gain and breast tenderness are common during first three months of use of OC & disappear with continued use.
- Serious side effects are rare and risk is high among women above 35 years.

i. Recommendations

- OPs are most suitable for women who have regular and fixed routine and who can take tablet daily without forgetting even for single day.
- **OP** is ideal for spacing between first and second pregnancy.

j. Instruction to be given to client by health worker

- Start taking pill from where it is marked as START and follow the arrow thereafter.
- Take pill at fixed time every day. Connecting pill consumption with some regular activity e.g. taking pill immediately after dinner will reduce chances of missing the pills.
- Missed pill will not protect from conception, so daily consumption of pill is most important.
- Do not discontinue taking pill during menstruation.
- If you miss the pill, follow guidelines given below -
 - If one pill is missed, take it when you remember or as soon as possible and next pill at the same time as usual
 - If pills are missed for two days or more -
 - Two tablets should be taken for number of days the pills have been missed.
 - Use condoms for 7 days till the next cycle starts.

Section - V : Reproductive and child health (Maternal health)

- OP may lead to serious complications occasionally. It is important to inform the client about warning signs and advise to contact MO if client experiences any of the warning sign.
- OP should be stopped two months prior to planning of pregnancy.

Following acronym will help to remember the warning signs -

- A - Abdominal pain
- C - Chest pain, cough, breathlessness
- H - Headache, dizziness, weakness
- E - Eye problems like loss of vision or blurring
- S - Severe pain in leg (Calf or thigh)

k. Role of MO

- Ensure adequate supply of OC for health workers
- Check all the new OP clients within three months for medical assessment and old clients in the month of April every year.
- Check whether MPW (F) selects client as per checklist and also patient is taking OC regularly.
- Check OP and CC record of health workers for ensuring regularity.

l. Cohort analysis

- List number of OP clients from same month last year.
- Check number of clients from above who are still continuing the pills.
- Proportion of clients still continuing with pills is continuation rate for one year and it indicates quality of work.
- This should be analyzed monthly and for each worker separately.
- Use this information while taking review of MPW during monthly meeting

3.1.4. IUCD(Intra uterine contraceptive devices)CopperT - 380 A

It is a T shaped device of polyethylene with fine copper wire wrapped on its vertical stem. Cu-T is impregnated with Barium Sulphate for visibility on X- rays. Surface area of copper wire is 380 sq mm.

Previously in national programme, CuT 200 A was provided but nowadays it is replaced by CuT 380 A. Mechanism, selection criteria, insertion technique & side effects/ complications are similar to CuT 200 A. However newer device is effective for 10 years after insertion due to more surface area of copper wire.

a. Mechanism of action

Copper T - 380 A exerts multiple anti fertility effects on reproductive tract.

- It interferes with sperm transport (thus reducing the number & viability of sperms) to upper genital tract by

immobilizing them. It also interferes with ovum transport, fertilization & implantation.

- Copper acts as a spermicidal, whereby zinc contained in the head of the sperm is replaced by copper ion, thus making the sperm inactive.
- The endometrium undergoes morphological & biochemical changes, that makes it unsuitable for implantation of zygote.

b. Effectiveness

Cu-T is highly effective. Once inserted, Copper T 380 A remains effective for 10 years.

The failure rate is less than 1 per 100 women years.

c. Advantages

Copper T 380 A is a safe and reliable method of contraception and it offers several advantages as listed below.

- It is highly effective method and effect starts immediately after insertion.
- Once Cu-T is inserted it is effective for 10 years.
- Does not interfere with intercourse and no continued effort like taking pill daily is required to avoid pregnancy.
- Does not affect breast feeding
- Can be removed when desired by client and fertility is returned immediately after removal.

d. Disadvantages

- Skilled person is required to insert and remove Cu-T.
- Does not protect against STDs including HIV/AIDS.
- Cannot be used by women who suffer from reproductive tract infection.

e. Side effects

i. Common side effects

- In first week, mild cramps, bleeding or spotting
- In first three months longer and heavier periods, increased cramps during periods, bleeding or spotting between periods.

ii. Rare side effects

Side effects continued beyond three months, anaemia, perforation of uterus, lost Cu-T strings, infection of genital tract and ectopic pregnancy.

iii. Pregnancy with CuT 380 A in place

- This occurs at a rate less than 1 per 100 women year.
- In such cases CuT should be removed.
- If CuT is in place & string is not visible & woman is pregnant, she runs a risk of early abortion or late septic abortion or premature labour.
- Such client should be counseled about risk of continuing pregnancy & termination of pregnancy may be offered as an option.

f. Eligibility criteria

- Any woman in reproductive age group who has at least one child.

- Method of choice in women who are breast-feeding and have a child below 6 months.
- User does not have h/o PID & infection of upper genital tract.

g. Absolute contraindications

Never insert IUD if you find any of the following conditions:

- Pregnancy
- H/o excessive menstrual bleeding or irregular bleeding in between periods.
- Active genital tract infection (Vaginitis/PID/STD)
- **Any** uterine abnormality
- Severe anaemia
- Previous history of ectopic pregnancy
- If client had infected abortion in past 3 months or post partum endometritis.

If the client has history of caesarean section or any chronic disease like heart disease, diabetes, hypertension, MO must examine before inserting Cu-T.

h. Timing for insertion

- At any time in the menstrual cycle, provided there are no indications of infection or pregnancy, preferably within 7 days of the LMP or on fifth day of menstruation
- Immediately after abortion, if pregnancy was in first trimester. For later abortions, insertion should be delayed by 6 weeks.
- After 6 weeks post-partum
- In lactational amenorrhea after excluding pregnancy.

i. Selection of client

i. History taking

Before inserting Cu-T following history must be asked by health worker:

- | | |
|---|-----|
| • Missed period | Y/N |
| • Pain in abdomen during menses | Y/N |
| • White discharge with bad smell per vagina | Y/N |
| • Excessive bleeding during menstruation | Y/N |
| • Intermenstrual bleeding | Y/N |

If answers to all above questions is "no" then after examination, Cu-T is inserted and

if answer to any of questions is "yes" then examination should be done by MO.

ii. Assessment of patient by MO

MO should perform following examination:

- Examine external genitalia for evidence of STDs. Do speculum examination for evidence of vaginal and cervical infection. If you see ulcer, abnormal discharge, growth or erosion on speculum examination, do not insert Cu-T.
- Conduct bimanual examination for determining uterine position and to rule out PID. If movement of cervix is painful do not insert Cu-T. If uterus is retroverted, enlarged,

irregular, soft or fixed do not insert Cu-T.

- Measure length of cavity of uterus by uterine sound. Uterine sound should be introduced in uterus till slight resistance is felt. Measure uterine length. It varies from 6 to 9 cm.
- Cu-T should not be introduced if uterine length is less than 6 cm. or more than 9 cm. If there is difficulty in introducing sound in cervical canal or it is painful stop procedure and refer to a specialist.

j. Cu-T insertion procedure

i. Loading Cu-T

Important points about loading Cu-T

- Cu-T is provided in pre-sterilized pack. Load Cu-T without touching any of the part, inside sterile plastic packet itself.
- While inserting transverse arms of Cu-T, care should be taken that tips of transverse arms are not more than 6 mm within the tube.
- Arms should not be kept bent for more than five minutes, as arms can remain bent. Therefore Cu-T should be loaded just before inserting in uterus.

ii. Insertion of Cu-T-

- Wash hands and put sterilized gloves. Never insert Cu-T without gloves.
- Pull cervix downwards by Allis forceps or volsellum to bring uterine cavity in line with cervical canal.
- Introduce loaded Cu-T with plunger through cervical canal upwards as per the length of uterine cavity determined by uterine sound till blue flange comes in contact with cervix and resistance of uterine fundus is felt.
- Holding the white solid rod stationery by one hand, withdraw tube downwards not more than ½ inch. This will release arms of Cu-T inside uterine cavity.
- This is called as 'Withdrawal technique' (insertion tube is withdrawn downwards). It is useful to avoid perforation.

k. Post insertion advice

- Cu-T is immediately effective after insertion.
- There may be slight bleeding or spotting for a week.
- It is normal to have slight cramping in first 48 hours.
- Check the string daily during bath for first week and then after each menstrual period.
- There may be spotting or increased bleeding during menstrual period for first 2-3 months, but it tends to become normal thereafter.
- Report immediately if any of the following happens

Warning signs-

- P : Periods late, spotting, bleeding.
- A : Abdominal pain, severe cramps, pain during intercourse,
- I : Infection
- N : Not feeling well, fever, chills along with lower abdominal pain

S : String missing, shorter, longer.

- CuT 380 A should be removed after 10 years.

l. Follow up

1st visit -	Immediately after first menstrual period or after 1 month.
Subsequent visits -	After 3 months and thereafter once a year.

m. Cohort analysis

Client is followed up after completion of 1 year of insertion. It is checked whether Cu-T is in uterus or removed or expelled. This is reported in monthly MIS. This is one of the quality indicators. MO can know retention rate, removal rate, expulsion rate and continuation rate of Cu-T in PHC area from the analysis. Ask MPW (F) to calculate all these rates for her area and review during monthly meeting.

n. Indications for removal

- After 10 yrs of insertion (New Cu-T can be reinserted if client desires)
- Pregnancy
- Client is planning for another child
- Severe bleeding or severe pain
- Pelvic infection not responding to treatment
- Evidence of Cu-T displacement

o. Record and reports of Cu-T

i. R4 register

All Cu-T insertions from PHC & sub-center are recorded in this register.

- Responsibility of regular completion of register should be assigned to HA (F).
- MO should check the register regularly and confirm that all columns are filled. Information on forms and register should tally.
- See that maximum Cu-T insertions are in women with 1 or 2 issues, which indicates quality of work.

ii. Reports - In MIS, ANM has to report number of Cu-T inserted during the month, report on issue wise insertion and follow up at one month and at three months and also cohort analysis.

3.1.5. Emergency contraceptive pills (ECP)

Emergency contraceptive pills are introduced in the National Programme, which help to prevent unwanted pregnancy.

a. Benefits of ECP

- It prevents unwanted pregnancy.
- Prevention of unwanted pregnancy will help to reduce number of maternal deaths from unsafe abortions.
- It helps to reduce fertility level.

b. What is ECP

Under the programme, Levonorgestrel (Progestogen only) which is oral hormonal contraceptive pill is used. It is available as 0.75 mg tablet.

c. Indications

Indicated in all cases within 120 hours (5 days) of the first act of unprotected intercourse in following conditions:

- Non use of any contraceptive
- Inconsistent use of contraceptive
- Contraceptive accident due to following:
 - Tear or slippage of condom
 - Failed coitus interruptus
 - IUD expulsion
 - Miscalculation of safe period days
 - Failure to take oral pills for three or more days consecutively

d. Guidelines for use

- ECPs should be used to prevent pregnancy following first unprotected sexual intercourse within past 120 hours. Encourage to take within 24 hours.
- Packet of two tablets is available.
- First tablet should be consumed as soon as possible but within 120 hours of unprotected sexual act.
- Consume second tablet 12 hours of first dose.

e. Effectiveness

When used in correct dose, within stipulated time period and after a single unprotected sexual intercourse, it prevents pregnancy in 85% of women.

f. Mechanism of action

Exact mode of action is not known but probably mechanism includes prevention of ovulation, fertilization and or implantation.

g. Advantages

- Effective if taken correctly.
- Does not affect lactation.
- It is safe for all women.
- Use is not associated with fetal malformation or congenital defects.
- There are no known medical precautions for use, as only very small dose of hormone is used for single course.
- There are no known interactions with other drugs.

h. Disadvantages

- Has to be used within 120 hours of the first unprotected sexual intercourse, as use beyond this period increases risk of pregnancy.
- Effectiveness decreases with frequent use.
- Side effects - Nausea, vomiting, irregular bleeding per vagina, breast tenderness, headache, dizziness, fatigue.
- Does not protect from RTI / STI.

i. Important aspects for client

- Tablet may cause minor side effects like nausea, vomiting, headache, giddiness etc.
- Taking tablets more than 2 does not increase effectiveness.

- If client vomits within two hours of taking pill, dose must be repeated.
- It does not cause abortion.
- It does not protect from future unprotected sexual intercourse.

j. Follow up

Follow up is important, as it is a good opportunity for initiating regular use of contraceptive by client. Follow up is essential:

- For motivating regular use of other contraceptive method immediately after menstruation.
- To check if there is delay in menstruation for more than one week of the expected date.
- To know any side effects.

3.2. Terminal methods of contraception (Sterilization)

Family Planning sterilizations are operative methods called as terminal methods, because these are practically irreversible and are used by clients when family size is completed. Sterilization offers many advantages over temporary contraceptive methods. It is one time method, thus not requiring sustained motivation of user for its effectiveness and provides most effective protection against pregnancy. Risk of complications is minimal if sterilization procedure is performed as per guidelines. Thus for couples who have completed desired family size, sterilization is the method of choice.

Female sterilization involves blocking of fallopian tubes that carry ovum and in males it involves blocking spermatic cords that carry sperms. Thus by these methods, the ovum and sperm cannot meet and there is no fertilization and pregnancy.

Various sterilization methods are available to clients through Primary Health Centers and selection of particular method depends upon their choice. For males, two methods - Classical Vasectomy and No Scalpel Vasectomy are available and for females, two methods - Minilap and Laparoscopy are available. As it is very difficult to re-canalize fallopian tube/spermatic cord after sterilization and success rate of recanalisation is also not satisfactory, sterilization operation should always be described as terminal method for all practical purposes and should be offered to couples who are convinced that their family size is complete.

Sterilization requires surgery for blocking fallopian tube / spermatic cord, therefore carefully assess client as well as family for eligibility and follow all the technical guidelines issued by Directorate of health services. All health staff and MO should have clear understanding in mind that sterilization safety should have top most priority in PHC functioning.

3.2.1. Selection of client (Eligibility criteria)

First ensure eligibility of client for sterilization. This is responsibility of MPW who should check for following criteria before counseling client for sterilization. These criteria are same for Male and Female sterilization.

- Client should be married.
- Age of husband less than 60 years and wife between 22

yrs. to 45 yrs.

- Couple is sure that desired family size is attained.
- If couple is willing for sterilization on one child, then child should be at least one year old and should have completed primary immunization.
- Client / spouse not undergone sterilization operation previously (Except in failure)
- **If** client for tubectomy is home delivered, then ensure that 6 weeks are completed.
- TT immunization should be complete. If not, give TT and send client to PHC after 10 days from booster dose (in previously immunized mothers) or from second dose for surgery.

MPW should recheck information given by client with the help of eligible couple register. This will reduce rejection rate of clients after admission to client. Medical Officer should again check all above mentioned criteria before admitting client for sterilization.

3.2.2. Registration of client

- Registration of client is responsibility of HA (Female). Admit the client in ward. Prepare indoor papers.
- Fill up tubectomy case paper and consent form. Client should sign consent form in front of HA after getting complete information that sterilisation is permanent method and it is small surgical procedure (describe the procedure to patient). This is called informed consent and it has legal value.
- If client is illiterate, thumb impression of client should be obtained. Someone who is literate & knows the client should countersign thumb impression.

3.2.3. Female sterilization

a. Pre-operative procedures

Pre-operative examination is essential to assess physical fitness of client for surgery and also to ensure that consent for surgery is voluntary and informed.

Preoperative examination should be carried out one day before sterilization operation and in sufficient daylight. This is important, as MO may miss early jaundice during examination at night in ordinary lamp. It is mandatory for Medical Officer to carry out pre-operative examination her/himself. Pre-operative examination for sterilization should not be left only to Intern or paramedical workers (MPW/HA)

Following instructions should be followed for pre-operative examination:

b. Case paper and consent form

Check whether case paper and consent form is duly filled.

Eligible couple number (R-14) should be entered on tubectomy case paper.

i. Demographic information

Enter information of client regarding age, marital status, religion, education, occupation, number of living children and age of last child.

ii. Medical history

There are few relative contraindications for tubectomy. Take carefully history of illnesses in the past to rule out following diseases -

- Psychiatric disorders
- Respiratory diseases like Tuberculosis and Bronchial Asthma
- Other chronic diseases like Heart disease, Diabetes, Hypertension, Thyrotoxicosis etc.
- Malignancy
- Bleeding disorders
- In addition to this, rule out following conditions in post-partum clients
 - Puerperal fever
 - Prolonged rupture of membranes (> 24 hrs.)
 - Pre-eclampsia, eclampsia
 - Trauma to genital tract.

If any of the above condition is detected in client, do not operate at PHC. Reassure client and refer to specialist for tubectomy.

c. Clinical assessment

All points of clinical examination are mentioned in Tubectomy case paper. Examine client as per the sequence given in case paper. Do not fill up any point in case paper blindly without examining client. You may miss important contraindication if not examined carefully & client may land into complications during or after surgery.

- Physical examination - Pulse, BP, RR, temperature, general condition, body weight, auscultation of heart and lungs, abdominal and pelvic examination.
- Laboratory tests - Hemoglobin, urine for sugar and albumin.
- Examine for -
 - Infection at operation site
 - Pelvic infection, mass
 - Severe nutritional deficiency
 - Pregnancy
 - Multiple scars of previous laparotomies
 - Gross obesity
- Pre operative P/V examination of all cases is must.

d. Skin sensitivity tests

- When MO is satisfied that client is medically fit for tubectomy, give order in writing to carry out skin sensitivity test for Xylocaine and Benzathine Penicillin.
- These two tests should be performed on separate arms and at two different times by HQ ANM/HA (F) under supervision of MO. Sensitivity tests should never be carried out in absence of MO.
- Inject 0.1 ml of Xylocaine/Penicillin intradermally; encircle site of injection and note down time of test.

- Observe the site of test after 15 and 30 minutes. If redness, wheel formation, itching, oedema etc. is observed, then patient is sensitive for particular medicine (Xylocaine or Penicillin)

e. Acceptance of patient for sterilization operation

Finally MO should again carefully go through examination notes, urine/blood examination results, sensitivity test results entered in tubectomy case paper and if nothing abnormal is detected, accept client for sterilization. Write down acceptance, time and date for operation to be performed and serial number of patient for OT on case paper.

Client should not be accepted for tubectomy if any of the following is detected -

- **Any** disease mentioned under relative contraindication.
- Infection at site of operation.
- **Any abnormality** detected during physical examination
- Hemoglobin less than 10 gram%: If Hb is less than 10 gram%, give therapeutic dose of Iron tablets and call client after one month, test Hemoglobin and then take the decision.
- Sugar in urine: If urine sugar is positive, ask client to attend PHC after six weeks as some times urine is positive for sugar, due to lactosuria in post-natal period. Repeat urine test after six weeks. If sugar is still present in urine, refer client to Physician.
- Albumin in urine: If albumin is present in urine, check whether client has urinary infection. If yes, treat & then repeat test after completion of treatment.
- Use alternative medicines if sensitivity to Penicillin is detected. If any client is xylocaine sensitive, refer to higher center for surgery like DH or Medical College.

f. Timing of sterilization procedure

Follow guidelines as below -

- Interval sterilization - Within 7 days after menstrual period to rule out possibility of conception.
- Post partum sterilization - Can be done at any time, preferably from 48 hours to 8 days of delivery in hospital delivered patients only. Laparoscopy sterilization should not be done in post partum period.
- Sterilization with MTP - Can be performed concurrently but not in sterilization camp. Laparoscopic sterilization should not be performed along with MTP in PHC.
- Following spontaneous abortion - Can be performed immediately with antibiotic coverage in absence of anaemia and infection.
- Laparoscopy tubal ligation should not be done concurrently with second trimester abortion in any facility.
- Home delivery - Tubectomy should be performed after 6 weeks of home delivery, after confirming complete TT immunization.

g. Preoperative instructions

- NBM 4 to 6 hours prior to surgery.

- Patient should wear clean and loose clothing.
- Empty bowel in the morning on the day of surgery. Not necessary to give enema.
- Empty bladder before entering OT.
- Do not shave operating area but clean with soap and water.
- Use betadine, 60-70% solution of ethyl alcohol or savlon for skin preparation.
- Apply antiseptic solution in a circular motion, beginning at the site of incision and working out for several inches.

h. Pre-operative medication

- Injection Pethidine 50 mg IM 45 minutes before operation.
- Injection Phenargan 50 mg. IM 45 minutes before operation.
- Injection Atropine 0.6 mg. IM 30 minutes before operation.

Precautions for pre-medication

- Never give any of the pre-medication by intravenous route.
- All medicines should be given at least 30 minutes before operation.
- MO should always write order of pre-medication in mg and not in ml.
- Always see the concentration of medicine supplied and adjust dose accordingly. For example, Atropine is available in 0.6 mg/ml (for preoperative medication) and 6 mg/ml (for treatment of organo-phosphorus poisoning).
- Ensure every time that you are using correct dose for pre-medication. Remember, high dose of pre-medication can cause serious complications to client that may sometimes lead to death.

i. Local anesthesia

Use 1% lignocaine as local anesthetic without adrenaline.

If you have been supplied 2% lignocaine, dilute it with equal amount of distilled water and use. Maximum dose is 20 ml of 1% lignocaine. Never exceed maximum dose.

j. Surgical procedure (Pomeroy method)

- Take transverse or longitudinal incision of not more than 4 cm length below umbilicus. Open the abdomen layer by layer as skin, sub-cutaneous tissue, and muscle. Be careful while opening peritoneum. Injury to intestine or bladder while opening the peritoneum is commonest complication of sterilization operation.
- Catch the fallopian tube slowly and smoothly by Babcock forceps. Ensure by tracing the tube towards fimbrial end that you have caught the fallopian tubes and not round ligament or other fibrous band. Fallopian tubes and appendix are the only structures in abdomen, having one free moving end.
- After confirmation that it is fallopian tube, form a loop of 1.5 to 2 cm tube length. Ligate fallopian tubes within 2-3 cm from uterine cornu in the isthmal portion using 1 'O' chromic catgut. Care must be taken to avoid damage to blood vessels, ovaries and surrounding tissue.

- Excise about 1 cm of tube above ligation. Do not crush or cauterize the tube.
- Observe carefully for any bleeding site before closing.
- First close peritoneum and then other layers of abdomen one by one.
- Close skin incision with absorbable or non-absorbable suture.
- Check pulse, RR and BP of client before transferring to ward.

k. Monitoring of patient

- Pre-operative - Pulse, RR, BP prior to pre medication and thereafter every 15 minutes
- Intra - operative - Pulse, RR, BP every 15 minutes, maintain verbal communication
- Post operative - Pulse, RR, BP, abdominal girth to be monitored and recorded every 15 minutes for 1 hour following surgery, every hour for next six hours and every four hours thereafter for next 24 hours. If you suspect any complication (bleeding, injury) increase frequency of observation.

l. Postoperative care and examination

- Minilap client should be examined twice a day (morning and evening) after 24 hours till discharge.
- Laparoscopic sterilization patient can be discharged 24 hours after operation, after checked by MO.
- Write down findings of examination and treatment advised on tubectomy case paper immediately after examination of client.
- Prescribe postoperative antibiotics if tubectomy and MTP are performed simultaneously.
- Remove stitches of minilap client on 7th day. Discharge client if wound is healthy. If wound is infected, start higher antibiotics and observe for another two days or till infection subsides.

m. Postoperative instructions to the client

- Resume normal diet as soon as possible.
- Keep incision area clean and dry.
- Bathe after 24 hrs following surgery keeping incision area dry.
- Return to full activity by two weeks.

n. Follow up

Schedule of follow up by health worker is as below and MO should ensure that follow up takes place. Review of follow up should be taken during weekly meeting of HAs and monthly meeting of MPWs.

i. For laparoscopic surgery

First follow up

- First follow up within 48 hours after discharge to rule out any immediate complication.
- Record pulse, RR and temperature of patient. Enquire about palpitation, breathlessness or fever.

- Examine the abdomen. It should be soft. Enquire if there is any vomiting, whether stools are passed & also about appetite.
- Measure abdominal girth. It should not increase.
- Fever, shortness of breath, vomiting, loss of appetite, tender abdomen and increase in abdominal girth are indications of serious complications. Health worker should immediately arrange for transport of patient to nearest District or Sub-district hospital. Simultaneously inform Medical Officer about referral of patient and accompany the patient till admitted in the hospital.

Second follow up

- Second follow up one week after discharge.
- Observe following points & advice as below:
 - Examine the wound. It should be healthy without any discharge.
 - Should resume normal diet.
 - Should start light work at home and move around.
 - Can have intercourse one week after surgery or whenever she feels comfortable.

Third follow up

- Third follow up at one month after discharge.
- Patient should resume full physical work.
- Wound should be dry & well healed.

Emergency follow up

Emergency follow up anytime after surgery

ii. For minilap surgery

As client is admitted in PHC for seven days under observation of Medical Officer, schedule of follow up is different than laparoscopy follow up.

First follow-up

- First follow up should be on 7th day of discharge.
- Examine the wound. It should be healthy without any discharge.
- Patient should resume normal diet.
- Should start Light work at home and move around.
- Patient can have intercourse one week after surgery or whenever she feels comfortable.

Second follow up

- Second follow up should be at one month after discharge.
- Patient should resume full physical work.
- No wound discharge, gaping should not be seen.

Emergency follow up

Emergency follow up should be at anytime as & when needed after surgery.

3.2.4. Male sterilization

At present two methods of vasectomy are available through Primary Health Centers.

- Conventional vasectomy

- No scalpel vasectomy

a. Indications

- Excellent method for couples with completed family size.
- Simpler than female sterilisation, therefore recommended. Always give choice of vasectomy to couple before they accept any other method.

b. Contraindications

No absolute contraindication.

Relative contraindications - Same as female sterilization. In addition to this - Local genital conditions (large varicocele, hydrocele, inguinal hernia, intra scrotal mass etc.)

c. Clinical assessment and screening

- Demographic information - same as female sterilization.
- Medical history - As mentioned in contraindications.
- Physical examination - TPR, BP, general condition, examination of penis, scrotum.
- **Laboratory** examination - Urine for sugar.

If any abnormality is found, do not accept the client for vasectomy & refer to the District Hospital.

d. Pre operative preparation

- Trim pubic, scrotal and perianal hair.
- Bath, wear clean, loose cloth.
- Light meal in the morning of surgery.
- Empty bladder before surgery.
- Paint area with non-alcoholic solution.

e. Pre medication

- Injection Atropine 0.6 mg intramuscularly 30 minutes before operation.
- If client looks anxious and uncomfortable, give tablet Diazepam 5 mg orally 30 minutes before surgery.
 - Lignocaine without adrenaline - 1% as local anesthesia. Maximum 20 cc of 1% lignocaine can be used for one case.
- Wait for few minutes to get effect of local anesthesia before starting the operation.

f. Technique

i. Conventional vasectomy

- Either two incisions just below root of scrotum on either side or one incision in midline is taken. Length should not be more than 2 cm.
- Vas must be separated from tissues and mid scrotal point should be excised not more than 1 cm.
- Vas must be tied with non-absorbable sutures (2 '0' silk)
- Depending on length of suture, skin is closed with non-absorbable suture. In case of very small incision no need to suture.
- Dressing and use of T shaped bandage for 1 week.

ii. No scalpel vasectomy (NSV)

Basic difference in NSV procedure over conventional is

surgical approach to vas. NSV approach is through a small puncture in the scrotum rather than incision. Thereafter the procedure of vas ligation is same as in conventional vasectomy.

As there is no incision, NSV is less invasive, takes much less time and causes fewer complications.

g. Postoperative care

- Client should rest at PHC for 6 hours.
- Examine pulse, RR and BP.
- Examine vasectomy site for bleeding, hematoma or severe pain.
- Give scrotal support by suspensory bandage.
- Discharge client if vital signs are stable, patient is ambulatory.
- Give analgesic for 5 days. Other medications should be prescribed only if needed.

h. Instructions to the client

- Wear tight underpants for scrotal support and for preventing complications like bleeding, hematoma formation.
- Rest for 48 hours after surgery.
- Take analgesics if required and contact health worker in case of bleeding, increase in scrotal size or severe pain.

i. Follow up

i. First follow up

First follow up should be carried out within 48 hours after discharge.

- Examine site of operation. Restructure scrotal support if necessary.
- Advise client to resume normal work after 48 hrs.
- Client can walk and move around and can take bath after 24 hours.
- Normal diet.
- Provide client with 20 condoms and advise that he does not become sterile immediately after operation and therefore should use condom for 20 ejaculations or three months whichever is earlier.

ii. Second follow up

Second follow up seven days after surgery.

- Observe for any complications or persistence of pain.
- Client can resume normal work except cycling, running etc. for long distance.
- Client can have intercourse if he desires but should use condoms.

iii. Third follow up

- Third follow up after 3 months
- Enquire about any problems related to operation.
- Client need not use condoms.
- Client can resume full normal work.

iv. Emergency follow up

Emergency follow up as needed.

4. Laparoscopy camp management

Laparoscopy sterilization operations are performed most of the times in camps. As number of cases operated at one time is more during camp possibility of quality compromise increases. Thus it is extremely important to organize laparoscopic camp in discipline with clear understanding about responsibility of each person attending camp. Responsibility of overall management of camp will be with the Taluka Health Officer and MO/MS in-charge of the institution (PHC or RH) where camp is being held.

4.1. Selection of client

- Medical fitness of clients as in abdominal tubectomy.
- MTP with tubectomy should not be done in camp.
- Laparoscopic sterilization has to be performed 6 weeks after delivery.

4.2. Management of camp

4.2.1 General aspects

As far as possible, camps should be organized in Rural Hospitals as RH is better equipped with basic infrastructure required for large number of patients. In-charge of hospital where camp is organized should assign duties to all MOs and staff attending camp in consultation with Taluka Medical Officer.

- Optimum number of cases to be operated per day by one laparoscopy surgeon is 25.
- Taluka Health Officer will supervise the camp. District level officers also visit & supervise the camps.
- Surgeon should start operating in the morning and finish before evening.
- Post operatively clients should be under medical observation for 24 hours in hospital and discharged thereafter.

4.2.2. Preparation of duty chart

District Health Officer assigns THO, MO PHC or Medical Superintendent RH (in consultation with CS) as i/c of camp. In-charge officer has the responsibility of overall management of camp. He/she should prepare duty chart of MOs and health workers considering each activity. All staff should work as per assignment given. All MPWs, HAs and MOs participating in camp from various PHCs should be assigned responsibilities as below:

4.2.3.Registration of clients

Responsibility of registration of clients should be given to one HA and MPW (M).

4.2.4. Pre operative assessment

Pre operative assessment includes laboratory examination and medical screening. This is the most important responsibility, as improper screening of cases is commonest cause of complications in laparoscopic camps. Give responsibility of preoperative assessment to senior MO. Preoperative assessment should be carried out as indicated for minilap tubectomy

(including PV examination).

a. Laboratory examination

Laboratory examination is responsibility of laboratory technician. Assign HA (F) and ANM to help laboratory technician as per requirement. If laboratory technician is not posted, give this responsibility to HA (F) and ANM. Following tests should be performed on clients for laparoscopic sterilization.

- Urine test for albumin & sugar
- Hb estimation
- Xylocaine skin sensitivity test

Note down results of urine and blood examination, skin sensitivity tests on case paper and send client for medical screening.

b. Medical screening

Number of Medical Officers posted for preoperative examination should depend upon number of cases. MO responsible for medical screening should first go through results of urine, blood examination and skin sensitivity test results & carry out check up of client as given in tubectomy form. It is responsibility of MO to take decision whether client is fit for laparoscopic sterilization operation or not. If rejected, write down reason for rejection and advice given to client.

c. Preoperative medication

One MO should be responsible for preoperative medication. Ensure that correct dose of preoperative medication is given only to client declared fit for operation by preoperative assessment. Give correct dose of medication. Never give pre operative medication by IV route.

4.2.5. Intra operative (OT) duty

Although team coming with laparoscopy surgeon has nursing staff, additional staff required by the surgeon must be provided. Local sister in-charge or HA (F) should assist the team in OT till last case is operated.

4.2.6. Post operative check up

As mentioned for tubectomy operations above, one senior MO should be assigned responsibility for postoperative check up. TPR, BP, abdominal girth every 15 minutes for 1 hr. after operation is a must. ANM and HA (F) should be made responsible for this. Cases should not be discharged from camp unless MO in-charge for postoperative care examines and allows for discharge in writing.

Duty chart prepared by camp i/c should be displayed and MO should supervise that assigned duties are being performed.

4.2.7. Post operative follow up

Responsibility of follow up should be assigned to specific MPW/HA according to area of residence of cases before discharge. List of clients and who will follow up each client should be displayed immediately after operations are over and before cases are discharged. Ask each client about address of staying for next one week, as many clients prefer to go to other places (parent's house) than place from where they were brought.

Health worker should give follow up visits as follows:

- Within 48 hrs. after surgery at home
- Seven days after surgery.
- After 1 month or after her first menstrual period whichever is earlier.
- Emergency follow up as and when required.

5. Guidelines of Hon. Supreme Court on safety, precautions & guidelines for conducting sterilization procedures

For complying the interim orders issued by the Hon. Supreme Court, following guidelines/instructions have been issued as per the GR no. KUSHAT 2005/CR130/FW3, dated 29 April 2005:

- Doctors having post graduate qualification as MD (OBGY) or DGO are competent to perform routine vasectomies, no-scalpel vasectomies, minilap tubectomies & laparoscopic sterilization.
- Doctors having PG qualification as MS General Surgery are competent to perform laparoscopic sterilization only after the specified training. They can perform other procedures listed above.
- Doctors with MBBS degree can perform routine vasectomies, NSV & minilap tubectomies only after the prescribed training & have 5 years experience. Laparoscopic sterilization can not be performed by MBBS doctors.
- Medical case cards for male & female sterilization should be scrupulously filled in & is to be signed by the operating surgeon before the sterilization operation.
- In addition to this, checklist as given in annexure has to be filled & signed by operating surgeon before sterilization procedure.
- Consent form should be explained to the patient & has to be filled accordingly.
- Information on category wise, age wise & issue wise break up of sterilization cases along with information about sterilization deaths & complications after sterilization has to be submitted monthly.
- Compensation of Rs. 5000/- is given to the case, if there is sterilization failure & patient becomes pregnant.

6. Indoor case papers of sterilization operation cases

- Every case either minilaparotomy or laparoscopy must have indoor case paper.
- MO should assess correctness of the information written on case paper related to age, number of issues and age of last child written by nursing staff at the time of pre-operative assessment.
- MO should confirm that consent of client is taken.
- MO should write pre operative notes immediately after medical examination.
- Results of laboratory investigations like Hb and urine should be entered.
- Operating surgeon should complete postoperative notes

immediately after operation.

- If surgeon finds any abnormality during operation or did not find fallopian tubes or tubes were adherent and were not ligated and cut, this should be mentioned in case paper and has to be informed to relatives and client with advise.
- If there is any complication during procedure, it should be mentioned in case paper and communicated to client and relatives.
- Postoperative check up and findings should be essentially written by MO.
- TPR and BP examined by nursing staff should be written on TPR chart separately. MO should confirm it.

7. Recanalisation

This operation is performed at Medical Colleges. Medical officer has to give certificate regarding sterilization operation. Certificate regarding deaths of issues after sterilization operation is given by Gram Panchayat. This information has to be submitted to DHO.

8. Involvement of Private practitioners / Hospitals

- Private hospitals can perform tubectomy without recognition from Government. However remuneration for tubectomy and ex-gratia payment in case of death due to tubectomy is permissible only in case of government recognized private hospital.
- If any practitioner is interested in performing tubectomy operations in his/her hospital, MO should take lead to get the hospital recognized, as availability of additional facilities will help to improve performance.
- Recognition for performing family planning sterilization operations is given by DHO in rural area, by Civil Surgeon in urban area and by Medical officer of Health in corporation area.
- Private practitioner has to apply in prescribed format. After checking availability of instruments, equipments, OT and training status of doctor recognition is given to the hospital.
- Do not pay compensation to clients in unrecognized hospitals.

9. Some other important aspects about family welfare services emphasised in RCH programme

9.1. Increasing male involvement

Presently, among all the contraceptives used, methods used by males (condoms and vasectomy) account for only 6 percent indicating least male involvement. Vasectomy is safer and easier to perform in PHC than tubectomy. In recent years, introduction of no scalpel vasectomy (NSV) has shown signs of success. Vigorous efforts should be made to promote this method. As males are main decision makers in Indian society, IEC activities also need to focus on men for imparting knowledge about reproductive health of both men and women and about advantages of small family.

9.2. Community mobilization through 'Satisfied Acceptor Couples'

Contraceptive use increases in closely-knit communities through diffusion of information and idea of small family norm. Inter-personal communication plays a key role. Thus satisfied users can serve as active agents in this process.

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10. MEDICAL TERMINATION OF PREGNANCY

Abortion is defined as expulsion of products of conception before 20 weeks of pregnancy. Reproductive health care for women includes provision of safe abortion services in primary health care setting. This is important because, unsafe abortion by untrained persons accounts for nearly 12% maternal deaths. Provision of easily accessible, cheap, safe abortion service can reduce burden of maternal morbidity and mortality.

MTP Act is implemented in India since 1st April 1972. Aim of the act is improvement of maternal and child health by avoiding unwanted births. Legal limit of abortion as per the act is 20 weeks. Abortion is safe when performed early, not repeatedly and on unscarred uterus.

The act has been amended during the year 2002 & came into force from 2003. Important aspects as per the Amendment of MTP Act are as below:

1. Indications

- Pregnancy likely to endanger woman's life or likely to cause grave injury to her physical or mental health.
- Child is likely to suffer from serious physical or mental disability.
- Pregnancy caused by rape.
- **Pregnancy** following contraceptive failure.

2. Experience and training

- MBBS doctor who has assisted for performing 25 MTP cases, of which at least 5 have been performed independently in the government approved hospital can conduct MTP up to 12 weeks of gestation. This training will enable RMP to do only first trimester termination (up to 12 weeks)
- Following doctors can perform MTP up to 20 weeks:
 - A doctor having postgraduate diploma or degree in OBGY or
 - MBBS doctor who has completed 6 months house job in OBGY or
 - MBBS doctor who has experience in practice of OBGY for a period not less than 1 year at any hospital.

3. Approved place

- Primary Health Centers, Rural Hospitals are approved places.
- As per the Amendment of Act, private places for MTP are to be approved for this purpose by the district level committee chaired by the Civil Surgeon. For each district a committee has been constituted.

- Private institution has to apply for approval of place in form A & certificate of approval is given in form B.
- A place previously approved as per previous Rules, will continue to have approved.
- Facilities essential for termination up to 12 weeks
 - Gynecological examination or labour table,
 - Resuscitation equipment
 - Sterilization equipment
 - Facilities for treatment of shock, including emergency drugs
 - Facilities for transportation.
- Facilities essential for termination up to 20 weeks
 - Operation table and instruments for performing abdominal and gynecological surgery
 - Drugs and parental fluids in sufficient supply for emergency use
 - Anesthetic equipment, resuscitation equipment
 - Sterilization equipment

4. Record and register

- After termination of pregnancy, within 3 hours RMP has to certify termination in a prescribed format (Form I).
- The consent given by a pregnant woman (Form C) and certified form (Form I) has to be sealed by RMP in an envelop. Write down serial number assigned to the pregnant woman in an admission register & name, address of doctor conducting MTP & date of termination of pregnancy on an envelop. Such envelop is to be marked as 'SECRET' & is to be kept in custody.
- Admission register (Form III) has to be maintained in which details of woman admitted for termination of pregnancy should be recorded. This register is a secret document and information should not be disclosed to anybody except under the authority of law. This register should be preserved for five years.
- Certificate for the purpose of MTP leave can be given to a woman whose pregnancy was terminated.
- No entry shall be made in any case sheet, operation theater register, follow up card or any other document / register other than admission register maintained for this purpose. Serial number of the admission register can be recorded on such records.
- Submit the monthly statement of cases in the form II to the Civil Surgeon.

5. Responsibilities of Medical Officer

- Perform MTP only after training.
- Perform MTP only up to 12 weeks of pregnancy at PHC.
- Maintain record.
- Ensure confidentiality.
- Display in your clinic, "unwanted pregnancy can be terminated at this clinic legally free of charge"..

- IEC for availability of MTP services, facilities.
- Do not perform gender specific MTP.
- Encourage women for use of reliable contraception.

6. Methods of MTP

6.1. Menstrual Regulation

Menstrual Regulation by using Menstrual Regulation kit can be performed up to 6 weeks. Menstrual Regulation kit consists of plastic syringe of 50 ml capacity, which has piston with rubber stopper and two-flange plastic valve to create negative pressure and rubber valve liner.

Advantages

- No anesthesia is required, as cervix need not be dilated for introducing 6mm cannula.
- Minimal bleeding.
- Safe, simple, economical.

6.2. Suction evacuation (Up to 12 weeks)

This method is performed by using set of cannulae & an electrical suction machine.

6.3. Manual Vacuum Aspiration (MVA)

By using double valve MVA kit consisting of a syringe & a set of cannulae of different sizes.

6.4. Medical Abortion

Doctors with postgraduate qualifications in Obstetrics and Gynecology only can perform medical abortion up to 7 weeks in which Mifepristone and Misoprostol are used as given below:

Day 1-	Mifepristone 200 mg orally
Day 3 -	Misoprostol 400 mcg orally
Day 14 -	Post treatment evaluation

6.4.1. Inform women as below

- Three visits schedule is necessary.
- Efficacy is up to 95%.
- If treatment fails, surgical termination is necessary; pregnancy cannot be continued, as there is risk of fetal malformation.
- Vaginal bleeding and uterine cramping may occur for 7-14 days.

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11. FORTY PLUS CARE

Care of men and women beyond forty is one of the important components under RCH Programme. This group is important from point of view of early detection and prompt treatment for following diseases:

- Hypertension, diabetes
- Malignancies especially Ca cervix, breast cancer
- Gynecological problems like prolapse, menopausal syndromes, RTI etc.

- Cataract
- Benign prostatic enlargement

Under RCH Programme, it is planned to organize regular forty plus clinics at FRU level and District Hospital. It will be monthly or fortnightly on a fixed day. Important investigations like urine and blood, pap smear, ECG/X-ray, other tests, appropriate guidance on exercise etc. are the facilities that will be available at these clinics.

1. What can be done at PHC

- Recording BP
- Urine sugar test
- Breast examination
- Abdominal palpation
- Speculum examination

- Vaginal examination
- Advice regarding healthy life style, which includes exercise, diet, stress management etc.
- Calcium supplementation

2. Role of PHC MO

- MO must know clinic days fixed for forty plus clinic at FRU or DH, which are adjacent to the PHC.
- During routine OPD, screen patients for above-mentioned diseases and refer them to these clinics.
- Follow up services should be given to patients who received treatment at forty plus clinics.
- Sensitize PHC staff regarding health problems common after age of 40 years, availability of services, appropriate referral etc.
- Community awareness regarding health problems in forty plus age group.

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SECTION VI

CHILD HEALTH

1. INTRODUCTION

Child health is an important component of RCH. Children are exposed to risk during fetal life, birth & early childhood. This results in high incidence of morbidity & mortality in children. Risk of mortality is highest in early period of life & there is gradual reduction in the risk as age advances. Although children up to 5 years constitute about 12% of the population, they contribute more than 40% of total deaths. Further, by single year age group highest mortality occurs in first year of life.

First four weeks of life are termed as neonatal period. Neonatal mortality constitutes two thirds of infant mortality. Between 1972 and 1992, NMR declined significantly. However, NMR in recent years has become static, which is a major cause of concern, as improving neonatal survival holds the key for reducing infant and child mortality.

Within neonatal period, first week is even more crucial. Three fourths of all newborn deaths occur during first week of life (early neonatal period). Major causes of neonatal mortality are sepsis (bacterial infections) (52%), birth asphyxia (20%) and prematurity (15%). Newborn deaths in first week of life are predominantly caused by birth asphyxia and prematurity, whereas those after first week are mostly due to bacterial infections. Irrespective of primary causes of deaths, over two thirds of neonatal deaths occur among infants who are born with low birth weight (weighing less than 2500 gm at birth). Over one third of all neonates are low birth weight. Mortality rate is three times higher in LBW babies than normal birth weight babies.

Important causes of mortality in post neonatal period are ARI, diarrhoeal diseases and vaccine preventable diseases.

1. Status of important child related mortality indicators of Maharashtra state is given below:

Table 1: Selected child related mortality indicators of Maharashtra state

Sr.	Indicator	Present status (Per 1000 live births)
1	Infant Mortality Rate	42 (SRS 2003)
2	Neonatal Mortality Rate	28 (SRS 2002)
3	Early Neonatal Mortality Rate	20(SRS 2002)
4	Late Neonatal Mortality Rate	8(SRS 2002)
5	Post Neonatal Mortality	17(SRS 202)
6	Perinatal mortality rate	29(SRS 2002)

2. Important child interventions

Based on the prevalent mortality & morbidity pattern, important child interventions under the programme are as below:

- Newborn care
- Immunization
- Management of diarrhoeal diseases
- Management of Acute Respiratory Infection (ARI)

- Nutrition

3. Integrated Management of Neonatal & Childhood Illnesses (IMNCI)

Every minute 20 children die under the age of five. Among all child deaths, neonatal mortality is having significant contribution. Majority of these deaths are due to ARI, diarrhoea, measles, malaria, malnutrition or a combination of these conditions. In view of the problem of high child mortality, WHO in collaboration with UNICEF has developed Integrated Management of Childhood Illnesses approach.

This approach has been slightly modified in India, as neonatal mortality component is high. Therefore this component is also included & is called as Integrated Management of Neonatal & Childhood Illnesses. For our state this programme will be implemented in phased manner initially covering tribal districts followed by non tribal.

3.1. Rationale of IMNCI

Most children present with signs & symptoms related to more than one of the conditions mentioned above. Therefore single diagnosis is not possible or appropriate & there is a need to combine therapy for several conditions. Thus the management is beyond single diseases & addresses overall health of a child.

3.2. Objective of IMNCI strategy

To reduce deaths, the frequency & severity of illness & disability, & to contribute to improved growth & development.

3.3. IMNCI interventions

IMNCI interventions is integrated case management of the five most important causes of childhood deaths:

- Acute Respiratory Infections
- Diarrhoea
- Measles
- Malaria
- Malnutrition

3.4. Components

- Improvement in the case management skills of health staff through the locally adapted guidelines in integrated management of neonatal & childhood illnesses & activities to promote their use.
- Improvements in the health system required for effective management of neonatal & childhood illnesses.
- Improvements in family & community practices.

3.5. IMNCI case management process

3.5.1. At out patient facility

- Assessment for major symptoms & examination for general danger signs
- Classification & identification of treatment
- Referral, treatment or counseling of the child's caretaker depending on the classification identified

3.5.2. Referral health facility

- **Emergency** triage assessment & treatment
- Diagnosis, treatment & monitoring of patient progress

3.5.3. Appropriate home management

- Teaching the mother or other care taker how to give oral drugs & treat local infections at home
- Counseling the mother or other caretaker about food, fluids, when to return to the facility & her own health.

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2. NEWBORN CARE

Principles of newborn care are simple and eminently achievable through primary care. Higher the non-institutional home delivery rate by untrained persons, higher the neonatal mortality rate. This is because of high rate of infection, unavailability of treatment of asphyxia and low quality care of LBW babies.

1. Basic components of newborn care

- **Quality** antenatal care
- Skilled attendance at birth including basic resuscitation
- Thermal protection
- Prevention of infection
- Exclusive breast feeding
- Extra care of low birth weight babies
- Early detection of illness & early care seeking. Care of sick babies at homes and at facilities including care during transport

2. Role of MO in newborn care

- Ensure that, all antenatal mothers in PHC area get registered before 16 weeks & get all antenatal services as mentioned in chapter on antenatal care.
- As far as possible, deliveries should be conducted in institution. Home delivery should be conducted by trained personnel by using five clean practices.
- Provide newborn care emphasising on following points:
 - Drying and wrapping neonates at birth
 - Achieve 100% weighing of neonates within 24 hours.
 - Ensure warmth, asepsis, exclusive breast-feeding
- Care of LBW babies:
 - Provide extra domiciliary care to low birth weight babies weighing less than 2500 gm up to 1800 gm:
 - Provide warmth by wrapping newborn in multilayered clothing
 - Give Kangaroo mother care by keeping newborn close to mother with skin to skin contact

- Breast-feed baby frequently. Give nothing other than breast feeding (exclusive breastfeeding)
- Prevent infection by minimum handling of baby
- Refer newborn babies weighing below 1800 gm where specialist services are available. Keep baby warm in multilayered clothes and breast feed frequently during transport.

- Promote exclusive breastfeeding
 - Initiate breastfeeding as early as possible after birth, preferably within half hour
 - Give exclusive breast-feeding for first 6 months of life
 - Avoid pre-lacteals, supplementary water or top milk during first 6 months.
- Promote early care seeking, treat common illnesses; administer antibiotics for sepsis.
- Ensure home visits to neonates by AWWs / by ANMs (two visits by AWW for all neonates on days 1 and 7; additional 5 visits on days 2, 3, 14, 21 and 28 for LBW neonates).

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3. IMMUNIZATION PROGRAMME

Immunization is most cost effective public health intervention to reduce morbidity and mortality due to vaccine preventable diseases. Immunization is important component of RCH programme.

Important landmarks in immunization programme

1978 Expanded Programme on Immunization (DPT, OPV, BCG, DT, TT)

1985 Universal Immunization Programme (Measles included)

1992 Child Survival and Safe Motherhood programme.

1995 Polio eradication activities started.

1997 Reproductive and child health programme

PHC staff is responsible for implementation of RCH services in their area. MO must, update knowledge and skills of him/herself and of PHC staff, as per recent guidelines. Your updated knowledge and skills will equip you further to strengthen the immunization programme. This chapter elaborates instructions/information & guidelines for effective implementation of the programme by PHC staff on the basis of recent knowledge about immunization.

1. National immunization & vitamin A schedule

Immunization services for vaccine preventable diseases are to be organized so as to provide vaccination to all targeted groups. National immunization schedule and target groups are given below -

Table - 2 : National & immunisation & Vit. A schedule.

Beneficiary	Age	Vaccines	Dose	Route of administration
Pregnant women	At registration	TT -1	0.5ml	Intramuscularly
	4 weeks after TT-1	TT - 2 *	0.5 ml	Intramuscularly
Infants	At birth	BCG and OPV - 0 dose	BCG - At birth 0.05 ml	BCG - Intradermal left deltoid region OPV - Oral DPT - Intramuscularly in anterolateral side of thigh Measles Sub-cutaneous in upper arm Vit A 1 st dose Orally
	At 6 weeks	BCG\$, DPT -1, OPV - 1 ^o	At 6 weeks 0.1 ml	
	At 10 weeks	DPT - 2, OPV - 2 ^o	OPV - 2 drops	
	At 14 weeks	DPT - 3, OPV - 3 ^o	DPT - 0.5 ml	
		9 months completed to 12 months	Measles - 0.5 ml. Vit A 1 st - 1 ml.	
Children	At 16-24 months	DPT and OPV booster Vit. A II nd dose with booster, III rd at 24 months	DPT - 0.5 ml OPV- 2 drops Vit A- 2 ml	Intramuscularly Orally Orally
	24 to 36 months	Vit. A IV th dose at 30 & V th at 36 months	2 ml	Orally
	At 5-6 years	DT#	0.5 ml	Intramuscularly
	At 10 years	TT#	0.5 ml	Intramuscularly
	At 16 years	TT#	0.5 ml	Intramuscularly

* Last dose of TT should be given at least one month prior to expected date of delivery.

In second & multipara only one booster dose is given, if previously immunized within last 3 years.

\$ - If not given at birth.

o Hepatitis -B immunisation has been recently started in some areas of the state, which will extend to other areas in phased manner. Three doses of this vaccine are given along with 3 doses of OPV & DPT. Dose is 0.5 ml. IM

- Two doses of DT/TT should be given at an interval of one month if there is no clear history or documented evidence of previous immunization with DPT/DT/TT.

2. Planning of immunization services

2.1. Estimation of beneficiaries

It is essential for MO to estimate beneficiaries of each age group to judge completeness of reporting of beneficiaries and also to plan immunization activities in PHC. Compare number of estimated beneficiaries with actual registration in R-15 (ANC register), R-16 register (0-2 years) and R-17 registers (2-16 years). Population of village/sub-center and birth rate are required for estimation of beneficiaries of each age group. Considering birth rate as 20/1000 population, estimated figures of various beneficiaries for sub center of 5000 population are given below -

2.1.1. Antenatal registration

This is the basic activity as it is entry point for Mother and child services.

Expected number of ANC's in one year = (Birth rate x

Population / 1000) + 10% (pregnancy wastage)

Example: Estimated number of ANC for 5000 population
= (20 x 5000 / 1000) + 10% = 100 + 10 = 110 ANC in 5000 population

At any given point of time MPW(F) should have in hand 50% of annual expected numbers of pregnancies in her area, because pregnancy is a 9-month event & most women acknowledge their pregnancy only around third month. Thus ANM having population of 5000, should have 55 ANC's at any given time.

2.1.2. Infant (0-1 year)

No. of estimated children (0-1 years) = Birth rate x Population / 1000.

Example: 20 x 5000 / 1000 = 100

There are estimated 100 children of 0-1 years age group in 5000 population.

2.1.3. Children 1-2 years (13-24 months) age group

No. of estimated children 1-2 years = Birth rate x population / 1000

Example: 20 x 5000/1000 = 100 children

There are estimated 100 children in 1-2 years age group. 4% deduction is due to infant mortality.

2.1.4. Children in 0-5 years age group

As birth rate has considerably declined in recent times, there are approximately 10% 0-5 years children in population. Therefore in 5000 population, children below 5 years will be between 500.

As birth rate and IMR of population changes, estimated figures will also change accordingly. There can be variation of 10% in estimations and actual beneficiaries due to differences of age and sex structure in particular population. If variation is more than 10%, MO should discuss with concerned staff about reasons for difference. If reasons are not appropriate, house-to-house survey needs to be carried out to enlist escaped beneficiaries.

2.2. Plan frequency and type of sessions

- **Frequency** of session depends on number of beneficiaries. Calculation of frequency of sessions is given in details in the chapter Arogya Seva Satra.

2.3. Identify high-risk area

Areas with low coverage resulting into possibility of getting cases of vaccine-preventable-diseases (VPD) are classified as high-risk areas.

2.3.1. Criteria to identify high-risk areas for immunization are

- Villages where a case or outbreak of any VPD has occurred in last 3 years.
- Areas with continuously low coverage of immunization.
- Remote villages not accessible for more than 6 months in a year.
- Areas with vacant post of MPW (F) for more than 3 months.
- Areas physically inaccessible because of river, dam, backwater of dam etc.
- Areas with high population migration.
- Borderline area.

2.3.2. Plan activities for high-risk areas

There is possibility of low service coverage in areas mentioned above. Medical Officer must identify areas, which fulfill above-mentioned criteria and plan activities as follows -

- Make one HA specifically responsible for the high-risk area.
- Check record of concerned MPW (M/F) and examine whether beneficiaries are registered as per estimation.
- Always take review of these areas on priority, during weekly meeting of HAs and monthly review meetings.
- Calculate vital indicators of high-risk areas and check whether they tally with other areas. If vital indicators are under reported or partially reported, arrange for special survey to register all events & beneficiaries.
- Personally visit place at least once a month and check service coverage by house-to-house visit.
- Take help of self-help groups, opinion leaders, Mahila Mandals, GP and other important persons to increase coverage. It is universal experience that, these organizations from remote areas are usually very cooperative.

2.4. Involve private practitioners

Encourage private practitioners from PHC area to give

preventive services to community. This increases service availability to community leading to improvement in coverage and also decreases load on health staff, which can be utilized to serve in remote areas. However private practitioner should fulfill following criteria:

- All vaccines should be kept in cold chain as per the guidelines from GOI.
- Private practitioner should follow National Immunization Schedule.
- All beneficiaries should be provided with immunization card.
- They should keep list of beneficiaries to whom vaccine is given.
- Private practitioner should report work done in prescribed format to PHC.
- Private practitioner should maintain record of vaccine utilization.
- Private practitioner should allow Medical Officer to check any time whether guidelines given are followed or not.

Private practitioner should submit application for approval of his/her dispensary/hospital to District Health Officer mentioning that he/she agrees to all the laid down criteria. After inspection by District RCH officer, practitioner will be given approval. Free supply of vaccines & also immunization cards should be made to the practitioner after approval.

2.5. Calculate logistic support

2.5.1. Vaccine requirement

Vaccine requirement depends on number of beneficiaries to be vaccinated, number of doses to be given and wastage. Formula to calculate vaccine requirement is -

Total number of infants x Number of doses of vaccine x Wastage Multiplication Factor (WMF)

Total number of infants are estimated on the basis of recent birth rate as given in the section on 'Estimation of Beneficiaries'. Number of doses of vaccine is decided by doses required to protect the child as per National Immunization Schedule.

Maximum vaccine wastage allowed for each type of vaccine is 20%. Thus for calculation of vaccine requirement WMF is 20%.

Example: Calculate requirement of DPT vaccine.

Total doses given in DPT are 3+1 (booster) = 4, WMF is 20%. Thus for a village with 20 estimated infants, DPT requirement will be -

Total number of infants no. of doses of vaccine WMF
 $20 \times 4 \times 1.2 = 96$ doses. One vial of DPT is of 10 doses. Thus village of 1000 population will require 10 vials in 12 months. As there cannot be half or quarter vial, MPW (F) should carry one vial of DPT every month for immunization session in that village.

Table below gives vaccine requirement of 1000, 3000 and 5000 population assuming BR as 20/1000.

Table - 3 : Vaccine requirement

Vaccine	No. of doses	WMF	Vaccine requirement								
			1000 population			3000 population			5000 population		
			Yearly	Monthly		Yearly	Monthly		Yearly	Monthly	
			Doses	Doses	Vials	Doses	Doses	Vials	Doses	Doses	Vials
BCG	1	1.20	24	2	1#	72	6	1	120	10	1
OPV	5	1.20	120	10	1	360	30	2	600	50	3
DPT	4	1.20	96	8	1	288	24	3	480	40	5
Measles	1	1.20	24	2	1\$	72	6	2	120	10	2
DT	1	1.20	24	2	1*	72	6	1	119	10	2
TT(ANC)	2	1.20	53	9	1	159	25	3	265	42	5
TT(10yrs)	1	1.20	24			72			120		
TT(16yrs)	1	1.20	24			72			120		

- For vial of 10 doses

\$ - For vials of 5 doses

* As number of children is less vaccine can be given during alternate session.

Prepare the chart of vaccine requirement for each Arogya Seva Satra, monthly and yearly. Total requirement for all Arogya Seva Satra will be the requirement of PHC. Remember, vaccine requirement can change year-to-year or place-to-place depending on population and birth rate for the year of planning.

2.5.2. Syringes & needles requirement

Generally, ordinary glass syringe would be used 40 times and a needle 10 times except BCG needle, which should be used 5 times only. However, if marking on syringes becomes faint or needles become blunt, they should be discarded irrespective of how many times they have been used.

Syringes and needles to be used for various purposes:

- For BCG vaccine (intradermal route) 1 ml. syringe or BCG syringe & 26 G needle
- For all other vaccines (intra-muscular and subcutaneous route) 2 ml syringe & 23 G needle
- For reconstitution of vaccine 5 ml syringe & 20 G needle.

Overall yearly requirement of needles and syringes is as below:

Table - 4 : Requirement of needles & syringes

Sr.	Particulars	Sub-center population		PHC population	
		3000	5000	20,000	30,000
1	Syringe 5 ml	10	10	50	60
2	Syringe 2 ml	20	30	120	180
3	Syringe BCG/1ml	10	10	50	60
4	Needle 20G	10	10	50	60
5	Needle 23G	60	100	400	600
6	Needle 26G	30	40	150	240

Calculate session wise requirement as below:

- Complete session wise vaccine requirement chart for all villages in PHC as described above.
- Calculate requirement of each type of syringe and needle with the help of vaccine requirement chart as follows -

- Syringe 5 ml: One 5 ml syringe for each type of vaccine vial you are carrying to session for which reconstitution is required + one more syringe.
- Syringe 2 ml: Add expected number of doses of DPT, Measles, DT, and TT (ANC/10yrs/16yrs) + 10% of the total expected doses of injectable vaccines.
- Syringe BCG/1ml: Consider number of doses of BCG to be given in session + 10% more.
- Needle 20G: Same number as 5ml. syringes
- Needle 23G: Same number as 2ml. syringes
- Needle 26G: Same number as BCG/1ml. syringes

Prepare chart for requirement of needles and syringes for each village as described above.

2.5.3. Requirement of MCH cards

All the services related to pregnancy, childbirth and childhood immunization should be registered in MCH card. MCH card should be issued at the time of ANC registration and continued after delivery for newborn up to preschool age. Therefore yearly requirement for immunization card will be:

MCH cards requirement of village = Number of estimated ANCs in the village + 10%

Dividing one-year requirement by 12 (months) gives MCH card monthly requirement.

Example: in a village with 20 expected ANCs in one year, the card requirement will be -

$20 + 2 = 22$ MCH cards will be required for one year.

$22/12 = 1.83 = 2$ new MCH cards will be required every month.

MPW (F) should expect 2-3 new ANCs per month for session and carry 3 new cards for every session.

2.5.4. Other material requirement

Adequate number of swabs, cotton, gauze, forceps to hold needle and syringes and Tablet Paracetamol will be required for immunization session. Do not forget to carry list of expected

beneficiaries and other related record for immunization session like R15, R16, R17 registers.

2.6. Arogya Seva Satra management chart

With the help of charts prepared for calculating requirement of vaccines, needles, immunization cards etc. prepare

three copies of following chart in your PHC. Display one copy above ILR in MO room, one copy in sister's room and once copy in autoclaving room.

Village wise monthly requirement of vaccines/needles/syringes/immunization card

Table - 5 : Villagewise requirement for Arogya Seva Satra

Sr.	Name of village	Population	Frequency of session	Requirement of vaccine							
				BCG		DPT		OPV		Measles	
				Doses	Vials	Doses	Vials	Doses	Vials	Doses	Vials
	1	2	3	4	5	6	7	8	9	10	11
1											
2											

Requirement of vaccines (contd.)						Requirement of vitamin A		Needles (23G,26G, 5ml, 2ml BCG)	Syringes	MCH cards	Remarks
DT		TT		Hepatitis B							
Doses	Vials	Doses	Vials	Doses	Vials	Doses	Bottles	20G)			
12	13	14	15	16	17	18	19	20	21	22	23

This chart should be referred at the time of autoclaving needles/syringes for sessions, issuing vaccine and during planning of extra immunization related activities. Medical Officer must ensure that, logistic support for Arogya Seva Satra is made as per this chart.

3. Monitoring cold chain

All vaccines should be stored between 2-8°C to keep them potent. Keeping vaccines within desired temperature (2⁰-8⁰C) from manufacturing to the point of use is called cold chain. Maintenance of cold chain is the key activity in immunization programme. The cold chain includes, personnel who handle & manage vaccine distribution, cold chain equipments & their maintenance and transport facilities.

For PHC, cold chain includes following components -

- Storing vaccines at recommended temperature (2⁰-8⁰C) after receiving from DHO.
- Daily** temperature maintenance and recording.
- Transporting vaccine for session in vaccine carrier by maintaining cold chain.
- Maintenance of cold chain equipment
- Training of health staff regarding cold chain, importance of cold chain, use of cold chain equipment and action to be taken if there is failure of cold chain equipment.

3.1. Sensitivity of vaccine to heat & freezing

All vaccines are not equally sensitive to heat. Spectrum of heat sensitivity to vaccine is given below which shows reconstituted BCG is most sensitive and TT is least sensitive to heat.

Most sensitive	BCG (After reconstitution)
	OPV
	Measles (Both before & after reconstitution)
	Hepatitis B
	DPT
	DT
	BCG (Before reconstitution)
Least sensitive	TT

DPT, DT and TT (Vaccines with T) get precipitated and damaged if stored below 2°C. All vaccines lose potency beyond 8°C. Therefore it is important that the temperature of ILR should not go below 2°C or above 8°C.

3.2. Cold chain equipment maintenance

3.2.1. Ice Lined Refrigerators (ILR) 140 lit. capacity

a. Capacity - 25,000 doses of all types of vaccine & 18,000 doses of OPV

b. Temperature- 2° - 8°C

c. Use - Storage of all vaccine supplied to PHC (BCG, OPV, DPT, Measles, Hepatitis B, DT, and TT)

d. Hold over time - Hold over time of ILR depends upon outside temperature. In case of electricity failure, inside temperature of ILR is maintained below 8°C for 78 hours when outside temperature is 32°C and 62 hours when outside temperature is 43°C. Do not open the ILR to record temperature for first 48 hours if there is electricity failure. After that, arrange for shifting of vaccine to cold box if still there is uncertainty about duration of electricity failure.

e. Thermostat- Thermostat is provided to keep inside temperature of ILR at desired level. At a particular level of thermostat, there is slight fluctuation of inside temperature of ILR depending upon outside room temperature. Because of this, level of thermostat needs to be adjusted periodically taking into consideration room temperature at that time. Keep thermostat at minimum during winter season so that temperature inside ILR will not fall below 2°C. Start adjusting thermostat towards maximum as room temperature starts increasing from end of winter till summer is over. Thermostat should again be adjusted towards minimum depending upon outside temperature during rainy season. Adjustment of thermostat should be carried out when daily temperature reading indicates that, inside temperature has reached either at lowest (2-3°C) or highest (7°-8°C) level. Remember, thermostat should be adjusted in such a way that temperature inside ILR should remain between 2°-8°C.

f. Checking proper closing of upper lid of ILR

In order to maintain correct temperature, lid of ILR should get closed tightly without any gap. To check whether the lid is closed tightly or not, keep a paper on the edge of ILR & close lid. Try to pull the paper outside. If resistance is felt while pulling the paper, it indicates that lid is tight. If there is no resistance while pulling the paper, then lid is not getting tightly closed. Repeat this test on edges of all sides of ILR. Gap after closing upper lid causes escape of cold air leading to overload of compressor. Temperature of such ILR rises rapidly above 8°C. If lid is not closing properly, inform DHO immediately for sending refrigeration technician.

g. Vaccine storage

Guidelines to be followed for vaccine storage in ILR

- ILR has two sections - top section with trays and floor section at the bottom.
- Bottom is the coolest part & therefore only OPV and Measles vaccine should be kept on floor. In the top section of ILR, DPT, DT, TT, Hepatitis B and BCG vaccines should be stored. Never keep DPT, DT, TT, Hepatitis B vaccine on the floor as they can freeze & get damaged.
- Keep each type of vaccine in a separate labelled box. Make holes to the box so that cold air can move freely through the box.
- In addition to this, keep a separate box & label it as a "returned vaccine box" for unopened vials returning after session. After immunization session, when vaccine carriers are returned to PHC, discard all the opened vials irrespective of VVM stage.
- If there are some unopened vials, check VVM of OPV vial. If inner square of VVM is lighter than outer circle, keep unopened vials in 'returned vaccine box'. If inner square of VVM is of same colour or darker than outer circle discard all vials.
- While issuing vaccine for next session, first issue vials from returned box. The returned vials should be first used during immunization session.
- Vaccine vials can be returned only two times. When

vaccine vial is returned for the first time one rubber band is put or one 'X' is marked on vial & if the same vial is returned for second time two rubber bands are put or 2 'X' marks are made on vial. If vials with two rubber bands or two X marks are not used and returned for third time, discard them even if they are not opened irrespective of VVM stage. However such situation should not arise with proper vaccine management.

- Do not keep diluents or any other material like empty boxes, polythene bags, needles, syringes etc. in ILR. This causes difficulty in free airflow inside ILR.

h. Defrosting

When ILR is opened, humidity in air enters inside it. This humidity is converted into ice in cold air and accumulates in the form of ice layers on sides and floor of ILR. When ice layer becomes thick, it overloads the compressors of ILR & therefore should be removed periodically. Removing ice layer is called defrosting. Defrosting should be done when ice layer is more than 6 mm thick. Defrosting is regular activity and responsibility of defrosting is of HA (F)/MPW (F) who records daily temperature and looks after the vaccine management.

Method of defrosting

- Put frozen ice packs in cold box. Close it & wait for few minutes.
- When temperature inside the cold box is below 8°C, transfer all vaccines kept in ILR to cold box.
- Switch off power supply of ILR & remove plug.
- Open defrost outlet plug, which is at the bottom & keep one tray under the drain.
- Keep lid of ILR open & allow ice to melt. Let ice melt on its own. Do not use sharp instruments to scrub ice.
- When total ice is melted, wash sides and floor of ILR with warm water & mild detergent. Wipe & dry with cloth. Keep open till inside is completely dry.

i. Restarting ILR after defrosting

- Close the drain outlet, close lid, connect power supply and switch on.
- Turn thermostat knob to maximum till inside temperature reaches to 7°C.
- Shift all vaccines at recommended places.
- Set the thermostat knob to original level (position before defrosting).

3.2.2. Deep Freezer (DF)

a. Capacity - 140 liters (25 - 30 ice packs can be frozen in one day).

b. Temperature - -18°C to -20°C

c. Use - For preparation of frozen ice packs. Do not store vaccine in DF.

d. Hold over time - In case of electricity failure, DF can maintain temperature at -18°C for 22 hours when outside temperature is 32°C and 18 hours when outside temperature is 43°C.

e. Preparation of ice packs

- Fill ice packs with water up to the mark shown near neck and close cap tightly.
- Check for leakages by holding icepack upside down, if water leaks out from cap, do not use icepack. Leakage of water inside deep freezer forms hard ice, which leads to fixation of icepacks to floor or walls of deep freezer that may cause damage to equipment.
- Dry outer surface of icepacks before keeping inside deep freezer, otherwise when frozen; it will be difficult to separate.
- Keep ice packs on the floor of DF on the edge horizontally, allowing 1-2 cm space between two icepacks.

f. Defrosting - Same as ILR

3.2.3. Cold box

a. Capacity - 5 liters, 1500 doses & 20 ice packs.

b. Use

- Transportation of vaccine
- Used for storage of vaccine in case of electricity failure or during defrosting of ILR.

c. Hold over time - More than 90 hrs at 43°C if cold box is not opened.

d. Vaccine storage

- Place frozen ice packs inside cold box covering walls & floor.
- Keep vaccines in cartons or plastic boxes & then place these boxes in cold box.
- Cover vaccine cartons at the top with frozen ice packs. Close the cold box and keep in cool dry place.

e. Maintenance

- Clean & dry after every use
- Examine for cracks.
- Check rubber seal if it is broken
- Lubricate hinges & locks routinely.

3.2.4. Vaccine carrier

a. Capacity - 1.7 liters, 15 - 20 vials & 4 ice packs

b. Use - To transport vaccine from PHC to Arogya Seva Satra.

c. Hold over time - 24 to 36 hrs.

d. How to pack

- Place 4 fully frozen ice packs on four sides of vaccine carriers. Wait for 10 minutes to fall temperature inside the vaccine carrier to less than 8°C.
- Keep vaccine vials first in a paper bag or paper packing & then keep this paper packing in polythene bag so that 'T' series vaccine do not come in direct contact with frozen ice packs.
- Keep diluents of BCG & Measles vaccine in vaccine carrier.
- Keep dropper of OPV in vaccine carrier.

e. Maintenance

Clean & dry inside after every use.

3.2.5. Thermometers - For recording temperature of ILR & DF one dial thermometer has to be kept in each equipment. Alcohol stem thermometers are also provided which are more sensitive & accurate than dial thermometers.

3.3. Cold chain store

- Keep ILR and DF in one room, preferably Medical Officer room. This room should be well ventilated avoiding direct sunlight. Keep cold box and ice packs in one room.
- Keep minimum 15 - 20 cm space between wall & sides of equipments.
- Display alternative emergency plan indicating what to do in case of electricity problem/failure or ILR not working.
- Keep one small board above the ILR and DF and write down daily stock of all vaccines and available frozen ice packs on this board. This should be updated daily.

3.4. Assessment of cold chain

Cold chain assessment is made by two methods. One is by recording temperature of ILR and Deep freezer daily and second is Vaccine Vial Monitor.

3.4.1. Monitoring temperature record

- For recording of temperature of ILR & DF prescribed format has been given to all PHCs.
- It is a small booklet, which contains 12 monthly temperature-recording forms.
- For each month, day wise temperature has to be recorded twice a day (10 am & 4 pm)
- Responsibility for daily temperature record has to be fixed with one HA (F) or headquarter ANM.
- MO should check temperature recorded by HA (F) and actual temperature in ILR and DF. It is a good practice for MO to check daily inside temperature of ILR/DF and recorded temperature on register before starting OPD.
- If there is power failure it has to be mentioned in remarks column.

3.4.2. Vaccine Vial Monitor (VVM)

VVM on OPV vial indicates cumulative effect of temperature on the vial since manufacturing. There is a circle on the vial, which is grayish or blackish in colour. There is a square inside the circle, which is of white colour at initial stage. Colour of this square becomes darker slowly after exposure to higher temperature.

a. Stages of VVM

- Stage-I: The small square is white and lighter than big circle. If expiry date is not passed, use the vaccine.
- Stage-II: The small square is darker but definitely lighter than circle. If expiry date is not passed, use the vaccine.
- Stage-III: The colour of small square is same as big circle, do not use the vaccine, irrespective of expiry date.
- Stage-IV: The small square is darker than big circle, do

not use the vaccine, irrespective of expiry date.

If OPV vial is exposed to higher temperature, colour of inner square starts becoming dark. When the colour of square is same as circle or is darker than the circle, it indicates break in cold chain.

Previously potency test of OPV was carried out, as OPV is most sensitive to temperature. Samples of OPV were sent from all levels by maintaining reverse cold chain to laboratory for potency test. However now a days this is not done since VVM is introduced on OPV vials.

3.5. Breakdown of cold chain

In case of breakdown of cold chain equipment, inform immediately to DHO / DIO. Every district has one refrigeration mechanic, who will visit your PHC & make minor repairs of cold chain equipment. For major repair, cold chain equipment has to be sent to State Health Transport Organization, Pune. Repair of ILR, DF should never be done from private mechanic or company.

Table - 6 : Emergency alternative plan

No.	Problem	Actions to be taken by HA/ANM
1	Electricity failure	- Ø Inform the MSEB immediately about electricity failure. - Ø Do not open ILR for 48 hours. If power failure still persists, make arrangements for vaccine transfer. § Shift vaccine to cold box with frozen ice packs. § If electricity will not be restored in next 72 hours, shift vaccine to PHC (Name of nearby PHC) _____ in cold box.
2	ILR Breakdown	- Ø Inform immediately to the technician at district health office - Ø If repair is possible within 2 weeks and DF is working § Shift vaccine to cold box with frozen ice packs. § Change icepacks every 3-4 days till ILR is repaired - Ø If repair not possible and DF is not working properly § Shift vaccine to PHC (Name of nearby PHC) _____ in cold box

4. Planning and monitoring of immunization services

We have seen about calculation of estimated number of beneficiaries, deciding immunization sessions, involvement of private sectors, vaccine, needles and other material requirement in planning the immunization services and also monitoring the cold chain. It is equally important to monitor immunization services to ensure protection of every child against vaccine preventable diseases.

Important components under planning and monitoring immunization services:

- Vaccine stock inventory and distribution of vaccine to Arogya Seva Satra
- Autoclaving of syringes and needles in adequate number
- Vaccine transportation in cold chain
- Immunization through Arogya Seva Satra
- IEC and follow up action

4.1. Vaccine stock and distribution of vaccine

- It is the responsibility of HA (F) to receive, store &

3.6. Power supply arrangement

- No electrical cold chain equipment should be installed without a voltage stabilizer.
- Function of voltage stabilizer is to adjust the range of fluctuations to 220 +/- 10 volts.

3.7. Emergency alternative plan

- For each PHC, emergency alternative plan for vaccine storage must be prepared in case of electricity failure or breakdown of cold chain equipment.
- This plan should be displayed in the room where cold chain equipment is kept. MO should ensure that all PHC staff knows that the plan is displayed & actions have to be taken accordingly.
- Always keep ready frozen ice packs in DF. For one cold box 20 frozen ice packs are required.
- If problem of cold chain failure persists for more than 3 days then vaccine should be shifted to nearby PHC in cold box. Never keep vaccine in domestic refrigerator.

distribute vaccines. If this post is vacant then HQ ANM should be made responsible for vaccine management.

- Calculate monthly requirement of vaccine and demand vaccine required for one month only. Do not store vaccine in PHC for more than one month. Method of calculating vaccine requirement for year, for month and for each session is given in planning section.
- Two registers should be maintained for monitoring the stock of vaccine. First is Vaccine Stock Book and second is Vaccine Distribution Register.
- Enter all the vaccines received from district level in Vaccine Stock Book. Each vaccine should be entered on separate page like medicine stock register. Record batch number, date of manufacturing, date of expiry of each vaccine. Record expenditure of vaccine on each day with the help of Vaccine Distribution Register. Entries should be made in stock book at the end of day and not at the time of distribution as few unopened vials may be returned back to PHC. Vaccine balance on stock book should match with actual vaccine in ILR.

- Vaccine Distribution Register contains detailed information about distributed vaccine; returned vials and wastage of each type of vaccine in each session. Following format should be used for vaccine distribution register -

Table - 7 : Format for vaccine distribution register

Sr.	Date	Place of MCP session	Name of vaccine	Vaccine issue information					
				Time of issue	Batch no.	Expiry	Doses	Vials	Sign of receiving person
	1	2	3	4	5	6	7	8	9

Vaccine return information						Vaccine use information				
Time of return	Condition of VVM & icepacks	Return status and doses			Sign of returning person	No. of doses given to beneficiary	Total no. of doses used	Wastage	% Wastage	Sign of distributing person
		First return	Second return	Total return						
10	11	12	13	14	15	16	17	18	19	20

- When all the vaccine carriers are returned and all the columns of Vaccine Distribution Register are completed, add number of doses used of each vaccine at all the sessions on that day and enter the sum as expenditure on that day in Vaccine stock register to get final stock at the end of the day.
- Maintaining this register is important as sometimes particular batch of vaccine is declared as substandard and you may be asked to inform the DHO about amount of vaccine received from this batch and area of use.
- Follow First In First Out rule (FIFO) i.e. vaccine received first should be used first. In addition to this you must see expiry date & in that case First to Expire First to Out (FEFO) principle must be used.
- Never use blunt needles for immunization as blunt needles injure muscle fibers and small blood vessels leading to severe pain and internal bleeding and sometimes swelling at the site of injection. Therefore destroy the blunt needles immediately after examination, as they may again enter into circulation.
- Never pick up syringes and needles with hands. Always keep forceps in drum above the syringes and needles at the time of autoclaving. This will help in avoiding touch to autoclaved syringes and needles by fingers.

4.2. Use autoclaved syringes and needles

You have chart of expected beneficiaries for each Arogya Seva Satra from your area. You have also information about how to calculate requirement of syringes and needles for the session. Prepare chart of number of syringes and needles required for each Arogya Seva Satra. It is proposed that syringes should be used 40 times and needles 10 times for immunization. In practice, it is very difficult to count frequency of use of needles and syringes.

Important aspects about needles & syringes:

- Syringes should be used till the markings on barrel are visible clearly and piston is freely moving in the barrel.
- Keep the barrel and piston of each syringe together while autoclaving, preferably by tying with cotton thread.
- Bluntness of each needle should be checked before autoclaving. Do not see this by moving the needle through fingertips (a common practice in the field). Draw the needle carefully across some cotton wool or gauze. If the needle is barbed it will catch in the fibers of cotton wool or gauze.
- See VVM on OPV before putting vaccine in vaccine carrier. Keep carton paper between vaccine and icepack to avoid direct contact.
- Do not open the vaccine carrier till you reach the

destination. Never keep vaccine carrier in sunlight or near hot places while transporting.

- Examine VVM before starting immunization session. During immunization session, avoid opening of vaccine carrier frequently.
- Use returned vaccine first. Destroy all the opened vials at the end of session. Take back all unopened vials to PHC. Examine VVM. If VVM is at stage-I or stage-II, mark the vials as per return stage and keep in return box.

4.4. Arogya Seva Satra

- MO is responsible for monitoring & supervision of Arogya Seva Satra in PHC area. When there are two MOs in PHC, all the sessions should be attended by MO. For PHC where only one MO is posted, at least 50% sessions (on alternate times) should be attended by MO. MO should visit all the villages at least once in two months.
- For each session there should be fixed day, fixed place & fixed time schedule.
- Responsibility of each activity under Arogya Seva Satra should be clearly mentioned and given to concerned health staff for smooth implementation. Responsibility chart should include activities like listing of beneficiaries, autoclaving, vaccine transportation, vaccination, monitoring adverse events following immunization, etc.
- It is the responsibility of MO to ensure that no Arogya Seva Satra is cancelled & sessions are held as per fixed date.

4.5. IEC activities and follow up

While giving any vaccine ensure that health worker is giving following messages -

1. Inform mother that, vaccines are used to protect the child from various VPDs.
2. It is important to give all the doses in time to fully protect the child from these diseases. Inform date & time for next dose of vaccine
3. Inform mother about likely reactions after administration of each vaccine and treatment to be given if anything adverse occurs.
4. Mother should attend PHC or inform MPW if child gets high fever, convulsions, swelling at the site of injection, skin rash or any serious reaction or adverse event following immunization (AEFI).

4.6. Record keeping

MO should observe that

- Immunization card is given to each beneficiary.
- Date & number of doses are correctly written.
- R 15, R 16, R 17 registers are completed on the same day.

5. Adverse Events Following Immunization (AEFI)

It is extremely important to monitor AEFI to maintain credibility and accountability of health services. Major reasons for AEFI are unsafe procedures or faulty techniques reflecting poor quality of service delivery. AEFI can be classified as follows

-
- AEFI due to programmatic errors / faulty technique - Abscess, severe local redness, suppurative lymphadenitis, Toxic Shock Syndrome due to measles etc. (58%)
- Vaccine induced AEFI - Mild local redness, pain, tenderness, fever, rash, lymphadenopathy. Some severe but rare events like suppurative lymphadenitis, anaphylactic shock, osteitis, paralytic polio, encephalitis, and encephalopathy. (19%).
- Coincidental events - Encephalopathy, encephalitis, Sudden Infant Death Syndrome (23%).

AEFI are rare events. Benefits of immunization outweigh the risks of AEFI; therefore health education has important role in case of AEFI incidences.

5.1. Monitoring of AEFI in PHC

People are very serious about illnesses of small children especially when illness or pain occurs due to immunization to otherwise healthy child. Thus all efforts to prevent AEFI should be carried out along with careful surveillance.

5.1.1. AEFI surveillance

a. Reporting of all AEFI by health workers

- All health workers must know about AEFI for each vaccine & should be encouraged to report all AEFI.
- One MPW (Male or Female) should visit to the village next day after each immunization session and enquire to beneficiaries who received vaccine about any problems after immunization. Anganwadi worker or Dai should also be contacted for any such event.

b. Investigation of AEFI

MO must do preliminary investigation of AEFI. This is helpful for informing of AEFI to DHO within 24 hours. District level officer investigates all AEFI & preliminary investigation report is submitted within 7 days of occurrence.

Important points in AEFI investigation include-

- Immediate visit to the village. Visit the house of index case. Ask about nature of symptoms and when was first symptom observed. Start treatment and if required refer the case.
- Ask health workers for house-to-house visit to all children immunized on that day & know number of children having AEFI. Enquire whether non-immunized children in the area also have similar symptoms.
- Preserve the vials used for the session as below which are required for laboratory investigation:
 - Used vials with remaining vaccine (if available).
 - Unused vials of same batch number from same storage point.
 - Empty used vials also need to be sent for laboratory examination, as swab from vial can be cultured.
- Collect the information about
 - Arogya Seva Satra: Date, time, place of satra (particularly floor of should be observed), MPW, HA attending the satra.

- n Vaccine: Batch number, manufacturing date, expiry date, cold chain.
 - n Needles & syringes: Requirement, actual supply, method of sterilization, signoloc register of inner strips, quality of sterilization, use of forceps to pick up the needles for injection etc.
 - n Technique of vaccine administration
 - Send the report to DHO immediately.
 - MO should help district level officer in preparing detailed investigation report which is to be submitted within 3 months.
- and rush to the place. MO has to manage & treat AEFI which are treatable at PHC. Priority attention will maintain faith of people in the programme.
- Start treatment in the village. First priority is to treat all the suffering children and then start investigation of the event. If there is large number of cases and it is difficult to transport the patients, convert one Grampanchayat room or convenient place into temporary treatment facility and start treatment. Transfer the patient to PHC or appropriate referral center if required.
 - Keep one health worker in the village till all the patients are OK.

5.1.2 Treatment & management of AEFI

Medical Officer must treat AEFI as medical emergency

Guidelines for management of adverse events

Sr	Adverse Event	Vaccine	Symptoms	Management
1	Anaphylaxis Extremely rare	Any vaccine	Within minutes- Ø Acute decompensation of circulatory system Ø Hypovolemic shock Ø Altered sensorium Ø Laryngospasm/oedema Ø Acute respiratory distress	Ø Adrenaline (1:10,000) SC - Dose: 0.01 ml/kg give immediately Ø Cardiopulmonary resuscitation Ø IV volume expanders Ø Oxygen inhalation Ø Hydrocortisone injection IV
2	Hypotensive hypo responsive episode Very rare	DPT	Within 12 hours Ø Acute paleness Ø Transient decreased level or loss of consciousness Ø Decrease in muscle tone	Ø IV fluids Ø Dexamethasone Ø Oxygen
3	Inconsolable cry	DPT	Excessive inconsolable crying within 48 to 72 hours after DPT immunization	Ø Mild sedation Ø Analgesic e.g. Paracetamol orally. Ø Feeding advised Ø Avoid DPT for subsequent dose/s and give "DT"
4	Toxic Shock Syndrome	Contamination of Measles vaccine by Staphylococcus aureus	Within 30 minutes to few hours Ø Rising fever Ø Vomiting Ø Diarrhoea Ø Septicemic shock	Ø IV fluids Ø Antimicrobials Ø Steroids Ø Paracetamol orally Ø Supportive therapy Ø Referral if required
5	Lymphadenitis Local ulcer	BCG	Within 2 to 6 months Ø Firm to soft axillary lymphadenitis 1.5 to 3 cms size with or without sinus Ø Ulcer at the site of injection	Ø If firm no treatment. Ø If soft and fluctuant, aspiration Ø If sinus present and persist beyond 12 weeks, give INH 5 mg/kg once daily for 3 months
6	Bacterial abscess or sciatic nerve injury.	Any vaccine	Ø Contamination of vaccine or lack of sterilization Ø Within 72 hours fluctuant or firm abscess with or without fever	Ø Antibiotic Ø Antipyretic Ø Drainage (if needed)
7	Sterile abscess	DPT, DT, TT, Typhoid & Hepatitis B if vaccine was frozen	By 72 hours - Minimum Inflammation - No fever	- Drainage if needed
8	Local reaction	Any vaccine	Non-fluctuant swelling/redness at the site of injection	Tablet Paracetamol

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9	Seizure/s with or without convulsions. (Rare)	DPT, Measles. Ruleout other causes of convulsions	By 24-48 hours - Always generalized - Simple or complex	Ø Anticonvulsants e.g. Injection Diazepam Dose: 0.3 mg/kg/dose slow IV, Can be repeated after 30 min. Ø Antipyretic
10	Hyperpyrexia	DPT & Measles	By 12-24 hours	Ø Antipyretic Ø Tepid water sponging

5.1.3. Role of MO in prevention of AEFI

Observe that following precautions are taken by HW/HA to prevent AEFI-

- Proper storage & cold chain maintenance of vaccine.
- Autoclaving of needles & syringes - for 20 minutes at a temperature 121°C.
- Correct dose & route of administration of all vaccines.
- No substitution of drugs as diluents of vaccine or as a vaccine.
- Avoid contamination of vaccine or diluents.
- Follow the contraindications correctly e.g. DPT not to be given to a child who experienced severe reaction after previous dose of DPT.
- 'T' series vaccine to be given after shake test.
- DPT not to be given after 2 years of age.
- Use pyrogen free double distilled water as a diluent for reconstitution of measles vaccine & normal saline for BCG.

6. Monitoring of Vaccine Preventable Disease (VPD) surveillance activities

Disease surveillance is data collection for action. Disease surveillance helps in evaluation of immunization services. A single case or death due to VPDs is considered as an outbreak and action should be taken accordingly.

6.1. Role of MO

6.1.1. Ensure regular & complete reporting

- Make all HAs and MPWs aware about case definitions of VPDs during monthly meetings.
- Take regular review of VPD surveillance. Encourage health workers to report immediately any suspected case of VPDs.
- Collect the data for following -
 - ₪ Number of cases due to VPDs
 - ₪ Number of deaths due to VPDs
 - ₪ Number of cases of AEFI
 - ₪ Neonatal deathS
- Ensure that all sub centers submit their surveillance reports timely & completely.

6.1.2. Analyze surveillance data

- Analyse the data as per age, sex, immunization status
- Prepare map of PHC & show VPD cases by using rounds of different colours for different VPDs.

6.1.3. In case of outbreak of VPDs take the following actions

- Visit immediately the affected village
- Examine the cases and if provisional diagnosis suggests VPD, report immediately to DHO
- Start management of cases, admit if required.
- Refer the cases with complications.
- Start immediately the containment measures of VPD like immunization, outbreak response immunization etc.

6.2. Important aspects of VPDs for MO

6.2.1. Diphtheria

Diphtheria is caused by toxin of *Corynebacterium diphtheria*.

a. HW should suspect diphtheria case if

- Mild fever
- Sore throat & grayish white membrane in throat with or without difficulty in breathing.
- Exposure to a suspect case of diphtheria in previous 1 week.
- Epidemic of diphtheria in area.

b. MO should confirm if

- Grayish white membrane in throat with or without difficulty in breathing.
- Acute pharyngitis, nasopharyngitis, laryngitis
- **Airway** obstruction
- Myocarditis or neuritis, one to six weeks after onset of symptoms
- Laboratory confirmed diagnosis if throat swab culture positive.

c. Actions to be taken by MO

- Active house-to-house search by health workers.
- After giving symptomatic treatment, MO should refer cases where anti toxin or immunoglobulin can be administered.
- As the cases occur in areas where immunization coverage is low, immunize all eligible children with DPT & DT through catch up rounds.
- House to house survey for 10 days from last case (Double the IP of 2-5 days)

6.2.2. Pertussis (Whooping cough)

Disease is caused by *Bordetella pertussis*

a. HW should suspect case if

- Cough persists for 2 weeks or more with typical whoop.
- Bouts of coughing followed by vomiting

- Exposure to suspect case in previous 2 weeks or epidemic in area.

b. MO should confirm if

- Prolonged coughing followed by apnea, cyanosis or vomiting.
- Typical whoop
- Subconjunctival hemorrhage

c. Action to be taken by MO

- Active search of cases by house-to-house survey. Not only cases but also search for complications of Pertussis like pneumonia, reactivation of tuberculosis, malnutrition, CNS complications. In case of complications refer the case to appropriate specialty.
- Treatment is erythromycin or cotrimoxazole for seven days.
- Continue house-to-house survey for about 3 weeks after last case, as incubation period is 7-10 days.
- Start immunization for all unprotected children as a catch up round.

6.2.3. Neonatal tetanus

Disease is caused by toxin of *Clostridium tetani*, which has high case fatality rate.

a. HW should suspect if

- Newborn with normal sucking for first 2 days is unable to suck between 3 - 28 days
- Stiffness or convulsion.

b. MO should confirm if

- Trismus
- Generalized muscle rigidity
- Convulsions

There is no laboratory test to confirm the diagnosis.

c. Actions to be taken by MO

- All neonatal deaths have to be investigated by MO
- Evaluation of TT coverage - If coverage is low take a catch up round to complete TT ANC coverage.
- Study delivery practices in the area of both trained and untrained persons. Orient dais about 5 cleans to be observed during delivery & use of DDK.
- Regular supply of DDK.
- Ask all HW to reports deaths occurring within 28 days of birth.

d. MO should classify PHC as per risk status for NNT as below -

i. High risk

NNT rate > 1/1000 live births OR TT2 coverage < 70% OR Attended deliveries < 50%

ii. NNT control

Rate >1/1000 live births AND TT2 coverage > 70% OR Attended deliveries > 50%

iii. NNT elimination

Rate < 1/1000 live births AND TT2 coverage > 90% OR Attended deliveries >75%

6.2.4. Measles

a. HW should suspect case if following symptoms are present

- Generalized blotchy rash lasting for 3 or more days
- Fever
- Running nose & red eyes.
- If exposure to measles case in previous 2 weeks
- Epidemic of measles in area.

b. MO should confirm if

- Generalized maculopapular rash
- Fever 101° F or more
- Cough, coryza, conjunctivitis
- Koplik's spots

c. Actions to be taken by MO

- House to house survey by HW to find out cases.
- Examine all the cases
- Treatment of measles cases & complications of measles - No specific antiviral treatment
 - Symptomatic treatment - Paracetamol for fever
 - Vitamin A additional dose - 1 ml. if child is less than 1 year & 2 ml if child is more than 1 year reduces severity of the disease.
 - Common complications of measles are diarrhoea, pneumonia, malnutrition - treat accordingly
 - Feeding should be continued
- For other unprotected children - Start measles vaccination within 72 hrs. of first case for close contacts & children living in the immediate neighborhood. Children up to 5 years of age should be immunized.
- House to house survey to be continued for the period of double the incubation period (incubation period is 7 -18 days) from the last case.

7. Polio eradication

The World Health Organization has decided the goal of polio eradication by 2005. This disease has been selected for eradication by WHO considering the impact of disability. The strategy of eradication has proved to be successful, as there is drastic reduction in cases.

7.1. Activities to be implemented under Polio Eradication

There are three important activities in polio eradication as below.

7.1.1. 100% routine immunization

All the children should be immunized with '0' polio dose at birth, primary immunization at 6, 10 & 14 weeks after birth and booster dose at 16 months age. Aim of routine immunization is to protect every child from Poliomyelitis.

'0' Polio dose is given to -

- All births that occurred in hospitals should be given '0' polio dose on the day of birth.

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- For home deliveries, ANM should give '0' polio dose to the newborn at home at the time of first contact preferably within 8 days.
- Give '0' polio to newborns brought to Sub center or PHC for BCG if it is not given before.

7.1.2. Mass Immunization Campaign - (PPI/ IPPI)

Pulse Polio Immunization - Pulse means sudden, simultaneous, mass administration of two doses of OPV to all children below 5 years irrespective of their previous immunization status. PPI programme has started in December 1995. Aim of PPI is to replace wild polio virus (Disease causing virus) by vaccine virus.

Detailed guidelines are issued to PHCs before each PPI. However major activities, which are common and need careful monitoring, are mentioned below.

Important activities

a. Enumeration of beneficiaries

- Enumerate children below 5 years by house-to-house survey. Total PHC area should be divided among all MPWs and 0-5 years children should be enumerated & registered so that not a single child is missed.
- HA should check whether all new births that have occurred since last PPI are included. Most common beneficiaries missed by MPWs are under five children of Sugar cane factory workers, Brick kiln workers, Nomadic tribes, construction workers and people who have come in PHC area for temporary period.
- Medical Officer should cross-check & ensure that all newborns are included in the list & the list is updated.

b. Cold chain planning

- Calculate day wise requirement of ice packs for booth based activities (PPI) & for house-to-house visits (IPPI). Give the responsibility of preparing ice packs to HA (F). DF supplied to PHC can prepare 30 icepacks per day. Depending on requirement, plan day wise programme for preparing frozen ice packs in such a way that all required icepacks should be ready at least three days before PPI. While planning, also consider electricity failure problem in your area. Alternatively, request nearby ice factory to keep ice ready in case of emergency.

c. Inter departmental co-ordination

- Arrange the meeting of Mukhya Sevika of ICDS, Gram Sevak, Talathi, and HM of schools for co-ordination. Discuss with them detailed programme & expectations from them.

d. Planning for booth

- There should be 1 booth for 1000 population & no beneficiary must need to walk a distance of more than 2 km. Decide place for booth, which will be suitable for all the beneficiaries from that area.
- Prepare chart-indicating booth wise HW, volunteers & supervisor (M/F).

e. Vaccine requirement

- After enumeration of beneficiaries, calculate vaccine

requirement for each booth. Add wastage allowed as per the guidelines of that PPI.

f. IEC

Community should be informed well in advance by using various methods of IEC.

i. Messages to be communicated

- Date of PPI
- Additional dose has to be given irrespective of previous immunization status & to newborns also.
- OPV has to be given to newborns, children with minor illness.

ii. Methods of communication

Important methods of IEC which have proven useful are as below:

- Meetings of Sarpanch, Panchayat samiti members, ZP members, MLA & other influential persons including organizations like Mahila Mandals and Self Help Groups.
- Involvement of mullahs & religious leaders.
- Involving students from school or college, NCC students for giving messages.
- Banners & posters should be displayed at such places where people gather in masses like bus stand, Grampanchayat, schools etc. Stickers, handbills are also provided before PPI. Slogans should be painted in prominent area well in advance. Wipe out all the dates of old PPI & repaint them with new dates.
- Use of loudspeakers is important especially in weekly bazaars & all villages.
- Informing people by house to house visit is the most effective method. Parents of every eligible child should be informed about specific booth where they are expected to bring their child & date of PPI.

g. Preparation of time schedule

About one & half months before starting PPI list the activities to be carried out at PHC & develop a time schedule for each activity i.e. when the activity will start & when it will be completed, as below -

Sr.	Activity	Date of	
		Starting	Completion
1	Enumeration of beneficiaries		
2	Preparation of action plan for PPI & IPPI		
3	Assessment of resources - Vaccine - Vaccine carries - Cold box - Ice packs - Human resources - Transportation		
4	Preparation of ice packs		
5	Arranging PHC level meetings		

6	IEC - For school & college students - Procuring IEC material - Display IEC material - Wall painting in PHC area - Miking in PHC area - Group meetings		
7	Training of HW, AWW, volunteers		
8	- Procurement of vaccine - Procurement of grants, IEC material		
9	Distribution of slips to beneficiaries		
10	Booth wise list of health workers, AWW, teachers etc		
11	Vaccine transportation route		
12	Report collection & dissemination		
13	IPPI implementation action plan		
14	IPPI reporting + final report		
15	Account submission		

7.1.3. Acute Flaccid Paralysis (AFP) surveillance

This is the third important activity in polio eradication, which includes searching of all cases of paralysis with acute onset, so that not a single case of paralysis due to polio is missed. It should be kept in mind that we are searching for cases of paralysis due to all causes and not only due to polio. Clinical examination and stool sample collection for virus isolation will confirm whether the paralysis is due to polio or any other reason.

Three important activities should be carried out under AFP surveillance -

- AFP case detection
- Stool sample collection and sending to laboratory for examination under reverse cold chain.
- Outbreak response immunization.

a. AFP case detection

Aim of AFP surveillance is to report all paralysis cases in the area as early as possible. AFP cases can be detected by health workers during active surveillance, by passive surveillance when case attends any of the government hospitals or private practitioners, particularly the pediatricians, neuro-physicians and from traditional healers who claim they have medicine for paralysis.

AFP case definition: A child with acute paralysis (duration between onset of symptom to development of paralysis should be less than 4 weeks) below the age of 15 years.

Following steps should be carried out for early detection of AFP case -

- List all the hospitals; private practitioners and traditional healers in your area where there is possibility that AFP case will go for treatment.

- Call a meeting of these practitioners and orient them about importance of AFP surveillance, case definition of AFP and mode of reporting. Discuss if any AFP case is identified by the hospital/practitioner.
- If your PHC is reporting unit, inform the district level authority (usually DIO) every Monday about number of AFP cases reported in your area from last Monday to Sunday. Weekly calendar is fixed for the year. Quote the week number for each weekly report. Report should be sent even if there is nil report during the week.
- If your PHC is informant then you need not convey the AFP surveillance report weekly but report nearest reporting unit (RH) and DHO when you find case of AFP in your area.
- Carefully record the address of AFP case as DIO will need to examine the case immediately after your reporting. This is important particularly for the nomads, labourers etc.

b. Stool sample collection

i. Adequate stool sample

- Adequate stool sample of all the AFP cases should be collected and immediately forwarded to DHO office for further transportation to Enterovirus Research Center, Mumbai. Transporting of stool sample should be carried out under reverse cold chain. One vaccine carrier in PHC should be identified, labelled as Laboratory Sample Carrier and should be used only for transporting the laboratory samples. This vaccine carrier should never be used for carrying the vaccines.
- Adequate stool sample means -
 - Two stool samples should be taken
 - Time interval between first & second stool sample should be more than 24 hours
 - Both the samples should be collected within 14 days from onset of symptoms
 - Quantity of stool should be minimum 8 grams (adult thumb size)
 - Collect stool sample in plain bulb or special bulbs provided under AFP surveillance programme by DIO.
 - Both the samples should be transported under reverse cold chain from the time of collection till it reaches to DHO office.

Even if patient reports late, stool sample should be collected. There is no need of collecting stool sample if the patient reports after 60 days from onset of symptoms.

ii. Reasoning for adequate stool sample collection

- Passage of viruses in stool of polio case is maximum up to 14 days and declines thereafter.
- Virus shedding is not continuous but intermittent. Therefore two samples with interval of 24 hours are needed.
- Bacteria present in the stools overgrow making survival of virus difficult. Also viruses die quickly at room temperature so maintaining cold chain while transportation is essential.

- If the paralysis is present on 60th day and stool sample is not adequate then it becomes very difficult to differentiate the case as polio or non-polio.

c. Outbreak Response Immunization

When there is a case of AFP reported from your area:

- Immediately visit & examine the case & confirm that it is the case of AFP i.e. child of less than 15 years having paralysis of acute nature (Onset to development less than 4 weeks). Paralysis may be of upper or lower limb.
- Report to DHO / DIO by earliest means of communication. As each case of AFP has to be investigated by DIO within 48 hrs.
- Immediately arrange for collection of two stool samples
- Arrange for Outbreak Response Immunization (ORI) to all children below 5 years in the 5 km radius from AFP case. They are given additional dose of OPV. In small municipalities, only municipality area should be involved. ORI helps for interruption of wild polio virus transmission
- ORI should be started earliest, immediately after the case is reported. There is no need of listing the beneficiaries. House to house immunization like IPPI should be carried out and report of village wise number of children immunized during ORI should be submitted to DHO/DIO.

7.1.4. Mop up round

When case of Poliomyelitis is diagnosed by laboratory confirmation, Mop up round is carried out in the district from where the case is reported and adjoining districts. In case your PHC is involved in mop-up round, DHO/DIO will inform you in advance. Two additional doses of OPV, 1 month apart are given to all children below 5 yrs from your area during the mop-up round. Mop-up round is planned like PPI and all additional resources required and implementation instructions are provided by DHO well in advance.

8. Monitor immunization performance

8.1. Performance of immunization can be monitored by

- Reviewing monthly reports.
- By checking the record. (R-15, R-16, R-17 registers)
- By actually visiting & interviewing beneficiaries.

8.2. During monthly meeting monitor the performance

Important aspects to be monitored are as below:

- Monitor session - Whether sessions are held as per plan.
- Monitor coverage - Whether number of immunized children matches the expected number of beneficiaries. Also monitor village wise performance so that villages with low performance are identified & appropriate actions can be taken to improve the same.
- Quality of performance - Quality of performance can be assessed by monitoring -
 - Proportion of infants who have completed BCG, three doses of OPV-DPT and Measles before first year. These are called as fully protected infants.

- Duration between two doses.
- Number of adverse events following immunization (e.g. abscess, swellings)
- Number of cases due to VPDs.

8.3. Monitor dropout rate

Monitor village wise and sub center wise dropout rate. Identify sub centers and villages with more than 5% dropout rate. Investigate the reasons for high dropout and take action. Dropout children are those who have received immunization services at one point in the past but do not return for the subsequent immunization.

Dropout rate is calculated by following two methods -

8.3.1. Calculation for multi dose vaccines

$$\frac{\text{Coverage for 1st dose} - \text{Coverage for 3rd dose}}{\text{Coverage for 1st dose}} \times 100$$

Coverage for 1st dose

Dropout rate indicates number of children who received 1st dose but did not turn up for subsequent doses. MPW has to find out these children with the help of R-16 register. Make list of these children and immunize them on priority during next immunization session to the village.

8.3.2. Dropout between highest covered antigen & lowest covered antigen

$$\frac{\text{Highest covered antigen} - \text{Lowest covered antigen}}{\text{Highest covered antigen}} \times 100$$

Highest covered antigen

Calculation of dropout by this method indicates scope to increase performance of lowest covered vaccine. Lowest covered vaccine is usually measles.

9. Vaccine information

9.1. BCG vaccine

a. Type

Live attenuated freeze-dried vaccine. BCG is reconstituted with normal saline.

b. Normal reaction

Small elevation (5mm) appears at vaccination site immediately after injection that disappears within 30-90 minutes. After 3-4 weeks induration is formed followed by papule of 5-8 mm diameter. Papule ulcerates and scar is formed within 10-12 weeks.

c. Contraindication

HIV +ve and children with symptoms & signs of AIDS

d. Temperature sensitivity

It is highly sensitive when reconstituted and moderately sensitive when in powder form. Reconstituted vaccine should be used within 2 hours & should never be used after 4 hours.

e. Remarks

Protection against Tuberculosis especially miliary tuberculosis.

f. Side effects

Sometimes axillary lymph node enlargement that may lead to development of abscess. This is due to higher dose or wrong route (subcutaneously or intramuscularly) or because of faulty technique of vaccination.

9.2. DPT vaccine

a. Type

Made of Diphtheria toxoid, Tetanus toxoid and killed Pertussis bacteria.

b. Side effects

Fever, pain, redness, swelling at the injection site.

c. Contraindications

DPT vaccine should not be given to children who suffered from convulsions in past following DPT vaccine. Give DT instead of DPT to such children.

d. Shake test

This test is performed to check whether the vaccine was frozen any time during storage. DPT vaccine vial kept for longer time shows transparent liquid in upper part & whitish, solid in lower part. Shaking the vial mixes these two layers uniformly very well. However if vaccine was frozen any time, it will not mix up & the floccules will be seen in the vaccine. Vial with positive shake test i.e. showing floccules after shake test should be discarded.

e. Remarks

DPT vaccine should not be given to children above 2 years. If there is an unimmunised child who is more than 2 years, give DT instead of DPT.

9.3. Oral Polio Vaccine (OPV)

a. Type

Live attenuated vaccine containing 3 types of poliovirus. Vaccine colour may be pink, yellow or colourless.

b. Contraindications

There is no absolute contraindication. However if child has diarrhoea, give OPV as per schedule and give extra dose after 4 weeks from given scheduled dose.

c. Side effects

Very rarely a child may get vaccine-associated paralysis. The incidence is 1 per 1 -2 million doses given.

9.4. Measles vaccine

a. Type

It is live attenuated vaccine. It is in powder form and should be reconstituted by purified double distilled water immediately before use.

b. Normal reaction

Mild fever & rash similar to measles disease may occur in about 25% children a week after immunization that lasts for 1-3 days.

c. Side effects

Very rarely convulsions & encephalitis may occur after

measles vaccination. There is a risk of Toxic Shock Syndrome (TSS) due to growth of Staphylococcus aureus, if reconstituted vaccine is used after 4 hrs or autoclaved needles/syringes are not used. Mortality due to TSS is very high. Therefore never use vaccine beyond 4 hours after reconstitution & never use unsterilized or improperly sterilized needles and syringes.

d. Temperature sensitivity

Highly sensitive when reconstituted. Moderately sensitive in powder form. Reconstituted measles vaccine must be used preferably within two hours & never after four hours. The diluents should be between 2-8°C temperature at the time of reconstitution. Therefore it should be kept in vaccine carrier while transporting to immunization site.

e. Special instruction

First dose of Vitamin-A is given along with measles vaccine.

9.5. Hepatitis B vaccine

This vaccine is being included in immunization schedule. Presently it is being administered in selected districts of Maharashtra and will be covered in phased manner all over the state in coming years.

a. Type

Plasma derived and recombinant vaccine

b. Dose, route and schedule

0.5ml given IM in anterolateral side of upper thigh. Three doses given at 6, 10, 14 weeks along with DPT & OPV. Hepatitis B and DPT should not be given on same thigh. Never give Hepatitis B vaccine on buttocks.

c. Normal reaction

Mild fever for one or two days.

d. Shake test

Before using a vial of Hepatitis B vaccine, shake test has to be performed & if precipitate is seen after shake test, this indicates that vaccine was frozen & should not be used.

e. Temperature Sensitivity

Both high temperature & freezing damages the vaccine. Therefore it should never come in contact with direct ice.

9.6. DT vaccine

a. Type

Diphtheria Toxoid and Tetanus Toxoid

b. Side effects

Not very common & usually mild pain and local redness.

c. Contraindications

None

9.7. TT vaccine

a. Type

Tetanus Toxoid

b. Beneficiaries

ANC and children at 10 yrs & 16 yrs

c. Side effects

Mild pain, redness, swelling at site.

10. Checklist for observing Arogya Seva Satra

10.1. Beneficiaries

- List is made on the basis of R-15/16/17 registers
- Whether list matches estimated number of beneficiaries
- Correct age of beneficiaries

10.2. Overall management of session

- Sitting arrangement for beneficiaries
- Soap & water for hand washing before starting vaccination.
- All resources required are available e.g.
 - Vaccines
 - Autoclaved needles & syringes along with forceps
 - Cotton swabs
 - Immunization cards
 - Bowl with water for keeping needles & syringes after use
 - Paracetamol tablets
 - Vitamin A syrup
 - IFA small & big tablets
 - Tablet cotrimoxazole (CTZ)
 - ORS
 - Spacing methods
 - IEC material
 - Signoloc register - for inner strips
- R 15, R 16, R 17

10.3. Cold chain

- Vaccine carrier has four frozen ice packs
- Vaccine is wrapped in paper & then in plastic bag.
- Diluents for Measles & BCG are in vaccine carrier.
- VVM of OPV vial is in Stage I or II (not in Stage -III /IV) and no expiry date crossed.
- “T” series vaccine not in direct contact with frozen ice packs
- Vaccine carrier is not opened frequently.
- OPV, BCG & Measles are kept on ice pack after reconstitution

10.4. Vaccine management

- All vaccines are in adequate quantity.

- Before starting session batch number, manufacturing date, expiry date is noted in the register.
- Correct diluents are used for reconstitution (Normal saline for BCG & Pyrogen free double distilled water for Measles)
- Vaccine given in correct dose
- For all T series vaccines & hepatitis B shake test is performed.

10.5. Needles & syringes

- Autoclaved needles/syringes are brought in adequate number (1 needle & 1 syringe for one dose + 10% more) and separate needle and syringe is used for each child.
- Signoloc tape (inner) is checked for its colour change and pasted in sub center signoloc inner register.
- Autoclaved forceps is in the drum to handle needles & syringes.
- Correct needle size is used (Reconstitution-20 G, BCG - 26 G, for all other IM & SC vaccines - 23 G).

10.6. Technique

- Vaccine site is cleaned with boiled water swab & not by spirit swab.
- IM injection is given on antero lateral side of child's mid thigh.
- Site of injection and dose of vaccine is correct.
- Correct route of administration as per National immunization Schedule.
- Angle of needle is correct while giving injection (IM - 90°, SC - 45°, ID - 15°)
- After administering vaccine, needles & syringes are flushed with cold water & soaked in container with water.

10.7. IEC

- All the mothers are given important messages regarding immunization like diseases prevented, number of doses, date/ timing for next dose, minor side effects etc.

10.8. All other services given during Arogya Seva Satra.

See that not only immunization but also other services are given by ANM as below:

- ANC check up - Ht., Wt., BP, Urine, Hb, P/A exam, high risk identification.
- IFA supplementation is given to all ANCs.
- Vitamin-A & IFA (small) supplementation to under five children.
- Treatment of diarrhoea & ARI cases, fever cases.
- Spacing methods.

11. Responsibilities of PHC staff in immunization programme

Sr.	Activity	Responsibility of PHC staff	
		Designation	Responsibility
1	Planning immunization session	ANM	Enumeration of beneficiaries
		HA (F)	Verify enumeration for correctness, assess requirement of logistics
		MO	Assess adequacy of sessions as per population covering all wadis, wastis, identify high risk area & plan for that, ensure adequacy of logistic supply, involve private practitioners
2	Monitor cold chain	ANM	Check VVM before each use
		HA (F)	Daily temperature recording, maintenance of cold chain equipments, regular defrosting, implement emergency plan of shifting vaccines in case of cold chain breakdown, prepare ice packs.
		MO	Monitor recording of daily temperature, implementation of emergency plan in case of cold chain failure, ensure correct storage of vaccine
3	Monitor immunization services	ANM	Autoclaving of needles/syringes, correct packing of vaccine in vaccine carrier, record maintenance, IEC
		HA (F)	Distribution of vaccine for session, maintain stock books, attend all arogya seva satra from area
		MO	Monitor stock registers, monitor transport of vaccines
4	Monitor AEFI	ANM/MPW (M)	Visit the villages next day after immunization session, report to HA/MO immediately in case of any AEFI
		HA (M & F)	Take preventive measures, review regularly, preserve the vaccine sample in case of AEFI
		MO	Regular review during monthly meeting. Treat, manage & investigate AEFI.
5	Vaccine Preventable Diseases surveillance	ANM /MPW (M)	Collect information about a case/death due to any VPD, inform HA/MO, give primary management, IEC
		HA (M & F)	Visit the place immediately
		MO	Regular monitoring of VPDs, ensure weekly reports submission, in case of reporting of any VPD immediately visit the village, investigate, treat the cases, report to DHO
6	Polio eradication	ANM /MPW (M)	Enumeration of all beneficiaries, distribution of slips, search for AFP case & immediate reporting to MO, perform ORI in case of AFP cases
		HA	Ensure completeness of enumeration, planning of PPI, IPPI, logistics, plan IEC
		MO	Inter departmental meetings, training, examine AFP case, report to DHO, arrange for adequate stool sample, timely supply of logistics
7	Monitor performance	ANM	Prepare immunisation monitoring chart
		HA (F)	Monitor sessions, coverage, drop out
		MO	Investigate low performance, planning for low performance

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4. DIARRHOEAL DISEASES

Diarrhoeal diseases include acute diarrhoea, persistent diarrhoea (diarrhoea duration two weeks or more) and dysentery (blood stained stools with fever). Diarrhoeal diseases are most common in young children, and incidence falls with increasing age. It is one of the important causes of death among under five children.

Most of the deaths in diarrhoeal diseases are due to

dehydration which is preventable by timely and adequate replacement of fluids. Persistent diarrhoea contributes to malnutrition, which further enhances risk of morbidity and mortality in under-five children. Dysentery is an acute form of diarrhoeal disease due to invasive bacteria that leads not only to dehydration, but also multi-system manifestations, which can prove fatal. Use of home available fluids (HAF) and Oral

Rehydration Solution (ORS) has resulted in significant decline of mortality associated with diarrhoea in under-five children.

1. Important causes of diarrhoeal diseases in under-five children

- Acute diarrhoea - Cholera, Rota virus, Food poisoning, gastrointestinal disorders and medications (rare)
- Persistent diarrhoea - Chronic bacterial infections
- Dysentery - Shigellosis

Important diarrhoeal diseases related to childhood diarrhoea are discussed below. Other diarrhoeal diseases are described in detail in Section - 04 : Communicable diseases

1.1. Rotavirus

Rotavirus infection is common in under-five children. In early childhood, rotavirus is one of the most important causes of severe dehydrating diarrhoea.

1.1.1. Etiological agent

Rotaviruses are double stranded RNA containing viruses belonging to family Rotaviridae. They are called as Rotaviruses because of wheel like appearance of complete virion on electronic microscopy.

1.1.2. Epidemiology

Rotavirus spreads through feco-oral route. Rotavirus infection is most common during winter season. Virus is shed in stools at very high concentration before and few days after clinical illness. Very few infectious virions are needed to cause disease in susceptible host.

1.1.3. Clinical features

Rotavirus infection typically begins after incubation period of less than 48 hours with mild to moderate fever and vomiting followed by onset of frequent watery stools. Vomiting and fever disappears on second day of illness but diarrhoea continues for 5-7 days. Dehydration may develop and progress rapidly, particularly in infants.

1.1.4. Diagnosis

As there is no facility available for virus isolation, diagnosis of rotavirus infection is made by clinical presentation of patient.

1.1.5. Treatment

There is no specific medicine to act against rotaviruses. Therefore most important management of rotavirus diarrhoea is correction of dehydration. Careful examination of child for hydration status and prompt management of dehydration are most important. Second important aspect is feeding the child. There is no role of antiviral treatment in rotavirus infection.

1.1.6. Prevention

Good hygiene reduces transmission of viral gastroenteritis. Live rotavirus vaccine is available but not marketed commonly and is not included in national immunization schedule.

1.2. Shigellosis

Shigella infection is most common in under 5 children.

1.2.1. Epidemiology

Infection with shigella is most common during rainy

season. Although infection can occur at any age, it is most common in 2nd and 3rd year of life. It is transmitted through contaminated food and water because of lack of personal hygiene.

1.2.2. Clinical features

After incubation period of 12 hours to several days, shigellosis begins with fever, abdominal pain and watery diarrhoea without blood. At this stage diarrhoea is difficult to distinguish from that caused by other organisms. With invasion of colonic mucosa, stool often becomes bloody, mucoid and of low volume.

1.2.3. Treatment

First concern of shigellosis treatment is correction of dehydration. Examine patient for dehydration and start ORS/ RL as per severity of dehydration. Start antibiotic treatment simultaneously. Drug of choice for Shigellosis is Cotrimoxazole. Alternatively Tablet Cefixime (8mg/kg/24 hours) can also be given.

1.2.4. Prevention

Hand washing with soap and water after defaecation, before food handling and before meals is most effective intervention to prevent spread of shigella infection.

DIARRHOEAL DISEASES CONTROL PROGRAMME

Diarrhoeal diseases control programme is being implemented with the aim of reducing deaths of children due to diarrhoea by half by 2007 and enhancing ORS use rate in diarrhoeal disease to 60%.

1. Definition of diarrhoea

By definition, diarrhoea is passage of three or more liquid / watery stools in 24 hours. However, change in consistency has more importance than number of stools passed.

2. Estimation of diarrhoea cases

Estimate number of diarrhoea cases for each village, sub center and for PHC for planning of diarrhoea management.

- On an average each under-five child gets 2-3 attacks of diarrhoea per year.
- There are approximately 10% under-five children in population. Thus village of 1000 population will have 100 under-five children. Number of attacks of diarrhoeal diseases will be $100 \times 3 = 300$.
- Out of these, 10% will develop some dehydration requiring ORS, i.e. 10% of 300 = 30 children of village with 1000 population will require treatment of dehydration by giving ORS in one year.
- Amongst all attacks of diarrhoea, 1% will develop severe dehydration requiring IV therapy, i.e. 1% of 300 = 3 children from village with 1000 population will require IV therapy for treatment of severe dehydration in one year.

Calculate number of diarrhoea cases, ORS requirement and IV requirement for Sub-center and PHC on similar lines.

3. Estimation of ORS requirement

Requirement of ORS for village of 1000 population is calculated in the table below -

Table - 8 : Calculation of ORS requirement for 1000 population

Type of diarrhoea case	No. Of attacks	Requirement calculation criteria	ORS requirement	Remarks
Diarrhoea without dehydration (90% cases)	270	One ORS packet per attack	270	Patient with severe diarrhoea and vomiting should be started ORS immediately without waiting for signs of dehydration to appear as such patient may go quickly into severe dehydration.
Diarrhoea with some and severe dehydration (10%)	30	Average 3 ORS packets per attack	90	Give ORS to all children. with some dehydration. Children with severe dehydration should be given ORS till child reaches IV facility. Continue ORS during IV therapy, if child can take orally.
Total requirement	***	***	360	One-year requirement of ORS packets for village of 1000 population is 360 packets.

ORS should be given on priority basis to all the cases with signs of dehydration. For patients of diarrhoea without signs of dehydration, advise home available fluid (HAF) and provide ORS if child is passing large volume of stools, has continuous diarrhoea or stays away from health facility. For other children,

provide ORS if available in sufficient quantity.

4. Diagnosis and management of dehydration

Diagnosis and management of dehydration discussed in detail in Section -04 : Communicable diseases, Chapter-3, Water borne diseases.

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5. ACUTE RESPIRATORY INFECTION

Acute Respiratory Infection (ARI) is an important cause of infant and child mortality and also the commonest cause of morbidity among children below five years. ARI is the infection of any part of respiratory tract, which includes cough, common cold, pharyngitis, pneumonia, laryngitis and ear infection.

Acute respiratory infections in children can involve upper respiratory tract (nose, throat) or lower respiratory tract (bronchi, lung). Lower respiratory tract infections (broadly termed as pneumonias) are a major cause of death of infants and children in India, accounting for about 30% under-five deaths. Timely treatment, based on well-researched algorithms can save most children with ARI. Majority of the cases of ARI have non-severe disease and can be managed in the community with oral co-trimoxazole. Severe ARI cases require urgent referral to a facility where injectable antibiotic therapy and supportive care are available.

On an average each child under five years gets 1-3 attacks of ARI in a year. If we take an example of a sub center with 5000 population, number of ARI and pneumonia cases will be as below:

- Total number of 0-5 children 10% of population = 100 children in 1000 population
- Number of ARI attacks in a year = 3 500 = 1500 attacks per year
- It is estimated that, about 10% cases amongst these are pneumonia cases. Thus in one year there will be 150 attacks of pneumonia to underfive children in 1000 population.

As pneumonia is the commonest cause of morbidity & mortality, its early diagnosis & prompt treatment helps to reduce deaths.

1. Diagnosis & management of ARI

Classification and management of ARI is based upon three important factors. These are age of the child, respiratory rate and danger sign like chest in-drawing.

1.1. Age of the child and respiratory rate

Children are classified into three age groups for ARI management. These age groups and criteria for fast breathing are given in table below -

Sr.	Age group	Criteria for fast breathing
1	0 - 2 months	Respiratory rate more than 60 / minute
2	2 months to 1 year	Respiratory rate more than 50 / minute
3	1 year to 5 years	Respiratory rate more than 40 / minute

1.2. Chest in-drawing

In normal child, during respiration, chest expands when the child breathes in and compresses when the child breathes out. In children with severe pneumonia, chest moves in when the child breathes in. This is called as chest in-drawing.

1.3. Pneumonia in 0-2 months age group

Important aspects about pneumonia in age group 0-2 months are as below:

- In these children, there are no usual features of pneumonia like fever, cough, etc.
- Child may have only fast breathing and/or chest in-drawing.
- Pneumonia in child less than 2 months age is always severe & mortality is high.
- MO & health worker should refer such cases to the facility where specialist & ICU are available, after giving one dose of pediatric CTZ tablet.

Classification

- **No** pneumonia
- Severe pneumonia/Very severe illness

1.3.1. No pneumonia

- If respiratory rate of child is less than 60/minute then the child is classified as 'No Pneumonia'.
- Give Paracetamol ¼ tablet if there is fever and demonstrate to the mother how to clean nose with normal saline drops.
- Advise mother to continue breast-feeding.
- Inform mother about danger signs of pneumonia, e.g. breathlessness (rapid movement of abdomen), inability to drink, excessive drowsiness, hypothermia, high fever etc. Ask mother to immediately bring the child back to PHC if she observes any of the signs mentioned above.

1.3.2. Severe pneumonia/Very severe illness

If child below 2 months presents with fast breathing (RR > 60/minute) and/or chest in-drawing

Plus

One or more of the following signs -

- **Inability** to drink
- Excessive drowsiness
- Stridor, wheeze
- Cyanosis
- Hypothermia
- Convulsions

In above cases, health worker or MO should immediately refer the child to specialist after giving one tablet of pediatric CTZ. (Sulphamethaxazole 100 mg + Trimethoprim 20mg).

In case referral can not be executed treat the child as below

Antibiotic	Dosage	Frequency		Route
		Age < 7 days	Age > 7 days - 2 months	
Inj Benzyl penicillin OR	50,000 IU/kg/dose	12 hrly	6 hrly	IV/IM
Inj Ampicillin AND	50 mg/kg/dose	12 hrly	8 hrly	IV/IM
Inj Gentamycin	2.5 mg/kg/dose	12 hrly	8 hrly	IV/IM

1.4. Pneumonia in 2 months to 5 years age group

Children with ARI of 2 months to 5 years age are classified into four groups as follows -

- No pneumonia
- Pneumonia
- Severe pneumonia
- Very severe illness

1.4.1 No pneumonia

When respiratory rate is normal and no sign of chest in-drawing is seen child is diagnosed as 'no pneumonia'. These children should be treated at home & observed for appearance

of danger signs (increase in RR and chest in-drawing) by mother. Following points should be advised to mother -

- Continue breast-feeding if child is breast-fed.
- Give plenty of oral fluids including water or ORS to child.
- If fever is present, give Tab. Paracetamol.
- Teach mother how to clean nose with saline water. This will clear airway of child and improve breast-feeding.
- In community, many home remedies are used for ARI. One of the best among them is honey & ginger. Advise mother to give honey and ginger to child.
- Inform mother about danger signs of pneumonia, e.g. breathlessness, inability to drink, excessive drowsiness, hypothermia, high fever etc. Advise her to bring child back to PHC if she observes any of the danger signs.

1.4.2. Pneumonia

If child has fast breathing (RR: 2-12 months > 50/ min. & 1-5 yrs. > 40/ min.) and no chest in-drawing, diagnose child as Pneumonia

a. Treatment of pneumonia

- Give child Cotrimoxazole for 48 hrs. Treatment schedule for pediatric cotrimoxazole is -

2-12 months: 2 tablets twice daily or syrup 5 ml. twice daily
1-5 yrs: 3 tablets twice daily or syrup 7.5 ml. twice daily.

Pediatric tablet contains Sulphamethaxazole 100 mg & Trimethoprim 20 mg.

Syrup 5 ml. contains Sulfamethaxazole 200 mg and Trimethoprim 40 mg.

- If fever is present, give Tab. Paracetamol.
- Teach mother how to clean nose with normal saline. This will clear airway of child and improve breast-feeding.
- Keep baby warm by covering with warm clothes and keeping in lap.
- Assess child after 48 hrs:
 - If improvement - Continue CTZ for 3 days
 - If Child has Chest in-drawing and RR may be fast complete 5 days course
 - If no improvement or child gets deteriorated refer child to specialist.

1.4.3. Severe pneumonia

Child with chest in-drawing & having RR normal or fast is diagnosed as severe pneumonia. Child with severe pneumonia should be treated by specialist. Give oxygen if child has cyanosis till the child is referred.

Treatment

a. Treat for first 48 hrs by

Antibiotic	Dosage	Interval	Route
Inj Benzyl penicillin OR	50,000 IU/kg/dose	6 hrly	IM
Inj Ampicillin OR	50 mg/kg/dose	6 hrly	IM
Inj Chloramphenicol	25 mg/kg/dose	6 hrly	IM

b. Assess after 48 hrs**i. If improvement, continue for next 3 days as below**

Antibiotic	Dosage	Interval	Route
Inj Procaine penicillin OR	50,000 IU/kg (Max 4 lac units)	Once	IM
Tab Ampicillin OR	50 mg/kg/dose	6 hrly	Oral
Tab Chloramphenico	25 mg/kg/dose	6 hrly	Oral

ii. If no improvement, change antibiotic as below

- If Ampicillin was given earlier then change to Inj Chloramphenicol
- If Chloramphenicol was given earlier change to Inj Cloxacillin 25 mg/kg/dose 6 hrly IM + Gentamycin 2.5 mg/kg/dose 8 hrly IM.

iii. Important aspects of antibiotic treatment

- Treatment with antibiotics should be continued for at least five days.
- Continue treatment for at least 3 days after child recovers.
- If cloxacillin & gentamycin are started continue for three weeks.

iv. In addition to this give following

- Administer Oxygen if required
- Continue breast feeding during illness
- If fever, give tablet or syrup Paracetamol
- If wheeze, treat by using bronchodilator
- Give plenty of oral fluids.

1.4.4. Very severe illness**Child has:**

- Chest in-drawing and RR may be fast or normal Plus
- One or more of following signs -
 - Inability to drink
 - Excessive drowsiness
 - Stridor, wheeze
 - Cyanosis
 - Hypothermia
 - Convulsions

Diagnose the child as suffering from very severe illness & refer the child to specialist having facility of intensive care unit.

2. Role of MO in ARI management

- Monitor sub center / village wise reporting of ARI cases during monthly meeting.
- Train MPWs in correctly counting respiratory rate & to diagnose chest in-drawing by demonstrating in patients, so that they can correctly manage & refer cases.
- Ensure that, MPWs are diagnosing & treating cases correctly.
- In addition to health workers, Anganwadi Workers should be oriented about home management of cases with no pneumonia and signs for referral and place of referral.

- Widen the net of service providers who can treat ARI. Train village practitioners, in treating ARI by prescribing co-trimoxazole wherever required. Train private practitioners (modern / ISM) in rational treatment of ARI.
- Confirm adequate stock of CTZ with all MPWs.
- Educate families in early care seeking for ARI.

Table below gives summary of management of ARI cases.

No.	Type manage	Who can managed	Where can be
Age group 2 months to five years			
1	No pneumonia	Anganwadi Worker, MPW	Home management
2	Pneumonia	MPW/HA, MO	Management at home or PHC
3	Severe pneumonia	PHC MO if specialist	PHC/ referral center
4	Very severe illness	Specialist	Specialist with ICU facility
Age group below 2 months			
Child should be referred immediately after giving one dose of CTZ			

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6. NAVSANJEEVANI YOJANA

Tribal population stays in remote, hilly and difficult to reach areas of the state. They do not have interaction with modern world and utilization of health services is poor. Infection load, poor nutrition and indifference towards modern health facilities are important factors for poor health condition of tribes. This has resulted in high proportion of Protein Energy Malnutrition, vitamin deficiency disorders, high infant and childhood mortality and overall less productivity. Tribal development department and health department is implementing number of schemes for tribal areas. Majority of these are grouped under Navsanjeevani Yojna which started on 1st May 1995.

Maharashtra state has 15 tribal districts. All the schemes under Nav Sanjeevani Yojna are implemented in these tribal districts. Medical Officers working in tribal area must understand the scheme and implement it effectively to reduce maternal and child morbidity and mortality.

1. Schemes under 'Navsanjeevani Yojana'**1.1. Matrutwa Anudan Yojana**

This scheme is being implemented in all fifteen tribal districts of the state.

1.1.1. Importance of scheme

Pregnant women in tribal area do not attend health centers regularly for health check up during pregnancy. This results into many avoidable pregnancy and delivery related complications. Low birth weight is most important contributing factor for high infant mortality in tribal areas. Poor nutrition and

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hard work during last trimester of pregnancy are important causes of low birth weight.

Regular checkup during pregnancy, adequate diet and consumption of IFA, multivitamin, protein preparations and rest during pregnancy, particularly during last trimester are crucial to avoid pregnancy complications and birth of low birth weight babies.

Regular visit of mother to health center during last trimester is essential to recognize pregnancy related complications and their timely management. Therefore to motivate tribal mothers for health check up during pregnancy, to follow the advice of MO during pregnancy and post-natal period, Matrutwa Anudan is given to pregnant women.

1.1.2. Important aspects of scheme

a. Monetary benefit

This benefit is given only up to 3 live births. Undertaking that, delivery will be done in hospital or from trained dai has to be given by pregnant woman.

- Rs. 800/- anudan is given to each antenatal case.
- Out of this, Rs. 400 is given in cash & remaining is in the form of medicines.
- Monetary benefit is given as follows:

n On registration at 16 weeks in PHC:	Rs.100/
n During 7th month:	Rs. 100
n During 9th month:	Rs. 100
n Immediately after delivery:	Rs. 100

b. Medicines provided under the scheme

- Cap. Folexon (150 capsules)
- Ferrous gluconate syrup (2 bottles): If there is a child in the age group of 1-6 years give one bottle.
- Tab Pyrantel Palmoate (12 tablets): Give six tablets in second trimester & repeat the dose after six months. Do not give during first & third trimester.
- Calcium syrup (3 bottles)
- Malt extract with vitamins (3 bottles)
- Protinules (3 bottles),
- Multivitamin syrup (3 bottles)
- DDK

1.1.3. Implementation of scheme

a. At PHC level

- Request DHO for advance and medicines required for Matrutwa Anudan
- Calculate number of ANC's in each sub center area of PHC and give advance to MPW (F).
- Describe the scheme carefully to all the PHC staff. Make sure that all ANMs have understood the criteria of inclusion of mother in Matrutwa Anudan Yojna. Give them chart of schedule of payment (rupees to be paid at particular month during pregnancy).
- Prepare copies of receipts of pregnant women and

distribute along with the advance.

- Insist MPW (F) to give account of this scheme every month without fail along with the MIS report.
- Submit the report to DHO about number of ANC's registered before 16 weeks, benefit given to women and receipts along with monthly MIS.
- MO should randomly check 10% of beneficiaries by home visit in at least 5-6 villages of PHC every month and discuss the findings during monthly meeting.
- Medicines under this yojana should be given as package along with money during health check up. Do not call mother separately for medicine, money and check up.
- Following important messages should be given to the mothers by ANM:
 - n Take cap. Folexon after meals.
 - n Calcium syrup & multivitamin syrup should be taken one hour before the meals.
 - n Do not take cap. Folexon & calcium syrup simultaneously. There should be gap of two hours between these two medicines.

b. At sub center level

- It is responsibility of MPW (F) to implement Matrutwa Anudan Yojna.
- Understand the scheme completely, particularly criteria for inclusion of mother, payment schedule, instructions to be given while giving medicines. Request for advance considering number of ANC's expected in sub center area.
- Pay first installment on registration and further installments from seventh month onwards. Never give anudan before 28 weeks of pregnancy even if the mother has visited the Arogya Seva Satra regularly.
- Always give anudan immediately at the end of check up. Never ask mother to come back again for anudan.
- Do not insist pregnant women to sign the receipt without giving anudan.
- Keep one register indicating anudan distribution to each mother, month of pregnancy and dates of anudan distribution.
- Submit your account without fail to MO at the end of month during MIS meeting.

1.2. Dai meeting

Large numbers of deliveries in tribal areas take place at home and are conducted by relatives or untrained persons. There are more maternal and early neonatal deaths when untrained persons conduct delivery, as they may not be able to recognize delivery complications and resuscitate newborn if required after delivery. To avoid these complications, training of how to conduct delivery, cleanliness during delivery and resuscitation of child is given to Dai who are already conducting deliveries. They are called to PHC regularly for continued medical education, replenishment of stock and distribution of honorarium.

1.2.1. Importance of dai meeting

- To register 100% deliveries & births occurring in tribal area.
- To orient dais about identification of high-risk mothers and newborn babies and their referral.
- Help to train & retrain dais to recognize early delivery complications and to resuscitate newborn babies if required.
- To register all infant deaths & maternal deaths in tribal area.

1.2.2. Implementation of scheme

- Request DHO for advance and DDK required for distributing to trained dais.
- Arrange meeting of all dais quarterly at sub center/PHC with the help of MPW (F) & HA (F).
- Train them during meeting about safe delivery practices, newborn care, identification of high-risk mothers & babies. Majority of dais are illiterate and need repeated instructions. Therefore reorient them about cleanliness during delivery, recognition of danger signs during pregnancy and delivery, resuscitation of newborn every time they come for meeting. Make sure they have understood the instructions.
- Ensure that all dais give information during the meeting about deliveries conducted, newborns, weight of newborn, infant death & maternal death.
- Remuneration (Rs. 80) should be given to all dais attending meeting.

1.3. Pada worker scheme

Remote small hamlets are called as pada in tribal areas. Many of the padas are unapproachable or difficult to approach. Malaria and gastroenteritis are common in tribal areas. These diseases may develop into epidemic form and result into complications and deaths. As these are remote places and tribal people may not seek treatment from modern health facility, information of such epidemic may not be conveyed to PHC in time. Pada workers are appointed for all the remote padas from all tribal districts. They work for 11 months during the year from May to March & are paid honorarium of Rs. 300 per month.

1.3.1. Selection of pada worker

- One pada worker preferably female is appointed for each remote pada.
- She should be acceptable to all groups of community.
- She should be resident of pada and preferably educated up to SSC minimum.
- Pada worker should be able to spare at least 2 hours every day for treatment of patients.

1.3.2. Implementation of pada worker scheme

- Confirm that pada workers cover all interior areas/padas of your PHC.
- Conduct training of pada workers regarding following -
 - Presumptive treatment of fever cases and treatment of dehydration.

- Chlorination of water.
- Immediate reporting of epidemic.
- Identification & referral of high-risk mothers & children.
- Treatment of minor ailments

- Monitor that they are performing all the expected activities in their area correctly.
- **Pay** honorarium regularly.
- Call the meeting of all pada workers from your area monthly on fixed day and distribute honorarium at the time of meeting.

1.4. Honorary doctors scheme (Flying squads)

Though population of PHCs is around 20,000 in tribal areas, many padas are far away from PHCs due to low population density. Honorary doctors are appointed for such remote places in tribal areas to improve the access of health services to tribal population. They are appointed for the period of 11 months during the period of May to March with honorarium of Rs. 6000/- per month.

1.4.1. Implementation of scheme

- Honorary doctors are appointed by DHO in the month of May and they work under MO PHC. Headquarter of honorary doctor should be such a place which is difficult, interior village where no any other health person is available. They should treat fever cases, examine grade III & IV malnourished children & other patients.
- Insist honorary doctor to stay at headquarter. This is responsibility of PHC MO.
- Meet Sarpanch and other community leaders and inform them about honorary doctor scheme for maximum utilization of the scheme.
- Be sure that sufficient medicine is always available with the honorary doctor.
- Regularly check the prescription pattern, clinical examination notes of honorary doctor to see whether treatment given is as per guidelines.
- **Honorary** doctors are provided with vehicle & medicines.

1.5. Pediatric ICU

Pediatric ICU has been established at RH Dharni & RH Chikhaldara from Amravati district & in other tribal districts with the aim of giving appropriate treatment to high-risk newborns in nearby tribal area & reduce infant mortality especially neonatal mortality. In these blocks, pediatricians are deputed in rainy season during June to December when chances of not getting treatment is much high because of the inaccessibility of area & other reasons.

2. Responsibilities of MO in tribal area

2.1. Survey before rainy season

MO should visit all tribal villages, before rainy season & should carry complete health check up in that area.

2.2 Ensure that

- PHC staff stays at HQ.

- ₪ All staff has sufficient medicines and this should be personally verified by MO every month.
- ₪ Pada Workers, Dais and MOs should work in team.

2.3. Water supply & sanitation

- Visit all the Gram Panchayats and check whether required quantity of TCL is purchased and water chlorination is done daily. Train Gramsevak and the person responsible for water supply regarding important aspects of chlorination, OT test, TCL storage, record keeping etc.
- Check whether PHC staff is regularly taking OT test and collecting water samples of all water sources for each village.
- In case of contaminated water samples, immediately advice Gram Panchayat about corrective measures.

2.4. Anganwadi check up

- Visit all Anganwadis & perform health check up of all children below 6 years regularly. Similarly all antenatal mothers & postnatal mothers delivered recently should be examined & treated accordingly.

2.5. Treatment of severely malnourished children

- Hospitalise all grade III, IV malnourished children & all seriously ill children irrespective of their nutritional status & treat them accordingly. In such cases for loss of wages of accompanying parent, provision of Rs. 40/day has been made.

2.6. Management of LBW babies

- Provision has been made for warm rooms & thermocole boxes for management of LBW babies at PHC.

2.7. Training

- Conduct training of all PHC staff, Pada workers, AWWs and honorary doctors regarding treatment of fever, dehydration, minor ailments and water supply surveillance preferably during second week or May.
- Identify dais in area, train them and get all the ANC services regularized with the help of these trained dais.

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7. SCHOOL HEALTH PROGRAMME

Majority of health problems in school going age are simple and easy to treat. If these problems are not treated in time they can affect the scholastic progress of the child. Early detection of disease and treatment in school going children helps in correcting the problems at early age. This minimizes the complications, reduces permanent effects of disease and also helps the child for improving school performance.

School health programme includes health check up of school children from -

- **Primary** schools
- Ashram schools

1. Primary schools

School examination is conducted with the involvement of both health & education department. Health check up of all students from 1st to 4th standard is performed under this programme. All primary schools (government, semi government, private schools) are covered under school health examination.

1.1. Objectives

- To reduce morbidity & mortality among school children.
- To treat diseases and complications at an early stage so that the child can optimally perform in school.
- To inculcate healthy habits of personal hygiene & environmental sanitation among school children.
- To create healthy generation.
- To create health awareness in community with the help of school children.

1.2. Components

- Health checkup of all children from 1st to 4th standard.
- Primary treatment of minor illnesses immediately after examination.
- Referral of students with major problems to Rural Hospital, District Hospital or Medical College Hospital.
- Organization of specialist camps for treatment of children with major problems.
- Follow up of referred children after seeking treatment from referral center.
- Health education to students, teachers and parents.

1.3. Implementation of school health programme

1.3.1. Preparatory phase

a. Enumeration of schools

- Enumerate all government, private, semi government primary schools from PHC area and number of students in 1st to 4th standard in each school.

b. Preparation of team wise programme

- Prepare school health check-up team that should include :
 - ₪ Medical Officer
 - ₪ HA Male and Female
 - ₪ Two teachers from the school, one of them should be a lady teacher
 - ₪ ANM from the area
 - ₪ Local volunteer for help
- Prepare a day wise programme of check-up of each school in consultation with Block Education Officer indicating date, name of school and number of students to be examined on that day. Inform each school well in advance about date of school examination and insist for 100% attendance on the day of examination. Also inform the non-officials, Panchayat Samiti Members, ZP Members and Sarpanch from area to get 100% coverage.
- Conduct one day training of all team members at the time of monthly MIS meeting of PHC. Training programme should cover:

- n Objectives of the school health check up campaign
 - n Role & responsibilities of each member
 - n Recording height, weight, assistance in check up.
 - n Filling up of cards, school registers, record and reports.
- Medical Officer should give specific responsibility to each team member. This includes registration, height and weight recording, refractory error check up, personal hygiene and health education messages.

c. Plan for referral & follow up

- Request DHO/Civil Surgeon to fix dates of specialist camps for your area in advance so that you can mention dates on referral slip of students. These camps are usually organized at RH.
- Prepare follow-up visit programme for all the students who were given treatment during campaign and who were referred to specialist camps. Inform these dates to all treated and referred students.

d. Logistic supply

- Indent the material required as per number of schools, number of students (Medicines, cards, tally sheets, reporting formats, referral chits etc) from DHO. Medical Officer should personally ensure that required medicine is available before starting the campaign.
- Prepare a checklist of each major activity to be conducted during campaign so that you will not miss any important equipment or medicine. One school health kit should be prepared in which sufficient medicines; health checkup equipment, blank forms, registers etc. should be kept. (List of contents of school health kit is given at the end of this chapter)

1.3.2. Implementation phase (check up and referral)

- Visit the schools as per the schedule. Check before examination whether you have taken everything needed with the help of checklist. Replenish the kit.
- Prepare new health card for all the first standard students and for new admissions of other classes. Fill up the general information of students with the help of class teachers.
- Health checkup of each student should be completed systematically. Responsibility of height, weight and eye checkup should be given to suitable team members and finally MO should thoroughly examine each student. Note down height, weight, health checkup findings and treatment if given on the card.
- Give treatment to all sick children on the same day. Children who need specialist advice should be referred to concerned specialist after giving primary treatment. Issue referral slip explaining the student, teacher and parents regarding place of referral & date if required. First referral will be at specialist camp organized at block level, usually at Rural Hospitals.
- Date for follow up should be given to all sick children on the day of examination.
- Examine all students with disability, which are already

listed by teachers & advice them accordingly.

1.3.3. Follow up phase

Attend the schools again on the date of follow up visit and carry on following activities -

- Examine students who were absent during the first visit of the team.
- Follow up (re-examine) the students found sick and treated during campaign.
- Take review of referred students regarding their visit to specialist, treatment received and any further treatment required. Inform parents that children with heart disease can get free treatment at super specialty hospitals.

1.3.4. Record keeping

a. School health register

Each Primary Health Center should have school health examination register, which should be maintained by HA female. This register should have following information:

- Village wise list of all the schools in PHC area including number of students in each class
- Names of head masters of schools and their contact telephone numbers.
- Date of health check up of each school & follow up date.
- School wise number of students examined, number found sick, number referred and reasons for referral.
- Follow up time table, number of students followed up and results of follow up.
- Names and addresses of students who required referral to super specialty hospitals.

1.3.5. School health programme reporting

Reporting should be done with the help of school health register. You have to report school health activity in regular MIS.

School health is the component reviewed by Panchayat Raj Committee. Therefore this record should be neatly kept and well preserved in PHC.

1.3.6. Important instructions for school health programme

- Don't change pre decided programme.
- Don't give unnecessary medicines to students.
- Avoid giving injectable medicines to students during examination.
- Avoid prescribing medicines from outside as far as possible.

1.3.7. Kit to be taken with team for school health examination

- Torch
- Weighing machine
- Stethoscope
- Tape for measuring height
- Medicines - (Paracetamol, Chloroquin, Cotrimoxazole, Ampicillin, ORS, Benzyl Benzoate, Mebendazole, Iron preparation etc.)
- **Dressing** material

- Health checkup cards, tally sheets, referral chits
- ENT set
- Health education material

2. Ashram schools examination

Ashram school students stay in hostel and are away from home. Overcrowding and unhygienic conditions in hostel may lead to skin infections, worm infestations and epidemic prone diseases. It is necessary to visit Ashram schools more frequently, examine and treat students carefully. Planning, implementation and record keeping of Ashram school health check up is similar to examination of primary schools. Few additional guidelines for Ashram school examination are as follows -

- MO should visit all Ashram schools from PHC area every 3 months.
- Treat students with minor illnesses immediately and inform concerned teacher in writing about any precautions to be taken by sick student.
- Admit the students requiring intensive treatment, e.g. student with high temperature, dehydration, snake/scorpion bite, major injuries etc. Those requiring referral should be referred appropriately and immediately. Always provide PHC vehicle to Ashram School students while referring.
- Take round of school premises during visit and inspect from sanitation point of view.
- Inspection of kitchen emphasizing on storage, preparation of food has to be made. Examine & treat food handlers for their personal hygiene, for diseases like boils, diarrhoea, hepatitis, skin diseases and pharyngitis. These persons should not handle the food.

2.1. Report of Ashram school examination

Ashram Schools Examination report should be sent every month to DHO.

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8. NUTRITION & INTEGRATED CHILD DEVELOPMENT SCHEME

1. Breast-feeding

Exclusive breastfeeding is a well recognized no cost infant and child survival intervention. Breast fed infants have better nutritional status and lower rates of morbidity and mortality. Breast milk not only provides essential nutrients for first six months of life, but also protects the child against infections.

World Health Organization recommends exclusive breastfeeding for first 6 months of life. Baby Friendly Hospital Initiative aims at promoting successful breastfeeding in health facilities where deliveries take place.

From 6 months of age, introduction of complementary food is necessary to meet the nutritional needs of infants. However, in majority of children complementary food is delayed and even if introduced at appropriate age, is often insufficient in nutrients.

2. Strategies for promoting breast feeding

- Promote breastfeeding by involving all healthcare workers including TBAs, AWWs, ANMs, village practitioners, male workers etc. Involve panchayats, self help groups, opinion leaders, NGOs & give specific and uniform message (like exclusive breast feeding for 6 months)
- Promote immediate successful breastfeeding in delivered mothers at all facilities, including PHCs
- Train TBAs, AWWs, ANMs, LHV's, male workers, pada workers, as well as private practitioners in lactation and feeding counseling techniques.
- Inform mothers about harmful effects of breast milk substitutes & feeding bottles.
- Promote appropriate and adequate complementary feeding. Counsel regarding solid foods; emphasize calorie density; promote culturally acceptable, low cost, balanced, locally available infant foods (list locally available infant foods for counseling).

3. Malnutrition in children

The literal definition of 'malnutrition' includes not only two extremes in terms of weight i.e. under-weight and obesity, but also various clinical conditions resulting from deficiencies and excesses of vitamins and minerals.

However, in the context of rural area, 'malnutrition in children' refers to the clinical complex of 'Protein-Energy Malnutrition' (PEM). PEM in children is never purely calorie or protein deficiency but often is accompanied by other mineral and vitamin deficiencies & is an important public health problem, as well as the commonest clinical condition that a health practitioner comes across. It significantly contributes to individual morbidity and under-five mortality rate. Therefore MO must know about causation and management of this problem.

Despite improvements in health and well being, malnutrition remains a silent emergency in India, where more than half of all children under the age of four are malnourished, 30 percent of newborns are significantly underweight and 60 percent of women are anemic.

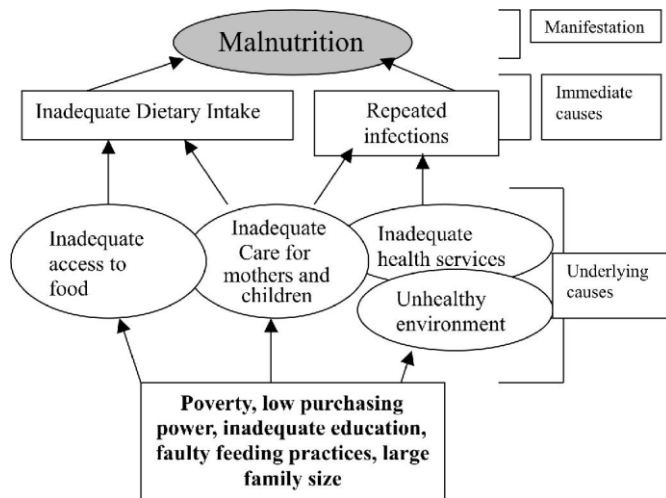
In Maharashtra, incidence of Low Birth Weight (LBW) is nearly 26%. In the age group of 'birth to 35 months nearly 40% children are stunted, 21% wasted and nearly 50% are underweight.

3.1. Causes of malnutrition

Causation of PEM is a complex phenomenon. Poverty along with inadequate child care and faulty feeding practices contribute to the problem. Lack of environmental sanitation plays important role in repeated infections among children, which lead to negative energy balance through increased demand combined with reduced intakes. Size of family decides the sharing of food among existing siblings.

Children in age group of six months to two years are extremely vulnerable to develop malnutrition. During this period quantity of breast milk starts becoming inadequate compared to the growth needs. Child starts mouthing any object that it holds increasing exposure to infections. If supplementary solid feeding

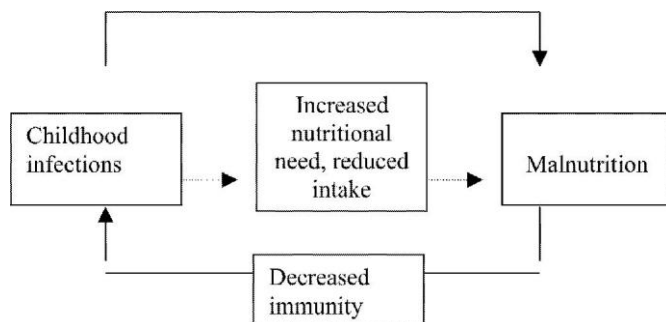
is not initiated child can easily slip in to PEM.



Malnutrition is the single most important underlying factor in infant and under-five mortality. Risk of death due to common childhood illnesses like diarrhoea and respiratory infections is doubled for mild, tripled for moderate and ten-times more for severely malnourished child. Due to suppressed immunity, incidence, duration and severity of illness increase with associated malnutrition.

Several of these negative factors often coexist and set up vicious-cycle that perpetuates the poor nutritional status in a child. The vicious cycles is - 'common childhood infectious diseases leading to increased need combined with reduced intake that cause malnutrition; and malnutrition itself leads to decreased immunity causing repeated infections!'

3.2. Vicious cycle of malnutrition & infection



3.3. Effects of malnutrition

- Malnourishment significantly lowers cognitive development and learning achievement during preschool and school years and subsequently results in lower productivity.
- Nutritional anemia is implicated in low physical and mental performance.
- Malnutrition including vitamin and mineral deficiencies leads to reduced productivity, hampering economic growth and the effectiveness of investments in health and education, and deepening poverty.
- Suspected long-term impacts of childhood malnutrition

leads to increased incidence of coronary heart disease, diabetes and even lower intelligence quotient and reduced productivity.

3.4. Diagnosis of PEM

3.4.1. Clinical diagnosis

a. The commonest presentation of 'PEM' is a thin cranky child with prominent ribcage and pitting oedema on legs and feet. The spectrum of protein-energy deficiency in children is from frank 'Kwashiorkor' or 'red-head-boy' - swollen, apathetic, miserable child to frank 'Marasmus' - 'skinny, hungry, old-man look in a child'. However in clinical practice most commonly Marasmic kwashiorkor is the presentation. Although less than 1 in 100 cases of PEM will present as frank Kwashiorkor or Marasmus, it is important to know about the differences in these two extremes.

Table -9: Characteristics of kwashiorkor & marasmus

Characteristi	Marasmus	Kwashiorkor
General appearance	'Wise old man' appearance, interested in food	Apathetic, miserable, cranky, not interested in food
Hair	Thin, sparse and easily breakable	Thin, sparse and easily breakable, discoloured - red-brown
Skin	Wrinkled, loose - generalized loss of subcutaneous fat, may show signs of vitamin deficiencies	Thin, stretched, crazy-pavement or earth in draught - broken, oozing skin
Oedema	Absent	Present - generalized with ascitis
Cheeks	Sunken - loss of buccal pad of fat	Cheeks full, buccal pad of fat not lost, false picture of well-being
Abdomen	Concave with wrinkled skin	Pot belly, ascitis

Clinically absence of pad of fat in the axilla is a good indicator of low weight, as is easily visible rib cage.

b. Associated deficiency signs: Following vitamin & mineral deficiencies are common:

- Dry muddy eyes, Bitot's spots (Vitamin A deficiency)
- Cracked lips and angle of mouth, glossy red-tongue (B complex deficiency)
- Beading of rib-junctions (painful in Scurvy, painless in rickets)
- Protruding tummy and widened wrist joints (Vitamin D deficiency)
- Flat and pale nails and conjunctiva (Iron deficiency anemia)

3.4.2. Anthropometric measurements for early diagnosis of PEM

Common anthropometric measurements used are:

- Weight for age (underweight)
- Mid-arm-circumference

surveys or for children attending Anganwadi.

- Arm circumference remains remarkably constant between the ages 1 to 5 years, varying between 16 & 16.9 cm. Therefore it is used independent of age between age 1 to 5 years.
- MAC of more than 13.5 cm indicates normal nutritional status.
- MAC between 12.5 & 13.5 indicates mild or moderate malnutrition.
- Whereas MAC less than 12.5 cm. indicates severe malnutrition.
- Therefore cut off point for diagnosing malnutrition in a child of 1 to 5 years age group is mid arm circumference of less than 13.5 cm for moderate malnutrition and 12.5 cm for severe malnutrition.
- For easy use of mid arm circumference by Anganwadi workers, the cut off points have been converted into specific colours as below:
 - Green zone of tape (above 13.5 cm) - Child is well nourished
 - Yellow zone (between 13.5 to 12.5 cm) - Child has Grade I or II malnutrition.
 - Red zone (below 12.5 cm) - Child is severely malnourished. Refer the child for treatment at appropriate level.
- Mid arm circumference should not be used for classifying nutritional status of children below one year and above five years.

3.5. Guidelines for management for PEM

3.5.1. Hospitalisation

Hospitalisation is necessary in case of malnourished children with following conditions:

- Apathy or anorexia (loss of appetite)
- Dehydration
- Severe anemia
- Life-threatening infection
- Hypoglycemia
- Hypothermia
- Severe vitamin A deficiency

3.5.2. Phases of management

- Stabilisation phase: During this phase acute medical conditions are managed which lasts up to one week.
- Rehabilitation phase: It is longer phase lasting from 2 to 6 weeks

3.5.3. Principles of management

a. Treat / prevent hypoglycemia

- If the child is conscious, give 50 ml of bolus of 10% glucose or 10% sucrose solution (1 rounded teaspoon of sugar in 3.5 tablespoons water), orally or by nasogastric tube (Ng tube). Then feed starter F-75 every 30 minutes for 2 hours.

- If child is unconscious, give IV sterile 10% glucose (5 ml/kg), followed by 50 ml of 10% glucose or sucrose by Ng tube. Then give starter F-75 as above. (Details about F-75 are given ahead).

b. Treat / prevent hypothermia

- If the axillary temperature is $< 35^{\circ}\text{C}$ or rectal temperature is $< 35.5^{\circ}\text{C}$, rewarm the child. Clothe the child including head, cover with a warm blanket & place a heater or lamp nearby (do not use a hot water bottle), or put the child in skin to skin contact with mother.

c. Treat / prevent dehydration

- Standard ORS solution contains too much sodium & too little potassium for severely malnourished children. Instead give special Rehydration Solution for Malnutrition (ReSoMal). It is difficult to estimate dehydration status in a severely malnourished child using clinical signs alone. So assume all children with watery diarrhoea may have dehydration.
- Give ReSoMal 5 ml/kg every 30 min. for 2 hours, orally or by Ng tube, then 5-10 ml/kg/hour for next 4-10 hours. Replace it with F-75 if rehydrated.
- In case of signs of over hydration (increasing PR, RR, increasing oedema & puffy eyelids) stop fluid immediately & reassess after one hour.

d. Correct electrolyte imbalance

All severely malnourished children have excess body sodium. Deficiencies of potassium & magnesium are present & may take at least 2 weeks to correct. Oedema is partly due to these imbalances. Do not treat oedema with a diuretic. Give:

- Potassium 3-4 mmol/kg/day
- Magnesium 0.4-0.6 mmol/kg/day
- When rehydrating, give low sodium rehydration fluid.
- Prepare food without salt

e. Treat/prevent infection

In severe malnutrition, the usual signs of infection, such as fever are often absent & infections are often hidden. Therefore give routinely on admission:

- Broad-spectrum antibiotics.
- Measles vaccine if child is not immunized
- If child has no complications give, pediatric co-trimoxazole orally for 5 days.
- If the child is severely ill or has complications (hypoglycemia, hypothermia, broken skin, respiratory tract/urinary tract infection) give Ampicillin 50 mg/kg, IM/IV 6 hourly for 2 days, then oral amoxycillin 15 mg/kg 8 hourly for 5 days. If amoxycillin is not available, give ampicillin orally as 50 mg/kg 6 hourly.
- In addition, give gentamycin 7.5 mg/kg, IM/IV once daily for 7 days.

f. Correct micronutrient deficiencies

- All severely malnourished children have vitamin & mineral

deficiencies. Although anemia is common do not give iron initially but wait until child has a good appetite & starts gaining weight. Giving iron can worsen infections.

- Give vitamin A orally on day 1 (Age > 12 months 2 lakh IU, 6-12 months 1 lakh IU & 0-5 months give 50,000 IU). Give at least for 2 weeks.
- Multivitamin supplement:
- Folic acid 1mg/day (give 5 mg on day1)
- Zinc 2 mg/kg/day
- Copper 0.3 mg/kg/day
- Iron 3mg/kg/day only when gaining weight.
- Combined electrolyte, vitamin, mineral mix is available commercially.

g. Start cautious feeding

Feeding should be started as soon as possible after admission to provide just sufficient energy & protein to maintain basic physiological processes. Essential features are as below:

- Small, frequent feeds of low osmolarity & low lactose
- Oral or Ng feeds (never give parenteral preparations)
- 100 kcal/kg/day
- 1-1.5 gm proteins/kg/day
- 130ml/kg/day of fluid (100ml, if child has severe oedema)
- If child is breastfed, continue breastfeeding, but give prescribed amounts of starter formula to meet child's needs.
- Milk based formulas such as starter F-75 containing 75-kcal/100 ml & 0.9 gm proteins/100 ml is satisfactory for most of the children.
- Volume should be gradually increased & frequency should be gradually decreased.
- Feeding should be given from cup & very weak children may be fed by spoon, dropper or syringe.

h. Achieve catch up growth

- In the rehabilitation phase catch up formula F-100, which contains 100 kcal & 2.9 gm proteins /100 ml, is given for 48 hours. (details about F-100 is given ahead).
- Increase each successive feed by 10 ml until some feed remains uneaten & unlimited amounts of a catch up formula containing 150-220 kcal/kg/day & 4-6 gm proteins/kg/day is consumed at least 4 hourly.
- Weigh a child each morning before feeding. Child should gain 10gm/kg/day.

i. Provide sensory stimulation & emotional support

- Provide
- Tender loving care
 - Cheerful, stimulating environment
 - Structured play therapy
 - Physical activity as soon as child is well enough
 - Maternal involvement

j. Emergency treatment of shock & severe anemia

- Shock in severe malnutrition is due to dehydration or sepsis. Children with dehydration will respond to IV fluids.
- Give oxygen, 10% glucose IV, IV fluids & antibiotics.
- For severe anemia child needs blood transfusion. Therefore refer the child to a facility where BT facility is available.
- In mild & moderate anemia, oral iron should be given for 2 months but this should not be given till the child has begun to gain weight.

k. Treatment of associated conditions

- If the child shows eye signs of vitamin A deficiency, give vitamin A on days 1, 2 & 14 as per age of the child. Give local treatment of corneal ulceration by antibiotics.
- Dermatitis: Skin quickly improves with zinc supplementation. Apply barrier cream to raw areas.
- Parasitic worms: Tablet mebendazole 100 mg orally, twice daily for 3 days is given.
- Treat if child has continuing diarrhoea.

l. Follow up after recovery

- Follow child regularly.
- Ensure complete immunization & vitamin A supplementation every 6 months.

3.5.4. Home based care (Domiciliary care)

- When the child is being rehabilitated at home, aim is achieving 150 kcal/kg/day & protein intake of 4 gm/kg/day.
- This means child should be fed at least 5 times a day with foods containing 100 kcal & 2-3 gm protein per 100 gm.
- Child should be given high-energy snacks between meals (e.g. milk, banana, jaggery & peanut etc).

3.5.5. WHO recommended various formulas to be used in a child with malnutrition

- F-75 starter formula
 - Full cream dried milk 35 gm, 100 gm sugar, 20 gm (or ml) oil, 20 ml electrolyte/mineral solution & make up to 1000ml.
 - Full-cream cow milk 300 ml, 100 gm sugar, 20 gm (or ml) oil, 20 ml electrolyte/mineral solution & make up to 1000ml.
- F-100 formula
 - Full cream dried milk 110 gm, 50 gm sugar, 30 gm (or ml) oil, 20 ml electrolyte/mineral solution & make up to 1000ml.
 - Full-cream cow milk 880 ml, 75 gm sugar, 20 gm (or ml) oil, 20 ml electrolyte/mineral solution & make up to 1000ml.

3.5.6. Important aspects of malnutrition management

- Risk of death due to hypothermia is documented in malnourished children. Therefore it is essential to keep malnourished children warm to prevent death.
- Intake of high protein & calories in first few days of

treatment is inappropriate.

- Carefully calculated amounts of protein & energy should be given frequently throughout day & night to avoid overloading the kidney, heart & intestine.
- Malnourished child should be fed at night also.
- Recurrent infections increase the severity of malnutrition & malnutrition predisposes to infection. Therefore give antibiotics & anti malarial routinely to all malnourished children.
- Give vitamin A to all malnourished children.
- Iron should not be given to malnourished children until recovery.
- Intra venous rehydration of a malnourished child may cause heart failure. Therefore use of IV fluids should be avoided as far as possible in malnourished children.
- Diuretics like frusemide should be avoided in oedematous malnourished children.
- Malnourished children with pneumonia breathe at a slower rate as compared to well-nourished children to conserve energy. Thus clinical parameters may underestimate the severity of pneumonia in malnourished children. Therefore you should be cautious while diagnosing pneumonia in malnourished children.
- Give nutrition education to mother as below:
 - Use locally available foods.
 - Give food in adequate quantities. One year old child needs 1000 calories.
 - Use concentrated calories - low fiber, minimum water
 - Sufficient protein 1 to 2 gm/kg per day
 - Gradually increasing quantity of food
 - Fresh food and clean hands for feeding
 - Regular follow up and growth monitoring.

3.6. Important nutrition education messages to mother for prevention of malnutrition

- Exclusive breastfeeding up to 6 months.
- Start supplementary solid foods at 6 month.
- Continue breast-feeding as long as possible.
- Pure water and clean hands for child feeding.
- Timely treatment of childhood infections & continuing feeding during sickness.
- Give additional feeding during convalescence to overcome inadequate intake during the illness episode.
- Pre-school children need frequent feeds every 3 to 4 hours. Special snacks should be prepared and given to children e.g. puffed rice, popped gram (Chana), Groundnut-Jaggery (good-dani / chikki), malted Ragi (Nachani-satva).

4. Integrated Child Development Scheme

Integrated Child Development Scheme (ICDS) started in 1975 with aim of overall development of preschool children. ICDS is implemented through an integrated approach for covering basic services to improve childcare, early stimulation & learning, improved enrollment & retention, health & nutrition, water & environmental sanitation.

Following beneficiaries are covered under the scheme:

- Children (0-6 years)
- Pregnant women
- Lactating mothers
- All women (15-45 yrs.)
- Adolescent girls

4.1. Objectives of the scheme

- To improve nutritional & health status of pre school children in 0-6 years age group.
- To lay the foundation of proper psychological development of the child.
- To reduce incidence of mortality, morbidity, malnutrition & school drop out.
- To achieve effective co-ordination of policy & implementation amongst the various departments to promote child development.
- To enhance the capability of mother to look after the normal health & nutritional needs of the child through proper nutrition & health education.

4.2. Services given under ICDS

Six services are given to the various beneficiaries under ICDS as below:

Sr.	Services	Beneficiaries
1	Supplementary nutrition	ANC, PNC, children below 6 yrs
2	Immunization	ANC, children below 6 yrs.
3	Health check up	ANC, children below 6 yrs.
4	Referral services	High Risk ANC/PNC, severely malnourished and seriously ill children.
5	Health education & nutrition education	Women between 15 to 45 yrs age, especially ANC and PNC, adolescent girls
6	Informal pre school education	Children 3-6 years

4.3. Infrastructure

There is one Anganwadi for 1000 population in non-tribal rural area & for 700 population in tribal area. For each Anganwadi there is one Anganwadi worker & one helper. Service delivery in ICDS is joint responsibility of ICDS and health department.

The district infrastructure -

Level	ICDS staff	Health staff
District	Dy CEO (ICDS)	Zonal Advisor (DHO)
Block	CDPO	Project Advisor (Block Medical Officer)
PHC	-	Sector Advisor (PHC MO)
	Mukhya Sevika (MS) (For 17-20 AWW)	HA (F)
SC	-	ANM
Village	AWW	-

4.4. Responsibilities of health functionaries under ICDS scheme

Out of six services covered under ICDS, four services viz. immunization, health checkup, referral services and nutrition and health education are provided by PHC staff in coordination with AWW. All these services are provided during Arogya Seva Satra and Anganwadi visit. Arogya Seva Satra should be organized in Anganwadi. Hence there should be good coordination between PHC and Anganwadi for timely health care delivery to community.

Role of health functionaries in ICDS implementation are as follows -

4.4.1. Medical Officer PHC (Sector Advisor)

a. Planning of visits

- Make fixed programme (for one year) of visits to Anganwadis in your area as per the guidelines given by DHO.
- Inform CDPO of your block about fixed programme with request for joint visits. Insist Mukhya Sevika to remain present at the time of your visit. This will help in coordination of services.

b. Health care delivery

- Plan for Arogya Seva Satra in Anganwadies.
- Carry out health check up of all 0-6 years children in Anganwadi regularly as per the guidelines.
- Carefully examine seriously ill & severely malnourished children as & when required, start treatment immediately and refer if necessary.
- Examine all grade III & IV children every month till their weight is normal.
- Examine, treat & advise all ill children referred by AWW on priority. Do not prescribe outside medicines to these children.
- Identify growth faltering in children earliest and give health and nutrition advice so that child will not develop malnutrition.
- Examine all children in grade I & II (growth faltering) for preventing them from going in grade III & IV.

c. Supervision

- Ensure that all beneficiaries registered by AWW are correct according to the population norm.

- Ensure that weight is correctly taken, correctly recorded on road to health chart & gradation of malnutrition is appropriately done by AWW. Ask AWW to weigh few children in front of you and observe the weighing, recording and grading. Explain the procedure if necessary.

- Check the records for correctness & completeness

d. Monthly meeting

- Arrange monthly meeting of all AWWs in PHC area along with ANM, HA (F) & concerned mukhya sevika. Take review of work done. See that for the same area & population reporting of ANM & AWW is similar.

- Review critical indicators from the monthly report of AWW like

- Infant deaths
- Grade III & grade IV malnourished children
- Improvement in nutritional status of Grade III & grade IV malnourished children since last month.

- Prepare yearly calendar for CME. Discuss one important topic concerned with day-to-day working during monthly meeting of AWWs & ANMs. Subjects selected should be according to the problem prevalent e.g. before rainy season training about diarrhoea, during November, December Polio eradication etc.

- Check immunization record of both AWW and ANM and correct the discrepancies.

4.4.2. Role of HA (F)

- HA (F) should visit each AW in her area once a month on the day of Arogya seva satra.
- Supervise & guide AWW for all the services to be given to beneficiaries.
- Check medicine kit of AW and revise the instructions for use of each medicine.
- Co-ordinate between MPW (F) & AWW.
- Arrange joint visit with Mukhyasevika for better co-ordination.

4.4.3. Role of MPW (F)

- Visit each AW once in 15 days
- Supervise & help AWW in correct recording of weight of a child & accurate monitoring on growth chart to decide grade of malnutrition.
- Plan & implement immunization services in AW area.
- Distribute vitamin A to children below 3 yrs & IFA small tablets to children in 1-5 years age group.
- Check medicine kit of AW & record related to treatment given.
- Check hygiene of cooked food & care taken while cooking & handling the food.
- Ensure food supplementation to grade III & IV malnourished children.
- Provide health & nutrition education to antenatal, postnatal & lactating mothers.

5. Responsibilities of AWW

5.1. Enumeration of beneficiaries

- Survey of the area once a year for recording all beneficiaries & updating of beneficiaries.

5.2. Early diagnosis of malnutrition

- Early diagnosis of malnutrition in under five children by 2 methods:
 - Growth monitoring by Road to Health chart
 - Use of Mid Arm Circumference
- For Growth monitoring weight of children between 0 - 5 years is recorded every month against the age on road to health chart & accordingly gradation of malnutrition is decided by AWW.
 - Monthly weight is recorded of children between 0-5 years with special attention to malnourished children till the weight is as per expected weight for age & also of children with repeated illnesses .

5.3. Supplementary nutrition

- Supplementary nutrition for children & mothers is one of the important jobs of AWW. Two types of feeding are provided under ICDS Scheme -
 - Wheat based supplementary food .
 - Local feeding from cereals & pulses produced locally (Khichadi/usal etc.)

Supplementary nutrition is given as below to the beneficiaries:

Beneficiaries	Supplementary nutrition		
	Weight	Calories	Proteins in gm
Severely malnourished children	200 gm.	600-800	20
Other Children <6 yrs	100 gm	300-400	10-12
Pregnant & nursing mothers BPL	200 gm	600-800	20-24

5.4. Treatment & referral

- Treatment of minor ailments: Each anganwadi is provided with a medicine kit. This kit contains some essential medicines, dressing material, anti diarrhoea drugs etc.
- Refer grade III & grade IV malnourished children to PHC.
- Help ANM in planning & implementation of Arogya seva satra.

6. Reporting under ICDS

- Reporting meeting should be on fixed day each month preferably at PHC headquarter.
- Monthly reports should be prepared by ANM & AWW together, so that there is no discrepancy in the figures reported by them.
- Mukhyasevika should check report of AWW.
- Consolidated report is sent to Block Medical Officer.
- Block Medical Officer sends reports to DHO from all PHCs after compilation.

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SECTION VII

OTHER IMPORTANT HEALTH PROBLEMS

1. MENTAL ILLNESSES

Psychiatric disorders amount for a large proportion of chronic health problems. Mental state of individual greatly influences general health status and ability to access needed health care services. It is essential for MO to recognize mental disorders and refer cases to appropriate specialists if required.

1. Issues indicating the importance of mental health in PHC set up

- Quality of life is largely determined by person's mental health.
- Large proportion of people who need medical care have psychiatric disorders.
- Many physical disorders have an important mental component.
- As the life expectancy increases, risk of chronic impairment raises.

Two features of mental disorders are distinguishable from other nonfatal conditions. First, the care of mentally ill has long been a government responsibility. Except for leprosy, no other disease enjoys this status. Second unique feature of psychiatric disorders is that, personal interview is most important tool for diagnosis of these diseases.

2. Management of excited, violent patient

Your approach should be calm and quiet. Enquire with relatives, examine patient for any obvious organic illness. For excited patient, recommended treatment is as below:

Inj. Haloperidol 10 mg. + Inj. Phenergan 50mg. IM stat. Dose can be repeated 8 hourly.

Wait for some time to get effect of medication. After the patient becomes relatively silent, refer to the psychiatrist.

3. Suicidal risk patients

Attempted suicidal or deliberate self-harm like poisoning, hanging, burns after primary treatment should be referred to district hospital where psychiatric services are available.

4. Follow Up

Follow up of psychiatric patient is very important. Psychiatric patients need close supervision. Once the patient is examined by psychiatrist and is on maintenance dose, such cases can be reviewed on OPD basis fortnightly or even once in a month.

5. Admission to mental hospitals and discharge

Government mental hospitals are situated at Pune, Thane, Ratnagiri and Nagpur. Admission and discharge procedure at these hospitals is governed by Mental Health Act 1887.

5.1. Admission to mental hospital

Admission to mental hospitals is carried out by three methods.

5.1.1. As a voluntary boarder (VB): In this method, patient gives his consent willingly to get admission in the mental

hospital. Superintendent of mental hospital examines the patient and if he feels that, patient needs admission patient can be admitted as voluntary boarder admission.

5.1.2. As a detention order (DO): If the court feels a person is mentally ill and needs observation, court passes detention order initially for 10 days and can be extended to 30 days. This is a temporary order. If superintendent and psychiatrist after observation confirm that, the patient is mentally ill and requires admission, they inform the court about confirmation of mental illness and need to admit the patient and then court sends reception order.

5.1.3. As a reception order (RO): Here person requires certificate from two doctors. One of them must be gazetted medical officer and second may be any medical graduate. After obtaining accommodation certificate from the superintendent, court passes order for admission to mental hospital. This is called reception order.

5.2. Discharge from mental hospital is by following ways

- VB discharge
- Leave of absence.
- Discharge through visitors committee.

6. Role of PHC staff in mental health program

Responsibility of MPW/ANM for mentally ill patients is as follows -

- Identify patients from history narrated by patients and relatives.
- Give health education in the community regarding mental illness & help to remove misbeliefs regarding psychiatric illness.
- Give primary treatment to psychiatric patients before referral.
- Guide patients/relatives who need admission to mental hospital.
- Plan IEC activities to create awareness regarding mental health.

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2. NATIONAL PROGRAMME FOR CONTROL OF BLINDNESS

Blindness is one of the important causes of disability and also one of the significant social problems in India. According to the World Health Organization criteria, blindness is defined as, visual acuity of less than 3/60 (Snellen) or its equivalent. Vision 3/60 means, the letter that can be seen from 60 meters by person with normal eye sight is seen by the person from 3 meters only.

As per the Government of India definition of blindness, visual acuity of less than 6/60 is considered as the cut off point

for blindness. According to this definition, prevalence rate of blindness is about 0.96% as per ICMR survey.

In order to facilitate the screening of visual acuity by health worker in the absence of appropriate vision charts, blindness is defined as inability to count fingers in daylight at a distance of 6 meters to indicate less than 6/60 or its equivalent.

1. Causes of blindness

Causes of blindness in 50 + population as per the survey during the year 1999-2001:

Causes	Percentage
Cataract	62.6
Refractive error	19.7
Corneal blindness	0.9
Glaucoma	5.8
Surgical complications	1.2
Post segment disorders	4.7
Others	5

Diabetic retinopathy and glaucoma are among the emerging causes of blindness.

2. Common ocular morbidity as revealed by 1986-89 survey

Diseases	Prevalence (Eyes) %
Refractive errors	49.96
Cataract	22.81
Trachoma	16.7
Vitamin A deficiency	4.46
Central corneal opacities	0.54
Glaucoma	5.8

3. Approaches to control blindness

- Primary prevention (Preventing the diseases causing blindness): Examples are vitamin A supplementation, Measles immunization and primary preventive measures for trachoma.
- Secondary prevention (Preventing vision loss from established disease): Examples are treatment of glaucoma, trachoma and corrective glasses for refractive error.
- Tertiary prevention (Restoring lost sight): Examples are cataract surgery, keratoplasty for corneal blindness.

4. National Programme for Control of Blindness

This programme is being implemented since 1976-77 and is 100% Central Government sponsored programme.

4.1. Objectives of programme

- To reduce proportion of blindness from 0.95 to 0.3% by 2020.
- Eye check up of school children and provide them glasses.
- Provide eye health services to unreached people.
- To improve quality of cataract surgery.
- To increase eye donation.
- Health education about eye care, avoidable eye diseases.

4.2. Activities at PHC

4.2.1. Cataract

Cataract is the major cause of blindness and surgical treatment is the only intervention for correcting blindness due to cataract. There are two surgical techniques adopted for cataract surgery. One is intra capsular extraction in which whole lens and its capsule is taken out. Another is extra capsular extraction in which lens is taken out and posterior capsule is left behind.

The lens has function of focusing rays on retina. After removal of lens focusing of rays on retina does not take place. Therefore this is achieved by giving spectacles or by giving intra ocular lens (IOL) i.e. a plastic lens implanting in the eye at the time of operation. Now a days this Intra Ocular Lens (IOL) method is used for surgery.

Important activities related to cataract at PHC are as follows –

a. Suspect & list cataract cases in PHC area

- Suspect cataract in a person, if he/she has a white spot in the pupillary area and on examination he/she is unable to count the fingers from 10 feet. (Visual acuity < 6/60).
- Find out cataract cases by:
 - § House to house survey by MPW
 - § During regular home visits by health workers
 - § Arranging screening camps at PHC with help of Para Medical Ophthalmic Assistant (PMOA)
 - § Screening of patients attending OPD of PHC
- Make village wise list of all blind persons who are suspected cataract cases.

b. Referral of cataract cases for surgery

- Presently cataract camps are organized at base hospitals, which may be Rural Hospital or District Hospital. MO should know nearest base hospital to PHC and days of cataract surgery in these hospitals.
- Refer the cataract cases at the base hospital, giving them correct address and referral chit.

c. Post operative follow up

- After surgery patients are discharged on the third day. All operated cases should be followed up by health workers by home visit after surgery as well as when required.
- Important messages should be given by HW during follow up visit, as below-
 - § Use medicines regularly prescribed by doctors
 - § Do not squeeze operated eye for 6 weeks after surgery.
 - § Protect eye from dust, smoke and heat.
 - § Do not lift heavy weight
 - § Do not smoke, sneeze or cough
 - § Do not sleep in lateral position on the side of eye which has been operated
 - § In case of redness, discharge, swelling in operated eye immediately attend the hospital.

§ When instilling eye drops, wash your hands and then instill the drops in lower eyelid.

- After 42 days of postoperative period follow up and refraction is essential.

4.2.2. School Eye Screening

Refractive error is the major cause of blindness especially in students, which leads to lower performance of such students in schools. Early detection and immediate correction of refractive error improves the scholastic performance of these students.

a. Objective

Check up of all students in middle school i.e. 6th to 8th standard for early detection of refractive error and its correction.

b. Stages in school eye screening

- Teacher in schools.
- PMOA
- Ophthalmologist for complicated cases.

c. Strategy

- List all middle and secondary schools in PHC area with number of students in 6th to 8th std.
- Select teachers from Science faculty for screening of students. Number of teachers depends on the number of students to be examined.
- Training is given to teachers for primary screening of students with suspected refractive error. Simplified standard Snellens chart is used for this purpose.
- Cut off point used is 6/9 of the standard Snellens chart.
- From this chart, teachers categorize each student as having good eyesight or student with refractive error requiring spectacles.
- Students with suspected refractive error are referred to PMOA for examination, diagnosis of refraction and advice about correction of the problem.
- Complicated cases are referred to specialist.
- Students from BPL, SC and ST categories are provided with free spectacles.

4.2.3. Treatment for minor eye problems and preventive care

- MO should treat patients with conjunctivitis, trachoma, ophthalmia neonatorum and corneal injuries correctly.
- For a child with night blindness, give vitamin A in therapeutic doses as, 2 lakh IU immediately, same dose on next day and after 15 days 2 lakh IU. For a child less than 1 year give 1 lakh IU as above.
- Preventive vitamin A supplementation for children below 3 year should be given under RCH programme as 5 doses between 9 months to 3 years.
- Immunise all children below one year with measles, as it leads to vitamin A deficiency as a complication. This intervention is covered under RCH.

4.2.4. Health Education

MO along with the team of PMOA and health workers should plan for health education. Make use of satisfied acceptors

(operated cases satisfied with surgery) for the same. Health education regarding eye care should include following

a. Causes of blindness

b. Eye care to prevent blindness

- Care for prevention of trauma to eyes in industries, agriculture, and household.
- Education about good reading habits, safety at play for children
- Not to use surma (Kajal) in eyes.
- Not to use any instrument or unscientific way in case of foreign body in eye.
- Immediate treatment for eye problems
- Vitamin A supplementation and measles immunization

c. Cataract surgery

Inform people about the base hospital where facility for cataract surgery is available, advantages, postoperative care, use of glasses after 42 days of surgery in case of conventional method.

d. Eye donation

- Eye donation and corneal opacity – Blindness due to corneal opacity occurs in children and young people. For persons with corneal opacity, corneal transplant surgery is the treatment of choice. Eye banks are developed at the District Hospitals to store and use the donated eye.
- Educate community regarding following important aspects of eye donation -
- § By donating eye, donor is making blind persons to see the world.
- § After death, within 4 to 6 hours eye donation has to be performed.
- § Arrangement for the same is made by informing Civil Surgeon.
- § Donated eye (cornea) is stored in eye bank and used within 72 hours for corneal transplant.

4.2.5. Supervise, guide and monitor functioning of PMOA

- There is one PMOA for 1 lakh population. PMOA's are posted at RH or may be posted at PHC.
- They prepare their advanced tour programme for visiting PHCs.
- MO has to ensure that, PMOA visits PHC on the assigned day, as per the schedule.
- Ensure that PMOA performs duties in the PHC area.

4.3. Responsibilities of PMOA

- Train health workers in eye care
- Treat patients with minor eye problems
- Perform examination for refractive error and prescribe glasses
- Screening and examination of school children.
- Assist mobile units in conducting eye camps
- Pre operative examination of patients for cataract surgery.

- Post operative follow up of cataract patients.
- Health education activities in the community

4.4. Record

Following record has to be maintained by health workers:

- Blind person register, persons with bilateral blindness
- Suspected cataract cases, cataract operated cases
- Children with vitamin A deficiency (Night blindness).
- Persons having squint
- Persons having corneal opacity
- School wise number of students in 6th to 8th std and trained teachers for eye screening.

Table - 1: Proforma for blind register

No.	Name	Age	Sex	Address	Visual acuity		Cause of blindness	Remarks
					Rt. eye	Li. eye		

Table - 2: Register for operated cataract cases

No	Name of the patient	Age	Address	Vision before surgery		Operated eye operation	Technique of	Surgeon	Vision after surgery	
				Rt	Li				Rt	Li

5. "Vision 2020"

For reducing the burden of avoidable blindness by the year 2020, a strategy has been advocated for "Vision 2020: The Right to Sight" as below:

5.1. Target diseases for Vision 2020 in India

- Cataract
- Childhood blindness
- Refractive error and low vision
- Corneal blindness
- Glaucoma
- Diabetic retinopathy
- Trachoma (Focal)

5.2. Strategy for reduction of disease burden

5.2.1. Cataract

- Primary screening by MPW at village level.
- Case selection by eye surgeon at screening camp or district hospital.
- IOL surgery.

5.2.2. Diabetic retinopathy

Two percent of the population is expected to have diabetes and twenty percent of them diabetic retinopathy.

- Awareness generation by health worker.
- All known diabetics to be examined by ophthalmic assistant.
- Referral to eye surgeon or at tertiary level depending on

case.

5.2.3. Glaucoma

- Opportunistic screening of persons above 35 yrs. with diabetes mellitus and family H/O glaucoma.
- Community based referral by health workers of persons with diminution of vision, haloes, rapid change of glasses, night blindness, ocular pain and family H/O glaucoma.

5.2.4. Corneal blindness

Corneal blindness is important as it occurs in childhood and the productive adult age. Strategy:

- Vitamin A supplementation programme
- Measles vaccination
- Better water supply and sanitation to reduce trachoma and other infections
- Establishing eye banks, collection of donated eyes and providing keratoplasty services.

5.2.5. Low vision and refractive errors

- Health education about normal vision, symptoms of visual impairment, asthenopia etc.
- Screening programme: School eye screening programme, regular check up after 40 years.
- Eye care services: Check up for refraction at all levels including primary level.
- Referral of difficult cases at secondary or tertiary level.

5.3. Vision Centers

To improve the accessibility of eye care services, one vision centers will be developed to deliver primary eye care to 50,000 population in rural area, which may include Primary Health Centers. There will be one Middle Level Ophthalmic Personnel per 50,000 population.

5.3.1. Functions of vision center

- Identification and treatment of minor eye diseases e.g. conjunctivitis, eye injuries etc.
- Vision testing, prescription/dispensing of glasses. School eye screening programme
- Eye health education
- Identification/referral of cataract, glaucoma etc. to service center.

6. Interventions, activities required at PHC level

Activities	Find	Treat	Prevention	Referral	H.E.
Cataract	+			+	++
Post operative follow up	+			+	++
Vision screening	+	+		+	+++
School eye screening	+	+		+	+++
Childhood blindness	+		+	+	+++
External abnormalities	+			+	++

Vit. A supplementation	+	+	+	+	+
Trauma	+	+	+	+	+
Diabetes	+			+	+
Red eye	+	+	+	+	+
Corneal ulcer	+	+	+	+	+
Trichiasis	+		+	+	+
Wrong practices	+		+	+	++
Eye donation	+			+	+++

7. District Blindness Control Society (DBCS)

DBCS is autonomous body responsible for implementation of National Programme for Control of Blindness in the district. The society is headed by the Collector and includes the representatives from government, private and NGO sector.

8. NGO and NPCB

Various NGOs are working in the state in the field of blindness control. Recognition to the NGO is given by DBCS. Cataract surgery & eye bank are the areas where NGOs work. If there is any NGO working in PHC area, MO should visit that NGO.

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3. INFORMATION EDUCATION AND COMMUNICATION

Information, Education, Communication is the important component of all the national health programmes. Unless community is made aware about various aspects of health, it is difficult to bring the desirable behavioral change among the people. Aim of IEC is to bring desirable behavioral change; therefore it is said as 'Behavior Change Communication' (BCC). Behavioral change is the slow process and repeated, continuous attempts are needed by MO and health workers to get desired behavioral changes in the community. Informing and educating people will help to improve utilization of health services and will help for demand generation from the community. Long-term goal of IEC activities is improving health status of the community.

BCC is a dynamic process, which involves an exchange or sharing of ideas & is concerned with information, attitudes, beliefs, myths, misconceptions and practices. BCC uses multiple channels to transmit and reinforce messages that address well defined target groups. This helps to change current behavior to the desired behavior by providing people skills and tools. It is not only necessary to adopt new behavior change but also need to maintain the same for better health outcomes. Hence, BCC is a process that promotes positive change in the individual and the environment.

1. Effective communication is based on

- Thorough understanding of behavior responsible for poor health outcomes of people, knowledge, practices, beliefs, myths and misconceptions, value systems, cultural and religious practices & educational level of community.
- A clear idea regarding changes that need to be brought about.
- An understanding of messages that need to be given to bring about the changes.
- Medium and media mix that can effectively bring about the change process.
- An analysis of the key influencers and involving them in the communication strategy.
- Use of material, which can enhance effectiveness of communication.

Continuum of behavior change ranges from becoming aware, improving understanding through repeated exposure, openness to trial of new behavior, experience of the product/services, reinforcement, sustaining new behavior and propagating new behavior through word-of-mouth.

Every opportunity should be utilized for creating awareness among the people by using appropriate health education material provided by DHO. Use of such visual material improves effectiveness of your programme. IEC is not independent vertical programme, but it is the part of regular health services and activities performed by health staff.

2. Areas to be covered for health education

- Services provided by PHC for various groups of people.
- Importance of personal hygiene and environmental sanitation.
- Nutrition and nutritional requirements of various groups.
- National health programmes.
- Important health related acts like PNDT, age at marriage etc.

3. Opportunities for health education

There are many opportunities for informing, educating people regarding health related matters.

3.1. Inter personal communication

- MO can educate patients regarding specific illnesses during OPD and during Arogya seva satra.
- Health worker has a very good opportunity for informing people during house to house visit, in Arogya seva satra or at the time of administering vaccine to child.
- Any new or follow up patient of leprosy or tuberculosis coming to MO has to be educated well.
- When informing individuals, use health education material provided like flipbook, flash card so that person understands message better.
- Inter personal communication being a two-way communication, is the best method. It gives patient a chance to discuss, ask questions and clear all the doubts in mind.

3.2. Group communication

- Important groups for whom awareness needs to be created are mothers attending clinic, school children, college students, youth groups, mahila mandals etc. In addition to this, Gramsabha, PHC advisory committee are also good opportunities.
- Health education activities of particular group should be planned taking into consideration area of interest of that group.
- Do not mix groups with different background, as interests of persons with different background differ.
- Use of flipbook, flipchart is essential for good understanding of group.
- Significant number of people can be addressed at one time and if group is small chances of clearing doubts are more by this method.

3.3. Mass communication

- Large number of people can be addressed at a time by using audiovisual media or print media like use of loudspeaker, distribution of handbills at public places, use of video etc.
- Opportunities for mass communication at PHC are disease diagnostic camps, weekly bazaar etc.
- In a short time span you can reach large number of people. However there is no opportunity for individual discussion.

4. IEC material

At district level District Education and Media Officer is looking after all IEC activities in the district.

IEC material provided to PHC is as below:

4.1. Posters

- Exhibit posters at public places where large number of people can see the poster e.g. Grampanchayat, schools, bus stand, railway station, etc..
- Height of poster should be such that people can see/read it.
- Change posters regularly.
- Replace the torn or damaged posters immediately. All health staff should be given instruction that if they come across torn or damaged poster, it should be immediately replaced by other poster.
- Subject of the poster should be such that it is of concern to the group of people who are going to see it.

4.2. Banners

- Banners are used usually for campaigns or any intensive short period activity.
- Banners should also be exhibited at public places like Gram Panchayat, schools, bus stand, railway station etc. where large number of people can see.
- Most of the times banners are related to date / place of some programmes or campaign. When activity is over, remove these banners from area.

4.3. Stickers

- They should be stuck on vehicles, shops, indoor places both private and public, in PHC, sub center, schools.
- Stickers are essentially of small size. They are placed in such a way that interested person can read it from close distance.
- Stickers can also be used as ready reference for professionals e.g. treatment of malaria, treatment schedule of dehydration etc.

4.4. Dangers

- They dangle and attract the people. Can be displayed outside PHC, in sub centers, gram panchayat office, schools etc.

4.5. Flipchart

- This is used for health education in small group, in schools, for mothers meetings etc.
- It is also useful for imparting training to health workers, AWW or any other training.

4.6. Flip book

- This is used for health education in small groups, in schools, for mothers meetings.
- On front side of each page there is picture and on backside information is given regarding the picture shown.
- While using, fold the flipbook on the hand of user so that people can see it.
- Keep this at the eye level of viewers.
- Correct method of use is important. Picture should be shown to the group and explanation regarding this should be given by reading information given on backside.

4.7. Folders

- These are used for informing large number of people as a mass communication method.
- Ensure that people for whom you are using folders are literate.
- Folders are also useful for group communication.

4.8. Handbills

- These are used for informing large number of people as a mass communication method and therefore can be distributed in places like bazaar, bus stand, rail way station etc.
- Useful for literate people.

In addition to this audio, video cassettes are also provided to PHCs. Make proper use of these cassettes.

5. Important health days

Taking into consideration important public health related issues, health days are celebrated. In addition to this, for some issues, week, fortnight or even month is celebrated.

Importance of celebrating health days is that, as one day or specific period is fixed, information related to the subject is given to the community through various methods, creating

Section VII : Other important health programmes

awareness at the same time all over the state.

MO should take this opportunity & celebrate various health days in PHC area as per the guidelines given by DHO by using local resources. Important health days are as below:

Table - 3: Important health days

Sr.	Day/Period	Importance
1	1st January	Anti Smoking day
2	30th January	Anti Leprosy day
3	5th February	Oral Health Day
4	8th March	World Women's Day
5	22 March	World Water Day
6	24 March	World Anti Tuberculosis Day
7	7 April	World Health Day.
8	1 - 7 May	Malaria Control Week.
9	12 May	World Nurses Day.
10	15 May to 15 June	Awareness Campaign - Water Borne Diseases.
11	31st May	No Tobacco Day.
12	5 June	Filariasis Control Day
13	10 -16 June	Eye Donation Week
14	10 July	Safe Motherhood Day.
15	11 July	World Population Day.
16	1-7 August	World Breast Feeding Promotion Week.
17	1 -7 September	Nutrition Week
18	1 October	Voluntary Blood Donation Day.
19	16 October	World Food Day
20	21 October	Iodine Deficiency Disorders Control Day.
21	Oct.-November	School Health Campaign
22	1st December	World AIDS Day.

6. Role of Medical Officer in IEC activities

6.1. Planning IEC activities

- Most important role of Medical Officer is to plan IEC activities for the year. This should be part of routine health activities and not separate independent activity. Planning should also be done for IEC activities for fairs, festivals and melas.

6.2. Celebration of health days

- Celebrate various health days in PHC area.

6.3. Training

- Train health staff about appropriate use of IEC material, conducting effective group meeting, effective interpersonal communication.

6.4. Health education material

- Obtain health education material from District Health Officer from time to time.
- Review available IEC material in Primary Health Center and give instructions to staff for its proper utilization as

below:

- § Posters should be exhibited at public places from where they can be easily seen.
- § Cloth banner should be exhibited outside Primary Health Center / Sub center building or near Grampanchayat / Bus stops.
- § Flip books should be utilized for Inter Personal Communication (IPC), for group communication.
- Ensure proper utilization of Audio Visual aids (e.g. Tape recorders, V.C.R., Television, Audio / Video Cassettes, Exhibition sets).
- Inventory of the IEC material received from DHO should be maintained. Keep separate stock book for IEC material received. Take entry of IEC material in stock book immediately after receipt. Distribute material to health workers, AWW from your area and see that they use it properly.

6.5. Review & reporting

- Take regular review of IEC activities in monthly meeting.
- Send monthly report of IEC to DHO every month.
- Record keeping: Assign responsibility of record keeping to HA (M).
- § Make separate register for recording IEC material.
- § Distribute IEC material immediately after receiving from DHO office.
- § Always take signature of health workers to whom the IEC material is distributed.

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4. DISABILITY

When considering total disease burden of the community, contribution of various disabilities in the disease burden is significant. Some of the disabilities could be prevented by taking primary preventive measures so that they do not occur, whereas for others early diagnosis and prompt treatment is important.

Disability has its impact in various ways. Person may have functional limitation by decreased mobility, he may suffer from psychological setback, and there may be decreased earning capacity. In addition to this, family has to support the disabled person physically, socially and economically.

Therefore providing preventive, promotive, curative and rehabilitative services to the community especially disabled persons is important.

1. Definition

Disability is defined as an existing difficulty in performing one or more activities which in accordance with age, sex of the subject and as per normative social role are generally accepted as essential basic components of daily living.

2. Disability incidence

There are no comprehensive surveys to know exact incidence of disability in our state. In India, some sample surveys

have been conducted and it is estimated that at least 2 to 5 percent of Indian population is suffering from some kind of disability.

3. Disability includes following conditions

- Blindness
- Low vision
- Leprosy cured
- **Hearing** impairment
- Locomotor disability
- Mental retardation
- Mental illness

4. Disability prevention

Prevention of disability is important which is made at three levels – primary, secondary and tertiary.

4.1. Primary prevention

It is the action taken prior to onset of disease, which causes disability. This eliminates possibility of occurrence of disease. Common examples are – Proper antenatal, intra natal, postnatal care to prevent birth of child with disability, prevention of accidents, avoiding consanguinous marriages, immunization to prevent polio etc.

4.2. Secondary prevention

These are actions, which halt progress of disease at its incipient stage and prevent complications. This includes correction of refraction, early diagnosis and treatment of leprosy etc.

4.3. Tertiary prevention

When disease process has advanced beyond early stage, tertiary preventive measures are taken e.g. cataract surgery, provision of artificial limb in case of amputation etc.

5. The persons with disabilities (Equal opportunities, § protection of rights and full participation) Act, 1995

5.1. Need for the act

Disabled persons face discriminatory attitude, they do not get opportunities for improving their quality of life and also community does not respect them. Considering these issues legislation has been formulated which is known as ‘the persons with disabilities (Equal opportunities, protection of rights and full participation) Act, 1995’. The bill was passed to provide services, create facilities and give support to people with disabilities in order to enable them to have equal opportunities in participating as productive and contributing citizens to their fullest extent.

5.2. Definitions used as per the act

- ‘Blindness’ refers to a condition where a person suffers from any of the following conditions:
 - § Total absence of sight.
 - § Visual acuity not exceeding 6/60 in the better eye with correcting lenses or
 - § Limitation of the field of vision subtending an angle of 20 degrees or worse.

- ‘Cerebral palsy’ means group of non-progressive conditions of a person characterized by abnormal motor control posture resulting from brain insult or injuries occurring in the pre natal, peri natal or infant period of development.
- ‘Hearing impairment’ means loss of sixty decibels or more in the better ear in the conversational range of frequencies.
- ‘Locomotor disability’ means disability of bones, joints or muscles leading to substantial restriction of movement of the limbs or any form of cerebral palsy.
- ‘Mental illness’ means any disorder other than mental retardation.
- ‘Mental retardation’ means a condition of arrested or incomplete development of mind of a person, which is specially characterized by sub normality of intelligence.
- ‘Person with disability’ means a person suffering from not less than forty percent of any disability as certified by the medical authority.
- ‘Person with low vision’ means a person with impairment of visual functioning even after treatment or standard refractive correction but who uses or is potentially capable of using vision for the planning or execution of a task with appropriate assistive devices.
- ‘Rehabilitation’ refers to a process aimed at enabling persons with disabilities to reach and maintain their optimal physical, sensory, intellectual, psychiatric or social functional levels.
- ‘Leprosy cured person’ means any person who has been cured for leprosy but is suffering from –
 - § Loss of sensation in hands or feet as well as loss of sensation and paresis in eye and eyelid but with no manifest deformity.
 - § Manifest deformity and paresis but having sufficient mobility in their hands and feet to enable them to engage in normal economic activity.
 - § Extreme physical deformity as well as advanced age, which prevents him from undertaking any gainful occupation.

6. Activities to be undertaken for early detection of disabilities as per the act

- To undertake survey and investigate cause of occurrence of disabilities.
- Implementation of activities for prevention of disabilities.
- Screen all children at least once in a year for identifying high-risk cases.
- **Pre** natal, peri natal and postnatal care of mother and child.
- Creating awareness among the community regarding causes of disabilities and preventive measures to be adopted.

7. Following activities are important for MO in disability prevention

- Medical Officer should examine the disabled persons coming to OPD in PHC, especially children; identify

- causes of disability and refer patient to appropriate specialty.
- Continued education of health workers regarding identification of various disabilities, prevention of disabilities etc.
- MO should plan IEC activities by involving all health workers, AWW in PHC area.
- MO should refer disabled persons to the Civil Surgeon for getting the handicapped certificate. The Social welfare department provides identity card to handicapped persons.
- MO should perform examination of children from primary schools as well as of non-school going children for assessment of disability and their appropriate referral.
- MO should try for getting facility of ramp at PHC.

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V. DISASTER MANAGEMENT

The term disaster usually refers to the natural event (e.g. flood or earthquake) in combination with its damaging effects (e.g. loss of life and destruction of houses). Following important points should be considered during disaster management.

- There is relationship between the type of disaster and its effect on health. For example, earthquake causes many injuries requiring medical care while floods and tidal waves cause relatively few.
- Actual and potential health risks of disaster do not occur at same time. Thus, casualties occur mainly at the time and place of impact and require immediate medical care, while risk of increased disease transmission takes longer to develop and are greatest where there is overcrowding and standards of sanitation have declined.
- Disaster affected people generally recover quickly from their immediate shock and spontaneously engage in search and rescue and transporting to health facility. They are most important as they extend help when it is maximally needed. Try to organize them and get their maximum help during disaster.

Table - 4 : Short term effects of major disasters

Effect	Earthquake	High wind (without flood)	Flash floods	Landslides
Deaths	Many	Few	Many	Many
Severe injury requiring extensive treatment	Many	Moderate	Few	Few
Increased risk of communicable diseases	Yes	Yes	Yes	Yes
Damage to health facilities	Severe	Severe	Severe but localized	Severe but localized
Damage to water system	Severe	Light	Severe	Severe but localized
Food shortages	Rare	Rare	Common	Rare

Effective management of health services depends on anticipating and identifying problems as they arise and implementing specific measures wherever needed.

1. Health problem in natural disasters

Health problems common to all natural disasters

Injuries: Injured persons require immediate medical care and referral. Proportion of injured depends upon type of disaster.

Communicable diseases: Risk of communicable diseases is proportional to population density and displacement. These conditions increase the pressure on water and food supplies and risk of contamination. Initially there is risk of diarrheal diseases; afterwards vector borne diseases may appear in some areas particularly after floods.

Water supply and sanitation: Drinking water supply and sewerage system are particularly vulnerable to natural disasters,

and disruption that occur in them may lead to outbreak of water borne diseases.

Mental health: Anxiety, neurosis and depression are not major, acute public health problems immediately following disasters. Help the community to support themselves through community structure. Indiscriminate use of sedatives and tranquilizers during emergency relief phase is discouraged.

2. Immediate health problems related to type of disaster

2.1. Earthquake

Usually because of dwelling destruction, earthquake may cause many deaths and injure large number of people. Toll depends mostly on three factors –

- Housing type:** Houses of adobe, stone, un-reinforced masonry cause more deaths whereas houses with wooden frame causes less deaths.

- Time of earthquake: Earthquake at night causes more deaths.
- Population density: Deaths and injuries are likely to be much higher in densely populated areas.

Most of demand of health services occurs within 24 hours of event. Injured persons may continue to show up to facility only during first three to five days. Afterwards health services have to concentrate on disease surveillance and outbreak prevention activities.

2.2. Destructive winds

Unless they are complicated by secondary disasters such as folds or sea surges, destructive winds cause relatively few deaths and injuries.

2.3. Flash floods and sea surges

Floods and sea surges can cause many deaths, but leave relatively few severely injuries in their wake. Deaths result mainly from drowning and are most common among weakest members of population.

2.4. Landslides

Landslides have become increasingly common disaster in Maharashtra state. Intense deforestation, soil erosion and human settlements in landslide prone areas have resulted into catastrophic events in recent years. Landslides cause high mortality with few injuries.

3. Disaster preparedness

Objective of disaster preparedness is to ensure that appropriate systems, procedures and resources are in place to provide prompt, effective assistance to disaster victims, thus facilitating relief measures and rehabilitation of services.

Following points must be kept in mind for disaster preparedness –

- List probable events that may occur in the PHC area, e.g. floods, landslide, earthquake, etc.
- Plan for main features of administrative response, such as location of various officers, support agencies, hospitals, etc. who will be helpful at the time of disaster.
- Develop system of early information of any such incidences in your areas.
- Compile important information of area which includes population of each villages, transportation facilities, hospital facilities, water supply, etc.

4. Actions to be taken during disaster

In the event of disaster, health sector is responsible for treatment of casualties, epidemiological surveillance and disease control, basic sanitation, health care delivery at temporary settlements, logistic resources and support and health education measures.

4.1. Treatment of casualties

- When information of disaster is received, PHC staff should rush to the site. First aid treatment should be administered at the site. Injured are identified and tagged at disaster site and classified according to priority for treatment and /or transfer to hospital. If required, doctors and other staff from nearby PHC should be called for help.
- It is always better to inform hospital where the casualties are being sent about the disaster, pattern of injury and likely number of patients.
- If large numbers of casualties are likely or rescue operation needs to be done, take help of community volunteers. Inform revenue and panchayat department for further help in rescue and transportation of patients.

4.2. Epidemiological surveillance and disease control

Establish house to house survey system to all the areas of the PHC including new settlement if any. All the surveying health workers must come together daily and report about the cases registered during the day. Compile the information daily and carefully observe whether there is any increase in number of patients of particular symptoms in affected areas.

4.3. Water disinfection

Most common cause of epidemic in disaster affected areas is infected water source. Assign duty of chlorination of all the water sources in and around affected area to senior health assistant. In addition to this, prepare stock solution in sufficient quantity and chlorinate drinking water by house to house chlorination.

4.4. Laboratory services

Establish makeshift laboratory adjacent to camp health facility. This laboratory should have facility to examine blood smear for malaria and water field test.

4.5. Vaccination

WHO does not recommend cholera or typhoid vaccination in disaster situation. Do not start mass tetanus vaccination as increase in number of tetanus cases after disaster is never observed. However, injured persons can be vaccinated considering risk of contamination and previous tetanus vaccination.

4.6. Vector control

Control programs for vector-borne diseases should be intensified in the emergency and rehabilitation period, especially in areas where such diseases are known to be endemic. Of specific concern in emergency situation are: leptospirosis (rats), dengue fever (aedes mosquito) and Malaria (anopheles mosquito). In flooded areas, rats will escape their burrows in search for dry hiding places, often in dwellings. Similarly flood waters provide ample breeding opportunities for mosquitoes.

Following measures should be taken for vector control measures –

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- Guide Gram Panchayat about safe disposal of waste
 - Conduct public education campaign to eliminate vector breeding sites in and near houses and on measures to prevent infection, including personal hygiene.
 - Survey camps and densely populated areas to identify potential mosquito, rodent and other vector breeding sites,
 - Eliminate vector breeding sites by draining, filling and by releasing guppy fish
 - Advise community to store food in closed and protected containers.
- Well organized vector control measures will drastically reduce the need of insecticide spraying.

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SECTION - VIII

HEALTH INFORMATION SYSTEM

1. VITAL STATISTICS

Births, deaths and stillbirths are vital events. Medical Officer must know how information about vital events is collected, various schemes to collect this information, reporting system and calculation of important rates and ratios for PHC. Calculation of rates and ratios will help to evaluate the health programmes implemented in PHC area.

Medical Officer and health staff should know following important schemes related to collection of vital statistics in which Primary Health Center is directly involved.

- Civil Registration System – (CRS)
- Vital Rate Scheme (VRS)
- Survey of Causes of Death (Rural) (SCD) (R)
- Hospital mortality and morbidity statistics

1. Civil Registration Systems (CRS)

Civil Registration System is the continuous, permanent and systematic recording of births, stillbirths and deaths under Registration of Births and Death Act 1969. Director Health Services is the Chief Registrar of Births and Deaths for Maharashtra State and is assisted by Deputy Director health Services (State Bureau of Health Information and Vital Statistics) who is Deputy Chief Registrar of Births and Deaths for Maharashtra State.

1.1. Organizational aspects of Civil Registration System in district

Table - 1 : Designation of officers under CRS

Sr.	Designation of officers	Designation specified under the act	Area of operation
1	District Health Officer	Dist. Registrar of Births and Deaths	Concerned revenue District
2	Deputy Chief Executive Officer (Panchayat)	Add. Dist. Registrar of Births and Deaths	Concerned revenue District
3	Block Development Officer	Add. Block Registrar of Births and Deaths	Concerned revenue Block
4	Chief Officer Municipality	Registrar of Births and Deaths	Concerned Municipality area
5	Gram Sevak	Registrar of Births and Deaths	Concerned Gram Panchayat

Registration of vital events under CRS is done on the basis of place of occurrence of event. Thus birth or death is recorded at the place where the event has occurred irrespective of residential status of the person.

1.2. Formats

There are three forms for giving information regarding birth, death and stillbirth to Registrar of births and deaths as follows-

Form no. 1	Reporting of births
Form no. 2	Reporting of deaths
Form no. 3	Reporting of stillbirths

1.3. Role of PHC staff in Civil Registration System

- It is the responsibility of Medical Officer to inform all births, deaths and stillbirths occurring within PHC building and premises to Gram Sevak or Chief Officer of Municipal Council if PHC is situated in Municipal area.
- Medical Officer should assign the responsibility of reporting to one Health Assistant. MO should check delivery and indoor register weekly and ensure that all births and deaths are informed to Gram Sevak in relevant form.
- Registration of vital events under CRS is grossly incomplete as people do not inform vital events to Gram Sevak due to ignorance. However this information is available with health staff as well as AWW, as it is required for planning of various health services. Medical Officer should inform concerned Gram Sevaks about date of PHC monthly meeting so that Gram Sevak and health workers can exchange and update information of vital events from whole PHC jurisdiction.
- Sometimes infant and maternal deaths are missed by MPWs. It is always a good practice to cross check the infant and maternal death events with Gram Sevak register.

Data generated is widely used for planning, evaluation of national health programmes and also for research purposes.

1.4. Registration of Births And Deaths Act 1969 & Maharashtra Registration Of Births And Deaths Rules 2000

Registration of Births and Deaths Act has made reporting and registration of births and deaths compulsory. Government of Maharashtra has recently framed revised rules of registration known as, Maharashtra Registration of Births and Deaths Rules – 2000 that came into operation with effect from 1st May 2000. Some of the important procedures of revised Rules, which should be known to PHC staff, are given below -

1.4.1. Reporting of births and deaths as per the Act

Births and deaths are to be reported by person responsible for registration to the Registrar of Births and Deaths appointed by the State government. In Maharashtra, Gram Sevak is Registrar of Births and Deaths for rural areas and Chief Officer of Municipality for urban areas. Births and Deaths are registered only at the place of occurrence. The person responsible for reporting events for registration depends on the place of occurrence of event as below -

Table - 2 : Reporting of vital events according to place of occurrence

Sr.	Place of occurrence	Person responsible for reporting (Informant)
1	House	Head of the household or in his absence nearest relative
2	PHC, hospital, maternity nursing home etc.	Medical Officer in charge of institution or person authorized by him on his behalf.
3	Jail	Jailor in charge
4	Hotel, lodging, boarding house, dharmashala.	Person in charge
5	Newborn or dead body found in public place	Gram Sevak in village and i/c Police station outside residential area of village.
6	Birth or death in moving vehicle (Plane, Train, Bus, Rickshaw etc.)	Vehicle in charge should report at the first place of halt

1.4.2. How to report

All vital events i.e. live births, stillbirths and deaths are to be reported in the forms prescribed by the state government. These are Form 1 for birth report, Form 2 for death report and Form 3 for stillbirth report.

Information has to be given under signature / thumb impression of informant. Name of child if not reported at the time of registration can be reported later on.

It is desirable to register name within 12 months from date of registering event of birth.

1.4.3. When to report

All events are to be reported within 21 days of their occurrence. Events reported later than 21 days can be registered on completion of formalities as mentioned below -

Table-3: Formalities to be completed for late reporting

When reported	Formalities to be completed	Late fee
After 21 days but within 30 days of occurrence	Payment of prescribed late fee	Rs. 2/-
After 30 days but within one year of occurrence	Written permission from Block Development Officer in rural areas, Chief Officer Municipality in urban areas and payment of late fee	Rs. 5/-
Over one year of occurrence	Order of executive magistrate of respective area and payment of late fee	Rs. 10/-

1.4.4. Issue of certificate

On registration of an event reported within 21 days, first copy of certificate is issued free of charge. Additional copies of certificate can be obtained on payment of nominal fee.

Registrar of births and deaths will issue birth certificate to reporting person or his/her nearest relative within 30 days of reporting. The certificate may be collected by the nearest relative.

In case concerned person does not collect certificate within 30 days, registrar shall send the same to the concerned family by post within fifteen days of expiry of aforesaid period.

1.5. Committees at various levels for monitoring registration of births & deaths

Registration of births & deaths under Civil Registration System is not complete. About 90% births are registered, similarly approximately 70% deaths are registered & registration of infant deaths is still very low.

For improving the Birth & Death registration qualitatively & quantitatively, GR no. Sankirna 2001/Pra Kra 1192/21 dated 12 Dec 2001 was published by the Rural Development Department. Co ordination committees were already established for reviewing ICDS scheme at village, block & district level. Area of work of these committees has been extended for improving 100% birth & death registration.

The details are as below:

1.5.1. Village level committee

- Sarpanch: Chairman
- Gramsevak: Member
- Auxiliary Nurse Midwife: Member
- Anganwadi worker: Member
- Dai: Secretary
- Lady Gram Panchayat member: Member
- NGO/Mahila Mandal representative: Member

Meeting of this committee will be held every three months.

Discussion & review of following issues should be taken in this meeting:

1. Registration of ANC, births, deaths (0-6 years age group)
2. ANC check up, delivery by trained persons
3. Immunisation, examination/treatment of common childhood problems
4. ICDS scheme etc.

1.5.2. Block level committee

- Chairman Panchayat samiti: Chairman
- Block Development Officer: Member
- PHC MOs: Member
- Child Development Project Officer: Member
- Lady Panchayat Samiti member: Secretary
- One NGO representative: Member

Functions of the committee

1. Monitor & review birth & death registration in the block
2. Discuss & implement actions required for 100% registration of births & deaths in the block.
3. To co ordinate with various departments for reducing child mortality & maternal mortality.

1.5.3. District level committee

At the district level similar committee is established under 234

chairmanship of District Collector & Dy. CEO (ICDS) as member secretary.

2. Survey of Causes of Death (Rural) Scheme

Information about the deaths occurring in rural area & reliable information regarding causes of death is not available. This information is essential for planning of health services.

Considering the problems, Model Registration Scheme (MRS) was introduced in 1967. Later it was renamed as Survey of Cause of Death -Rural (SCD-R) in 1982. The scheme is being implemented in 600 villages, which are randomly selected among the 33 districts covering about 26 lakh population. The data collected is related to only resident population (de jure).

Health workers of selected villages use the verbal autopsy technique to collect signs & symptoms of deceased at the time of death. Medical officer PHC ascertains the cause of death according to signs & symptoms reported by health workers. List of causes is provided, which is based on International Classification of Diseases 10th Revision. Causes of death are analysed age-wise & also sex-wise.

2.1. Implementation of SCD (R)

Following steps should be carried out for implementation of SCD-R scheme in PHC.

2.2. Selection of village

SCD (R) is not implemented in all PHCs of the state. Vital Rate Scheme is being implemented in the state for getting information about vital rates covering 10% revenue villages from each district. Out of these 10% villages, 14% of the villages are selected under SCD (R). Thus your PHC may or may not be included in SCD (R) scheme. Information about inclusion of your PHC in SCD (R) scheme is available with statistical officer in DHO office. If your PHC is selected for the scheme, implement the scheme as per the actions given below.

2.3. Planning of scheme

- Name of village selected for SCD (R) scheme will be informed by DHO office.
- Preparation of map: Prepare map of 45 cm X 45 cm size showing whole area of PHC. Villages under VRS should be shown by V & out of these villages selected under SCD (R) should be encircled by red colour. Show all roads and other important landmarks.
- Selection of field agent: MPW is designated as field agent under SCD (R). Divide population among male and female MPWs equally, maintaining natural divisions as far as possible. Do not give more than 1500 population to one MPW.
- Selection of field recorder: HA is designated as field recorder under SCD (R). Appoint one Health Assistant (M/F) for supervision and for six monthly surveys.

2.4. Implementation of scheme

2.4.1. Step I: Continuous enumeration by Field Agent (MPW)

Field agent visits every house of the area allotted to him/her twice a month with interval of not more than 15 days and

collects information of all deaths, births, stillbirths, infant deaths, child deaths, maternal deaths occurred in the population. Birth/death of resident population occurred outside the village should also be recorded. (Such births or deaths are not recorded under CRS). In case of death, MPW should collect the detailed information from the near relative about signs / symptoms before death & events leading to death.

2.4.2. Step II: Ascertaining cause of death

MO PHC should ascertain cause of death on the basis of information collected by field agent about the disease or incidence leading to death. Medical officer has to classify and code cause of death according to the list provided in the SCD manual. This is based on International Classification of Diseases 10th Revision. SCD code should be used which starts with number and not with alphabet. There are total 19 groups of conditions based on disease wise, system wise or as per incidence leading to death. Cause of death should not be given as mode of dying e.g. cardiac failure or respiratory failure etc., but specific disease condition leading to death should be given. For each death, separate form-C should be filled.

2.4.3. Step III: Compilation, analysis of the reports.

Field recorder collects all the reports from MPWs, compiles, gets the cause of death from MO, prepares monthly report of PHC & submits the monthly report to DHO along with other MIS.

2.4.4. Step IV: Six monthly surveys by field recorder (HA)

Field recorder surveys all houses in the village twice a year and records vital events independent of records submitted by field agent. All vital events occurring during January to June are recorded in July and those occurring during July to December are recorded in January.

2.4.5. Step V: Cross checking events

Medical Officer should organize SCD meeting of field agents and field recorder immediately after six monthly survey is completed by field recorder. All events are crosschecked on the basis of monthly reports submitted by field agents, six monthly surveys by field recorder and sub center registers (R-15, R-16). Annual report should be prepared after cross checking of all events mentioned in continuous enumeration, six monthly report and sub center record.

2.5. Records and reports under SCD (R)

Total four forms are to be filled while recording vital events as below:

- Field agent should fill up 'Family Information Form' during survey.
- 'Form-A' for all the information related to the births
- 'Form-B' for information related to deaths.
- 'Form-C' for recording cause of death.

2.6. Recording of stillbirths and infant deaths

Stillbirths should be recorded in birth record form, (Form-A) & serial number '0' should be given to stillbirth. Many times newborn deaths occurred within short period after birth are recorded as stillbirth. This is a very common mistake. To avoid

this, ask birth attendant specifically about history of cry (which may be once only and feeble) or any active movements of newborn immediately after birth to ensure whether it was actually stillbirth or death of live born baby within short period after birth. Such live birth with early deaths should be recorded first in birth register and then in death register.

Thus if the field agent notices any vital event in the house surveyed, he/she should fill up all the required information related to the births in 'Form-A' and related to deaths in 'Form-B'. Medical Officer should fill cause of death in 'Form-C'.

2.7. Registers and records required in SCD (R)

Table - 4 : Registers and records in SCD (R)

Sr.	Register / File / Record	Responsible Person	Utilization
1	SCD map	HA (Male)	To show villages covered under VRS & SCD.
2	List of field agents	HA (Male)	To know field agents under SCD.
3	Birth register: Form - A	HA (Male)	List of all births recorded by
		MPW (M/F)	field agents, verified and corrected by field recorder. Evaluation of work done by Field Agent.
4	Death register: Form - B	HA (Male)	List of all deaths recorded
		MPW (M/F)	by field agent, verified and corrected by field recorder. Evaluation of work done by field agent.
5	Cause of death register: Form - C	MO PHC	Investigation of cause of death. Coding of cause of death and reporting.
6	House wise list	MPW (M/F)	Family information of all houses from selected village.
7	Fortnightly continuous enumeration report	HA (Male)	Separate file for fortnightly
		MPW (M/F)	continuous enumeration reports of each field agent kept date wise. One file for one year. Close the file and keep in record room at the end of year.
8	Six monthly survey report file	HA (Male)	Report of six monthly survey carried out by field recorder, to be used to compare with fortnightly enumeration and preparation of annual report. One file for one year. Keep in record room after completion of year.
9	Annual report file	MO PHC	Annual report should be
		HA (Male)	prepared by conducting
		MPW (M/F)	meeting of MPWs and HAs by using fortnightly enumeration, six monthly survey, record and registers of sub center. Keep the file of reports year wise for last ten years.
10	SCD correspondence file	HA (Male)	Instructions, information, guidelines regarding implementation and reporting of SCD to be kept date wise. Helpful as ready reference for programme implementation.

3. Vital Rates Scheme (VRS)

Information about vital events like births, deaths and mortality pattern is very important for planning and evaluation of health schemes. Births and deaths in rural areas are registered through Civil Registration System. However registration is incomplete.

Another important problem is getting reliable vital rates for each district of the state. Sample Registration Scheme (SRS) provides vital rates but they are for the state and are not available as district specific rates for district planning. The problem is overcome by this scheme and it is the only scheme that gives information about various rates district wise.

Thus Vital Rates Scheme is being implemented for getting district wise information about vital rates and fertility rates from

rural areas. This scheme was previously known as 10% survey which was started in 1995-96. The scheme is known as Vital Rate Scheme since 2002 and is clubbed with the SCD for implementation. For implementation of the scheme out of total revenue villages covered under CRS, 10% villages are selected randomly.

Aim of the scheme is to make available reliable district wise vital rates and fertility rates for rural Maharashtra. Survey of 10% villages is carried out once a year during the month of January to get vital information of the district, which includes Birth Rate, Death Rate, Infant Mortality Rate, Stillbirth Rate, Neonatal Mortality Rate, and Child Mortality Rate.

This scheme collects data related to resident population of that village (de jure)

Important activities to be carried out by PHC for VRS**3.1. Selection of village**

Villages from your PHC will be selected by DHO for VRS. Name of the villages selected from your PHC, population covered and prescribed formats will be provided by DHO.

3.2. Planning of scheme

Planning of village survey is responsibility of MO PHC. Select one MPW per one thousand population for survey. Divide village among MPWs keeping natural divisions (e.g. pada, vasti, gulli etc.) intact. For collection of data, MPW should take help from dai, Anganwadi Worker, pada worker etc.

3.3. Data Recording

Three types of forms should be filled during survey. Form-I should be filled for all the families surveyed. If there are births in the family, fill up Form-II and in case of death in the family fill up Form -III.

3.4. Scheme implementation

- Survey will be carried out in the month of January and information of vital events occurred in previous calendar year will be collected. For example, if survey is carried out in January 2004, information of vital events occurred during 1st January 2003 to 31st December 2003 is collected.
- All the vital events related to residents of identified village are recorded even if they have not occurred in the village. Resident of a village is a person residing for minimum 6 months in a village.
- Information of guests coming to a village on the day of survey should not be collected.
- MPW will fill up the Form -I by house-to-house visit. Information of vital events e.g. births, stillbirths, infant deaths, maternal deaths and other deaths is collected & recorded in the prescribed formats.
- Appoint one HA for every two MPWs to supervise the survey. HA should verify 100% houses. HA should continue the survey in absence of MPW.
- Each house is stenciled on the door during the survey. Supervisors e.g. HA, Statistical Assistant, MO should also stencil the verified houses.

3.5. Supervision

Medical Officer must remain present in the village during survey and visit at least 10% houses and all the houses from where infant and maternal deaths are recorded.

3.6. Rechecking

Once survey is completed, Medical Officer must verify all events with help of R-15 and R-16 registers, AWW records, CRS records and note down if any vital event is missed during survey. This verification will also give idea of quality of survey.

Send the information to the DHO office within time.

4. Hospital morbidity & mortality statistics

Information on morbidity and mortality is collected from all PHCs in prescribed format recommended by Central Bureau

of Health Intelligence, New Delhi. Format is based on International Classifications of Diseases (ICD) that comprises a condensed list having 194-major causes. This is based on diagnosis of OPD/IPD patients attending the PHC.

4.1. Important instructions for MO

- Hospital morbidity & mortality statistics is information of disease pattern in PHC area.
- Most important aspect of correctness of this statistics is writing accurate diagnosis on case paper of each patient. This will help in getting meaningful data from scheme.
- In case of injury, it is essential to write part of the body involved (e.g. fracture skull), type of injury e.g. fracture, contusion, laceration, crushed injury, as well as supplementary cause of injury e.g. H/O fall, road traffic accident etc., homicide, suicide.
- This information is helpful in planning specific health programmes and for evaluation of the progress of existing health programmes.

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2. FERTILITY INDICATORS

Fertility indicators are important for measuring fertility from PHC area. Fertility indicators are basic to understand population policy goals and base for population control. Medical officer can calculate fertility indicators of PHC area to understand progress of PHC in family welfare programme.

1. Important fertility indicators

- Crude Birth Rate
- General Fertility Rate
- Age Specific Fertility Rate
- Total Fertility Rate
- Gross Reproduction Rate
- Net Reproduction Rate

1.1. Crude Birth Rate (CBR)

- It is the ratio of total registered live births to total population in specific year /1000.
- This rate is called crude because all differences in composition of population are ignored in calculating it.

1.1.1. Importance

- It points to the contribution of fertility to the growth rate of population.
- Requires minimum data for computation.
- Indicates level of fertility of society.

1.2. General Fertility Rate (GFR)

- It is the first refinement of crude birth rate.
- It is the number of births per 1000 women of reproductive age. It uses the number of women of childbearing age in a population as denominator.

- It is usually four to five times high than CBR because women of these ages normally contribute from one fourth to one fifth of total population

1.3. Age Specific Fertility Rate (ASFR)

- *ASFR for any year is obtained by dividing the number of births to mothers of each age group in population by the number of women of this age group in the population at that time and multiplying by 1000.*
- While calculating fertility by this rate, it is accepted that all women in all age groups do not have same reproductive capacity and that changes with age.
- *This rate is essential because fertility rate differs as per age groups of women.*
- ASFR is not affected by any variation in age structure.
- It is possible to calculate TFR with the help of ASFR.

1.4. Total Fertility Rate (TFR)

- TFR indicates average number of children a woman would have during her reproductive period bearing the children at the same rate as the women now in each age group bear.
- TFR is not affected by age structure of women under study.
- It is also useful when comparisons between two groups of women are made.
- TFR can be thought as the completed family size, children born per woman at the end of reproduction. Slight differences occur because of deaths and migration of women in childbearing period.

1.4.1. How to compute

- Make sum of ASFR.
- The sum is multiplied by 5, as each age group consists of women of 5 different ages.
- TFR is expressed as per woman, therefore above figure is divided by 1000.

1.5. Gross Reproduction Rate (GRR)

GRR is restricted to the number of female children. It is about half of the TFR. It indicates number of daughters each woman can bear during her entire reproductive span.

This rate indicates how many girl babies i.e. potential future mothers would be born to 1000 women passing through their child bearing years, if ASFR of a given year remained constant and no woman entering child bearing period dies before reaching menopause.

1.5.1. How to compute

- If data on births by sex is available for each reproductive age group, then ASFR may be computed for female children. Sum of ASFR for females is multiplied by 5 and product is divided by 1000.
- However data on births by sex is not usually available. In such cases GRR is calculated as multiplying TFR by 0.49.
- This 0.49 factor is derived by assuming that sex ratio at birth is 105 male babies for 100 female babies. Thus

proportion of female babies in total number of births is 100/205, which is approximately 0.49.

1.6. Net Reproduction Rate (NRR)

- NRR takes into account both fertility and mortality. As is considered in GRR, it is not realistic to assume that all women in the cohort will survive up to the end of childbearing period. Therefore a refinement in the GRR is introduced by taking into account mortality of the women and the NRR is computed.
- This indicator is concerned with the extent to which a group of females replaces its own female members by the mutual process of fertility and mortality. NRR indicates number of daughters ever born to a cohort of women, if they give birth according to fixed schedule of ASFR and experience fixed age specific mortality rates up to the end of their child bearing period.
- This measure is sometimes called a replacement rate, as it provides a consistent index of how many daughters are in the next generation per woman in the previous one.
- NRR 1 means that, combination of fertility and mortality is such that one mother is replaced by one daughter.

1.6.1. How to compute

This is constructed by calculating number of girls surviving at the current mortality from a thousand births from the ages of reproductive period.

- At each age corresponding specific fertility rates are applied to surviving women to give resulting births.
- Summation over all ages gives the total births to the original 1000.
- These are translated into daughters i.e. multiplication by proportion of births, which are female births (100/205)
- Thus NRR is GRR multiplied by proportion of females surviving from birth to the age at which they replace their mothers on average.

2. Examples of calculation of fertility indicators

In a village Pimpalgaon with midyear population of 10,000, there were total 200 births during the year 1999-2000. MYP in the age group 15-44 during the same year was 2010.

2.1. Crude Birth Rate

$$= \frac{\text{Total live births in one year}}{\text{Mid year population during the same year}} = \frac{200}{10,000} \times 1000 = 20$$

2.2. Gross fertility rate

$$= \frac{\text{No. of births during the year}}{\text{MYP of women in age group 15-44 during the same year}} = \frac{200}{2010} \times 1000 = 99.5$$

2.3. Age specific fertility rate

= $\frac{\text{Number of births in a specific age group of women in a year}}{\text{No. of women of same age group during the same year}} \times 1000$

Age group	No. of births	No. of women	ASFR = Col.2 / Col. 3 x 1000
1	2	3	4
15-19	12	385	31.2
20-24	70	413	169.5
25-29	61	359	169.9
30-34	42	375	112
35-39	12	275	43.6
40-44	3	203	14.8
Total	200	2010	541

2.4. Total fertility rate

= $\frac{\text{Sum of ASFR (No. of years in each age group)}}{1000}$
 = $541 (5 / 1000 = 2.7)$

2.5. Gross Reproduction Rate

= $\frac{\text{TFR (100/205)}}{1.3}$
 = 1.3

2.6. Net Reproduction Rate

= $\frac{\text{GRR (Proportion of females surviving from birth to the age of replacement of mother)}}{1.3}$

If we consider that 2% females die before the age of 27 yrs then proportion of females surviving is 0.98, then

$\text{NRR} = \text{GRR} (0.98)$
 = $1.3 (0.98)$
 = 1.27

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3. VITAL RATES, MID YEAR POPULATION & CENSUS

Life events such as births and deaths are called as vital events. These events have direct relationship with fertility and health condition of the population. Various rates that indicate health status of community can be calculated with the help of these vital events, which are called as vital rates.

1. Important aspects of various vital rates for MO

- MO should calculate various rates like birth rate, death rate, infant mortality rate, stillbirth rate for PHC.
- He/she should study rates sub center wise and also village wise.
- Compare these rates with state figures from SRS as well as with district rates from SCD(R).
- After calculation of the rates, analysis is more important e.g. if rates are much less, it indicates reporting is

incomplete, try to find out the reasons for this. Find out which villages have under reporting and try to correct it.

- MO can plan & evaluate health programmes by studying these rates.
- After studying infant mortality and its causes, train the staff and plan specific interventions according to prevalent causes of infant mortality in PHC area.

2. Mid Year Population

Mid Year Population (MYP) is the population on 1st July in that year. Medical Officer of PHC must know how to calculate Mid Year Population. MYP is required for following purposes:

- To assess correctness of survey.
- To estimate beneficiaries based on MYP under various national health programmes especially Pulse Polio Immunization programme.
- For planning of services.

2.1. Calculation of MYP

For calculation of MYP, data of last 2 census is required. Calculate MYP as follows -

$\text{MYP} = P_1 + \frac{(P_1 - P_0)}{10} (d + 1/3)$, where

P_1 = Current census population

P_0 = Last census population

10 = Time period between 2 census is 10 years. If difference between two census is divided by 10, it will give per year increase in population in last decade.

d = Difference in years between latest census and the year for which MYP is to be calculated

1/3 = Census is conducted on 1st March and MYP is on 1st July, this difference is 4/12 = 1/3 year

2.2. Example of calculation of MYP

Calculation of MYP for 2003 of village Ambegaon. Census population of Ambegaon for 1991 is 3000 and for 2001 is 5000.

P_1 = Census population of 2001 - 5000

P_0 = Census population of 1991 - 3000

d = Difference between 2001 and 2003, which is 2 years.

$d + 1/3$ = Diff. between 1st March 2001 to 1 July 2003 = 2 + 1/3 = 2.33

$\text{MYP (2003)} = 5000 + \frac{(5000 - 3000)}{10} (2.33)$
 = $5000 + (2000/10) \times 2.33$
 = $5000 + (200) \times 2.33$
 = $5000 + 466$
 = 5466

3. Calculation of expected vital events in PHC area

For review during monthly meeting, MO must know expected number of vital events for each sub center as per the population. For calculation of expected events use state rates or district rates.

Suppose Mid Year Population of a PHC is 30,000 and if we presume CBR as 21, CDR as 8 and IMR as 45, then expected vital events for PHC will be calculated as below. Every MO

should do this exercise for PHC.

3.1. Total expected births in a year

Expected births in PHC =

$$\frac{\text{Crude birth rate}}{1000} \times \text{Mid Year Population}$$

$$= \frac{21}{1000} \times 30,000 = 630$$

Total expected births in a year will be 630 & about 52-53 during every month.

3.2. Total expected deaths in a year

Expected deaths in PHC =

$$\frac{\text{Crude death rate}}{1,000} \times \text{Mid Year Population}$$

$$= \frac{8}{1,000} \times 30,000$$

$$= 240$$

Total expected deaths in a year in PHC of 30,000 population will be 240 & during one month about 20.

3.3. Expected infant deaths in a year

Expected infant deaths in PHC =

$$\frac{\text{IMR}}{1000} \times \text{Live births}$$

$$= \frac{45}{1000} \times 630$$

$$= 28.3$$

Thus total expected infant deaths in PHC would be approximately between 28 to 30 in one year & 2-3 in one month.

Many of the vital events are under reported especially infant deaths. If reported figures show great variation than these figures, try to find out weak areas and take corrective actions.

4. Important vital rates

4.1. Crude Birth rate (already described)

4.2. Crude Death rate

(Number of deaths in a year / Mid year population) 1000

4.3. Infant Mortality Rate

(Number of deaths below 1 year / Number of live births in a year) 1000

4.4. Neonatal Mortality Rate

(Number of deaths from birth to age less than 29 days / Number of live births) 1000

- Early neonatal mortality rate: From 0 to 7 days
- Late neonatal mortality rate: From 8 days to less than 29 days

4.5. Stillbirth Rate

(Number of stillbirths in a year / Number of total births in a year) 1000

4.6. Maternal Mortality Rate

(Number of maternal deaths in a year / Number of live births in a year) 1000

4.7. Perinatal Mortality Rate

(Number of deaths from 28 weeks of gestation to 7 days of births in a year / Number of total births (live births + stillbirths) in a year) 1000

5. Investigation of infant and maternal deaths

MO has to investigate all maternal and infant deaths in a prescribed format that occur in PHC area.

5.1. Death audit

- MO should investigate all maternal & infant deaths occurring in PHC area by personally visiting that house & using verbal autopsy method.
- Person who was attending the deceased at the time of death must be interviewed.
- Discuss in detail with the relatives about signs, symptoms, duration of illness, complications, treatment received if any, whether case was referred, problems in referral, whether deceased was hospitalized and problems in transportation etc.
- If patient was hospitalized, go through the hospital records. In case of maternal death, visit the hospital where mother was admitted for treatment. Discuss with treating doctor and go through the patient case paper in hospital.
- You can arrive to probable cause of death with the help of history and medical records of patient.
- It is good practice to discuss the infant and maternal deaths occurring in PHC area during monthly meeting. First narrate total history of patient from starting of illness to death. Discuss steps of intervention by which death could have been prevented by each level of function, i.e. MPW, HA and MO. Details of discussion of death audit during meeting is given in Section-I.
- This will help MPW / HA to take actions so as to prevent such type of deaths if same situation arises in future.

6. Important vital rates for Maharashtra

Table 5 : Important vital rates of Maharashtra

No.	Rate	Maharashtra	India
1	Crude Birth Rate	19.1 (SRS 2004)	24.1 (SRS 2004)
2	Crude Death Rate	6.2 (SRS 2004)	7.5 (SRS 2004)
3	Infant Mortality Rate	36 (SRS 2004)	58 (SRS 2004)
4	Neonatal Mortality Rate	28 (SRS 2002)	40 (SRS 2002)
5	Early Neonatal Mortality Rate	20(SRS 2002)	27(SRS 2002)
6	Late Neonatal Mortality Rate	8(SRS 2002)	13 (SRS 2002)
8	Perinatal Mortality Rate	29(SRS 2002)	35 (SRS 2002)
9	Stillbirth Rate	10 (SRS 2002)	9 (SRS 2002)
10	Under five mortality rate	10.4 (SRS 2002)	17.8 (SRS 2002)

7. Census

The first complete census of India was conducted in 1881, on a uniform basis throughout the country. Since then, the census is being conducted regularly after every 10 years.

The Census of India 2001 is 14 th Census in the series & is 6 th since independence. This is first Census of this millennium & century.

Table 6: 2001 at a glance: Salient features of Maharashtra

Census Population ;Total	Persons	9,67,52,247
	Male	5,03,34,270
	Female	4,64,17,977
Rural	Persons	5,57,32,513
	Male	2,84,43,238
	Female	2,72,89,275
Urban	Persons	4,10,19,734
	Male	2,18,91,032
	Female	1,91,28,702
Total Number of Districts including Mumbai + Mumbai suburban		35
Number of villages		43,722
Number of Municipal Corporations		22
Number of Municipal Councils		222
Number of Cantonment Boards		7
Decadal population growth rate		22.57%
Urban Population		42.4%
Sex Ratio	Total:	922
	Rural:	959
	Urban:	874
Sex ration 0-6 years		917
Literacy rate :	Total:	77.27%
	Male:	86.27%
	Female:	67.51%

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4. HEALTH MANAGEMENT INFORMATION SYSTEM

Health Management Information System is one of the most important managerial tools available for PHC MO. HMIS has been developed to make available the required information for decision-making.

Health staff of Primary Health Center provides various types of services to community. Services provided need to be recorded properly which helps in proper planning and regular monitoring of all activities under any programme. Thus daily

recording of work done is not wastage of time but it is part of programme implementation.

Health management information system comprises of recording of data related to services provided & health status information. Analysis of the data and using findings to improve programme implementation are the inherent components of HMIS.

MIS includes

- Collection of data at a fixed frequency
- Compilation and transmission of data
- Analysis and interpretation of data
- Storage and retrieval
- Feedback to the concerned individuals

1. Frequency of data collection

- Daily e.g. during epidemic period
- Weekly e.g. weekly health condition report
- **Monthly** e.g. regular monthly reports

2. How the HMIS works

2.1. Preparation of sub center MIS report

- MPW (male and female) have separate diaries. They record work done on each day date wise in their diary, which includes all activities carried out by MPW (M&F).
- MPW (M&F) compiles work done during the month with the help of diary and registers provided.
- MPW (M) should first complete his HMIS booklet and hand over to MPW (F). MPW (M&F) then prepare collective sub center HMIS report for submission to MO.

2.2. Submission at PHC level

- PHC HMIS meeting is held on fixed day every month usually on last day of month. Sub center MIS booklet is scrutinized by HA & then submitted by MPW (M&F) to MO.
- Medical officer will receive reports from following sources-
 - § Work done by MPW (M) and (F) in sub centers.
 - § Work carried out by DDC / FTD / Dais etc. (Included in sub center report)
 - § Work carried out at PHC HQ
 - § Work done by HA during field visit
 - § Work done at Private hospitals / NGOS.

2.3. Compilation at PHC

- Compilation of report and development of PHC report is responsibility of HAs, Pharmacist and Junior Assistant as per their subjects under supervision of MO.
- PHC MIS report is prepared by compilation of all reports received to PHC as above.
- Medical officer should personally review work done by each MPW and HA and plan for next month.

2.4. Submission of report to district level

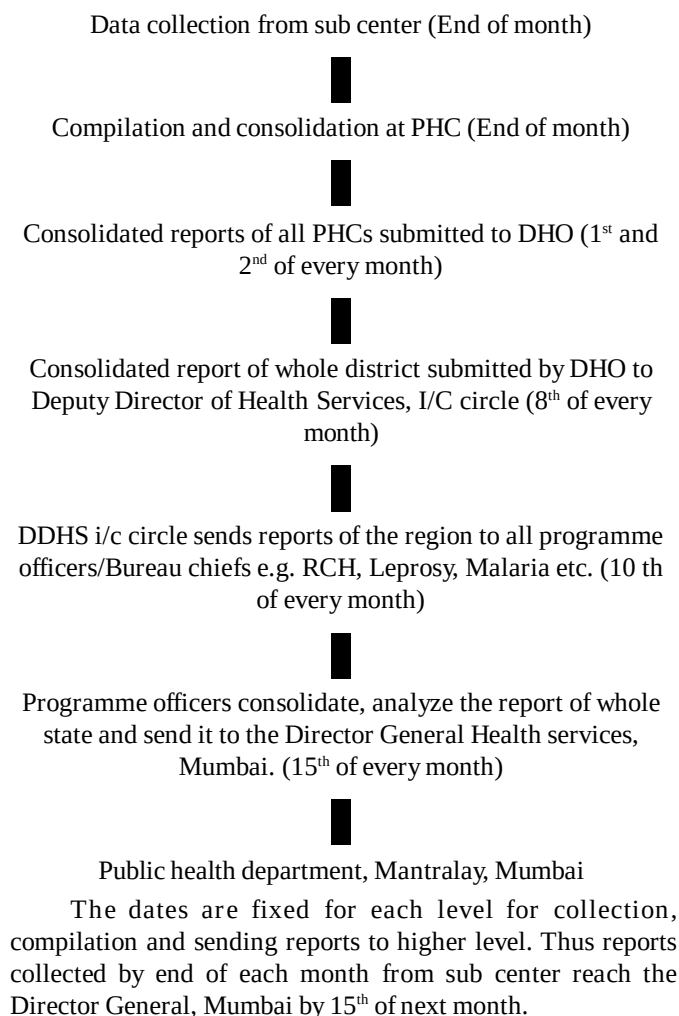
- One HA (female) should be assigned duty to submit the

HMIS at district on predecided, fixed date during 1st-3rd of every month.

- Monthly meeting of Medical Officers is held during 2nd week of every month to DHO office.

3. MIS in Maharashtra

Well-established MIS works in Maharashtra since 1981 as below:



3.1. Computerisation of HMIS

Recently Web based HMIS has been developed in Maharashtra. Software has been prepared & it is hosted on NIC server. Now HA can enter PHC MIS data on line which will be available to all the levels in department.

3.1.1. How the system will work

For sub center & PHC level, data will be collected & compiled manually as per the present system.

Courier system comprising of Health Assistants from PHCs submitting reports to the DHO every month will be replaced by the web based data entry at block level.

At the block level, the data entry, will be through web based system on fixed dates.

Compiled reports will be available to the district, regional & state level after data entry of all PHCs is completed. Therefore

no manual compilation will be done district onwards.

4. Analysis and interpretation of MIS reports by MO

Medical Officer should analyze and interpret MIS reports and judge quantitative and qualitative performance of all workers in PHC, try to find areas lagging behind and also nature of support required.

4.1. Timeliness, regularity & completeness of reports

- Assess timeliness, regularity and completeness of the reports received. For assessing regularity and timeliness, make the register, in which month wise reports received from each sub center should be noted along with date of receipt. This gives at a glance view of timeliness and regularity of reports received from each sub center.
- Confirm whether all reports are in given format, all columns are filled, monthly, progressive figures are given and report is signed by MPW & checked by HA.

4.2. Quantity of performance

- Examine performance of key indicators as per population norm and also as per expected level of achievement. Key indicators should be analyzed village wise. This helps to identify villages with poor performance, where MO has to concentrate.
- Compare inter linked indicators with each other to identify gaps in service delivery. For example, compare ANC registration with TT immunization, IFA supplementation, deliveries etc. Compare BCG immunization with 3rd dose of DPT, OPV and also with Measles coverage. Identify mothers and children not received these services with the help of registers.

4.3. Quality of performance

Assess quality of the performance by analyzing indicators such as percentage of sterilization with 2 issues amongst the total sterilization, Cu-T retention in Cu-T cohort, proportion of ANC registration before 16 weeks among total ANC registration, proportion of fully protected ANCs and percent of fully immunized children below 1 year. These are some of the quality indicators.

4.4. Comparison of performance with the available stock

Compare performance with inventory report submitted by the worker. Services given and stock utilized should coincide e.g. number of women given therapeutic and prophylactic IFA should be tallied with consumption of IFA during the month, number of OP & CC available & expended should tally with the reports of number of users of these methods.

4.5. Check validity of the data

Validity of the data should be assessed by cross checking the indicators e.g. report of total live births and report on number of newborns with birth weight recorded and not recorded, number of pneumonia cases and number treated with CTZ etc.

4.6. Calculate various rates

- Calculate various rates like birth rate, death rate, infant mortality rate for PHC and also for each sub center and compare with district or state vital rates. If there is

difference, find out reasons for difference.

- In addition to these rates, calculate drop out rate for multiple doses vaccines, this should not be more than 3 percent. Calculate Couple Protection Rate, which will help to identify areas with low use of FP methods and hence requiring more concentration.

4.7. Monitor other important indicators

- Specifically monitor infant deaths reported, as reporting needs to be complete.
- Review new case detection and cure of important communicable diseases like tuberculosis, leprosy against the targets.

5. Uses of MIS

- Monitoring and review of performance under various national health programmes and compare actual performance with expected level of achievement.
- Compare performance of this year with corresponding period of last year, performance of different workers & different sub centers.
- MIS helps for identification of problem areas, high-risk areas as well as low performance area and based on this, it is possible to decide the priorities.
- **Planning of** the services is dependent on analysis of reports.
 - Proper distribution of resources and facilities like medicines, equipments, supervisors etc is based on MIS.
 - Reviewing their performance makes appraisal of PHC staff.
 - Decision making for taking corrective actions as per the identified problems is possible using MIS.
 - Proper guidance and support should be given to the concerned staff as per the analysis.
- MIS will also help to identify training needs of the staff.

6. MIS meeting at PHC

PHC MIS meeting is most important activity for reporting and reviewing work done in PHC. Details of PHC meeting are discussed in chapter on PHC meeting. Some important aspects are:

- Meeting should start in time at 10.00 am. Senior MO should conduct meeting & should remain present throughout the day. Clinical work of that day should be assigned to second MO.
- Agenda should be pre decided and communicated to health workers in time.
- Sequence of meeting should be:
 - § Report submission and scrutiny of the reports by HA
 - § Review by MO
 - § Communicating instructions received from the District level, related to health workers.
 - § Informing about important letters and technical

circulars received from higher authorities.

- § Problem solving
- § Continued Medical Education.
- § Death audit: Detailed discussion about infant deaths and maternal deaths that have occurred in PHC area during last month.

7. Responsibilities of various functionaries for effective use of MIS

7.1. MPW (F)

- Prompt and correct record of work done after daily home visit and Arogya Seva Satra
- Updating the registers
- **Monthly summary** of all registers
- Utilization of this information for improving the work
- Planning for next month
- Preparing MIS report

7.2. MPW (M)

- Recording work done daily during house-to-house visit
- Updating registers and monthly summary of all registers
- First fortnight reporting
- Second fortnight and monthly reporting
- Utilization of this information for improving performance
- Planning for next month
- Preparing MIS report

7.3. HA

- Helping MPW to update registers
- Review of records once a week
- Helping MPW to prepare monthly summary of each register
- Checking all reports for correctness
- Comparison with ELA (target) and give feedback accordingly
- Preparation & submission of monthly PHC MIS report in time

7.4. Medical Officer

- Detail inspection of records of one MPW (M) and one MPW (F) once a month
- Twice a month review of critical indicators of each programme
- Supervising MIS of the PHC
- Utilization of MIS reports to assess progress of PHC
- Feed back on MIS report to MPWs
- Planning for the next month
- Evaluation of the programmes implemented

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5. RECORD KEEPING

1. Medical Record

Medical record is essential for patient as well as for health care providers for systematic study, which helps in improving health care delivery system. Patient records are confidential and should be available only to people involved directly in patient care.

Well maintained records provide evidence of quality work done by the team & can always protect the concerned staff in difficulties. Clinical notes are important means of communication for the team involved in patient's care by documenting management and care offered; they can also be used to improve patient care when reviewed as part of an audit. Notes may also be requested for insurance and medico legal purposes.

All members of the health care team are responsible for ensuring that records are:

- Complete
- Accurate
- Legible and easily understood
- Written at the time of patient contact
- Signed, with date, time, name and position of person making entry.

Once written, notes must not be changed; a subsequent entry can be made if there is a change in the patient's condition or management.

1.1. Admission note/preoperative note

Preoperative assessment should be documented; including full history and physical examination, patient consent where required.

1.2. Operating room records

Operating room records should be kept in Operation Theater Patient Register. Standardized forms save time and encourage staff to record all required information.

Operation theatre record should include -

- Patient identity
- Procedure performed
- Persons involved
- Complications

By looking at records of all procedures, MO can evaluate complication rate and postoperative wound infections or review number of procedures performed. Such evaluation, which should be regular duty of one HA (Female) helps in assessment of aseptic routine within PHC and allows for future planning.

2. Delivery register

Delivery register should contain a chronological list of deliveries and procedures, including interventions, complications and outcome. It should also contain information about sex of baby, birth weight, condition at the time of birth and date of information of birth to Gram Panchayat.

3. Indoor patient record

All patients should be assessed at least twice a day, even those who are not seriously ill. Vital signs should be taken as dictated by the patient's condition and recorded; this can be done on a standard form as well as graph and can also include fluid balance record. Progress notes need not be long, but must comment on patient's condition and any changes required in management plan. MO writing note should sign them.

Notes can be organized in the "SOAP" format:

Subjective:	How patient feels
Objective:	Findings on physical examination, vital signs, laboratory results
Assessment:	What MO thinks
Plan:	Management plan; this may also include directives which can be written in a specific location as 'orders'.

A consistent approach such as this ensures that all areas are included and that it is easy for other members of team to find information.

3.1. Discharge note

On discharging patient from ward, record:

- Diagnosis on admission and definitive diagnosis
- **Summary** of patient's course in hospital
- Instructions about further management as an outpatient, including any medication, length of administration and planned follow-up.

4. Registers & record to be maintained and their use

Various registers are required to be maintained by PHC staff related to the national health programmes, services provided, water supply and sanitation etc. These registers help to assess coverage of services and also for tracing course of particular event and outcome of individual case.

PHC staff and Medical Officer do not fully utilize registers and records for planning and implementation of service. This has led to common belief that registers and records are unnecessary burden on health worker. In reality, if these registers are used properly for planning and implementation of services in PHC, quality services can be delivered to more number of beneficiaries in less time due to proper planning. This helps to save time and energy of all health staff. List and use of Register/records to be maintained by each category of staff is given in annex. Regular updating of this record is also responsibility of concerned staff. MO should regularly check these registers for completeness & correctness.

Not only maintenance of technical record is important but administrative record and filing is equally important. List of these is also given along with importance of each in annexure.

SECTION IX

MEDICO LEGAL ASPECTS

1. MEDICO-LEGAL WORK AT PHC

Medical Officer is concerned with medico-legal work along with clinical & administrative jobs at PHC. MO should apply medical knowledge to certain branches of law. MO needs to depose in court as an expert witness. Therefore MO should carefully note all the facts observed & learn to draw conclusions correctly & logically.

1. Medico legal cases

Cases sent by police only do not constitute whole quota of medico legal work. Cases at the time of admission may be purely medical or surgical; however they may assume medico legal importance later on due to changed circumstances. Following cases should be considered as medico-legal cases and recorded in detail, even if they are not sent by police.

- All accident cases
- Burns, poisoning, snake bite, scorpion bite, human bites, tetanus etc.
- Un-natural or suspicious death e.g. sudden death due to unknown cause, suicide, homicide, death in anesthesia or on operation table, death of a convict in jail, police custody etc.
- Death of a patient within 24 hours of admission.
- Patient brought unconscious or already dead to PHC/ hospital.
- Complaint of rape.
- Person under influence of alcohol.
- Any doubtful case or death for which cause cannot be certified.
- Injury after hospital admission e.g. falls from cot.

2. Identification marks

It is advisable to write one or two identification marks of the party examined. Whenever MO is called in a court of law to give evidence, he/she is asked whether he/she remembers to have examined the party. Identification marks have legal significance as actual verification can be done in court. Signature or left thumb impression of patient would also be very useful for subsequent examination.

3. Summons

It is issued by the court in writing, in duplicate & signed by presiding officer of the court. It is served on witness by police officer or officer of the court. MO should know following important aspects of summons -

- MO should sign first copy & return back to police and should retain second copy
- When summons is served, MO must attend court and give evidence.
- Attendance can be excused if MO is ill or is rendering a genuine emergency service for which no other doctor is available.

- Criminal courts get precedence over civil courts.
- It is necessary to maintain a summons register, indicating name of MO called, name of the court, date & time of hearing, name & register number of case.

4. Recording of evidence

- Examination in chief: Witness is first examined by the side, which has called him. In government set up, this is commenced by public prosecutor.
- Cross-examination: By opposite counsel.
- Re-examination: After cross-examination, witness may be re examined by counsel who has called him.
- Court question: Judge may ask questions to witness to clear doubtful points.

5. Medico legal reports

Medico-legal report consists of three parts -

- Introduction, date, place & time of examination including identification marks.
- Facts observed on examination.
- Opinion or inference drawn from the fact.

Report should be written at the time of examination or immediately afterwards. Copy of report should be preserved in same form as original. Examples: Injury report, PM report.

6. Dying declaration

- Accepted in court as legal evidence after death of a person who made the declaration.
- This is the statement verbal or written made by a person narrating circumstances leading to death. No oath is required.
- It is admissible in all cases where cause of death is under inquiry.
- As a rule, Magistrate should be present for dying declaration. Attending doctor should arrange for a magistrate to record dying declaration. However in exceptional cases MO can him/herself take dying declaration if dictated by circumstances.
- If the patient's condition is grave, medical attendant should record statement him/herself.
- MO should certify that, patient is in sound mental condition to make declaration.
- There should not be police officer nearby, no extraneous person around & no prompting to the person making declaration.
- Declaration may be oral, but MO should write it down in presence of two disinterested/ unrelated witnesses. Preferably witness should be female. It should be recorded in words of declarant in the form of questions put to him & answers. If patient is unable to speak, then it should be recorded in the form of signs.
- Declaration when concluded should be read over to the

patient & signature or left thumb impression should be recorded.

- Doctor & 2 witnesses should sign it.
- Investigating officer should not be present while recording.
- It should be forwarded to concerned Magistrate in sealed cover.
- If the victim survives it ceases to have legal value, but is still useful as a supporting statement in case that person is examined.

7. Doctor in Witness Box

7.1. General aspects

- When summons is served, MO must attend court & produce document.
- Dress properly. Take MLC register, OPD/IPD case papers, etc. with you.
- Master the facts, refresh memory & carefully study related recent literature.

7.2. Giving evidence

- Address the judges as “Sir” or “Your Honour”.
- Answers should be brief & precise. Give evidence slowly in a loud clear voice. Use simple words, avoid technical words. Avoid indiscriminate talk.
- If you do not know the answer of any question, clearly say so. Never give opinion without knowledge.
- Never lose temper. Always appear cool & dignified.
- Sometimes council quotes a passage from text book & asks you as a witness whether you agree with it. Request the council to show textbook to you before replying, note the date of publication, read the paragraph contents and then state whether you agree or not.
- When evidence is concluded, this should be read, signed by MO after getting corrections.
- Do not leave court till permission is granted.

8. Preservation of medico legal record

All medico legal record should be preserved for 30 years where evidence has been recorded under 1 or 2 subsections of the section 512 of code of criminal procedures. Other medico legal record may be destroyed after 5 years from final date of case.

In ML cases where no court proceedings are taken, record may be destroyed after 5 years from initial date of case in consultation with police authorities.

Similar rule is applied for X ray plates i.e. if under section 512 (subsection 1 or 2) preserve for 30 years & all other for 5 years.

9. OPD and IPD case papers

- These case papers must have the stamp ‘MLC’. In addition to this, any correspondence related to any MLC must bear MLC stamp.
- Outdoor & indoor register has to be separately maintained for MLC cases. Each case should have separate MLC

number in addition to usual register number.

- After thorough examination, case paper should have detailed notes of findings along with laboratory, X-ray, other investigations, operation notes, treatment given etc.
- Case paper should not be handed over to patient.
- MLC Record (case papers, registers) should be kept by MO in his/her custody under lock & key. Indoor case papers should be kept by ward sister under lock & key until patient is discharged & thereafter it should be with MO.
- Record including indoor, outdoor case papers should be maintained in duplicate as some times original record may be required to be handed over to the court.
- Case papers & correspondence should be maintained month & year wise.

10. X-ray plates & laboratory report

It is often necessary to refer medico legal cases for X-ray or laboratory examination. X-ray plates are positive proof & accepted as evidence in court of law. X-ray plates should be carefully marked with name of patient.

Detailed X-ray & laboratory report should be properly recorded on case paper immediately on receipt. Time & date of receipt should be written on paper.

11. Medico legal register

Every institute dealing with medico legal work must maintain “medico legal register” which is also called as “police register” or “Emergency police register (EPR)”.

- Enter all the information recorded on case paper in MLC register, which includes Sr. no., date & time of attendance, buckle number of police constable, findings, treatment given, medico legal case paper number etc.
- In remarks column, enter information regarding dispatch of letters and replies received.

12. Medico legal report

- MLC report should be issued promptly to police without waiting for demand letter.
- Information recorded on case paper, MLC register and report should be same.
- Report should be complete in all respects. Keep O/C of report in lock along with case papers. If case papers are in ward then keep them locked in ward.
- Sometimes patient has to be investigated further or is kept under observation, in such cases provisional report has to be given & this has to be mentioned in covering letter as well as in remarks column of report.
- If patient is referred to higher center for advanced treatment, concerned authority will give final report.
- In any case never give backdated report.
- Each MLC report must have outward number of PHC.
- If patient demands MLC certificate-
§ Patient has to give request letter demanding certificate.

- § MO can issue a copy of certificate to patient on his demand. However MO should ensure that certificate is handed over to police before giving it to patient.
- § Signature of patient should be taken after issuing certificate.

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2. MEDICO LEGAL AUTOPSY OR POST MORTEM EXAMINATION

1. Objectives of medico legal autopsy

- To determine identity of a person when not known.
- To determine cause of death, manner of death.
- Ascertain time since death.
- In case of newborns, to determine live birth & viability of child.
- To collect evidentiary material.

2. Rules

PM examination should be considered as an urgent work taking into account psychology of relatives waiting for the body to be handed over. In addition, decomposition changes advance rapidly in our country due to weather condition, which may affect findings on PM examination.

Following rules should be observed for PM examination.

- PM examination should not be undertaken unless there is written order (authorization) from a police officer or magistrate.
- Once written order (authorization) is obtained, there should be no delay in holding PM examination. It should be performed as early as possible.
- MO should carefully read the police report about appearance of body, when it was first found & cause of death.
- Examination should be conducted in daylight. Government of Maharashtra has directed that, PM may be done at night if adequate quantity & quality of light can be assured so as to have correct interpretation.
- Examination should be thorough & complete.
- Some MOs refuse to accept dead body on ground that it is from outside their jurisdiction. This is not correct. MO should perform PM examination in first instance & make representation in the matter if necessary later on.

3. Carrying out post mortem

3.1. Check following record

Ask the accompanying police officer for following records while accepting body.

- Dead body challan
- Inquest report / panchanama
- In case of admitted patient summary of hospital record.

3.1.1. Dead body challan - It is a requisition submitted by investigating police officer to MO while handing over body for PM. It contains general information like name, age, sex, religion etc. It also contains place from where body has come, distance, name of person accompanying, identification, time since dispatch and suspected cause of death. MO has to fill time of arrival & time of PM examination in the same challan.

3.1.2. Inquest report - This includes description of the incidence, circumstances under which body was found, opinion of witnesses & police officer regarding injuries, cause of death etc.

3.2. Verify record and findings on body examination

Verification of injuries noticed & recorded by investigating police officer is important. After identification of body, verify injuries recorded in panchanama. If MO fails to find injuries recorded by police officer, this should be clearly mentioned in report. If there are major discrepancies in observations by police officer & MO, it is preferable to ask for second panchanama by Magistrate.

3.3. Conducting post mortem

Even if cause of death is obvious from examination of a particular part of body; all parts must be systematically examined.

3.3.1. External Examination

- Body should be identified by police constable who brought it & also by relatives present on the spot before starting postmortem.
- In case of unknown body, general appearance of body describing age, sex, race, stature, features, scars, colour, hair, tattoo marks etc should be noted for purpose of identification. Body should be photographed & finger prints taken.
- If there are clothes on body, they should be examined for stains of blood, saliva, semen, vomit, faecal matter etc. & preserved for chemical analysis.
- In case of firearm deaths, residues/used bullets if any, be preserved & handed over to investigating authority.
- Approximate age should be given from presence of teeth & other appearances.
- Time since death should be noted from rectal temperature, post mortem lividity, rigor mortis, putrefaction, maggots etc.
- Natural orifices should be examined for injuries, foreign bodies, discharges like blood, pus etc.
- Careful search for presence of injuries from head to foot & on the front & back should be made.
- In case of burns, position, extent & degree should be noted.

3.3.2. Time since death

Estimation of exact time since death is difficult but approximation is possible.

Following table gives guidelines to decide time since death.

Table - 1: Guidelines to decide time since death

Time since death	Condition of body
Less than 1 hour	Body warm.
3 hours	Patch of post mortem lividity.
6-8 hours	Lividity fully developed & fixed.
12 hours	Rigor present all over. Green patch on skin/ over caecum
24-36hrs	Rigor receding or absent. Green discolouration over whole body, abdomen distended with gases. Ova of flies seen.
48 hrs	Trunk bloated. Face discoloured & swollen. Blisters present. Moving maggots seen.
72 hrs	Whole body grossly swollen & disfigured. Hair & nail loose. Tissues soft & discoloured.
1 week	Soft viscera putrefied.
2 weeks	Only more resistant viscera distinguishable.
1-3 months	Body skeletonised.

Important points to remember

- In tropical country like India, average heat loss is roughly 0.5° to 0.7°C per hour & body attains environmental temperature in about 16-20 hours after death.
- Post Mortem lividity is fully developed & fixed in about 6-8 hours.
- Rigor mortis usually commences in 2-3 hours after death, takes 12 hours to develop from head to foot, persists for another 12 hours and takes 12 hours to pass off.
- In 12-18 hours, gases collect in intestines & distend the abdomen. In 18-36/48 hours after death gas formation is abundant.
- Flies are attracted to putrefying body & lay their eggs in open wounds & moist natural orifices. Eggs hatch into maggots or larvae in about 12-24 hours and in course of 4-5 days maggots develop into pupae. In another 4-5 days pupae into adult flies.
- State of digestion of food contents help to fix time interval between food consumption and death. If at autopsy stomach is full, it would suggest that victim died within 2 hours of taking last meal. Food becomes indistinguishable in less than 4 hours and stomach is emptied in 4-6 hours.

3.3.3. Internal examination

If there is fatal wound leading to one of the cavities, that cavity should be opened first. Otherwise head should be opened first, then thorax and finally abdomen. Every organ from the cavities must be examined but spinal cord need not be ordinarily examined unless suspicion of injury to vertebral column.

3.3.4. Preservation of viscera & other material

In fatal cases of suspected poisoning, viscera and other material should be preserved for chemical analysis. Clean, wide mouthed, white glass bottles fitted with glass stopper with one litre capacity should be used to preserve viscera. Such bottles are available in the office of the chemical examiner.

a. Guidelines for preserving & sending viscera

- Preserving viscera & sending for analysis are two separate acts.
- Only in genuine cases with direct or indirect evidence of poisoning, vomit, viscera etc. should be submitted for analysis.
- MO should preserve viscera in following cases:
 - § Drowning, burns, hanging, strangulation, suspected poisoning.
 - § Where cause of death cannot be ascertained.
 - § In all other cases MO should preserve viscera & explain to the police in writing why viscera is preserved & only if analysis is absolutely necessary it should be sent.
 - § In all cases of drowning viscera has to be preserved but not dispatched unless police desires so.
 - § Preservation & dispatch of viscera is not substitute for careful PM examination.

b. Viscera & its quantity

Following viscera/material should be preserved and handed over to investigating authority:

- Whole stomach & its contents about 300 ml or all if less.
- Small intestine - 3 feet in adults, 5 feet in children & whole in infants. 100 ml small intestine contents or whole if less.
- Liver- 400-500 gm; whole in infants. Preferably portion containing gall bladder.
- Spleen - Half in adult, whole in children.
- Kidneys - Half of each kidney in adults & both whole kidneys in children.
- Blood- 10 ml or more.
- Urine - 100 -200 ml. If less available, whole quantity.
- Piece of long bone or plucked hair in case arsenic or lead poisoning is suspected.
- Examination of blood & urine is useful in suspected poisoning cases. Collect blood and urine directly from heart & bladder respectively.

c. How to preserve viscera**i. Number of bottles**

- Preserve stomach, its contents and small intestine in one bottle.
- Preserve pieces of liver, spleen & kidney in one bottle.
- Urine sample should be preserved in separate bottle.

ii. Preservative to be used

- In all poisoning cases (including alcohol poisoning) except by acid, saturated solution of common salt should be used as preservative.
- For all acid poisoning cases rectified spirit should be used as preservative.
- Formaline & denatured spirit should never be used as preservative in any poisoning case. Pieces of viscera should

be cut into small pieces to ensure penetration of preservative.

- All material should be submerged in preservative otherwise decomposition will take place & gases formed may cause lid spilling or even break the bottle.
- Stoppers should be treated with grease or vaseline to prevent sticking & should be securely tied in position by tape or string.

iii. Labelling, sealing & sending bottles

- Bottles should be labelled & sealed.
- A forwarding letter along with post mortem report, full history of patient in case of poisoning along with name of suspected poison if known is essential. Name of victim, nature of exhibit & case number given in forwarding letter should tally with labels on bottle.
- Copy of seal should be sent with forwarding letter.
- Bottles to be sent to chemical analysis should be sealed by concerned MO & sent to the officer I/C of nearby police station (under intimation to the office at whose instance examination was conducted) for sealing & safe custody until order of magistrate or superintendent of police.

d. Fingertips & bones

Whenever bodies are not identified, MO should preserve fingertips. Dissecting terminal phalanx can do this. Occasionally bones require special examination & bones are sent to the Professor of Anatomy for such examination.

4. Visit to place of crime

Medical Officer can visit place of crime if he/she feels necessary to arrive at cause of death. PM should be performed on spot in circumstances where body is severely decomposed or vital evidence may be lost during transportation.

4.1. In case of on the spot PM examination MO should note following

- Place & nature of soil where body is found, its position, state of clothes.
- In case of death from violence, position of body in reference to surrounding objects such as sharp stones & like, contact with which may produce injury, whether blood stains are visible on such objects or anywhere near the corpse, whether any weapon lying near it.
- In case of suspected poisoning any vomited matter in neighbourhood.

5. Outsiders during PM examination

Unauthorized persons should not be allowed to be present during examination except medical students undergoing training. Police officer accompanying corpse for PM examination should not be allowed to be present in PM room at the time of autopsy.

6. Writing cause of death & autopsy report

Following important points should be kept in mind when writing PM report -

- Report should be written on printed form.
- No.5: Do not write 'as per inquest report', but write

summary of the important facts & mention injuries as given in panchanama & confirmed by you.

- No.9: Do not write 'nil', as it is improbable not to find any identification mark.
- No.11: Rigor mortis should be described in detail i.e. whether present on whole body or part of body.
- No.17: Enter details about injuries e.g. their exact site from fixed bony points, length, breadth, depth & character. It is advisable to attach diagram of injuries.
- Injuries should be measured individually though numerous in number. Age and cause of each injury must also be mentioned.
- If blood is present in any of body cavities, always mention approximate quantity.
- After complete PM examination, MO should form opinion about cause & manner of death or probable cause of death & probable time since death based on finding of examination. He/she should immediately give abstract of opinion to the police constable accompanying body for communication to investigating officer.
- A certificate should be given to police constable in charge of body immediately after PM examination is over in following form

"This is to certify that, PM examination has been held on the body of the deceased.....today betweento The cause of death / probable cause of death as derived from PM examination is as follows"

Signature of MO performing PM exam.

- Write detailed PM report in triplicate. One copy is sent to investigating police officer within 24 hours by hand of police constable who brought body for examination & another to the superintendent of police/magistrate. Third copy is retained as office copy for future reference.
- At the time of performance of PM examination, MO should complete original PM report in his/her own handwriting in PM room itself. Other copies can be typed. MO should keep original with him/herself.
- When cause of death requires further examination, opinion about cause of death should be reserved pending such examination.

7. PM report to private parties

Sometimes, private parties request for PM examination report. However this report is confidential document & cannot be given to private parties. Private party may be asked to approach police authorities or concerned magistrate.

8. PM room

- Light should be adequate.
- Colour of walls, floor & ceiling should be natural white, off white or gray.
- Each PM room should have at least two light sources situated on opposite sides so that there are minimum

shadows & total power being not less than 160W & not more than 200W.

9. Record in PM room

Following registers should be kept in PM room -

- Dead stock registers of equipment & supplies.
- Incoming & outgoing dead body register giving time & date of dead body arrival, identification, time of handing over body, signature of person receiving dead body & his relationship with dead body.
- Register for consent in case of non-medico legal PM examination.

10. Exhumation

It is lawful disinterment or digging out of a buried body from the grave, which is sometimes necessary for purpose of identification & to determine cause of death when foul play is suspected. Guidelines to be followed for exhumation are -

- Police officer cannot order for exhumation, only magistrate can order it.
- Exhumation is carried out under supervision of MO & in the presence of police officer.
- About 500 grams sample of earth is collected from above, below & sides of the body.
- PM should be conducted as per regular procedure.

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3. MECHANICAL INJURIES

An injury or a wound is disruption of anatomical continuity of any of the tissues of the body. Injuries caused by application of physical violence to body are mechanical injuries. Under section 44 IPC an injury is defined as - any harm, whatever illegally caused to any person in body, mind, reputation or property.

1. Classification of injuries

Injuries are classified depending upon their nature as follows:

- Abrasions
- Bruises (Contusions)
- Lacerations (Tear)
- Incised wounds (Cuts)
- Stab wounds (Punctures)
- Firearm injuries

1.1. Abrasion

- It is injury involving only superficial layer of skin.
- Caused by friction or pressure between skin & some rough object.
- Bleeds very slightly, heals rapidly in few days and leaves no scar.

Abrasions are caused by pin, thorn, fingernail, as a result of road accidents, fall on ground & by ligature mark in hanging / strangulation etc.

1.2. Bruise (Contusion)

Bruise is an infiltration of blood into tissues following rupture of capillaries. It is the result of application of blunt force e.g. stick, stone, fist, whips etc.

- Bruises are subcutaneous & there is no disruption in the continuity of skin.
- They vary in size, from small pinhead to a large collection of blood (hematoma).
- Bruise may not always be present at the site of impact as blood may gravitate & appear at any different area.
- A superficial bruise usually appears red & swelling may come on almost at once.
- A deep bruise may take one or two days to appear. Therefore such person should have a second examination after 1-2 days.
- Bruising is more marked on parts overlying bones e.g. over tibia. It occurs easily in lax tissues around eyes, face etc. than firmly tacked tissues like scalp.
- Sub conjunctival hemorrhages do not show usual colour changes. It is red first, then yellow & finally disappears.

1.3. Laceration

Wounds in which skin & underlying tissues are torn as a result of blunt force. If underlying tissue is rigid structure e.g. skull beneath the scalp lacerations occur readily & may simulate incised wound. Characteristic features of laceration are -

- Margins are commonly abraded.
- Edges are ragged, irregular & frequently bruised.
- Deeper tissues are unevenly divided.
- Majority of lacerated wounds are caused due to blows from blunt instruments such as sticks, iron bars & stones, falls on rough objects, fist blows & kicks.
- Lacerated wounds caused by stones, bricks, bottles, earthen pots, fall on rocks etc contain foreign matter in the wound, which is of value for investigation. Some times external evidence of injury may be minimal or absent but there can be massive internal injuries.

1.4. Incised wound

Incised wound is caused by a weapon with sharp cutting edge when it is drawn across the skin e.g. by knives, pieces of broken glass etc.

- Injury is usually straight but may be irregular. Tissues are divided more deeply at the commencement of the cuts, than at its termination.
- Length of injury is greater than its breadth.
- Margins are clean cut and no bruising of wound edges.
- Tissues are clearly divided and as blood vessels are cut across, bleeding is profuse.
- These wounds tend to gape due to retraction of skin.

1.5. Stab wound (Punctured wound)

Injury caused by more or less pointed weapon when it is driven in through the skin.

Weapons include knife, dagger, needle, arrow, scissors, bichva, ice pick etc.

- When weapon enters body cavity such as thorax or abdomen, injury is called as penetrating injury.
- When weapon after penetrating comes out from other side making an exit wound injury is called as perforating injury.
- Description of stab wound should include entry, depth, direction and exit of wound.
- Wound of entry is generally bigger than wound of exit. Clothes may be pushed into the wound of entry.
- Shape of wound may correspond to the weapon used. However skin aperture is smaller than breadth of weapon due to elasticity of skin.
- Margins at entry are clean cut & inverted. Margins at exit are everted.
- External examination gives no indication of depth, direction or extent of stab injury. Depth of a stab wound is greater than its length & breadth. Direction can be ascertained by drawing line joining wound of entry & exit.
- Stab wounds should not be probed.

2. Nature of injury

2.1. Simple injury

Injury which is neither extensive nor serious & which heals rapidly without leaving any permanent deformity or disfigurement is known as simple injury.

2.2. Grievous injury

Following injuries are grievous

- Emasculation (cutting penis, castration or loss of erection due to spinal injury)
- Permanent loss of sight of either eye.
- Permanent loss of hearing of either ear.
- Privation of any part, organ, limb or joint.
- Destruction or permanent impairing of the power of any member or joint.
- Permanent disfigurement of head or face.
- Fracture or dislocation of bone or tooth.
- Any hurt which endangers life or which causes the sufferer during the period of 20 days, severe bodily pain or unable to follow daily routine.

2.3. Dangerous injury

It is type of grievous injury, which poses immediate danger to life. It is either extensive or serious in relation to the organ or part wounded e.g. gun shot injuries, compound fracture of skull, trauma to a large or important blood vessel, rupture of internal organ.

3. Medico legal aspects of wounds

3.1. Examination of injured person

Details of the examination of injured person must be entered in accident register, which is confidential record (both out patient cases & indoor cases).

3.2. Entry of following points has to be made in accident register

- Place, date, time of examination.
- Name, age, sex, occupation, address of injured person.
- Identification marks.
- Consent for examination.
- Name & address of accompanying person.
- Name & number of police constable, police station.
- Brief summary of how injury was caused as told by injured person.
- Detailed description of injuries.
- Opinion & signature of MO.

No erasers should be made & if any alterations are made they must be initialized.

3.3. Nature of injuries

- Nature & number of injuries, character of their edges, size (length, breadth, depth), direction, and situation.
- Presence of any extraneous material in the wound should be noted.
- Measurement - Exact measures in cm. with measuring tape should be noted without any guess about measurement.
- When mentioning situation, reference to some body prominence or anatomical landmark should be made. Whether injury is simple, grievous or dangerous need to be mentioned.

3.4. Age of injury

Important for 2 reasons

- Signifies time of occurrence of crime.
- All injuries may not have been inflicted by the same assailant or at the same time.

It is not easy to give, exact time of infliction of any injury, but approximate time can be given. Therefore it is necessary to mention "about" when giving period of an injury.

3.4.1. Age of abrasions

- Bright red in colour.
- Bright red scab in 12-24 hours.
- Scab becomes reddish brown in 2-3 days.
- Heals from periphery in about 4- 7 days & by that time scab falls off.
- Healing is completed by 10 days.

3.4.2. Age of the bruise (From colour changes)

- Fresh bruise is red.
- From red to blue in one day.
- Bluish black to brown in 2-4 days.
- Green in 5- 7 days.
- Yellow in about 7 -10 days.

- Normal skin colour in 14-15 days.

3.4.3. Aseptic incised wound

- Edges are red & swollen after 12 hrs.
- Appreciable healing begins with formation of crust or scab in 24 to 36 hours.
- Divided surfaces are in opposition & are covered with lymph in 36 hrs.
- Edges join together in 3 days.
- Healing with red, tender linear scar by 7th day.
- Such wound on vascular part like face heals in about 3-5 days.

3.4.4. Wound, which is not aseptic & is gaping due to loss of tissue

- Edges are bound together by blood & lymph during first 12 hours. Margins are red & swollen.
- Pus may appear in about 36 to 48 hrs & granulation tissue within a week.
- Does not heal for days or even weeks.

3.4.5. Fracture of bone

- S/o inflammation, hematoma in soft parts 1-3 day.
- Soft provisional callus 3-14th day.
- Starts ossifying 14th day -5th week.
- 6-8 weeks for complete callus absorption, bone formation.

3.4.6. Tooth has been knocked out

- Bleeding from socket stops in 24 hrs, sometimes in 2-3 days & clot is formed.
- Clot is obliterated by fibrous tissue in about 14 days.
- Socket is completely filled with gradual new bone in about a year.

4. Management of mass casualties

Sometimes large number of casualties (e.g. accident) have to be managed by MO. In such case following points should be kept in mind:

- In case of accident with very large number of casualties, MO should visit accident place.
- Screening of patients according to severity has to be made.
- Gasping patients need immediate referral. For such cases noting all medico legal aspects may be difficult.
- Names of referred cases, vital parameters, nature of treatment given and identification marks should be noted.
- Police should be informed immediately.
- When patient is kept under observation for sometime before referral or treated by MO, then whole medico legal procedure should be completed as per rules.
- In case of referral to higher center, MO has to mention that, details have not been noted & are to be noted at hospital where patient is referred.

4. THERMAL INJURIES - BURNS

Burns are injuries produced by application of dry heat such as flame, radiant heat or some heated solid substance like metal or glass to body surface. Scalds are moist heat injuries produced by liquid at or near its boiling point or in its gaseous form such as steam.

Burns may constitute grievous injuries involving loss of sight or permanent disfigurement from unsightly scars on head or face.

1. Classification

Dupuytren surgically divided burns into six degrees of severity. Wilson has modified this into 3 degrees as follows:

1.1. Epidermal

These burns are very painful but repair is complete.

- Affected part is red.
- There may be acute inflammation & formation of blister.
- No scar results, as only superficial layer of epithelium is destroyed. Some slight staining of the skin may subsequently remain.

1.2. Dermo-epidermal

- Whole thickness of skin is destroyed.
- Affected part appears shriveled, depressed area of coagulated tissue surrounded by hyperemic blistered skin.
- Necrosed tissue separates within about a week leaving ulcer, which heals with scar formation.
- Scar may contract causing disfigurement.
- They may or may not be associated with pain.

1.3. Deep burns

- Affected area is completely charred.
- Gross destruction of skin, subcutaneous tissue, muscles & bone.
- Nerve endings are destroyed. Therefore burns are relatively painless.

2. Estimation of surface area of burns - Rule of nine.

Entire head & neck	9%
Both arms (9% each)	18%
Both legs (18% each)	36%
Front of trunk	18%
Back of trunk	18%
Perineum	1 %
Total	100%

There is marked fluid loss resulting in shock when 20% body is affected & burns over 50% are usually fatal.

3. Nature of burns in the absence of death

- Burns of epidermal type are mostly classified as simple injury.

- Burns are grievous, if they cause scars causing permanent disfigurement of head or face, permanent loss of sight of either eye or a permanent impairment of a joint due to formation of cicatrix & contraction.
- Burns are grievous if individual has suffered from shock so as to endanger life or if he/she has been in severe bodily pain or bed ridden & unable to follow his ordinary duties for 20 days or more.

4. Age of a Burn

- Redness occurs immediately after burn and vesiculation within 2-3 hours.
- Exudates from partial thickness burn usually begin to dry in 12-24 hrs & within 48- 72 hrs. forms dry crust.
- Pus within 36-72 hours.
- Superficial slough separate out in about a week & deeper slough in about a fortnight. After this, granulation tissue begins to cover the surface of burn.
- Last result is formation of cicatrix & deformity after several weeks or even months.

5. Medico legal aspects of burns

Distinction between ante mortem & post mortem burns is based on evidence of vital reaction as below:

5.1. Line of redness: In case of burns caused during life, a line of redness involving whole true skin is formed round about the injured part. This is a permanent line persisting even after death. Line of redness being a vital function separates living from dead tissue & is always present in burns caused during life.

5.2. Vesiculation - Vesiculation caused by a burn during life contains a serous fluid & skin surrounding this is of bright red or coppery colour.

Vesication formed after death contains air only but may contain a very small quantity of serum. Its base is dry, hard, horny & yellow instead of red.

5.3. Reparative process- Signs of inflammation, formation of granulation tissue, pus & slough will indicate that burns were caused during life.

Burns caused after death show no vital reaction & have a dull white appearance. Evidence of black soot in trachea, bronchi, up to bronchioles & in oesophagus and stomach are also important signs of ante mortem burns in spot death cases.

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5. DRUNKENNESS

Drunkenness is the condition, which results from excessive intake of alcohol & person concerned is so much under influence of alcohol that -

- He loses control over his mental faculties.
- He is unable to perform his duties.
- He may be a source of danger to himself or to others.

When drunken person is brought for examination, Medical

Officer has to answer whether concerned person is so much under influence of alcohol that he has lost control of his mental faculties. He is unable to execute safely occupation in which he is engaged or is a nuisance to public or is endangering life of another person.

1. Diagnosis

When a drunken person is brought by police requesting for medical examination of accused, MO can carry out examination even without his consent & if necessary by force.

1.1. Diagnosis is based on following observations

- Full history of incident from police.
- Smell of alcoholic liquor in his breath & or vomited matter.
- Excited, talkative, abusive with slurred and incoherent speech. Clothes are disarranged or disorderly clothes.
- Eyes - Extreme dilatation to extreme contraction. Fine lateral nystagmus.
- Tongue - Dry, furred or excessive salivation
- Memory- Loss or confusion as regards recent events & time.
- Co ordination- Impaired e.g. unable to thread a needle, button clothes, unable to walk along a straight line, finger nose test impaired.
- Reflexes- Sluggish or delayed.
- Unusual actions - Hiccups, vomiting, belching, and fighting.

2. Laboratory tests

Common tests performed include estimation of alcohol from blood & urine sample. Blood is a better index of alcohol level than urine. Urine sample is collected only when it is not possible to collect blood sample. Following precautions should be taken when collecting blood sample -

- Spirit must not be used to clean skin. It should be cleaned with sterilized water.
- Syringe must be sterilized and free from alcohol & other chemicals.
- Blood should be preserved in fluoride bulb.

After taking sample, container should be vigorously shaken to dissolve anticoagulant & preservative in blood sample. Urine sample should be preserved by adding 2-3 ml. concentrated hydrochloric acid or 2-3 ml of chloroform/100 ml urine.

Container should be tightly stoppered to prevent loss of alcohol by evaporation and should not be kept in hot place / near hot substance. Sample should be labelled as name, date & time of taking sample. It should be sealed by means of wax with official seal or the monogram of PHC. Sample should be immediately handed over to police along with prescribed 'B' form.

3. Interpretation of results

- Alcohol concentration in blood below 0.05% (50 mg %) is without any effect
- At 0.1 % (100 mg %) some impairment is observed.

- At 0.15 % (150 mg %) person is under influence of alcohol.
- Under BPA a person having a blood alcohol level of 0.05% (50 mg %) & above has legally committed the offence of consumption.
- Under motor vehicle act it is an offence to drive or attempt to drive a motor vehicle with any quantity of alcohol (no threshold limit specified.)

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6. POISONING

Poison is the substance, which on its administration by various routes (including local exposure or contact) produces ill health or death. It may be chemical, animal, microbial or vegetable origin. In India, suicidal or homicidal cases are common due to availability of poisons in bazaar. Insecticides are commonest poisons in our country. Nowadays accidental poisoning cases are increasing significantly.

1. Duty of MO in case of suspected poisoning

- In all cases, MO should record preliminary particulars like name in full, sex, age, occupation, address, date & time, brought by whom, history. Arrange for dying declaration if necessary.
- **Immediately** start treatment to the patient.
- MO must report all suicidal, homicidal or accidental poisoning cases admitted in PHC to police.
- Collect stomach wash & samples of vomit & urine passed in your presence & preserve properly in separate containers.

2. Post mortem of poisoning case

Read police report carefully. Get as much as possible information from relatives of the deceased regarding characteristic of symptoms, time of taking poison, duration between taking of poison and treatment and time of death. Many of the poisons except corrosives & irritants do not show any characteristic post mortem signs, particularly when bodies are in advanced state of decomposition.

2.1. External examination

- Some poisons e.g. ether, alcohol & opium give off a peculiar smell on opening the body.
- Body surface & clothes may show stains or marks of vomit, faeces or of the poison.
- Natural orifices such as mouth, nostrils, rectum & vagina may show presence of some poisonous material or evidence of corrosive changes in mouth or lips etc.
- Marks of injection may sometimes give clue to injected poison.
- It is necessary to preserve viscera & urine in all cases of suspected poisoning even if there are no positive post

mortem signs of poisoning.

2.2. Internal examination

- Alimentary system should be chiefly examined & contents preserved, as signs of irritant & corrosive poisons are likely to be found in stomach, oesophagus & intestines.
- Changes produced by irritants, corrosive poisons in the digestive tract especially stomach are hyperemia, softening, ulceration of mucous membrane, perforation.

2.3. Stomach examination

- In all cases of death from presumed poisoning, stomach should be tied at both the ends & removed from the body, so that its contents may be retained.
- After removal it should be opened, its smell noted, acidity checked with litmus paper, contents received in clean bottles, mucus membrane carefully examined for appearance & for presence of suspicious particles like pills or fragments thereof. If found adherent, pick off & place in separate container.

3. Chemical analysis

Most important proof of poisoning is detection of poison in vomit, urine etc., in blood during life & in contents of stomach, bowel & in tissues of body after death. MO after obtaining necessary orders from Judicial Magistrate should forward viscera to chemical examiner or State Forensic Laboratory for analysis.

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7. DEATH FROM ASPHYXIA

Death from asphyxia occurs when supply of oxygen to the tissues is reduced below normal working level due to interference with respiration.

1. Hanging

Hanging means death caused by suspension of body by a ligature around neck.

- Usually suicidal and no s/o struggle.
- Neck is stretched due to round pull of ligature and head inclined to opposite the knot.
- Face usually pale, pupils are usually dilated, tongue is swollen & blue.
- Saliva dribbling from the corner of mouth opposite the side of knot, vertically down along the neck & front of chest & abdomen.
- Ligature mark above thyroid cartilage, between larynx & chin directed obliquely upwards.
- Absence of fatal injuries.

1.1. Internal appearance

- A careful dissection of neck, layer by layer is essential.
- Injuries to the muscles of neck rare.
- Fracture or fracture dislocation of cervical vertebrae along with compression or laceration of spinal cord may be

noticed.

- Mucus membrane of trachea red & congested.
- Right side of heart full of blood & left empty and abdominal organs congested.

2. Strangulation

Constricting neck by force other than weight of body (ligature, hand, stick etc.)

- **Mostly** homicidal. S/o struggle present.
- Well-defined & slightly depressed mark corresponding roughly to breadth of ligature, low down below thyroid cartilage completely encircles the neck horizontally below hyoid bone. Abrasions & ecchymosis around edges of the ligature mark common.
- If fingers are used, marks of pressure by thumb & fingertips on either side of wind pipe.
- Fracture dislocation of cervical vertebra rare.
- Face congested, marked with petechiae.

2.1. External appearance

Face is puffy & cyanosed, marked with petechiae. Eyes prominent & open, conjunctiva congested, pupil dilated, lips blue, tongue swollen, bruised, protruding & dark in colour.

2.2. Internal appearance

- Extravasations of blood into subcutaneous tissues under ligature mark.
- Muscles of neck are usually lacerated.
- Larynx, trachea congested, contains frothy mucus.
- Fracture of larynx, trachea & also hyoid bone.
- Injury to carotid artery common. Injury to muscles of neck common.
- Lungs congested, hemorrhagic patches & petechiae, may show emphysematous bullae on surface.
- Right side of heart full of dark blood & left empty. Brain is congested.

3. Drowning

It is asphyxia death in which access of air to lungs is prevented by submersion of body in water or fluid medium.

3.1. External appearance

- Clothes on the body wet.
- Face is pale, conjunctiva congested, pupil dilated, and tongue swollen & protruded.
- Profuse, fine froth at mouth & nose. If not visible, appears on compression of chest. This is the diagnostic sign of drowning.
- Material firmly grasped in hands like weeds, mud, sand, twigs or leaves etc.

3.2. Internal appearance

- Increased volume & edematous condition of the lungs. Distended balloon like lungs overlap heart. Often indented by ribs, heavy, doughy to feel.

- On section, exude large quantity of frothy, blood stained fluid.
- Larynx, trachea, bronchial tubes usually contain fine white froth, mucus membrane congested.
- Right side of heart full & left empty.
- Presence of water in stomach & some times in small intestine.
- Liver usually gorged with dark fluid blood. Spleen & kidneys are dark in colour.

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8. MEDICO LEGAL ASPECTS OF STERILIZATION DEATH

1. Definition: Death of a sterilization case on the table to within 4 weeks of the operation is called as sterilization death.

Tubectomy deaths are classified as

- T1-** Death of a case on the table
- T2-** Death within 24 hours of operation
- T3-** Death within 7 days of operation
- T4-** Death from more than 8 days to 4 weeks

2. Investigation of sterilization death

District level officers investigate sterilisation death. MO PHC should immediately report death to DHO giving detail information of the case.

Reporting of death	Immediately to higher authority
Preliminary investigation reports	Within 8 days.
Detail report	Within 30 days.
Quality assurance committee report	Within 60 days.

3. Quality assurance committee

Quality assurance committee at regional level investigates all deaths following sterilization, IUD insertion and MTP occurring in the circle.

Every circle has the Quality Assurance Committee comprising of following members

Dy. Director of Health Services	Chairman
Civil Surgeon of concerned district	Member
Professor of Surgery	Member
Professor of Pathology	Member
Professor of OBGY	Member
Professor of Medicine	Member
Professor of Anesthesia	Member

DHO of concerned ZP where death/complication has occurred will be member of circle level Quality Assurance Committee.

3.1. Responsibilities of the committee

- To investigate all cases of complications/reaction or death

due to sterilization, IUD insertion, MTP & other FW related interventions.

- Fixing responsibilities & recommending actions.
- Ensuring delivery of prompt services.
- Reporting of deficiencies & lapses observed & suggest for improvement.
- Submit its report to DHS within 2 months from the date of occurrence of incidence.

4. Ex-gratia financial assistance in cases of fatality/ complications

- As per new Supreme Court orders, ex-gratia compensation in the event of death related to sterilization is Rs. 1,00,000 to the legal heirs of death attributable to a sterilization after confirmation from the Divisional Quality Assurance Committee. Out of which Rs. 10,000/- is paid in cash to the spouse of deceased & remaining Rs. 90,000/- is paid in the form of National Saving Certificates.
- Ex-gratia payment of Rs. 30,000/- is to be given to the patient if he/she is incapacitated or handicapped due to sterilization operation after confirmation by Divisional Quality Assurance Committee.
- In case of postoperative complications as a result of sterilization operation, the expenditure incurred by the patient on laboratory investigations & medicines will be reimbursed up to Rs. 20,000/- after approval by Divisional Quality Assurance Committee.

5. PM in case of death due to sterilization

- After sterilization death post mortem is a must. PM should be performed by 2 MOs & one of them should be senior experienced officer. If gynecologist available it is preferable.
- Sterilization death should be considered as medico legal case & reported to police.
- Viscera should be preserved for chemical analysis & specimen should be sent for histopathological examination. (Especially tubes, ovaries & uterus). If there is problem with intestine, intestine should be sent for HP examination.

6. Record of tubectomy death & police department

- All record related to investigation of tubectomy death, report of Quality Assurance Committee is confidential.
- Prior permission of govt. has to be taken before giving record to police department.
- If police complaint is lodged against Medical Officer in case of sterilization death, prior permission of health department authority has to be taken before taking action against doctor.

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9. AIDS AUTOPSY

Although universal precautions should be taken for all autopsies, AIDS autopsy should be carried out with special care & additional protective clothing.

1. Pre-requisites

Sodium hypochlorite solution, payjama, shirt, gown, cap, mask, double latex gloves, shoes with plastic shoe cover, plastic apron, protective goggles or face shield.

2. Important precautions to be observed

2.1. During the procedure

- Use all personal protective devices, never take chance.
- Tips of fingers are particularly prone to needle or blade injury during procedure, therefore handle needles & blade carefully. Take care when loading scalpel or removing blade.
- Never put one hand under the tissue or organ that you are cutting with other hand.
- Removal of the sternum should be done carefully preferably with the help of bone cutter. Ribs should be cut with cartilaginous portion; this prevents injury to hand by tips of already cut ribs.

2.2. After postmortem procedure

- After PM procedure, stitch cadaver properly so that no fluid can come out.
- Wash cadaver with tap water & then with 2:1 sodium hypochlorite solution.
- Plug nose & mouth with cotton swab soaked with sodium hypochlorite solution.
- Put cadaver in a plastic bag for handing over to relatives to avoid dissemination of HIV.

2.3. Tables & floors

Wipe carefully tables & floors with 2:1 sodium hypochlorite solution to remove blood stains & body fluids & then with soap & water.

2.4. Instruments

Instruments used should be wiped with sodium hypochlorite solution. Aluminum & stainless steel instruments are damaged by sodium hypochlorite solution & therefore decontaminated with 2% aqueous glutaraldehyde solution. After 4 hours instruments should be washed & autoclaved.

2.5. Autopsy staff & MO

- After completion of procedure, staff & MO must wash hands thoroughly with soap & water.
- Plastic apron, plastic shoe cover, gloves, plastic cap & mask must be discarded in plastic bag. Tie the bag properly & send it for incineration.
- Pajama, shirt, cotton gown should be soaked in sodium hypochlorite solution, washed with water & then sent for autoclaving.

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10. PNDT Act

Pre Conception and Pre Natal Diagnostic Techniques (Prohibition of sex selection) Act Amended in 2003

Pre conception and prenatal diagnostic techniques (Prohibition of sex selection) Act Amended in 2003 is an important legal intervention for declining sex ratio of Maharashtra. By this act, detecting sex of baby before birth by any means is legally banned. Various conditions for which these techniques are permissible are defined, similarly authorities are identified at various levels & also punishments for violation of act are given.

Though MO PHC is not directly involved in implementation of act, he/she has very important role in giving information of such places and to generate awareness in the community.

1. Sex ratio

Sex ratio is the number of females per 1000 males, which indicates social status of women and the degree of gender discrimination in the community. For Maharashtra state, there is overall decline in sex ratio by 56 points from 1901 (978) to 2001 (922).

Son preference of families leading to prenatal female feticide is one of the important reasons for declining sex ratio. In addition to this, after birth, parents ignore health, nutritional & social needs of a female child, which leads to high morbidity & mortality in females.

2. Important aspects of act

Implementation of the act started in 1994 as Prenatal Diagnostic Techniques (Regulation & prevention of misuse) Act. It was amended in 2003 and called as “The Pre-conception & Prenatal Diagnostic Techniques (Prohibition of Sex Selection)”.

Important aspects of the act are as follows -

- No center or no person shall conduct pre-conception & pre-natal diagnostic techniques for sex determination.
- No person shall communicate sex of fetus by words, signs or by any manner.
- No person shall conduct sex selection (i.e. any procedure / technique / test / administration/prescription/provision for increasing or ensuring the probability of a particular sex) on a woman or a man or any tissue, embryo, conceptus, fluid or gametes.

2.1. Prenatal diagnostic techniques

No place shall be used for conducting pre-natal diagnostic techniques except in following conditions:

ANC having -

- Age > 35 Years
- Undergone 2 or more abortions
- Exposed to teratogenic agents such as drugs, radiation, infection or chemicals
- H/o mental retardation or physical abnormalities in previous birth.

2.2. PNDT Centers

- Centers conducting pre-natal diagnostic techniques should be registered and no such techniques should be conducted at un-registered place.
- All the sonography units should be registered to appropriate authorities identified at various levels. All the PNDT centers and sonography units should employ persons having prescribed qualifications.
- Such centers should display a notice in English / in local language expressing that, no pre-conception & prenatal diagnostic techniques are performed for sex determination.
- There is prohibition on sale of USG machines or any other machine, capable of detecting sex of the fetus to persons not registered under act.
- These centers have to keep complete record of use on pregnant women. Doctor has to declare on each report that he has neither detected nor disclosed the sex.
- Pregnant woman has to declare that she does not want to know the sex of fetus.

2.3. Appropriate Authority

At State, District/corporation, taluka or ward level Appropriate Authorities have been identified as below.

State Appropriate Authority:	Additional Director (FW), Pune
District Appropriate Authority:	Civil Surgeon/Health officer of corporation
Taluka Appropriate Authority:	Medical superintendent of Rural Hospital.

- Important functions of Appropriate Authority are:
 - § To grant, suspend or cancel registration.
 - § To investigate complaints & take action
 - § To take appropriate legal action

2.4. Punishment

There are heavy penalties under act for offenders, including doctors, antenatal cases & relatives.

3. Role of PHC Medical Officer and PHC staff

- Inform all staff working at PHC about provisions in the PNDT Act. They should be aware that, knowing the sex of newborn before birth by any means is legally banned under this act.
- Identify doctors having USG machines / scanners from PHC area & inform their names & other details to the Medical Superintendent of RH or Civil Surgeon.
- Create awareness in the community regarding prohibition of sex determination & sex selection.
- Verify ANC register (R15) of ANMs & identify women with previous one or more female children. Create awareness among them & motivate them not to undergo sex determination.

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APPENDIX - I

Job Responsibilities of PHC Functionaries

1. Job Responsibilities of Medical Officer, Primary Health Centre

Duties of Medical Officer

If there is more than one Medical Officer, the senior most will be in charge of the PHC and will be fully responsible for the administration. The area of the Centre should be divided amongst themselves on a sub-center / geographical basis, and each will be responsible for all the activities under the national and local health and family welfare programmes, and health development.

I. Medical or Curative Work-

1. To organize and manage the dispensary, outpatient clinic, indoor beds, and allot duties to other staff to ensure smooth running of the PHC in all its functions and purposes.
2. To arrange suitably for distribution of work in the treatment of emergency cases which come outside the usual hours of the O.P.D.
3. To organize and develop laboratory services for diagnostic and follow-up purposes.
4. To organize and arrange out-reach services for treatment of minor ailments and injuries at community level in the villages and hamlets, sub-centres and PHC through the Community Health Officer, Health Workers, Health Assistants, and others.
5. To attend to the cases referred by paramedical and auxiliary staff of the PHC, and the HGs/CHWs, dais, teachers, etc.
6. To examine and screen patients who need specialized medical or surgical attention, including dental and nursing care, and refer them in time to appropriate hospital / institution.
7. To train and guide all his staff, health guides, community health workers, dais, school teachers, etc., in the treatment of minor ailments and injuries, and first-aid.
8. To co-operate and co-ordinate with other institutions and organizations, private practitioners etc., who provide medical and health care services in his area.
9. To visit each sub-centre in his area. Frequency of Medical Officer's visits at the subcentre: Every subcentre to be visited at least once every month. If two Medical Officers are posted, the subcentres should be divided amongst the two. If only one Medical Officer is posted, he should visit the subcenter in the afternoon. PHC vehicle or public transport are used for the visit. A board indicating the day and time of the visit to be displayed at the subcentre. Subcentre staff are expected to stay at the headquarters on the day of the Medical Officer's visit. The following activities are to be performed during the visit:
 - i. Meeting the Sarpanch, members of the village panchayat and functionaries of the other departments.
 - ii. Conducting OPD.
 - iii. Examination and IEC activities in the Ashram schools.
 - iv. Supervision
 - v. Examination of TB and Leprosy patients.
 - vi. Motivating resistant couples for Family Planning
 - vii. Visit to the Village Panchayat for assessing the registration of vital events.
 - viii. Visit to the anganwadi for guidance and examination of children with Grade I and Grade II malnutrition.
 - ix. Examination of high risk mothers and children.
 - x. Problem solving

A note in triplicate on the work done during the visits be prepared; one copy to the DHO, one to the concerned ANM and one for filing in the office.

II. Preventive and Promotive Work-

He has to train, guide and ensure that all the members of his staff are fully conversant and clear about the objectives and all activities of various national and local health and family welfare programmes. They should also know their area and all the programme activities. He has to prepare operational plans, calendar and fixed and other programme of work for all his staff with a view to ensure that different health programmes are effectively and efficiently implemented.

He has to keep close liaison with the Block Development Officer and his staff, community leaders, voluntary and non-Governmental agencies, school teachers, etc. to actively involve them in the promotion of various health and development programmes in the area and to seek community participation.

He has to conduct field investigations to identify local health needs and problems, to find out local determinants and possible solutions, to study epidemics and other unusual happenings with a view to control and prevent them, and to generate data and information that will assist better delivery and/or planning health and family welfare services.

1. National Family Welfare Programme -

- a. To be responsible for effective implementation, including education and training, motivation, delivery of the services, and follow-up.
- b. To provide immediate and sustained attention to any complication or adverse effect occurring due to acceptance of any of the family planning methods.
- c. To motivate and encourage motivational advice to all the eligible persons / couples.
- d. To get trained and acquire proficiency in tubectomy and vasectomy operations, IUD insertions, M.T.P. and M.R. (Menstrual Regulation), organization of tubectomy and vasectomy camps, etc. To undertake this work at his PHC.
- e. To seek help from other agencies, centres and experts for sterilization operations, M.T.P, IUD insertions.
- f. To learn communication techniques, to improve leadership capabilities, to co-operate and maintain functional relationship with other organizations and local leaders so as to promote family welfare movement and acceptance of small family norm,
- g. To encourage and assist local private medical (of all systems) practitioners in implementation and promotion of the Family Welfare Programme.

2. Maternal and Child Health -

- a. To direct and provide services such as antenatal, natal and posnatal care to women; and infant and child care through O.P.D. and special clinics regularly conducted at the PHC and sub-centers. It is desirable to conduct such clinics in remote and inaccessible villages, say once in two months at least.
- b. To ensure detection and special care as may be indicated to high-risk mothers, infants and children.
- c. To ensure successful implementation of National Programmes for Prevention of Nutritional Anaemia and of Prevention of Blindness through administration of the iron and folic acid tablets, and vitamin A doses, respectively, in adequate quantities and period to all the needy women and children.
- d. To treat all maternal and child cases, complicated or otherwise, referred by the Health Workers, Health Assistants, Dais etc.
- e. To maintain a tidy and clean delivery room, properly furnished, equipped, lighted, and readily available.
- f. To examine and screen cases that need specialist care, and to refer them in time to appropriate hospital or specialist.

3. Universal Immunization Programme -

- a. To plan and implement the programme according to the latest directive and guidelines, and ensure full protection of the target population of the women, infants and children.
- b. To procure and ensure adequate and timely supply of various vaccines and other items required, at places of immunization sessions.
- c. To ensure maintenance of the Cold Chain to ensure that potency of the vaccines is retained till administered.
- d. To treat promptly the cases of complications and adverse reactions following immunization.

4. National Malaria Eradication Programme -

- a. To be responsible for all administrative and technical activities for effective implementation of NMEP
- b. To get acquainted with all difficulties and problems regarding insecticide spray and surveillance operations in the PHC area, and to take necessary corrective measures immediately.
- c. To train and guide the field and other concerned staff on all treatment schedules such as for presumptive treatment of fever cases, and radical treatment for the cases which are blood-smear positive. To learn management and treatment of cerebral malaria, and to treat cases of cerebral malaria as and when they come.
- d. To investigate all outbreaks of malaria, i.e. more than two cases in a day at one place /village.
- e. To check laboratory work for diagnosis, and ensure that the prescribed percentage of slides are sent to the designated laboratory / authority for cross - check.
- f. To supervise maintenance of accounts of the microscopy slides, antimalarial drugs, etc.
- g. To ensure follow-up of treatment of malaria positive cases.

5. Control of Communicable Diseases -

- a. To ensure that strict surveillance is maintained for the control of common communicable disease.
- b. To promote improvement of sanitary condition and proper maintenance of sanitary facilities in villages.

- c. To investigate and act promptly in case of any outbreak of an epidemic in his area.
- d. To maintain accurate and up-dated data on mortality and morbidity data on the common communicable diseases in his area.
- 6. National Leprosy Eradication Programme -**
 - a. To be responsible for effective implementation of NLEP in the PHC area.
 - b. To provide facilities for early detection of cases, confirmation of diagnosis, and treatment, c. To ensure regular procurement and supplies of drugs, d. To ensure follow-up of all cases for regular and complete treatment.
 - c. To examine and screen cases who require physio-therapy, reconstructive surgery or rehabilitation, and to refer them to an appropriate centre / hospital or specialist.
- 7. National Tuberculosis Control Programme -**
 - a. To be responsible for all activities for effective implementation for the national programme.
 - b. To provide facilities and ensure early detection, confirmation of diagnosis, and treatment.
 - c. To ensure follow-up of all cases to ensure that they take treatment regularly and completely till declared as cured.
- 8. Control of Sexually Transmitted Diseases and AIDS -**
 - a. To provide facilities and ensure that all cases of STD are diagnosed and treated properly.
 - b. To provide facilities or referral for confirmation of diagnosis and / or screening. It is necessary that VDRL test is done in all antenatal cases.
 - c. To know the nearest laboratory where testing for AIDS is possible. Such a testing is important before blood transfusion.
- 9. School Health -**
 - a. To organize health inspection of the schools in the area.
 - b. To arrange for medical check-up of school children, immunization, detection of physical and other defects and treatment, and follow-up and referral support.
- 10. National Programme for Prevention of Visual Impairment and Control of Blindness -**
 - a. To arrange for testing of vision, refraction and provision of spectacles.
 - b. To ensure prompt treatment of eye ailments.
 - c. To examine and refer suitable cases for specialist care to appropriate hospital expert.
- 11. National Diarrhoea! Diseases Control Programme -**
 - a. To organize and provide facilities for early detection of cases of watery diarrhoea, dysentery, etc.
 - b. To promote use of oral rehydration solution, etc., by way of education and training of health staff and mothers,
 - c. To examine and treat cases which come or are referred to sub-centres or PHC, or refer for specialized care to a hospital or an expert.
- 12. Control of Acute Respiratory Infections -**
 - a. To organize and ensure early detection of pneumonia in young children by the field staff and parents by way of educating and training them.
 - b. To organize and facilitate home treatment of cold and cough, and mild pneumonias. This could be only supportive care or use of an antibiotic.
 - c. To examine and treat cases of severe pneumonia who come or are referred to PHC with antibiotic treatment, and to refer them for specialized care to a hospital or an expert.
- III. Training and Continuing Education -**
 - a. To organize and conduct staff meetings every month on a fixed day and time and review the work and progress made by each member of the staff, to understand and solve difficulties of the staff, to identify and solve problems, and to plan the next programme for action. To use the monthly review meetings for specific guidance. Generally, the weaknesses and gaps in the knowledge and skills are revealed in the course of such meetings. Correction of these provide a useful learning opportunity to the staff.
 - b. To organize periodical training programmes with the help of the senior staff and District level staff. Updating and new programmes may be covered.
 - c. To organize training programmes and inform the local leaders, dais, health guides and volunteers so that they can serve as effective communications to the people. They will be best agents for change, d. To select and periodically send staff for training at the Health and Family Welfare Training Centre, or other places.

IV. Administrative Work -

- a. To provide leadership to his team of staff and the people.
- b. To supervise and direct the work of all the staff working under him.
- c. To ensure good house-keeping and general cleanliness inside and outside the premises of PHC and sub-centres; and proper maintenance of all equipments and materials under his charge.
- d. To maintain up-to-date inventory and stock registers of all the stores, equipments and supplies provided / procured. To be responsible for correct accounting of all these items.
- e. To procure and ensure adequate, regular and timely supplies of equipments, drugs, contraceptives, educative materials, and other supplies required for efficient delivery of the services.
- f. To prepare indents for supply of drugs, instruments, linen, vaccines, contraceptives, chemicals, petty and miscellaneous supplies etc., sufficiently in advance, and submit to appropriate higher authority.
- g. To maintain the transport jeep, etc., in his charge.
- h. To plan and periodically scrutinize the working of his staff and suggest changes, if necessary, to improve performance and suit the priorities of work.
- i. To get prepared and display maps and charts in his office room to exhibit clearly the geographical area of the PHC, locations and areas of the sub-centres, morbidity and mortality rates for last two years and the current year, other health and demographic information, and performance under various health and family welfare programmes.
- j. To conduct monthly staff meeting with a view to review and evaluate the progress of work, and taking steps to further improve coverage, quality and effectiveness.
- k. To ensure regular and timely supplies of medicines and honorarium etc., to Health Guides and Dais.
- l. To properly constitute village and block level Health Committees and ensure that they are functional.
- m. To ensure maintenance of the prescribed registers and records at the PHC and the sub-centres. These should be made accurate, up-to-date and reliable by thorough checks, cross-checks and utilization.
- n. To ensure that he gets reports of the work done and happenings in the PHC area from all his staff regularly and in time, get these reports compiled, and send to the District Health Authorities on time. Such monthly reports should be studied by him and used for better management of the PHC work.
- o. To maintain personal diary of his visits and work. Relevant information should be included in monthly report of the PHC.
- p. To discharge all the financial duties entrusted to him.
- q. To discharge all the day-to-day administrative functions pertaining to the PHC and the people.

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२. आरोग्य सहाय्यक (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या

महाराष्ट्र शासन

सार्वजनिक आरोग्य विभाग

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १

मंत्रालय, मुंबई ४०० ०३२.

दिनांक : ११ डिसेंबर २००१

प्रस्तावना : बहुविध आरोग्य सेवा योजनांतर्गत कार्यरत असणाऱ्या आरोग्य सहाय्यक (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या सरकारकडून निश्चित करण्यात आल्या असून राज्य सरकारने त्या स्वीकृत केल्या आहेत.

शासन निर्णय : बहुविध आरोग्य सेवा योजनांतर्गत आरोग्य सेवेतील आमुलाग्र बदल लक्षात घेता आरोग्य सहाय्यक (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयाद्वारे निश्चित करण्यात आल्या आहेत.

आरोग्य सहाय्यक (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयासोबत जोडलेल्या सहपत्राप्रमाणे रहातील.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने,

(र.ग.पवार)

महाराष्ट्र शासनाचे उपसचिव.

प्रति,

प्रधान सचिव/सचिव/सहसचिव/सर्व उपसचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई.

सचिव, ग्रामविकास व जलसंधारण विभाग, मंत्रालय, मुंबई.

सचिव, महिला व बालविकास विभाग, मंत्रालय, मुंबई.

सचिव, आदिवासी विकास विभाग, मंत्रालय, मुंबई.

महासंचालक, आरोग्य सेवा, मुंबई.

अतिरिक्त संचालक, आरोग्य सेवा (माता व बाल संगोपन, कुटुंब कल्याण) पुणे.

संचालक, आरोग्य सेवा (सर्व कार्यक्रम)

उपसंचालक, आरोग्य सेवा (सर्व परिमंडळे)

मुख्य कार्यकारी अधिकारी, सर्व जिल्हा परिषदा.

जिल्हा आरोग्य अधिकारी, जि.प. (सर्व)

आरोग्य सेवा संचालनालयांतर्गत सर्व प्रशिक्षण केंद्रे.

निवडवस्ती सेवा १.

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १ दिनांक ११/१२/२००१ चे सहपत्र

आरोग्य सहाय्यक (पु.) यांची कर्तव्ये व जबाबदाऱ्या :

बहुउद्देशीय आरोग्य कर्मचारी योजनेतर्गत पुरुष आरोग्य सहाय्यकाने एकूण २०,००० लोकसंख्येला सेवा देणे अपेक्षित असून एकूण ४ उपकेंद्रे व ४ आरोग्य कर्मचारी (पु.) यांचे पर्यवेक्षण करणे बंधनकारक आहे. त्याचप्रमाणे प्रजनन व बाल आरोग्य कार्यक्रम व कुष्ठरोग दूरीकरण कार्यक्रमाचे प्राथमिक आरोग्य सेवेत होणाऱ्या विलीनीकरण अनुषंगाने व इतर राष्ट्रीय कार्यक्रमात झालेला बदल लक्षात घेता पुरुष आरोग्य सहाय्यकाच्या जबाबदाऱ्या खालीलप्रमाणे आहेत.

अ) पर्यवेक्षण व मार्गदर्शन :

१. कार्यक्षेत्रातील सर्व पुरुष आरोग्य कर्मचाऱ्यांच्या कार्याचे संनियंत्रण, पर्यवेक्षण, त्यांच्या कामाची आखणी व कौशल्यवृद्धीसाठी आरोग्य कर्मचाऱ्यांना मार्गदर्शन.
२. पर्यवेक्षणासाठी नियमित व आकस्मिक भेटी
३. वैद्यकीय अधिकारी, आरोग्य कर्मचारी व लाभार्थी यांच्यात आरोग्य सेवा संबंधाने योग्य समन्वय साधणे.
४. आरोग्य सहाय्यक (स्त्री) च्या सहाय्याने सर्व कर्मचाऱ्यांची सभा व कामाचा आढावा.
५. मासिक सभेत आरोग्य कर्मचाऱ्यांच्या कामाचा आढावा देणे.
६. आरोग्य सेवकाला साधनसामुग्रीचा पुरवठा.
७. आरोग्य सेवकांच्या नोंदवह्या व दप्तर पडताळी व मार्गदर्शन.
८. आरोग्य सेवकांकडून आलेल्या अहवालाचे एकत्रिकरण, छाननी व अहवाल सादरीकरण.

ब) साहित्य सामुग्री व्यवस्थापन :

१. आरोग्य सहाय्यकेसोबत नियमित व आकस्मिक उपकेंद्र साठा तपासणी.
२. साहित्य सामुग्रीचे मागणीपत्र योग्य वेळी सादर करून पुरवठा प्राप्त करणे.
३. उपकेंद्र औषधीसाठी व इतर साहित्यांच्या योग्य साठवणुकीकडे नियमित लक्ष.
४. पुरुष आरोग्य कर्मचाऱ्यांच्या किटची नियमित पडताळणी.

क) संघकार्य :

१. पुरुष आरोग्य कर्मचाऱ्यांना संघकार्य सुलभ करणे.
२. आरोग्य सहाय्यका व इतर कर्मचाऱ्यांसोबत कार्याचे समन्वय व नियमित बैठकीचे आयोजन.
३. इतर विभागाच्या शासकीय कर्मचाऱ्यांसोबत समन्वय व गटपातळीवर आयोजित सभेत सहभाग.
४. प्राथमिक आरोग्य केंद्राच्या सभेत नियमित सहभाग.
५. कार्यक्षेत्रात विविध आरोग्य सेवांचे आयोजनासाठी वैद्यकीय अधिकाऱ्यांना मदत करणे.
६. इतर कर्मचाऱ्यांसह आरोग्य सेवा शिबिरांचे आयोजन व सहभाग.

ड) अहवाल व नोंदी :

१. आवश्यक नोंदी व अहवाल तत्परतेने सादर करणे.
२. पुरुष आरोग्य कर्मचाऱ्यांकडून प्राप्त नोंदी व अहवालांचे योग्य संकलन करून वैद्यकीय अधिकाऱ्यांना सादर करणे.

Appendix

१) राष्ट्रीय हिवताप प्रतिरोध कार्यक्रम :

- आरोग्य सेवकांच्या सर्वेक्षण भेटीचे नियोजन व पर्यवेक्षण.
- घरभेटीत आढळलेल्या रुग्णाचे रक्त नमुने, गृहीत उपचार, हिवताप रुग्णांना समूळ उपचार.
- ताप उपचार केंद्र व गोळ्या वाटप केंद्र यांची पडताळणी.
- किटकनाशक फवारणी कार्यक्रमावर देखरेख.
- डास उत्पत्ती स्थाने पडताळणी.
- गप्पी मासे पैदास केंद्र तपासणी.
- मजूर शिबिरांना (Labour camps) आठवडी भेट.
- मच्छरदाणी वाटप

२) साथरोग नियंत्रण :

- हगवण, अतिसार, कावीळ, विषमज्वर, मेंदूज्वर, घटसर्प, गोवर इ. च्या साथीवर नियंत्रण व लक्ष.
- उद्रेकाच्या प्रसंगी त्वरीत कार्यवाही, उद्रेक नियंत्रण पथक तयार करणे, विहीरी निर्जंतुकीकरण, ओ.टी. पर्यवेक्षण, दूषित पाणी नमुने कार्यवाही, ग्रामपंचायत भेटी, ब्लिचिंग पावडरसाठी तपासणी.
- प्रतिबंधनात्मक कार्यवाही व वरिष्ठांना आवश्यक माहिती सादर करणे.
- उद्रेक होवू नये म्हणून साथरोग विषयक आरोग्य शिक्षण.
- रेबीज प्रतिबंधन - लावारीस कुत्र्यांचा बंदोबस्त.

३) राष्ट्रीय अंधत्व निवारण कार्यक्रम :

- मोतीबिंदू रुग्णांची यादी तयार करून घेणे व शिबिराचे नियोजन.
- शाळेत जाणाऱ्या सर्व मुलांची दृष्टीदोष, तिरळेपणा व इतर नेत्र आजाराकरीता तपासणी होईल याची खात्री करणे व त्यांना उपचार देण्याची व्यवस्था करणे.

४) राष्ट्रीय कुष्ठरोग व निर्मुलन कार्यक्रम :

- निदान व नियमित उपचार.
- संशयित रुग्णांचा त्वचा नमुना घेणे व तपासणीसाठी पाठविणे.

५) राष्ट्रीय क्षयरोग नियंत्रण कार्यक्रम :

- नियमित औषधोपचार
- आरोग्य कर्मचाऱ्यांकडून घेतलेले थुंकी नमुन्यांची पडताळणी.

६) प्रजनन व बाल आरोग्य :

- ६.१ सार्वत्रिक लस टोचणी कार्यक्रम.
 - लसीकरणासाठी लागणारा साधनसामुग्रीचा साठा अद्ययावत ठेवणे.
 - पल्स पोलिओ लसीकरण
 - लसीकरण गावाचे पर्यवेक्षण
- ६.२ क्षार संजीवनी उपचार.

- अतिसाराच्या रुग्णांना क्षार संजीवनी उपचार
- आरोग्य सेवक (स्त्री/पुरुष) यांना क्षार संजीवनीचा पुरवठा करणे.

६.३ शालेय आरोग्य कार्यक्रम.

- लसीकरणासाठी आरोग्य कर्मचाऱ्यांना सहाय्य.
- विद्यार्थ्यांना आरोग्य शिक्षण

६.४ कुटुंब कल्याण कार्यक्रम.

- कुटुंब पाहणीचे वेळी पर्यवेक्षण व गोषवारे काढणे
- प्रतिसाद न देणाऱ्या जोडप्याचे मतपरिवर्तन
- निरोध डेपो होल्डर - नियमित साधन पुरवठा
- कुटुंब नियोजन शिबीरे आयोजित करण्यासाठी सहाय्य
- लाभार्थ्यांचा पाठपुरावा व पर्यवेक्षण
- पुरुषांचा कार्यक्रमात सहभाग वाढविण्यासाठी प्रयत्न

६.५ उपकेंद्र नियोजन मार्गदर्शन.

- आरोग्य सेविकेला उपकेंद्र नियोजन आराखडा तयार करण्यासाठी आवश्यक मार्गदर्शन व मदत
- पुरुष आरोग्य कर्मचाऱ्याचा सहभाग निश्चित करणे
- लाभार्थ्यांच्या गरजा व निश्चितीसाठी मदत व मार्गदर्शन

६.६ लोकसंख्या धोरण, आरोग्य शिक्षण.

- लोकसंख्या धोरणाची उद्दिष्टे व प्रमुख बाबी
- प्रस्तावित उपाययोजनांची माहिती
- सेवांची उपलब्धता व गुणवत्ता सुधारणे
- विविध क्षेत्राचा व विभागांचा सहभाग

६.७ प्रजनन मार्ग जंतुसंसर्ग - पुरुष रुग्णांसाठी निदान व उपचार

- प्रजननमार्ग जंतुसंसर्गाचे परिणाम व निदान
- प्रतिबंधात्मक उपाययोजना
- उपचार व पद्धती

६.८ लैंगिक शिक्षण

- किशोरवयीन मुलामुलींना लैंगिक शिक्षण
- सुरक्षात्मक उपाययोजना
- दुष्परिणामांची जाणीव करून देणे

फ) जीवन विषयक आकडेवारी

- आरोग्य कर्मचाऱ्यांनी गोळा केलेल्या जन्ममृत्युच्या माहितीचे एकत्रिकरण.

Appendix

- एम आय एस चालू असलेल्या प्राथमिक आरोग्य केंद्रामधील कार्यावर देखरेख व गळती पाहाणे.
- ग्रामपंचायतमध्ये केल्या जाणाऱ्या जन्ममृत्यू नोंदीबाबत सर्वेक्षण व पडताळणी.
- अहवाल संकलन.

ग) परिसर स्वच्छता

- सुरक्षित पाणी पुरवठा.
- शोष खड्डा, परसबाग, खत खड्डे, आरोग्यदायी संडास, बिनधुराची चूल तयार करण्यासाठी जनतेला प्रोत्साहन व मार्गदर्शन.
- पाण्याचे निर्जंतुकीकरणाबाबत ओ टी टेस्ट.
- पाणी नमुने गोळा करून चाचणीसाठी प्रयोगशाळेत पाठविणे व अहवाल ग्रामपंचायतीकडे पाठविणे व पाठपुरावा करणे.
- पाणी शुद्धीकरणासाठी ग्रामपंचायत कर्मचारी प्रशिक्षण.
- दूषित पाणी नमुना असलेल्या स्रोताकरिता योग्य उपाययोजना.

घ) प्रथमोपचार व किरकोळ आजार व संदर्भसेवा

- आरोग्य सेवकाकडे प्रथमोपचार व किरकोळ आजारांच्या उपचारासाठी लागणारे सर्व साहित्य असल्याची खात्री.
- आरोग्य सेवकांचे निरंतर प्रशिक्षण.
- किरकोळ आजार, उपचार व अपघात प्रकरणी प्रथमोपचार व संदर्भ सेवा.
- आरोग्य कर्मचाऱ्यांकडून संदर्भीत रुग्णांवर योग्य उपचार व आवश्यक तेथे पुढील संदर्भ सेवेसाठी रुग्ण रवानगी.

न) आयोडिन न्युनता विकार कार्यक्रम

- आयोडिनच्या कमतरतेमुळे होणारे विकार/आजार आणि आयोडिनयुक्त मिठाचा आहारातील वापराबाबत लोकांना आरोग्य शिक्षण देणे.
- वापरण्यात येणाऱ्या मिठाचे नमुने आयोडिनचे प्रमाण तपासण्याकरिता प्रयोग शाळेत पाठविणे.

प) आरोग्य शिक्षण, प्रशिक्षण, संप्रेषण व समोपदेशन

- महत्वाच्या कार्यक्रमात गटसभांचे आयोजन
- साथरोग, परिसर स्वच्छता, प्रजनन व बाल आरोग्य कार्यक्रमांतर्गत माहिती व संप्रेषण कार्यक्रमांचे आयोजन.
- शालेय भेटीद्वारे आरोग्य शिक्षण.
- यात्रा समारंभ इत्यादीचेवेळी प्रदर्शनीचे आयोजन.
- पुरुष आरोग्य कर्मचाऱ्यांचे मदतीने स्थानिक नेत्यांचे प्रशिक्षण.
- आरोग्य कर्मचाऱ्यांचे प्रशिक्षण.

१) समोपदेशन सत्रांचे आयोजन

- कुटुंब नियोजन साधने वापरण्यासाठी
- लैंगिक मार्ग जंतुसंसर्ग
- लैंगिक आजार व वैकल्ये
- एचआयव्ही/एड्स

क्ष) अंगणवाडी तसेच आश्रमशाळेची भेट.

३. आरोग्य सहाय्यक (स्त्री) या पदाची कर्तव्ये व जबाबदाऱ्या

महाराष्ट्र शासन

सार्वजनिक आरोग्य विभाग

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १

मंत्रालय, मुंबई ४०० ०३२.

दिनांक : ११ डिसेंबर २००१

प्रस्तावना : बहुविध आरोग्य सेवा योजनांतर्गत कार्यरत असणाऱ्या आरोग्य सहाय्यक (स्त्री) या पदाची कर्तव्ये व जबाबदाऱ्या भारत सरकारकडून निश्चित करण्यात आल्या असून राज्य सरकारने त्या स्वीकृत केल्या आहेत.

शासन निर्णय : बहुविध आरोग्य सेवा योजनांतर्गत आरोग्य सेवेतील आमुलाग्र बदल लक्षात घेता आरोग्य सहाय्यक (स्त्री) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयाद्वारे निश्चित करण्यात आल्या आहेत.

आरोग्य सहाय्यक (स्त्री) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयासोबत जोडलेल्या सहपत्राप्रमाणे रहातील.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने,

(र.ग.पवार)

महाराष्ट्र शासनाचे उपसचिव.

प्रति,

प्रधान सचिव/सचिव/सहसचिव/सर्व उपसचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई.

सचिव, ग्रामविकास व जलसंधारण विभाग, मंत्रालय, मुंबई.

सचिव, महिला व बालविकास विभाग, मंत्रालय, मुंबई.

सचिव, आदिवासी विकास विभाग, मंत्रालय, मुंबई.

महासंचालक, आरोग्य सेवा, मुंबई.

अतिरिक्त संचालक, आरोग्य सेवा (माता व बाल संगोपन, कुटुंब कल्याण) पुणे.

संचालक, आरोग्य सेवा (सर्व कार्यक्रम)

उपसंचालक, आरोग्य सेवा (सर्व परिमंडळे)

मुख्य कार्यकारी अधिकारी, सर्व जिल्हा परिषदा.

जिल्हा आरोग्य अधिकारी, जि.प. (सर्व)

आरोग्य सेवा संचालनालयांतर्गत सर्व प्रशिक्षण केंद्रे.

निवडनस्ती सेवा १.

Appendix

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १ दिनांक ११/१२/२००१ चे सहपत्र

आरोग्य सहाय्यक (स्त्री) यांची कर्तव्ये व जबाबदाऱ्या :

बहुउद्देशीय आरोग्य सेवक योजनेतर्गत ग्रामीण विभागामध्ये एकूण १५,००० लोकसंख्येसाठी आणि आदिवासी भागामध्ये १०,००० लोकसंख्येसाठी किमान ३ उपकेंद्र कार्यरत असून आरोग्य सहाय्यिकेला आरोग्य सेविकांच्या कामाचे पर्यवेक्षण आणि नियंत्रण लागते त्यांच्या जबाबदाऱ्या खालीलप्रमाणे आहेत.

१) पर्यवेक्षण व मार्गदर्शन (Supervision & Guidance) :

१. आरोग्य सेविकेला आरोग्य सेवा देतांना मार्गदर्शन करणे व त्यांच्या कामाचे पर्यवेक्षण करणे तसेच त्यांचे कौशल्य व ज्ञान वृद्धीगत करणे.
२. आरोग्य सेविकेला कार्यक्रम तयार करण्याकरिता आणि त्यांची अंमलबजावणी करण्याकरिता मदत करणे व मार्गदर्शन करणे.
३. प्रत्येक उपकेंद्राला आठवड्यातून एका विशिष्ट दिवशी भेट देऊन आरोग्य सेविकेने केलेल्या दैनंदिन कामाची पाहणी करणे व काही आढळल्यास त्यांना मार्गदर्शन करून तृप्तीची दुरुस्ती करणे.
४. आरोग्य सेविकेने केलेल्या कामाची नियमित पडताळणी करून पडताळणी अहवाल प्राथमिक आरोग्य केंद्रांच्या वैद्यकीय अधिकाऱ्यांना सादर करणे.
५. आरोग्य सेविकेच्या क्षेत्रात पर्यवेक्षकीय गृहभेटी देणे.
६. राष्ट्रीय प्रजनन व बाल आरोग्य कार्यक्रमात व राष्ट्रीय कुष्ठरोग निर्मुलन कार्यक्रमात पर्यवेक्षण व मार्गदर्शन करणे.
७. प्राथमिक आरोग्य केंद्र येथे आरोग्य कर्मचाऱ्यांच्या सभेला उपस्थित राहणे व मार्गदर्शन करणे.
८. आरोग्य सेवक महिला यांनी केलेल्या कामाची कमीत-कमी १० टक्के घरांना भेटी देऊन पडताळणी करून पर्यवेक्षण करणे.
९. सर्व गर्भवती स्त्रियांना व्ही.डी.आर.एल. तपासणीकरिता मोई उपलब्ध असलेल्या हॉस्पिटलला पाठविणे.

२) संघकार्य (Team Work) :

१. सर्व आरोग्य कर्मचाऱ्यांना संघकार्याचे सदस्य म्हणून कार्य करण्यास मदत करणे.
२. आरोग्य सहाय्यक पुरुष व इतर आरोग्य कर्मचारी, आरोग्य मार्गदर्शक, दाई यांच्या मदतीने कार्य करणे.
३. क्षेत्रातील इतर विभागाच्या आणि संस्थांच्या कार्यक्रमासोबत आपले आरोग्य विषयक कार्यक्रम राबविणे आणि गटस्तरावरील उपस्थित राहणे.
४. आरोग्य सहाय्यक पुरुष यांच्या मदतीने उपकेंद्रातील आरोग्य कर्मचाऱ्यांच्या सभेचे नियमित आयोजन करणे.
५. कार्यक्षेत्रात निरनिराळ्या आरोग्य सेवांचे आयोजन करण्यामध्ये प्राथमिक आरोग्य केंद्रातील वैद्यकीय अधिकाऱ्यांना सहाय्य करणे.
६. आरोग्य संघाचे घटक म्हणून आरोग्य कार्यक्रमांतर्गत जनशिबीर आणि धडक मोहिमेमध्ये सहभाग घेणे.

३) पुरवठा, साहित्य व उपकेंद्राची देखभाल (Material Supply & Maintenance) :

१. आरोग्य सहाय्यकाच्या सोबत प्रत्येक उपकेंद्रातील साहित्य पुरवठ्याची वेळोवेळी पाहणी करणे आणि साहित्य पुरवठा उपलब्ध देण्यात मदत करणे.
२. उपकेंद्रावर औषधी व्यवस्थित ठेवलेल्या आहेत किंवा नाही ह्याची पडताळणी करणे व इतर साहित्याची देखभाल योग्यरित्या केली किंवा नाही हे पाहणे.
३. आरोग्य सेवक महिला स्वतःची किट व प्रसुती किट व्यवस्थित ठेवते किंवा नाही ते पाहणे व त्याची खात्री करणे.
४. उपकेंद्र स्वच्छ व निटनेटके आहे याची दक्षता घेणे.
५. प्रजनन व बाल आरोग्य कार्यक्रमांतर्गत औषधी व साहित्याची देखभाल व व्यवस्थापन करणे.

४) नोंदवही आणि अहवाल (Register & Report) :

१. आरोग्य सेविकांची नोंदवही तपासणे व त्यांना अडचण आल्यास मार्गदर्शन करणे.
२. नोंदवही व्यवस्थित ठेवणे व आवश्यक अहवाल तयार करणे.
३. आरोग्य सेविकांच्या अहवालाचा आढावा घेणे व अहवाल संकलित करून प्राथमिक आरोग्य केंद्राला सादर करणे.

५) प्रशिक्षण (Training) :

१. आरोग्य सेविकेच्या मदतीने दाईचे प्रशिक्षण आयोजित करणे.
२. वेगवेगळ्या आरोग्य कर्मचारी, आरोग्य मार्गदर्शक, दाई ह्यांचे प्रशिक्षण आयोजित करण्याकरिता वैद्यकीय अधिकाऱ्यांस मदत करणे.

६) प्रजनन व बाल आरोग्य कार्यक्रम (R.C.H.) :

१. आरोग्य सेविकेच्या मदतीने दर आठवड्याला उपकेंद्र स्तरावर आरोग्य सेवा सत्र आयोजित करणे.
२. आरोग्य सेवक/सेविका आणि प्रशिक्षित दाई यांना गरज पडेल तेव्हा मदत करणे.
३. कुटुंब कल्याण कार्यक्रमाचा स्वीकार न करणाऱ्या जोडप्यांना स्वतः जातीने भेटी देऊन मत परिवर्तन करणे.
४. जनतेला वैद्यकीय गर्भपाताविषयी उपलब्ध असलेल्या सेवांची माहिती देणे व गरजूंना योग्य शासनमान्य दवाखान्यात पाठविणे.
५. कुटुंब नियोजनाच्या प्रचलित साधनांच्या वितरणाकरिता आरोग्य सेविकेला डेपो होल्डरला तयार करण्याकरिता मदत करणे व त्या डेपोहोल्डरला आरोग्य सेविकेच्या मदतीने प्रशिक्षण देणे.
६. तांबी कार्यक्रम राबविणे व पाठपुरावा करणे तसेच सहाय्यक प्रसुती प्रसविका यांचे प्रशिक्षण घेणे.
७. सर्व गर्भवती माता, नवजात शिशु व बालकांच्या लसीकरणाची व्यवस्था करणे व पर्यवेक्षण करणे.
८. शितसाखळी अखंड ठेवणे.

७) पोषण (Nutrition) :

१. नवजात बालक व पाच वर्षाखालील बालकातील कुपोषणाचे रुग्ण शोधणे, त्यांना सल्ला व उपचार देणे आणि गंभीर रुग्णांना प्राथमिक आरोग्य केंद्राला रवानगी करणे.
२. अंगणवाडी कार्यकर्त्यांच्या मदतीने कामाचे पर्यवेक्षण व त्यांना मार्गदर्शन करणे.
३. लाभार्थींना लोह व फोलीक ॲसिडच्या गोळ्या व जीवनसत्व अ च्या मात्रा योग्य प्रमाणात योग्य कालावधीकरिता मिळतील याची दक्षता घेणे.
४. मातांना स्तनपानाविषयी शिक्षण देणे.

८) वैद्यकीय उपचार (Medical Treatment) :

१. किरकोळ आजारवर उपचार, अपघात व आकस्मिक बाबीकरिता प्रथमोपचार देणे आणि गंभीर रुग्णांना प्राथमिक आरोग्य केंद्र येथे किंवा जवळच्या दवाखान्यात रवानगी करणे.
२. आरोग्य कर्मचारी यांनी पाठविलेल्या रुग्णांना सेवा पुरविणे आणि आवश्यकतेनुसार संदर्भ सेवेकरिता पाठविणे.

९) आरोग्य शिक्षण संप्रेषण कौशल्य आणि समोपदेश (H. E. Communication Skill & Counseling):

१. प्रजनन आणि बाल आरोग्य, कुटुंब कल्याण, पोषण आणि लसीकरण याबाबत आरोग्य सेविकेच्या सहकार्याने आरोग्य शिक्षण उपक्रम

Appendix

राबविणे.

२. समाजातील पुढाऱ्यांसोबत गटसभेचे आयोजन करणे आणि त्यांना आरोग्य कार्यक्रमाविषयीचे संदेश प्रसारीत करण्यामध्ये करून घेणे.
३. आरोग्य सेविकेच्या मदतीने महिला नेत्यांकरिता प्रशिक्षण आयोजित करणे.
४. कुटुंब कल्याण कार्यक्रमांमध्ये महिला मंडळ, शिक्षण आणि समाजातील इतर महिला यांचा सहभाग मिळवून घेणे.
५. कुटुंब नियोजन साधनांचा स्विकार वैद्यकीय गर्भपात, प्रजनन मार्ग जंतुसंसर्ग, लैंगिक आजार आणि एड्स याविषयी आरोग्य सेवे (स्त्री/पुरुष) यांच्या मदतीने समोपदेशन सत्राचे आयोजन करणे.

४. बहुउद्देशिय आरोग्य कर्मचारी (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या

महाराष्ट्र शासन

सार्वजनिक आरोग्य विभाग

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १

मंत्रालय, मुंबई ४०० ०३२.

दिनांक : ११ डिसेंबर २००१

प्रस्तावना : बहुविध आरोग्य सेवा योजनांतर्गत कार्यरत असणाऱ्या बहुउद्देशिय आरोग्य कर्मचारी (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या भारत सरकारकडून निश्चित करण्यात आल्या असून राज्य सरकारने त्या स्वीकृत केल्या आहेत.

शासन निर्णय : बहुविध आरोग्य सेवा योजनांतर्गत आरोग्य सेवेतील आमुलाग्र बदल लक्षात घेता बहुउद्देशिय आरोग्य कर्मचारी (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयाद्वारे निश्चित करण्यात आल्या आहेत.

बहुउद्देशिय आरोग्य कर्मचारी (पुरुष) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयासोबत जोडलेल्या सहपत्राप्रमाणे रहातील.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने,

(र.ग.पवार)

महाराष्ट्र शासनाचे उपसचिव.

प्रति,

प्रधान सचिव/सचिव/सहसचिव/सर्व उपसचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई.

सचिव, ग्रामविकास व जलसंधारण विभाग, मंत्रालय, मुंबई.

सचिव, महिला व बालविकास विभाग, मंत्रालय, मुंबई.

सचिव, आदिवासी विकास विभाग, मंत्रालय, मुंबई.

महासंचालक, आरोग्य सेवा, मुंबई.

अतिरिक्त संचालक, आरोग्य सेवा (माता व बाल संगोपन, कुटुंब कल्याण) पुणे.

संचालक, आरोग्य सेवा (सर्व कार्यक्रम)

उपसंचालक, आरोग्य सेवा (सर्व परिमंडळे)

मुख्य कार्यकारी अधिकारी, सर्व जिल्हा परिषदा.

जिल्हा आरोग्य अधिकारी, जि.प. (सर्व)

आरोग्य सेवा संचालनालयांतर्गत सर्व प्रशिक्षण केंद्रे.

निवडनस्ती सेवा १.

Appendix

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १ दिनांक ११/१२/२००१ चे सहपत्र

बहुउद्देशिय आरोग्य सेवक यांच्या जबाबदाऱ्या :

बहुउद्देशिय आरोग्य सेवक योजनेतर्गत प्रत्येक ५००० जनसंख्येकरिता, आदिवासी आणि डोंगरीभागात ३००० लोकसंख्येकरिता उपकेंद्र स्थापन करून तेथे एक आरोग्य सेवक व एक आरोग्य सेविका नियुक्त करण्यात आलेली आहे. आरोग्य सेवकाने कार्यक्षेत्रातील प्रत्येक घरी दर १५ दिवसात एकदा भेट देणे आवश्यक आहे.

आरोग्य सेवकांच्या जबाबदाऱ्या

हिवताप नियंत्रण कार्यक्रम :

१. दर पंधरवड्यात प्रत्येक घरी भेटी देवून तापाच्या रुग्णाची चौकशी करणे व तापाचा रुग्ण आढळल्यास रक्त नमुना घेवून हिवताप गृहीत उपचार करणे.
२. हिवतापाचा जंतू आढळलेल्या रक्त नमुन्याची नोंद करणे व आरोग्य सहाय्यकाला समूळ उपचारासाठी कळविणे.
३. कार्यक्षेत्रात हिवताप फवारणी विषयक बाबींची देखरेख करणे.
४. कार्यक्षेत्रात कायमची व तात्पुरती डास उत्पत्ती स्थाने शोधून त्यात गप्पी मासे सोडणे.
५. हिवतापाचा अभिलेख काढणे व अहवाल ठेवणे.
६. लोकांना खालील गोष्टी बाबत आरोग्य शिक्षण देणे :-
तापाच्या रुग्णाचे तपासणीचे महत्व, घरात फवारणीचे महत्व, डास अळी नियंत्रणाचे महत्व, हिवतापाचा प्रसार होवू नये म्हणून उपाय योजना.

साथरोग नियंत्रण :

१. गृहभेटी दरम्यान साथीच्या आजाराचे रुग्ण शोधून काढणे. उदा. अतिसार, हगवण, पुरळ असलेले तापाचे रुग्ण, मेंदूदाह, कावीळ, घटसर्प, पोलिओ इ. आणि अचानक साथीच्या आजाराचे अपेक्षेपेक्षा जास्त रुग्ण आढळल्यास आरोग्य सहाय्यक व अधिकारी यांना तातडीने कळविणे.
२. साथ नियंत्रण उपाययोजना राबविणे.
३. क्षार संजीवनीचे द्रावण तयार करून अतिसाराच्या रुग्णांना वयोगटाप्रमाणे देणे.

कुष्ठरोग :

१. गृहभेटीत कातडीवर चट्टा आढळल्यास किंवा कातडीच्या रंगामध्ये बदल व त्या ठिकाणी संवेदना नसल्यास अशा रुग्णांची नोंद घ्यावी.
२. रुग्ण नियमित उपचार घेतो किंवा नाही याची खात्री करणे.
३. कुष्ठरोगामुळे व्यंगत्व येवू नये म्हणून आरोग्य शिक्षण देणे.
४. अनियमित व अर्धवट उपचार घेतलेल्या रुग्णांना नियमित व संपूर्ण औषधोपचारासाठी प्रवृत्त करणे व असे रुग्ण आरोग्य सहाय्यक यांच्या निदर्शनास आणणे.
५. कुष्ठरुग्ण व त्यांच्या कुटुंबातील सहवासित यांच्याशी सुसंवाद साधून कुष्ठरोगाबाबत असलेले गैरसमज दूर करणे.
६. बहुविध औषधोपचार योजनेची अंमलबजावणी करणे.
७. नविन कुष्ठरुग्ण शोध मोहीम राबविणे.
८. कुष्ठरुग्णांचा पाठपुरावा व सर्वेक्षण करणे.

क्षयरोग :

१. संशयित क्षयरोगी शोधून थुंकी नमुना घेणे व ते तपासणीसाठी प्रा.आ.केंद्र किंवा क्षयरोग केंद्रात पाठविणे.
२. क्षयरुग्णांच्या नियमित उपचाराची खात्री करणे.

३. अनियमित व अर्धवट उपचार घेतलेल्या रुग्णांना नियमित व संपूर्ण औषधोपचारासाठी प्रवृत्त करणे व असे रुग्ण आरोग्य सहाय्यक (पु.) यांच्या निदर्शनास आणणे.

४. पंधरा दिवसापेक्षा जास्त दिवस खोकला व ताप असल्यास लोकांना थुंकी नमुना तपासून घेण्याविषयी आरोग्य शिक्षण देणे.

परिसर स्वच्छता :

१. सार्वजनिक पाण्याच्या साठ्यांची नियमित शुद्धीकरणाची खात्री करणे.
२. पाणी नमुना आणि विरंजक चुर्ण नमुना प्रयोगशाळेत तपासणीकरिता नियमित पाठविणे.
३. लोकांना खालील बाबींवर आरोग्य शिक्षण देणे -
घरातील स्वच्छता, बिनधुराची चूल व उपयोग, सुरक्षित संडासाचे फायदे व उपयोग, मलमुत्राची व सांडपाण्याची योग्य विल्हेवाट.
४. समाजाला खालील गोष्टी करून घेण्याबाबत मार्गदर्शन व मदत करणे-शोषखड्डा, परसबाग, खतखड्डा, सुरक्षित संडास

जीवनविषयक आकडेवारीची नोंद :

१. कार्यक्षेत्रात होणाऱ्या जन्ममृत्युंची नोंद करणे व तसा अहवाल आरोग्य सहाय्यक यांना कळविणे.
२. कार्यक्षेत्रात होणाऱ्या रुग्णांची नोंद करणे आणि कायद्यानुसार कमी वय असणाऱ्या मुलामुलींचे लग्न ठरल्यास किंवा झाल्यास आरोग्य सहाय्यक (पु.) यांच्या निदर्शनास आणणे.
३. जन्म आणि मृत्युची नोंद वेळीच करण्याचे महत्त्व लोकांना सांगणे.

प्रथमोपचार व किरकोळ आजारांवर उपचार :

१. प्रथमोपचाराचे साहित्य, क्षारसंजीवनीची पाकीटे व किरकोळ आजारावरील औषधे योग्य त्या व्यक्तींना/रुग्णांना उपलब्ध करून देणे.
२. गंभीर आजार व गुंतागुंत झालेल्या, किरकोळ व साध्या आजारांच्या रुग्णांना वैद्यकीय अधिकारी प्रा.आ.केंद्र किंवा जवळच्या दवाखान्यात पाठविणे.
३. आरोग्य मार्गदर्शकाने पाठविलेल्या रुग्णांवर उपचार करणे व आवश्यक वाटल्यास रुग्ण पुढील उपचारासाठी पाठविणे.

संधत्व नियंत्रण कार्यक्रम :

१. संशयित मोतीबिंदू रुग्णांची यादी तयार करणे, त्यांना तपासणीसाठी पाठविणे व पक्क मोतीबिंदू असणाऱ्या रुग्णांस मोतीबिंदू शस्त्रक्रिया करून घेण्यास प्रवृत्त करणे.
२. मोतीबिंदू शस्त्रक्रिया झालेल्या रुग्णांचा पाठपुरावा करणे.
३. डोळ्यांची योग्य निगा घेण्याबाबत आरोग्य शिक्षण देणे.

प्रजनन व बाल आरोग्य कार्यक्रम :

१. आरोग्य सेविकेसोबत समाजाच्या आरोग्य विषयक गरजांवर आधारित उपकेंद्राचा कृती आराखडा तयार करणे.
२. जोखमीचे गरोदरपणी वैद्यकीय उपचाराची आवश्यकता असलेल्या व प्रजननाविषयी समस्या असलेल्या स्त्रियांना आरोग्य सेविकेकडे पाठविणे.
३. गुंतागुंत आढळून आलेल्या नवजात अर्भकास व मातेस प्रथम स्तर संदर्भसेवा केंद्रात ताबडतोब पाठविण्यासाठी मदत व पाठपुरावा करणे.
४. मातांना व वयात येणाऱ्या मुलींना वैयक्तिक किंवा एकत्रित पणे खालील बाबींवर आरोग्य शिक्षण देणे :- कौटुंबिक आरोग्य, माता आणि मुलांचे आरोग्य, कुटुंब नियोजन, आहार, सांसर्गिक आजारावर नियंत्रण, लसीकरण, वैयक्तिक व परिसर स्वच्छता इ. जेणेकरून रोगांपासून बचाव करण्यासाठी आणि आरोग्य चांगले राखण्यासाठी लोक स्वतः पुढे येतील.
५. लैंगिक आजार व प्रजनन मार्गाचा जंतुसंसर्ग झालेल्या रुग्णांचा शोध घेणे आणि त्यांना आवश्यक त्या सेवा देणे.
६. प्रत्येक गावात आरोग्य सेवा सत्र आयोजित करून आरोग्य सेविकेसोबत आवश्यक त्या आरोग्य सेवा पुरविणे आणि लसीकरण

Appendix

कार्यक्रमात आरोग्य सहाय्यिकेला मदत करणे.

७. विविध सांसर्गिक आजाराविरुद्ध लसीकरणाचे महत्व आणि लसीकरण वेळापत्रकाबाबत लोकांना आरोग्य शिक्षण देणे.
८. लसीकरणांद्वारे टाळता येणाऱ्या आजारांचे रोगसर्वेक्षण करणे.
९. शालेय-पूर्व मुलांमध्ये आणि अर्भकांमध्ये कुपोषणाचे रुग्ण शोधून काढून अशा मुलांना आवश्यक तो उपचार देणे आणि नवीन आंगणवाडी/बालवाडी केंद्रात पुरक आहार घेण्याबाबत किंवा वैद्यकीय अधिकारी प्रा.आ.केंद्र यांचेकडे जाण्याचा सल्ला देणे.
१०. शालेय-पूर्व बालके, गरोदर माता, स्तनदा माता आणि कुटुंब नियोजनाची पद्धत स्वीकारणाऱ्यांना आरोग्य सेविकेशी समन्वय साधून लोहयुक्त गोळ्यांचे वाटप करणे.
११. तीन वर्षाखाली बालकांना जीवनसत्व अ च्या मात्रा पाजणे.
१२. स्थानिक पातळीवर उपलब्ध असणाऱ्या अन्न पदार्थांपासून समतोल आहार तयार करण्याबाबत लोकांना माहिती व आरोग्य शिक्षण देणे.
१३. कुटुंब पहाणी करणे व योग्य जोडप्यांची यादी अद्यावत ठेवणे.
१४. व्यक्तिगत किंवा एकत्रितपणे योग्य जोडप्यांना कुटुंब नियोजनाचा संदेश देणे आणि कुटुंब नियोजनासाठी प्रवृत्त करणे.
१५. पात्र योग्य जोडप्यांना पाळणा लांबविण्यासाठी साधने पुरविणे.
१६. कुटुंब कल्याण शस्त्रक्रिया करून घेण्यासाठी आणि तांबी बसवून घेण्यासाठी आलेल्या लाभार्थींना सुविधा पुरविणे व मदत करणे.
१७. कुटुंब कल्याण शस्त्रक्रिया करून घेतलेल्या पुरुष लाभार्थ्यांचा पाठपुरावा करणे आणि त्यांच्या समस्या सोडविणे.
१८. समाधानी पुरुष लाभार्थी, स्थानिक नेते, आरोग्य मार्गदर्शक, शिक्षक, स्वयंसेवक आणि इतरांशी चांगले स्नेहसंबंध प्रस्थापित करून कुटुंब कल्याण कार्यक्रमाला चालना देण्याबाबत प्रवृत्त करणे.
१९. निरोध आणि तोंडाने च्यावयाच्या गर्भनिरोधक गोळ्यांच्या वाटपासाठी डेपो होल्डरांची निवड करणे, त्यांना प्रशिक्षण देण्यासाठी सहाय्यिकेला मदत करणे आणि डेपो होल्डरांना वरील साधनांचा नियमित पुरवठा करणे.
२०. जनसभेमध्ये सहभागी होऊन मुलांचे आरोग्य, कुटुंब कल्याण इ. वर माहिती व आरोग्य शिक्षण देणे.
२१. लैंगिक समानतेवर समाजाला प्रवृत्त करणे व प्रजनन व बाल आरोग्य कार्यक्रमात पुरुषांचा सहभाग साधण्याबाबत प्रवृत्त करणे.
२२. वैद्यकीय गर्भपात करून घेणाऱ्या स्त्रियांना जवळच्या सरकारमान्य केंद्रात पाठविण्यासाठी मदत करणे व आरोग्य सहाय्यिकेला मदत करणे.
२३. वैद्यकीय गर्भपात करून घेण्यासाठी उपलब्ध असलेल्या सुविधांची माहिती स्त्रियांना करून देणे आणि त्याबाबत आरोग्य शिक्षण देणे.
२४. असुरक्षित गर्भपात केल्यामुळे होणाऱ्या गंभीर परिणामाबाबत लोकांना आरोग्य शिक्षण देणे आणि त्यांना असुरक्षित आणि वेळोवेळी गर्भपात करून घेण्यापासून परावृत्त करणे.

आयोडीन न्यूनता विकार नियंत्रण कार्यक्रम :

१. आयोडीनच्या कमतरतेमुळे होणाऱ्या आजारांचे रुग्ण शोधून काढणे.
२. वापरण्यात येणाऱ्या मिठात आयोडीनचे प्रमाण तपासणे.
३. वापरण्यात येणाऱ्या मिठाचे नमुने प्रयोगशाळेत तपासणीकरिता पाठविणे.
४. आयोडीनच्या कमतरतेमुळे होणारे विकार/आजार आणि आयोडीनयुक्त मिठाचा वापर व आहाराविषयी लोकांना आरोग्य शिक्षण देणे.

अहवाल व नोंदवही ठेवणे :

१. कार्यक्षेत्रात असणाऱ्या सर्व कुटुंबांचे सर्वेक्षण करून प्रत्येक कुटुंबाची सर्वसाधारण माहिती अद्यावत ठेवणे.
२. गाव-निहाय कुटुंबाची नोंदवही तयार करणे, अद्यावत करणे व त्यांचा उपयोग विविध कार्यक्रमांतर्गत येणाऱ्या लाभार्थींसाठी करणे.
३. आरोग्य सेविकेच्या मदतीने योग्य जोडप्यांची नोंदवही, कुटुंब पहाणी नोंदवहीवरून तयार करून अद्यावत ठेवणे.
४. केलेल्या कामाचा पुरावा म्हणून नोंदवही व अहवाल ठेवणे.
५. वेळोवेळी नियमितपणे पाठविण्यात येणारा अहवाल तयार करून तो वेळेत आरोग्य सहाय्यिकांना पाठविणे.

६. कार्यक्षेत्राचा नकाशा व आलेख तयार करून त्याचा उपयोग कामाचे नियोजन करण्यासाठी करणे.

संघकार्य :

१. प्राथमिक आरोग्य केंद्रात होणाऱ्या कर्मचाऱ्यांच्या प्रत्येक सभेत हजर राहणे व सहभागी होणे.
२. आपल्या कार्याचा आरोग्य सेविकेशी आणि इतर आरोग्य कर्मचाऱ्यांशी समन्वय साधणे.
३. प्रत्येक आठवड्याला एकदा तरी आरोग्य सहाय्यक (पु.) यांना भेट देणे आणि त्यांचा सल्ला व मार्गदर्शन आवश्यकतेप्रमाणे घेणे.
४. कार्यक्षेत्रात घेण्यात येणाऱ्या विविध शिबीरात आणि मोहिमेत सहभागी होणे.
५. स्थानिक स्वयंसेवी संस्था शोधून त्यांना समाजाचे आरोग्य चांगले राखण्यास प्रवृत्त करणे.



५. बहुउद्देशिय आरोग्य कर्मचारी (महिला) या पदाची कर्तव्ये व जबाबदाऱ्या

महाराष्ट्र शासन

सार्वजनिक आरोग्य विभाग

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १

मंत्रालय, मुंबई ४०० ०३२.

दिनांक : ११ डिसेंबर २००१

प्रस्तावना : बहुविध आरोग्य सेवा योजनांतर्गत कार्यरत असणाऱ्या बहुउद्देशिय आरोग्य कर्मचारी (महिला) या पदाची कर्तव्ये व जबाबदाऱ्या भारत सरकारकडून निश्चित करण्यात आल्या असून राज्य सरकारने त्या स्वीकृत केल्या आहेत.

शासन निर्णय : बहुविध आरोग्य सेवा योजनांतर्गत आरोग्य सेवेतील आमुलाग्र बदल लक्षात घेता बहुउद्देशिय आरोग्य कर्मचारी या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयाद्वारे निश्चित करण्यात आल्या आहेत.

बहुउद्देशिय आरोग्य कर्मचारी (स्त्री) (सहाय्यक परिचारिका प्रसविका) या पदाची कर्तव्ये व जबाबदाऱ्या या शासन निर्णयासोबत सहपत्राप्रमाणे रहातील.

महाराष्ट्राचे राज्यपाल यांच्या आदेशानुसार व नांवाने,

(र.ग.पवार)

महाराष्ट्र शासनाचे उपसचिव.

प्रति,

प्रधान सचिव/सचिव/सहसचिव/सर्व उपसचिव, सार्वजनिक आरोग्य विभाग, मंत्रालय, मुंबई.

सचिव, ग्रामविकास व जलसंधारण विभाग, मंत्रालय, मुंबई.

सचिव, महिला व बालविकास विभाग, मंत्रालय, मुंबई.

सचिव, आदिवासी विकास विभाग, मंत्रालय, मुंबई.

महासंचालक, आरोग्य सेवा, मुंबई.

अतिरिक्त संचालक, आरोग्य सेवा (माता व बाल संगोपन, कुटुंब कल्याण) पुणे.

संचालक, आरोग्य सेवा (सर्व कार्यक्रम)

उपसंचालक, आरोग्य सेवा (सर्व परिमंडळे)

मुख्य कार्यकारी अधिकारी, सर्व जिल्हा परिषदा.

जिल्हा आरोग्य अधिकारी, जि.प. (सर्व)

आरोग्य सेवा संचालनालयांतर्गत सर्व प्रशिक्षण केंद्रे.

निवडनस्ती सेवा १.

शासन निर्णय क्रमांक आरईएस १०.१००१/प्र.क्र.१२२/सेवा १ दिनांक ११/१२/२००१ चे सहपर

आरोग्य सेविकेच्या जबाबदाऱ्या

अ) प्रजनन व बाल आरोग्य कार्यक्रम :

१. समाजाच्या गरजांवर आधारित उपकेंद्र कृति आराखडा तयार करणे.
२. गरोदर मातांची नोंदणी करणे व त्यांना प्रसुती पूर्व, दरम्यान व प्रसुतिपश्चात सेवा देणे.
३. रक्तक्षयाकरिता शारीरिक तपासणी, लघवीतील साखर व प्रथिनांची तपासणी, रक्तातील लोहाचे प्रमाण, रक्तदाब घेणे, वजन घेणे आणि पोषण व विप्रेक्षा बाबतचा सल्ला देणे.
४. सर्व गरोदर स्त्रियांची लैंगिक आजाराची तपासणी होईल ह्याची खात्री करणे.
५. जोखमीच्या, गुंतागुंत असलेल्या गरोदर मातांना वैद्यकीय उपचाराची आवश्यकता असलेल्या आणि प्रजनन विषयक समस्या असलेल्या स्त्रियांना संदर्भ सेवेकरिता पाठविणे.
६. कार्यक्षेत्रात होणाऱ्या एकुण प्रसुतींपैकी ५० टक्के प्रसुती स्वतः करणे.
७. कार्यक्षेत्रातील सर्व प्रसुती केवळ प्रशिक्षित व्यक्तींकडून होतील ह्याची खात्री करणे व प्रशिक्षित दाईकडून होणाऱ्या बाळंतपणावर देखरेख करणे व त्यांना मदत करणे.
८. अडचणीचे बाळंतपण व जोखमीचे नवजात अर्भकांना प्राथमिक आरोग्य केंद्रात/प्रथमस्तर संदर्भ सेवा केंद्रात ताबडतोब पाठविण्यासाठी मदत व पाठपुरावा करणे.
९. कार्यक्षेत्रात बाळंत झालेल्या प्रत्येक स्त्रीस कमीत कमी तीन भेटी देणे. आवश्यक त्या सेवा व सल्ला देणे. उदा. स्तनपान, अर्भकाची काळजी आणि मातेची काळजी.
१०. बालकांची वाढ व विकासाकडे लक्ष देणे आणि आवश्यकता असल्यास संदर्भ सेवा उपलब्ध करणे.
११. मातांना व वयात येणाऱ्या मुलांना व्यक्तिगत किंवा एकत्रितपणे खालील बाबींवर आरोग्य शिक्षण देणे. कौटुंबिक आरोग्य, माता आणि मुलांचे आरोग्य, कुटुंब नियोजन, आहार, सांसारिक आजारावर नियंत्रण, लसीकरण, वैयक्तिक व परिसर स्वच्छता इ. जेणेकरून रोगापासून बचाव करण्यासाठी आणि चांगले आरोग्य राखण्यासाठी लोक स्वतःपुढे येतील.
१२. लैंगिक आजार व प्रजनन मार्गाचा जंतुसंसर्ग झालेल्या रुग्णांचा शोध घेणे आणि त्यांना आवश्यक त्या सेवा देणे.
१३. उपकेंद्र स्तरावर आरोग्य सेवा सत्रात आरोग्य सहाय्यिका व वैद्यकीय अधिकारी यांना मदत करणे.
१४. प्रत्येक गावात आरोग्य सेवा सत्राचे आयोजन करून लाभार्थ्यांना आवश्यक सर्व आरोग्य सेवा पुरविणे.
१५. सर्व गरोदर स्त्रियांना धनुर्वात प्रतिबंधक लसीच्या आवश्यक मात्रा देणे.
१६. कार्यक्षेत्रातील सर्व अर्भक व मुलांचे लसीकरण वेळापत्रकाप्रमाणे योग्य वयात करणे.
१७. लसीकरणासाठी आवश्यक असलेल्या सुया व सिरिंजेस आणि इतर साहित्याचे व्यवस्थितपणे निर्जंतुकीकरण झाले किंवा नाही याची खात्री करणे व प्रत्येक लाभार्थ्यांना वेगळी सिरिंज व सुई वापरणे.
१८. लसीची तपासणी करणे व दिलेल्या सूचनांचे पालन करणे. लसीकरण वेळापत्रक, महत्वाबाबत स्त्रियांना आरोग्य शिक्षण देणे.
१९. शालेय-पूर्व मुलांमध्ये आणि अर्भकांमध्ये कुपोषणाचे रुग्ण शोधून काढून अशा मुलांना आवश्यक तो उपचार देणे आणि नजीकच्या अंगणवाडी/बालवाडी केंद्रात पुरक आहार घेण्याबाबत किंवा आवश्यकता असल्यास वैद्यकीय अधिकारी प्रा.आ. केंद्र यांचेकडे संदर्भसेवेसाठी रवानगी करणे.
२०. शालेय-पूर्व बालके, गरोदर माता, स्तनदा माता आणि कुटुंब नियोजनाची पद्धत स्वीकारणाऱ्यांना आरोग्य सेविकांशी समन्वय साधून लोहयुक्त गोळ्यांचे वाटप करणे.
२१. तीन वर्षाखाली बालकांना जीवनसत्व अ च्या मात्रा पाजणे.

Appendix

२२. स्थानिक पातळीवर उपलब्ध असणाऱ्या अन्न पदार्थांपासून समतोल आहार तयार करण्याबाबत लोकांना माहिती व आरोग्य देणे.
२३. योग्य जोडपी आणि लहान मुलांच्या नोंदवह्यांच्या आधारे कुटुंब नियोजन स्वीकार करण्याकरीता जोडप्यांना व्यक्तिगत किंवा प्रवृत्त करणे, कुटुंब कल्याण संबंधित सर्व नोंदवह्या अद्यावत ठेवणे, योग्य जोडप्यांना कुटुंब नियोजनाचा संदेश देणे आणि कुटुंब नियोजनासाठी प्रवृत्त करणे.
२४. पात्र योग्य जोडप्यांना पाळणा लांबविण्यासाठी साधने पुरविणे.
२५. कुटुंब कल्याण शस्त्रक्रिया करून घेण्यासाठी आणि तांबी बसवून घेण्यासाठी आलेल्या लाभार्थींना सुविधा पुरविणे व मदत करणे.
२६. कुटुंब कल्याण शस्त्रक्रिया करून घेतलेल्या स्त्री लाभार्थ्यांचा पाठपुरावा करणे आणि त्यांच्या समस्या सोडविणे.
२७. समाधानी स्त्री लाभार्थी, स्थानिक नेते, आरोग्य मार्गदर्शक, शिक्षक, स्वयंसेवक आणि इतरांशी चांगले स्नेहसंबंध प्रस्थापित करणे.
२८. निरोध आणि तोंडाने ध्यावयाच्या गर्भनिरोधक गोळ्यांच्या वाटपासाठी डेपो होल्डर्सची निवड करणे, त्यांना प्रशिक्षण देण्यासाठी सहाय्यिकेला मदत करणे आणि डेपो होल्डर्सना वरील साधनांचा नियमित पुरवठा करणे.
२९. महिला मंडळाच्या सभेत सहभागी होवून जमलेल्या समुदायाला कुटुंब कल्याण, मुलांचे आरोग्य इ. बाबत माहिती व आरोग्य देणे.
३०. लैंगिक समानतेबाबत समाजाला प्रवृत्त करणे व प्रजनन व बाल आरोग्य कार्यक्रमात पुरुषांचा सहभाग साधण्याबाबत प्रवृत्त करणे.
३१. वैद्यकीय गर्भपात करून घेणाऱ्या स्त्रियांना जवळच्या सरकारमान्य केंद्रात पाठविण्यासाठी मदत करणे व आरोग्य सहाय्यिकेला मदत करणे.
३२. वैद्यकीय गर्भपात करून घेण्यासाठी उपलब्ध असलेल्या सुविधांची माहिती स्त्रियांना करून देणे आणि त्याबाबत आरोग्य सहाय्यिकेला मदत करणे.
३३. असुरक्षित गर्भपात केल्यामुळे होणाऱ्या गंभीर परिणामाबाबत लोकांना आरोग्य शिक्षण देणे आणि त्यांना असुरक्षित आणि वेळोवेळी गर्भपात करून घेण्यापासून परावृत्त करणे.

ब) दाई प्रशिक्षण :

१. कार्यक्षेत्रातील सर्व दाईची यादी तयार करून त्यांना कुटुंब कल्याण व सुरक्षित प्रसुतिबाबत मार्गदर्शन करणे.
२. दाई प्रशिक्षणात आरोग्य सहाय्यिकेला मदत करणे.

क) साथरोग नियंत्रण :

१. गृहभेटी दरम्यान साथीच्या आजारांचे रुग्ण शोधून काढणे. उदा. अतिसार, हगवण, पूरळ असलेले तापाचे रुग्ण, मेंदूदाह, कावीळ, घटसर्प, पोलिओ इ. आणि अचानक साथीचे आजाराची अपेक्षेपेक्षा जास्त रुग्ण आढळल्यास आरोग्य सहाय्यक व अधिकारी यांना तातडीने कळविणे.
२. अतिसाराच्या सर्व रुग्णांस क्षारसंजीवनीचे द्रावण वयोगटानुसार देणे.
३. संशयीत मोतीबिंदू आणि अंधत्वाच्या सर्व रुग्णांच्या नोंदी घेवून त्यांना पुढील उपचारांसाठी पाठविणे.
४. गृहभेटीच्या वेळी आढळून आलेल्या तापाच्या रुग्णांचा रक्त नमुना घेवून त्यांना गृहितोपचार देणे आणि पुढील कार्यवाही करणे.
५. गृहभेटीच्या वेळी कातडीवर चट्टा आढळल्यास किंवा कातडीच्या रंगामध्ये बदल व त्या ठिकाणी संवेदना नसलेले रुग्ण शोधून काढणे आणि आरोग्य सहाय्यकाच्या निर्देशनास आणणे.
६. क्षयरोग्यांची आणि कुष्ठरोगांची यादी करण्यास आरोग्य सेवकाला मदत करणे. वरील रुग्ण नियमित औषधोपचार घेतात काय याबाबत ठेवणे, अनियमित व अर्धवट उपचार घेतलेल्या रुग्णांना नियमित व संपूर्ण औषधोपचारासाठी प्रवृत्त करणे आणि असे रुग्ण सहाय्यक यांच्या निर्देशनास आणणे.

ड) जीवनविषयक आकडेवारीची नोंद :

१. कार्यक्षेत्रात होणाऱ्या जन्ममृत्युंची नोंद करणे व तसा अहवाल आरोग्य सहाय्यक यांना कळविणे.
२. कार्यक्षेत्रात होणाऱ्या रुग्णांची नोंद करणे आणि कायदानुसार कमी वय असणाऱ्या मुलामुलींचे लग्न ठरल्यास किंवा झाल्यास आरोग्य सहाय्यक (पु.) यांच्या निदर्शनास आणणे.
३. जन्म आणि मृत्युची नोंद वेळीच करण्याचे महत्त्व लोकांना सांगणे.

ई) प्रथमोपचार व किरकोळ आजारांवर उपचार :

१. प्रथमोपचाराचे साहित्य, क्षारसंजीवनीची पाकीटे व किरकोळ आजारांवरील औषधे योग्य त्या व्यक्तींना/रुग्णांना उपलब्ध करून देणे.
२. गंभीर आजार व गुंतागुंत झालेल्या, किरकोळ व साध्या आजारांच्या रुग्णांना वैद्यकीय अधिकारी प्रा.आ.केंद्र किंवा जवळच्या दवाखान्यात पाठविणे.
३. आरोग्य मार्गदर्शकाने पाठविलेल्या रुग्णांवर उपचार करणे व आवश्यक वाटल्यास रुग्ण पुढील उपचारासाठी पाठविणे.

फ) संघकार्य :

१. प्राथमिक आरोग्य केंद्रात होणाऱ्या कर्मचाऱ्यांच्या प्रत्येक सभेत हजर राहणे व सहभागी होणे.
२. आपल्या कार्याचे आरोग्य सेविकेची आणि इतर आरोग्य कर्मचाऱ्यांशी समन्वय साधणे.
३. प्रत्येक आठवड्याला एकदा तरी आरोग्य सहाय्यक (स्त्री) यांना भेट देणे आणि त्यांचा सल्ला व मार्गदर्शन आवश्यकतेप्रमाणे घेणे.
४. कार्यक्षेत्रात घेण्यात येणाऱ्या विविध शिबीरात आणि मोहिमेत सहभागी होणे.
५. स्थानिक स्वयंसेवी संस्था शोधून त्यांना समाजाचे आरोग्य चांगले राखण्यास प्रवृत्त करणे.

म) अहवाल व नोंदवही ठेवणे :

१. सहा आठवड्यांनंतरच्या सर्व गरोदर माता, १२ महिने वयोगटातील सर्व बालके, शालेय-पूर्व बालके आणि १५ ते ४५ वयोगटातील सर्व स्त्रियांची नोंद करणे व नोंदवही तयारी करणे.
२. प्रसूतिपूर्व, प्रसूतिसंबंधित आणि मुलांना देण्यात येणाऱ्या सेवांचे अहवाल तयार करणे.
३. योग्य जोडप्यांची यादी आणि लहान मुलांची यादी तयार करणे व अद्यावत ठेवण्यासाठी आरोग्य सेवकाला मदत करणे.
४. कुटुंब कल्याण साहित्य वाटप, तांबी बसविलेल्या स्त्रिया, कुटुंब कल्याण शस्त्रक्रिया करून घेणाऱ्या लाभार्थ्यांची यादी ठेवणे.
५. उपकेंद्र स्तरावर आरोग्य सेवा सत्रात वाटप केलेल्या स्त्रियांची नोंद ठेवणे.
६. आलेले साहित्य व वाटप केलेले साहित्याची नोंदवही ठेवणे.
७. मासिक प्रगती अहवाल तयार करून तो वेळीच आरोग्य सहाय्यकेकडे पाठविणे.

ह) इतर :

१. अंगणवाडीला भेट देवून कुपोषित मुलांची यादी करून मातेला आहाराबाबत आरोग्य शिक्षण देणे.
२. शालेय आरोग्य तपासणीत वै. अ. व आरोग्य सहाय्यक यांना मदत करणे, नविन कुष्ठरोगी शोध मोहिमेत सहभाग घेणे.



APPENDIX II : प्रा.आ.केंद्र व उपकेंद्र पातळीवर ठेवण्यात यावयाच्या नोंदवह्या

विषय : प्रजनन व बाल आरोग्य

प्राथमिक आरोग्य केंद्रातील आणि उपकेंद्रातील आरोग्य सेवक/ आरोग्य सहाय्यक वैद्यकीय अधिकारी यांचे मार्फत आरोग्य कार्यक्रम, मोहिमा आणि सत्रांचे अंतर्गत विविध सेवा जनतेला पुरविल्या जातात. या सेवा पुरविण्यामागे जनतेच्या आरोग्यात सुधारणा करणे हा प्रमुख उद्देश असतो.

आरोग्य सेवा देताना त्याची अचूक नोंद त्या सेवेशी संबधीत नोंदवह्यांमध्ये केल्यास कामाची प्रगती कळते. प्रत्येक कार्यक्रमांतर्गत किती लाभार्थीना सेवा मिळाली आणि किती लाभार्थी शिष्टक आहेत याची माहिती असल्यास त्याप्रमाणे नियोजन करता येते. आरोग्य व्यवस्थापन माहिती अंतर्गत मासिक अहवाल या रजिस्टर्सच्या आधारे तयार करावयाचे आहेत.

आरोग्य सेवा देताना नोंदी करणे म्हणजे कामातील अनावश्यक वाढ नसून आपल्या कामाचाच तो एक भाग आहे. लाभार्थीला सेवा दिल्यानंतर तशी नोंद संबंधीत नोंदवह्यांमध्ये केल्यानंतरच ती सेवा पूर्ण होते हे आपल्या लक्षात असणे महत्त्वाचे आहे. या परिशिष्टात देण्यात आलेल्या नोंदवह्या प्रा.आ. केंद्र आणि उपकेंद्र स्तरावरील आहेत. प्रत्येक नोंदवह्याचा स्तर आणि त्यासाठी जबाबदार कर्मचाऱ्याचे नाव सोबत दिले आहेत.

प्रजनन व बाल आरोग्य कार्यक्रमांतर्गत वापरण्यात यावयाच्या नोंदवह्या आर.या अक्षराने संबोधण्याची पद्धत आहे. हीच पद्धती पुढे चालू ठेवण्यात आली असून आवश्यकतेप्रमाणे आर-१ ते आर-२० नोंदवह्या देण्यात आल्या आहेत. काही जिल्ह्यांमध्ये नोंदवह्यांचे क्रमांक व विषय सध्याचे पद्धतीपेक्षा वेगळे असू शकतात. त्या जिल्ह्यांनी या मॅन्युअलमध्ये दिल्याप्रमाणे नोंदवह्या क्रमांकात बदल करून घ्यावेत. यामुळे राज्यात सर्व जिल्ह्यांमध्ये सारख्या क्रमांकाच्या नोंदवह्या उपलब्ध होतील. इतर राष्ट्रीय कार्यक्रमांतर्गत अनावश्यक असणाऱ्या नोंदवह्याही सोबत दिलेल्या आहेत. परिशिष्टातील सर्व नोंदवह्या आपल्या प्रा.आ. केंद्रात व त्या अंतर्गतच्या सर्व उपकेंद्रात स्तरानुसार उपलब्ध आहेत याची जबाबदारी वैद्यकीय अधिकारी यांची आहे. वैद्यकीय अधिकारी आरोग्य सहाय्यक आणि आरोग्य कर्मचारी यांनी नोंदवह्यांचा उपयोग कार्यक्रम नियोजन, अंमलबजावणी आणि मुल्यमापन यासाठी करावा.

नोंदवही क्र.	नोंदवही	स्तर	जबाबदार कर्मचारी	माहिती आणि उपयोग
आर १	आरोग्य सेवा सत्र नोंदवही	उपकेंद्र/ प्रा.आ.केंद्र	ब.आ.से. (स्त्री) एलएचव्ही	उपकेंद्र द्वारे आरोग्य सेवासत्राचे नियोजन करणे. सेवासत्रात दिलेल्या सेवांची माहिती मिळते.
आर २	उपकेंद्र साठा नोंदवही	उपकेंद्र	ब.आ.से. (स्त्री)	उपकेंद्रात पुरविण्यात येणाऱ्या, कुटुंब कल्याण साधने, लसिकरण साहित्य, औषधे इ. चे साठा व खर्च याची तारीखवार नोंद. कोणत्या औषधांचा किती साठा शिष्टक आहे याची माहिती मिळते.
आर ३	शस्त्रक्रिया लाभार्थी नोंद नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु) कनिष्ठ सहाय्यक	प्रा.आ.केंद्रात, कु.क. शिबीरात आणि प्रा.आ. केंद्र कार्यक्षेत्रातील शासनामन्य खाजगी रुग्णालयांमध्ये झालेल्या शस्त्रक्रियांची माहिती मिळते.
आर ४	तांबी लाभार्थी नोंद नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	प्रा.आ.केंद्रात, उपकेंद्रात व प्रा.आ.केंद्र कार्यक्षेत्रातील शासनामन्य खाजगी रुग्णालयांमध्ये तांबी बसविलेल्या स्त्रियांची नोंद. तांबी वापरणाऱ्या स्त्रियांची वयाप्रमाणे आणि आपल्याप्रमाणे माहिती मिळते.

नॉंदवही क्र.	नॉंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
आर ५	प्रा. आ. केंद्र कार्यक्षेत्रातील योय जोडप्यांच्या कार्यक्षेत्राबाहेर शस्त्रक्रियांची नॉंदवही	प्रा. आ. केंद्र	ब. आ. से. (स्त्री)	प्रा. आ. केंद्र कार्यक्षेत्रातील योय जोडप्यांमधून पुरुष/स्त्री शस्त्रक्रिया प्रा. आ. केंद्र कार्यक्षेत्राबाहेरील शासकीय/खाजगी रुग्णालयात झाल्यास अशा शस्त्रक्रियांची नॉंद. कार्यक्षेत्रात एकुण किती शस्त्रक्रिया झाल्या याची माहिती या व आर-३ वरून काढता येते.
आर ६	गर्भनिरोधक गोळ्या लाभार्थी नॉंदवही	उपकेंद्र	ब. आ. से. (स्त्री)	उपकेंद्र कार्यक्षेत्रातील गर्भनिरोधक गोळ्या घेणाऱ्या सर्व लाभार्थींची नॉंद. ब. आ. से. (पुरुष) यांनी त्यांचे मार्फत दिल्या जाणाऱ्या गर्भनिरोधक गोळ्यांच्या लाभार्थींची यादी तारखांसह ब. आ. से. (स्त्री) यांना द्यावी. या नॉंदवहीचा उपयोग लाभार्थींचे गोळ्या घेण्याचे सातत्य, गुंतागुंत, गोळ्या सुरू करण्याची कारणे इ. माहितीचे विश्लेषण करण्यासाठी केला जातो.
आर ७	निरोध लाभार्थी नॉंदवही	उपकेंद्र	ब. आ. से. (पु)	उपकेंद्र कार्यक्षेत्रातील निरोध घेणाऱ्या सर्व लाभार्थींची नॉंद. ब. आ. से. (स्त्री) यांनी त्यांचे मार्फत दिल्या जाणाऱ्या निरोध लाभार्थींची यादी तारखांसह ब. आ. से. (पु) यांना द्यावी. या रजिस्ट्रारचा उपयोग लाभार्थींचे निरोध वापरण्याचे सातत्य, बंद करण्याची कारणे इ. माहितीचे विश्लेषण करण्यासाठी केला जातो.
आर ८ अ/ब	संदर्भसेवा नॉंद नॉंदवही	प्रा. आ. केंद्र उपकेंद्र	वैद्यकीय अधिकारी ब. आ. से. (स्त्री) ब. आ. से. (पु)	आर-८ अ : महत्वाच्या आजारासाठी संदर्भसेवा उपलब्ध असणाऱ्या रुग्णालयांची माहिती. याचा उपयोग संदर्भसेवा देताना योय रुग्णालय निवडण्यासाठी करावा. आर-८ ब : संदर्भसेवा दिलेला रुग्णाची माहिती. कोणत्या आजारांना संदर्भसेवा दिली जाते याची माहिती मिळते.
आर ९	जिवनविषयक आकडेवारी नॉंदवही	उपकेंद्र	ब. आ. से. (स्त्री)	जन्म, मृत्यू आणि विवाह यांची नॉंद या रजिस्ट्रारमध्ये करण्यात यावी. ब. आ. से. (पु) यांनी त्यांचेकडील जन्म, मृत्यू आणि विवाहासंबंधी माहिती ब. आ. से. (स्त्री) यांना द्यावी. ही माहिती आपल्या कार्यक्षेत्रातील जन्मदर, मृत्यू दर, अर्भक मृत्यू दर काढण्यासाठी उपयोगी आहे. त्याचप्रमाणे योय जोडणी नॉंदवही अद्ययावत करण्यासाठी आहे.
आर १०	दाई कार्य नॉंद नॉंदवही	उपकेंद्र	ब. आ. से. (स्त्री)	कार्यक्षेत्रातील सर्व दाईची नावे, पत्ते इ. माहिती, प्रत्येक दाईने दरमहा केलेल्या बाळंतपणांची संख्या, दाईना देण्यात येणारे बाळंतपणाचे साहीत्य यांची नॉंद या रजिस्ट्रारमध्ये करावी. दाईंकडून होणारी एकुण बाळंतपणे, त्यांचे प्रशिक्षण, किती दाई कार्यरत आहेत याची माहिती या रजिस्ट्रारवरून मिळते.

नॉदवही क्र.	नॉदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
आर ११	आर सी एच साठा नॉदवही	प्रा.आ.केंद्र	एल एच व्ही	आर सी एच कार्यक्रमांतर्गत मिळणारी कु.क. साधने, लोहगोळ्या, निडल, सिरिज इ. (लसी सोडून इतर सर्व) चे साठा रजिस्टर. प्रत्येक बाबीचा निश्चित साठा कळतो.
आर १२	आरोग्य शिक्षण व प्रचार कार्य नॉदवही	प्रा.आ.केंद्र/उपकेंद्र	आरोग्य सहाय्यक (पु) ब.आ.से. (पु)	जिल्हा आरोग्य अधिकारी आणि इतर कार्यालयातून मिळालेल्या आरोग्यशिक्षण साहित्याची नॉद व वाटप याची माहिती तसेच आरोग्य शिक्षणासाठी भरविण्यात येणारी प्रदर्शने, सिनेमा, कॅम्प, गटचर्चा इ. कामाची नॉद व माहिती मिळते.
आर १३	प्रशिक्षण नॉदणी अ, ब, क,	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	(अ) प्रा.आ.केंद्रातील घेण्यात आलेल्या प्रशिक्षणांची माहिती. उपस्थित कर्मचाऱ्यांची संगनिहाय्य आकडेवारी (ब) प्रा.आ.केंद्र कार्यक्षेत्रातील सर्व आरोग्य कर्मचारी, वैद्यकीय अधिकारी यांचे झालेल्या प्रशिक्षणाची नॉद (क) प्रा.आ.केंद्रात पार पडलेल्या प्रशिक्षकांचे हजेरीपत्रक. या रजिस्टर्सचा उपयोग प्रशिक्षणाचे रेकॉर्ड ठेवणे योग्य कर्मचाऱ्यांची प्रशिक्षणासाठी निवड करणे यासाठी होतो.
आर १४	प्रजनन आरोग्य पहाणी नॉदवही	उपकेंद्र	ब.आ.से. (स्त्री)	पत्नीचे वय १५-४४ वर्षे यामध्ये मोडणाऱ्या सर्व जोडप्यांची माहिती या रजिस्टरमध्ये भरण्यात यावी. या रजिस्टरवरून कार्यक्षेत्रातील एकुण जोडपी, ते वापरत असणाऱ्या कुटुंब कल्याण पद्धती, कुटुंब कल्याण साधने/शस्त्रक्रिया करण्यास पात्र जोडपी यांची माहिती मिळते.
आर १५	माता सेवा नॉदवही	उपकेंद्र	ब.आ.से. (स्त्री)	गरोदर माता नॉदणी आणि त्यानंतर दिल्या जाणाऱ्या सेवांची नॉद या नॉदवहीमध्ये करावी. गरोदर मातांना द्यावयाच्या सेवांचे नियोजन या नॉदवहीच्या आधाराने केले जाते. प्रत्येक सेवा देण्यासाठी किती माता शिल्लक राहिल्या आहेत याची यादी आरोग्य सेवा सत्रास जाण्यापूर्वी करावी.
आर १६	०-२ वर्षे बालक सेवा नॉदवही	उपकेंद्र	ब.आ.से. (स्त्री)	जन्मापासून २ वर्षांपर्यंत बालकांना दिल्या जाणाऱ्या सर्व सेवांची नॉद. प्रत्येक बालकाची लसीकरण स्थिती, लसीकरण कधी पूर्ण झाले याची माहिती, त्यासाठीचे नियोजन, लसी द्यावयाच्या बालकांच्या याद्या करणे इ. बाबी या रजिस्टरवरून कळतात. लसीकरण अपूर्ण असणाऱ्या बालकांची नॉदवही केल्यास बरेच बालमृत्यू कळून येतात.
आर १७	२-१६ वर्षे सेवा नॉदवही	उपकेंद्र	ब.आ.से. (स्त्री)	दोन वर्षांहून मोठ्या मुलांच्या सेवांची (जीवनसत्त्व 'अ' द्विगुणी, धुनुवात (१० व १६ वर्ष) नॉद करण्यासाठी या नॉदवहीचा उपयोग होतो.

नॉंदवही क्र.	नॉंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
आर १८ अ ब	शालेय आरोग्य तपासणी नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	आर-१८ अ) कार्यक्षेत्रातील सर्व शाळांची माहीती. शालेय आरोग्य तपासणी कार्यक्रमाचा तपशील. शाळांशी संबंधित सर्व योजना या रजिस्ट्रच्या आधारे राबविता येतील. ब) वर्षाप्रमाणे शालेय आरोग्य कार्यक्रमांमध्ये झालेल्या कामाची नोंद. या रजिस्ट्रच्या आधारे प्रा.आ.केंद्राचा शालेय आरोग्य तपासणी अहवाल तयार करता येतो.
आर १९	महिलांमंडळ, तरुणमंडळ नॉंदवही	उपकेंद्र	ब.आ.से. (स्त्री) ब.आ.से. (पु)	आरोग्याशी संबंधित सेवा, मोहीमा, यासाठीचा प्रचार, जनतेचा सहभाग, आरोग्य शिक्षण तसेच गावपातळीवरील विविध आरोग्य विषयक कार्यक्रमांचे नियोजन, अंमलबजावणी इ. कामांमध्ये मदत करणाऱ्या कार्यक्षेत्रातील सर्व संस्थांची यादी या नॉंदवहीत करावी. या संस्थांच्या मदतीने कार्यक्रमाचे नियोजन, प्रचार इ. करणे सोपे जाते.
आर २०	मासिक दैनंदिनी नॉंदवही	उपकेंद्र/प्रा.आ.केंद्र	सर्व कर्मचाऱ्यांची स्वतंत्र दैनंदिनी असावी	प्रत्येक दिवशी केलेला कामाची नोंद त्या त्या रकान्यात भरावी. महिन्याचे शेवटी रकान्याची उभी बरीज त्या महिन्यात केलेले काम दर्शविते. मासिक दैनंदिनीच्या आधारे उपकेंद्राचा मासिक एम आय एस अहवाल तयार करता येतो.

राष्ट्रीय किटकजन्य आजार नियंत्रण कार्यक्रमान्तर्गत हिवतापाशी संबंधित नोंदवह्या

नोंदवही क्र.	नोंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
एम एफ १	कुटुंब आरोग्य नोंदवही	उपकेंद्र	ब.आ.से. (पु)	गावातील सर्व कुटुंबांची एम क्रमांकानुसार माहिती. प्रथम गावातील सर्व घरांना एम क्रमांक द्यावा व त्यानंतर क्रमांकानुसार घरांची माहिती भरावी.
एम एफ २	रक्तनमुना नोंदणी व अहवाल नोंदवही	उपकेंद्र	ब.आ.से. (पु) (स्त्री) प्रा.आ.केंद्र (मुख्यालय) प्रत्येकाची स्वतंत्र नोंदवही	रक्तनमुना व गृहीतोपचारासह माहिती भरावी. रक्त नमुन्याचा अहवाल पॉझीटिव्ह असल्यास तीही माहिती भरावी. हिवताप संवेक्षणाल केलेल्या दैनंदिन कामाची माहिती या नोंदवहीत नोंदविता येते.
एम एफ ३	आरोग्य सहाय्यक (हिवताप) कार्य नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	आरोग्य सहाय्यक पुरुष यांनी क्षेत्रभेटीच्या वेळी बहुविध आरोग्य सेवकाच्या कामाची पडताळणी केल्याच्या नोंदी या नोंदवहीत असाव्यात. ब.आ.से. व आरोग्य सहाय्यक या दोघांच्याही कामाचे मुख्यमापन या नोंदवहीतून करता येते.
एम एफ ४	मासिक हिवताप कार्य (रक्त नमुने वयानुसार) नोंद वही	प्रा.आ.केंद्र	आरोग्य सहाय्यक	रा.कि.आ.नि.कार्यक्रमांतर्गत प्रा.आ. केंद्रातील एकुण रक्तनमुने व वयानुसार पॉझीटिव्ह केसेस यांची माहिती.
एम एफ ५	मासिक हिवताप कार्य (साथनियंत्रण) नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	प्रा.आ.केंद्र कार्यक्षेत्रात रुग्ण हिवताप पॉझीटिव्ह आल्यानंतर नियंत्रण कार्यवाहीची नोंद या नोंदवहीत करावी. यामुळे नियंत्रण कार्याची गुणवत्ता कळते.
एम एफ ६	हिवताप रुग्ण नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	प्रा.आ.केंद्र कार्यक्षेत्रातील पॉझीटिव्ह रुग्णास दिलेल्या सेवांची माहिती. रक्तनमुना घेतल्यापासून किती दिवसात तपासला/समुळ उपचार दिला याची माहिती या नोंदवहीतून मिळते. समुळ उपचाराची गुणवत्ता या नोंदवहीतून कळते.
एम एफ ७	ताप उपचार केंद्र नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	कार्यक्षेत्रातील एफटीडी/डीडीसी यांचा अहवाल नोंदविण्याचे रजिस्टर

इतर नोंदवह्या

नोंदवही क्र	नोंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
१	क्षयरोग नोंदवही	उपकेंद्र/प्रा.आ.केंद्र	ब.आ.से.(पु) / मिश्रक	अ) क्षयरोग संशयीत रुग्ण माहिती - ३ आठवड्यांपेक्षा जास्त दिवस ताप व खोकला असणाऱ्या कार्यक्षेत्रातील सर्व रुग्णांची माहिती या नोंदवहीत असावी. संशयीत क्षयरुग्णांची संख्या आणि त्यांना देण्यात आलेल्या सेवा याबाबी या नोंदीद्वारे तपासता येतात. ब) क्षयरोग नियमित उपचार नोंदवही. क्षयरोगाचे निदान झालेल्या रुग्णांच्या डॉट्स उपचाराची माहिती या नोंदवहीमध्ये असावी.
२	कुष्ठरोग नोंदवही	अ) उपकेंद्र ब) प्रा.आ.केंद्र	ब.आ.से.(पु) मिश्रक	अ) संशयीत कुष्ठरुग्ण माहिती - कातडीवर संवेदना कमी असणाऱ्या कार्यक्षेत्रातील संशयीत कुष्ठरुग्णांची यादी करण्यात यावी. ब) कुष्ठरुग्ण नियमित उपचार नोंदवही - प्रत्येक कुष्ठरुग्णास देण्यात आलेल्या उपचारांची माहिती या रजिस्टरमध्ये असावी.
३	अंधत्व नियंत्रण कार्य नोंदवही	उपकेंद्र / प्रा.आ.केंद्र	ब.आ.से.(पु) आरोग्य सहाय्यक (पु)	अ) ६/६० पेक्षा कमी दिसत असणाऱ्या सर्व व्यक्तींची नोंद या नोंदवहीत ठेवावी. अंधव्यक्तीच्या पुढील उपचारांचे नियोजनासाठी या नोंदवहीचा उपयोग होतो. ब) मोतीबिंदू उपचार नोंदवही - प्रा.आ.केंद्र कार्यक्षेत्रात असणारे एकुण संशयीत मोतीबिंदू रुग्ण व त्यांचेवर करण्यात आलेला शस्त्रक्रिया यांची माहिती या नोंदवहीत करण्यात यावी.
४	ग्रामपंचायत निहाय पाणी स्रोतांची नोंद अ, ब	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	अ) प्रा.आ.केंद्र कार्यक्षेत्रातील प्रत्येक ग्रामपंचायतीअंतर्गत असणारे वापरातील एकुण स्रोत, स्रोताचा प्रकार आणि त्यावर अवलंबून असणारी लोकसंख्या ही माहिती या नोंदवहीतून मिळते. पाणी शुद्धीकरणासाठी जास्त लक्ष द्याव्याची गावे या माहितीतून ओळखता येतात. ब) गाववार पाणी शुद्धीकरणास जबाबदार असणाऱ्या कर्मचाऱ्यांची माहिती.
५	पाणी नमुने तपासणी आणि ओ.टी. टेस्ट नोंदवही	उपकेंद्र प्रा.आ.केंद्र	ब.आ.से.(पु) आरोग्य सहाय्यक (पु)	प्रत्येक उद्भवणाऱ्या पाणी शुद्धीकरणाची माहिती या नोंदवहीमध्ये मिळते. वापरात असणाऱ्या प्रत्येक उद्भवणाऱ्या स्रोताची स्वतंत्र पान असावे. ओ.टी. निगोटीनह असणाऱ्या ग्रामपंचायतीस लोचच पाणी शुद्धीकरणाबाबत कळवा. लाल, हिरवे प्रमाणपत्र देताना या नोंदीचा उपयोग करावा. सलग तीन महिने ओ.टी. निगोटीनह असल्यास जि.आ.अ. यांना अशापत्राने कळवावे.

नोंदवही क्र.	नोंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
६	पाणी नमुने तपासणी नोंदवही	उपकेंद्र	ब.आ.से. (पु) आरोग्य सहाय्यक (पु)	पिंप्याच्या पाण्याच्या गुणवत्तेची माहिती या नोंदवहीमध्ये मिळते. पाणी नमुना दुषित आल्यास त्वरीत गावास भेट द्यावी. पाणी योजनेची पहाणी करून पाणी नमुना दुषित असल्याच्या कारणांसह ग्रामपंचायतीस लेखी कळवावे. ग्रामपंचायतीने त्यावर कार्यवाही न केल्यास प्रथम गटविकास अधिकारी व त्यानंतर जि.आ.अ. यांना कळवावे. कार्यवाही होईपर्यंत ग्रामपंचायतीस प्रत्येक आठवड्यास एक स्मरणपत्र पाठवून त्याची प्रत गटविकास अधिकारी यांना द्यावी.
७	पाणी पुरवठा योजना सर्वेक्षण नोंदवही	प्रा.आ.केंद्र	वैद्यकीय अधिकारी आरोग्य सहाय्यक (पु)	वर्षातून एकदा ऑक्टोबर नोव्हेंबर महिन्यात पाणीपुरवठा योजनेचे सर्वेक्षण करून या संबंधीत लाल किंवा हिरवे कार्ड ग्रामपंचायतीस देण्यात यावे. लाल कार्ड दिलेल्या ग्रामपंचायत पाणीपुरवठा योजनेची पुनर्तपासणी पावसाळ्यापूर्वी करून पुन्हा पाणीपुरवठ्याच्या स्थितीनुसार कार्ड देण्यात यावे.



प्रा.आ.केंद्र स्तरावरील नोंदवह्या

नोंदवही क्र.	नोंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
१	बाह्य रुग्ण नोंदवही	प्रा.आ.केंद्र	मिश्रक	बाह्य रुग्णांची नोंद. आजाराच्या निदानाची नोंद करावी. दैनिक गोपवारा आवश्यक. बाह्य रुग्ण विभागात आलेल्या एवढ्या रुग्णांची आजारांनुसार माहिती मिळते.
२	दैनिक औषध खर्च नोंद	प्रा.आ.केंद्र	मिश्रक	प्रत्येक रुग्णास दिलेल्या औषधे व गोळ्यांची केस पेपर क्रमांकांनुसार नोंद. या नोंदवहीच्या मदतीने औषधांचा दैनंदिन खर्च काढता येतो.
३	औषधासाठी नोंदवही	प्रा.आ.केंद्र	मिश्रक	प्रा.आ.केंद्रास मिळालेली सर्व औषधे या रजिस्ट्ररमध्ये नोंदविण्यात यावीत. दैनंदिन वापरासाठी भांडारातून देण्यात येणाऱ्या औषधांची नोंद रजिस्ट्ररमध्ये केल्याशिवाय औषधे भांडाराबाहेर काढू नयेत. प्रत्येक औषधांचा किती साठा शिल्लक आहे हे या रजिस्ट्ररवरून कळते.
४	औषधे मुदतबाह्यनोंदवही	प्रा.आ.केंद्र	मिश्रक	प्रा.आ.केंद्रात प्राप्त झालेल्या प्रत्येक औषधाची मुदतीप्रमाणे नोंद या रजिस्ट्ररमध्ये करावी. औषधे मुदतीत संपतील यासाठी दक्ष रहाण्याची जबाबदारी वै. अ. आणि मिश्रक यांची आहे. प्रत्येक तीन महिन्यांनी सर्व औषधांचा आढावा घ्यावा आणि तीन महिन्यांचे आतील मुदतीची औषधे संपण्याची शक्यता नसल्यास जि.आ.अ. यांचे परवानगीने नजिकचा प्रा.आ.केंद्रास द्यावीत.
५	ऑटोक्लेव्ह नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	ऑटोक्लेव्ह लावण्याची वेळ. प्रेशर चालू व बंद करण्याची वेळ नमुद करावी. प्रत्येक ड्रूमच्याबाहेरील बाजूला लावलेली Signaloc Strip आउटर रजिस्ट्रर चिकटवावी. प्रा.आ.केंद्रात वापरावयाच्या ड्रूमची आतील स्टीपही याच रजिस्ट्रर चिकटवावी.
६	शस्त्रक्रिया गृह निर्जंतुकीकरण नोंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	या नोंदवहीत शस्त्रक्रिया गृहाची लांबी, रुंदी आणि उंची त्यानुसार फॉर्मेलीन, पोटॅशियम परमँगनेटचा ड्रेस, प्युमिगेशन कधी केले, वेळ इ. माहिती असावी. शस्त्रक्रियागृहाच्या निर्जंतुकीकरणाची नियमितता या नोंदवहीतून पहाता येईल.

नॉंदवही क्र.	नॉंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
७	आयएलआर, डीप फ्रिजर तापमान नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	प्रा.आ.केंद्रातील आयएलआर व डीप फ्रिजरचे तापमान दररोज दोन वेळा सकाळी १० व दुपारी ४ वाजता पहाण्यात यावे व त्याची नॉंद या रजिस्टरमध्ये करावी. दररोज हे रजिस्टर त्याच वेळेत भरले गेले याची खात्री वै. अ. नी केली पाहिजे.
८	आर.सी.एच. साठा नॉंदवही	प्रा.आ.केंद्र/ उपकेंद्र	आरोग्य सहाय्यक (स्त्री) ब.आ.से. (स्त्री)	आर.सी.एच. कार्यक्रमांतर्गत पुरविण्यात येणारे निरोध, ओरलपील, कॉपटी, व्हिटॅमीन-ए, लोहगोळ्या, कीट्स इ. साहित्याची नॉंद या नॉंदवहीत करावी. या नॉंदवहीच्या मदतीने या साधनांचा एकुण खर्च, शिष्टक, दिलेल्या साठ्याच्या प्रमाणात कामाचा अहवाल आहे का याची तुलना इ. बाबी तपसणे सोपे जाते.
९	लस साठा नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	प्रा.आ.केंद्रास दरमहा प्राप्त होणाऱ्या, वापरलेल्या लसींची लसनिहाय माहिती या नॉंदवहीत ठेवावी. या नॉंदवहीच्या मदतीने लसींचा वापर, लागणाऱ्या लसींची संख्या इत्यादी माहिती काढता येते.
१०	आंतर रुग्ण नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री)	प्रा.आ.केंद्रात भरती झालेल्या सर्व रुग्णांची (कु.क. शस्त्रक्रिया रुग्णांसह) नॉंद या नॉंदवहीमध्ये करावी.
११	कर्मचारी निहाय कार्य (एमआयएस) नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (स्त्री) (पु)	एमआयएस सभेच्या वेळी सर्व क्षेत्रीय कर्मचाऱ्यांनी केलेल्या कामाची नॉंद कार्यक्रमानुसार करण्यात यावी. या नॉंदवहीच्या मदतीने प्रा.आ.केंद्राचा एमआयएस अहवाल तयार होईल.
१२	क्रिटीकल इंडिकेटर नॉंदवही	प्रा.आ.केंद्र	वैद्यकीय अधिकारी	प्रा.आ.केंद्रातील कामकाजाच्या दृष्टीने प्रत्येक राष्ट्रीय कार्यक्रमातील अत्यंत महत्वाचे इंडिकेटर्स वै. अ. यांनी पहाणे आवश्यक आहे. या इंडिकेटर्सची नॉंद स्वतः वै. अ. यांनी करावी. या रजिस्टरच्या मदतीने मासिक सभा घेण्यात यावी.
१३	प्रशासन नॉंद नॉंदवही	प्रा.आ.केंद्र	आरोग्य सहाय्यक (पु)	प्रा.आ.केंद्रात दिली जाणारी सर्व मोड्युल्य, प्रशिक्षण पुरविका, आरोग्य शिक्षण साहित्य यांची एक प्रत प्रशासनात ठेवावी. त्याची नॉंद या नॉंदवहीत करावी.

नोंदवही क्र.	नोंदवहीचे नाव	स्तर	तपशील आणि उपयोग
१४	सभा इतिवृत्त नोंदवही	कनिष्ठ सहाय्यक	प्रा.आ.केंद्रात घेतल्या जाणाऱ्या प्रत्येक सभेतील झालेली चर्चा व निर्णयांची नोंद या रजिस्ट्रमध्ये करण्यात यावी. सुरुवातीला हजर असलेला सर्व अधिकारी कर्मचाऱ्यांची यादी व स्वाक्षरी घ्यावी व त्यानंतर सभेचे इतिवृत्त लिहावे.
१५	वैद्यकीय अधिकारी सभा नोंदवही	वैद्यकीय अधिकारी	तालुका व जिल्हा स्तरावर आयोजित करण्यात आलेल्या सर्व सभा, नोंदी व सूचना वैद्यकीय अधिकार्यांनी या रजिस्ट्रमध्ये कराव्यात. तालुका व जिल्हा स्तरावरील सभेसाठी जाताना वैद्यकीय अधिकारी यांनी हे एकत्र रजिस्ट्र न चुकता प्रत्येकवेळी न्यावे. प्रा.आ.केंद्रातील सभा घेताना तालुका व जिल्हास्तरीय सभामधील सूचना कर्मचाऱ्यांना कळविण्यास आणि त्याप्रमाणे नियोजन करण्यास या रजिस्ट्रचा उपयोग होतो.
१६	दैनंदिन हजेरी पत्रक	कनिष्ठ सहाय्यक	जिल्हा आरोग्य अधिकारी यांचे मार्फत हजेरीपत्रक पुरविण्यात येते. वैद्यकीय अधिकारी यांनी दररोज सकाळी कार्यालयात आल्यानंतर सर्वप्रथम हजेरीपत्रक पाहून सर्व कर्मचारी हजर असल्याची व कर्मचाऱ्यांनी वेळेत आल्याची खात्री करून मगच कामकाजाला सुरुवात करावी.
१७	हालचाल नोंदवही	कनिष्ठ सहाय्यक	प्रा.आ.केंद्रातील कर्मचारी कोणत्याही कामासाठी बाहेर पडल्यास त्याची नोंद कामाच्या कारणासह या रजिस्ट्रमध्ये करावी.
१८	आवक/जावक नोंदवही	कनिष्ठ लिपिक	प्रा.आ.केंद्रात येणारे प्रत्येक टपाल तारीखवार नोंदवून त्यावर आवक क्र. टाकणे. आवश्यक आहे. त्याचप्रमाणे प्रा.आ.केंद्रातून पाठवावयाच्या सर्व पत्रांना (अशापत्रासह) जावक क्रमांक देणे आवश्यक आहे.
१९	शेरा नोंदवही	वैद्यकीय अधिकारी	वरिष्ठ अधिकारी/पदाधिकारी किंवा शासकीय पाहुणे प्रा.आ.केंद्रास भेट देतात त्या वेळी त्यांच्या सूचना, प्रतिक्रिया शेरा नोंदवहीमध्ये नोंदविल्या जाव्यात. या सूचनांवर लगेचच कार्यवाही करून त्याबाबत लेखी अहवाल जिल्हा आरोग्य अधिकारी यांना पाठवावा.

प्रा.आ.केंद्रात ठेवावयाच्या प्रशासकीय फाईल्स

क्र.	फाईलचे नाव	स्तर	तपशील आणि उपयोग
१	स्टॅडींग ऑर्डर फाईल	कनिष्ठ सहाय्यक	प्रा.आ.केंद्र कामकाजासंबंधीच्या सूचना, नियम आणि शासनपरिपत्रके यामध्ये असावीत. दैनंदिन कामकाजात अडचण आल्यास या फाईलचा उपयोग होतो.
२	शासन निर्णय फाईल	कनिष्ठ सहाय्यक	वेळोवेळी नियालेल्या विविध विभागांच्या शासननिर्णयांची स्वतंत्र फाईल करावी.
३	कर्मचारी वैयक्तिक फाईल	कनिष्ठ सहाय्यक	सर्व कर्मचाऱ्यांच्या वैयक्तिक फाईल्स ठेवण्यात याव्यात. कर्मचाऱ्याचे कामकाज, प्रशासकीय पत्रव्यवहार, ज्ञापने इ. त्या फाईल्समध्ये ठेवावेत.
४	विषयवार टपाल फाईल्स	विषयाप्रमाणे अधिकारी/कर्मचारी	वैयक्तिक अधिकार्यांनी येणाऱ्या टपालावर विषयाशी संबंधित कर्मचाऱ्यास स्पष्ट सूचना द्याव्यात. संबंधित कर्मचाऱ्यांनी सुचनाप्रमाणे प्रत्येक विषयाची स्वतंत्र फाईल ठेवून विषयासंदर्भात चर्चेचे वेळी पूर्ण फाईल दाखवावी.
५	मोहीम फाईल्स	विषयाप्रमाणे अधिकारी/कर्मचारी	प्रा.आ.केंद्रात वेगवेगळ्या मोहीमा राबविल्या जातात. मोहीमेसंबंधी सुचना येताच फाईल तयार करावी. त्यामध्ये प्रा.आ.केंद्राची माहिती, मसुदाबळ, मोहीमेची कृतियोजना, जबाबदाऱ्या इ. माहिती व त्यानंतर जिल्हास्तरावरून आलेली पत्रे अशी माहिती असावी.
६	पाणीपुरवठा फाईल	आरोग्य सहाय्यक (पु)	प्रत्येक ग्रामपंचायतीनुसार पाणी पुरवठ्याची स्वतंत्र फाईल ठेवावी. त्यामुळे संबंधित ग्रामपंचायतीत दिलेले कार्ड, पाणी तपासणी निष्कर्ष पत्र, व इतर पत्रव्यवहार असावा.

लेखा विषयक मार्गदर्शक बाबी

वैद्यकीय अधिकारी हा त्या प्राथमिक आरोग्य केंद्राचा प्रमुख असून प्रशासकीय व आर्थिक बाबींवर प्रमुख नियंत्रक म्हणून त्यांना काम पहावे लागते. लेखाविषयक अनियमितता झाल्यास त्यांना जबाबदार धरले जाते. त्यामुळे प्रत्येक लेखाविषयक कागदपत्रावर सही करताना समजावून घेवून व विचारविनीमय करून स्वाक्षरी करावी. यासाठी आवश्यकता वाटल्यास अनुषंगी वैद्यकीय अधिकारी किंवा गटविकास अधिकारी यांचा सल्ला घ्यावा.

नॉंदवही क्र.	नॉंदवहीचे नाव	नमुना	तपशील आणि उपयोग
१	रोकड नॉंदवही	पेटी कॅश बुक, नमुना क्रमांक. ४	म जि प व पं स लेखा संहिता १९६८ नियम ४२ नमुना क्रमांक ४ मध्ये ठेवणे आवश्यक आहे. रोकड नॉंदवहीत सर्व रोख व्यवहारांची नॉंद रोजच्या रोज करणे आवश्यक आहे. तसेच दररोज रोकड वहीला असलेली शिल्लक रकम व हातावरील शिल्लक रकम ही बरोबर आहे किंवा नाही हे तपासले पाहिजे. प्राथमिक आरोग्य केंद्रात दररोज जमा झालेल्या सर्व रकमांची नॉंद रोकडवहीच्या जमा बाजूला केली पाहिजे.
२	पावती पुस्तक	नमुना क्रमांक. १०	१. वसुल केलेल्या रकमेची पावती देण्यासाठी २. जिल्हा परिषदेचा शिक्षा असणे आवश्यक आहे. ३. पावत्या बरोबर असल्याचा दाखला शेवटच्या पानावर नॉंदवावा.
३	धनादेश स्विकृती नॉंदवही	नमुना क्रमांक ११	१. प्रा. आ. केंद्रास प्राप्त झालेल्या सर्व धनादेशांची नॉंद ठेवणे आवश्यक (म.जि.प.व पं.सं लेखा संहिता १९६८ नियम क्र. ५०) २. धनादेशाची रकम काढली/भरणा केला या प्रमाणे नॉंदी घेवून महिना अखेरीस प्राप्त चेक चा आढावा घेणे आवश्यक आहे.
४	बँकेचे चलन		१. बँकित रकम भरतांना अधिकृत चलनाचे नमुना फॉर्ममध्ये भरणे २. चलनामध्ये भरणा करावयाच्या रकमेचा तपशील व हिशोबाचे सदर ही महत्वाची सदरे असतात. ३. बाह्य रुपण फीचा भरणा कोषागारांमध्येच शासकीय सदरी भरणे.
५	जमा व खर्चाच्या नॉंदवह्या	नमुना क्र. १३ व १४	म.जि.प. व पं. स. लेखा संहिता १९६८ मधील नियम ५५ व ७८ अन्वये प्रा.आ. केंद्रांमध्ये जमा होणाऱ्या व खर्च होणाऱ्या रकमांची तपशीलवार नॉंद वेगवेगळ्या हिशोब सदरात नॉंदविणे, जेणे करून प्रत्येक हिशोब सदरात जमा व खर्च झालेला तपशील अंदाजपत्रकासाठी व खर्चावर नियंत्रण ठेवणेसाठी तसेच इतर माहितीसाठी उपलब्ध होतो.

नॉंदवही क्र.	नॉंदवहीचे नाव	नमुना	तपशील आणि उपयोग
६	सादीलवार खर्च नॉंदवही	नमुना क्र. ३०	- म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ८१ अन्वये प्रा.आ.केंद्रातील आकस्मीत खर्चाची नॉंदवही ठेवणे आवश्यक आहे. - आकस्मीत देयकांच्या नॉंदीवर वैद्यकीय अधिकारी यांनी सदरच्या नॉंदीवर अद्याक्षरीत करणे. - पोस्टेज, दूरध्वनी, इंधन, दुरुस्ती, औषधे इत्यादीवर करावयाचा खर्च स्वतंत्रपणे नॉंदविणे. म्हणजे सादीलवार खर्चाचे तलुदीचे नियंत्रण करणे सोईचे होवुन अंदाजपत्रके तयार करतांना त्याचा उपयोग होतो.
७	जंगम मालमत्ता नॉंदवही	नमुना क्र. ३२	म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ९० अन्वये प्रा.आ.केंद्रासाठी उपलब्ध असलेले व नवीन येणारे फर्निचर, साहित्य, मशिनरी या वस्तुचा डेडस्टॉक म्हणुन अंतर्भाव होतो. अशा सर्व वस्तुंची किंमत, संख्या या बाबत अद्यावत नॉंदी घेवुन वैद्यकीय अधिकारी यांनी अद्याक्षरीत करणे. जून महिन्यात त्याची तपासणी करून बरोबर असल्याचा दाखला नॉंदविणे.
८	साठा नॉंदवही	नमुना क्र. ३३	- म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ९ अन्वये साठा नॉंदवही ठेवणे गरजेचे आहे. प्रा.आ.केंद्रामध्ये प्राप्त होणाऱ्या सर्व प्रकारच्या साठ्याची औषधे, स्टेशनरी, साहीत्य इ. वस्तुंची तपशीलवार नॉंद सदरच्या नॉंदवहीत घेणे. - दरवर्षी मागील वर्षाची शिल्लक जमेस घेवुन त्या वर्षातील खरेदी व वाटप दाखवून अखेरची शिल्लक दाखविणे. - प्रत्येक नॉंदीवर देणाऱ्याची व घेणाऱ्याची स्वाक्षरी घेऊन शिल्लक काढणे. - वैद्यकीय अधिकारी यांनी किमान ६ महिन्यातून एकदा साठा तपासून त्या प्रमाणे दाखला नॉंदविणे. - सदरची नॉंदवही महत्वाची असल्याने त्यावर नॉंदी अद्यावत असणे आवश्यक आहे.
९	विद्युत वापर नॉंदवही	नमुना क्र. ३४	- प्राथमिक आरोग्य केंद्रातील विजेचे वापराचे बील तपासणेसाठी मिटरप्रमाणे अद्यावत नॉंदी त्या नॉंदवहीत घेणे. - विजेची बीले अदा करतांना म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ९२ अन्वये नॉंदवहीत बीज वापराची पडताळणी करणे.
१०	पेट्रोल व डिझेल वाटा नॉंदवही	नमुना क्र. ३५ व ३६	म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ९३ अन्वये या आ.केंद्रातील वातनासाठी खर्चीक वीज व वातनाच्या पेट्रोल/डिझेलची बीलां बाबती तीस तपस अद्यावत नॉंदी घेणे.

नॉंदवही क्र.	नॉंदवहीचे नाव	स्तर	जबाबदार कर्मचारी	तपशील आणि उपयोग
११	वाहनाची तपशील नॉंदवही व इतिहास नॉंदवही (हिस्ट्रीशीट्स)	नमुना क्र. ३७ व ३८		- म.जि.प. व पं.स. संहिता १९६८ मधील नियम ९४-९५ अन्वये वाहनाच्या वापराची किलोमिटर प्रमाणे दैनंदिन नॉंद करणे. - पेट्रोल, डिझेल, ऑईल ची नॉंद घेणे, मासिक गोषवारा काढणे. तसेच सर्व दुरुस्तीच्या नॉंदी इतिहास नॉंदवहीत घेऊन वैद्यकीय अधिकारी यांनी साक्षात्कीत करणे. - केंद्रामधील वाहनांची तपशीलवार नॉंद. खरेदी, मेक, चेसीज नंबर, विमा, दुरुस्ती किंमत इ. तपशीलवार इतिहास नॉंदवहीमध्ये भरणे. त्यामुळे वाहनांची संपूर्ण माहिती सत्वर प्राप्त होते.
१२	स्थावर व जंगम मालमत्ता नॉंदवही	नमुना नं. ३९		म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ९७ अन्वये प्रा.आ.केंद्रासाठी प्राप्त झालेल्या इमारती, जमिनी यांच्या नॉंदी सदाच्या नॉंदवहीत ठेवणे आवश्यक आहे. त्यामुळे जागत होणारे अतिक्रमण व जागेच्या वापरासाठी, दुरुस्तीसाठी, आवश्यक असणारी माहिती मिळू शकते.
१३	तसलमात नॉंदवही	नमुना नं. ७९		म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम २०८ अन्वये कर्मचाऱ्यांना वैयक्तिक रित्या दिल्या जाणाऱ्या वेतन अग्रीम, प्रवास अग्रीम, सण अग्रीम, घराबांधणी अग्रीम इत्यादी बाबतचे पॅमेंट व पगपातून वसुल केलेल्या रकमांचा तपशील त्यात नॉंदवावा. त्यामुळे अग्रीम वसुलीवर नियंत्रण ठेवता येते. कर्मचाऱ्यांची एका ठिकाणाहून दुसऱ्या ठिकाणी बदली झाल्यास त्या अनुषंगाने वसुलीसाठी पत्रव्यवहार करणे सोईचे जाते.
१४	दूधधनी नॉंदवही	नमुना क्र. ९१		म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ४७ अन्वये ज्या प्राथमिक आरोग्य केंद्रात दूधधनी उपलब्ध आहेत अशा ठिकाणी दूधधनी नॉंदवही ठेवावी. त्यावर व्यवस्थित नियंत्रण ठेऊन त्याचा वापर शासकीय कामासाठीच केला जाईल या बदल दक्षता घ्यावी. कोणालाही परवानगी शिवाय दूधधनी करू देऊ नये. खाजगी दूधधनी केल्यास ती रकम वसुल करून शासकीय सदरी भरणे करावी.
१५	बिल नॉंदवही	नमुना क्र. १२		म.जि.प. व पं.स. लेखा संहिता १९६८ मधील नियम ५१ अन्वये प्रा.आ.केंद्रातील बिलांची नॉंद करणेसाठी बिल रजिस्टर ठेवणे. त्यामधील सर्व रकमे पूर्ण करून गोषवारा काढणे.

प्राथमिक आरोग्य केंद्र / उपकेंद्र येथे आवश्यक लेखाविवरण रजिस्टर्स

अ.क्र.	नमुना क्र.	नोंदवहीचे नांव	नियम
१	१	साठा नोंदवही (पावती/चेक)	११ व २६
२	२	बँकेचे चलन	१३
३	४	रोकड नोंदवही	४२/५०/५७
४	५	वैयक्तिक सुरक्षिता लेख (जामिन कदबा)	४३
५	६	सुरक्षितता लेख नोंदवही (जामिन कदबा)	४३
६	१०	पावती पुस्तक	५०
७	११	धनादेश स्वीकृती नोंदवही	५०
८	१२	बिल रजिस्टर्स	५१
९	१३	जमेची नोंदवही	५५
१०	१४	खर्चाची नोंदवही	५८ व ६०
११	३०	सादिलवार खर्च नोंदवही	८०
१२	३२	जंगम मालमत्ता नोंदवही	९०
१३	३३	साठा नोंदवही	९१
१४	३४	विद्युत वापर नोंदवही	९२
१५	३६	पेट्रोल/डिझेल साठा नोंदवही	९४
१६	३८	वाहनाचे तपशिल नोंदवही	९४-९५
१७	३९	रबावर जंगम मालमत्ता नोंदवही	९७
१८	४१	तलासगत नोंदवही	९८
१९	४२	सुरक्षा नोंदवही	१०१

APPENDIX III

MLC- CERTIFICATES/REGISTER-FORMATS

1. SICKNESS CERTIFICATE

This is to certify that, I have examined Mr./Ms. _____ aged about _____ bearing the following identification marks this day _____ & I find that s/he is suffering from _____ S/he is advised to take rest for a period of _____ w.e.f. _____.

Identification Marks: - 1.

2.

Signature/Thumb impression

Place

Date -

Signature & registration
number of doctor

2. AGE CERTIFICATE

This is to certify that, Shri/Smt. _____ was examined by me for employment / school. His/her age according to his/her own/parents statement is _____ years and by appearance about _____ years. His/her date of birth as per his/her own / parents statement is _____

Mark of identification 1.

2.

Thumb impression of left hand of the candidate

Signature of Medical Officer

3. INJURY CERTIFICATE

Name _____ Age _____ Sex _____

Address _____

Police station _____ Date of examination _____ Time _____

Police accompanying Name _____ No. _____

Name of injury i.e. cut, bruise or burn etc.	Size of each injury in cm (length, breadth, depth)	On what part of the body inflicted	Whether simple or grievous	By what kind of weapon inflicted	Age of injury	Remarks

Identification marks 1.

2.

Date

Place

Outward no. of PHC

Signature of the doctor
(Designation)

4. CERTIFICATE OF DRUNKENNESS - FORM A

Certificate by registered medical practitioner _____
 Serial No. _____ Name of Hosp/PHC _____ Certified that Shri/Smt/
 Kum _____
 of _____ was brought to this hospital by _____
 (Name & designation of the officer) on dt. _____ at _____ a.m./p.m. & was examined by me on dt
 _____ at _____
 A clinical examination of the above-mentioned person disclosed following-
 Age _____ Weight - _____
 Breath: _____ Smelling / not Smelling of alcohol
 Speech: _____ Incoherent /normal
 Gait: _____ Unsteady / steady
 Pupil: _____ Dilated /normal.
 Additional remarks if any _____
 I find that above named person has consumed alcohol/not consumed alcohol. I also find that he is/ is not under the influence of
 alcohol.
 (N .B. - Blood from the body of above named was/was not collected by me for chemical examination & handed over to PC/HC
 no. _____ on _____
 Date _____ Time _____ a.m./p.m.

Signature/ thumb impression of the person examined.

Marks of identification of the person examined

(Signature)

(Designation)

In case he refuses to give his signature - thumb impression

5. RECORD OF DYING DECLARATION

Statement made by Mr./ Mrs./ Miss _____
 Age _____ Reg. No. _____ Address _____
 who is brought to the casualty of _____ Hospital on _____
 with the history of _____
 I Dr. _____ in the capacity of _____ a
 ttending the deceased declare that, the following statements were given by _____
 _____ and the declarant was of compos mentis throughout the process of taking down the dying
 declaration.
 Date _____ Time _____
 Name of doctor _____
 Designation _____

The statement of the deceased:

Signature of the doctor _____

Designation _____

The dying declaration has been given in the presence of witness

1. _____ Signature _____

2. _____ Signature _____

FORMATS OF THE IMPORTANT MLC REGISTERS

I. Register for information given to the police

No.	Name of Patient	Age	Sex	Address	Name & designation of informing police officer	Buckle number	Date	Time	Sign of MO

II. MLC register

No.	Date	Time	Name of patient	Age	Sex	Address	Brought by self / relative / police	Particulars of injuries	Source of weapon	Age of injury	Nature	Remarks

III. Patients brought already dead to hospital

No	Name	Age	Sex	Time & date of receipt	Who brought the body	Address

IV. MLC court call register

No	Name of MO called	Name of the Court	Date & time of hearing	Name & register number of the case

APPENDIX IV - IMPORTANT MEDICINES

Sr No	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
A ANTIBACTERIAL DRUGS						
1	Amoxycillin (Tablets / Capsules, Oral Suspension powder)	GIT Inf:- typhoid, gall bladder infection, tonsillitis RS:- Bronchitis, otitis media, pneumonia, sinusitis, whooping cough Urinary tract infection	Adults : Children > 12 yrs - 500 gm. 3 times daily (in severe infections up to 1.5 gm. 6 hrly) < 6 months - 10-20 mg per kg. 8 hrly 1/2-2 yrs. - 125-250 mg. 3 times daily 3-6 yrs - 250 mg. 3 times daily 7-12 yrs - 250-500 mg. 3 times daily Duration : 7 Days	- Allergy - Hypersensitivity - GI upset	- Hypersensitivity to Penicillins - Special precautions infectious mononucleosis	Oral Suspension should be used only for small children. - For children calculate dose carefully according to body weight.
2	Ampicillin 500 mg powder for injection	Parenteral Ampicillin used for severe infections e.g. Meningitis, septicemia, shigellosis, typhoid fever, UTI, Skin & soft tissue infection and Respiratory infection	Adults & Children >12 yrs: 1-1.5 gm. 4 times daily < 6 months: 25-40 mg./kg. 6 hrly. 1/2-2 yrs: 250 mg. 3-4 times daily 3-6 yrs: 500 mg. 3-4 times daily 7-12 yrs: 750 mg. 3-4 times daily			- Storage of prepared solution - 12 hrs at room temp or 24 hrs at 2-8°C
3	Benzathine penicillin 1.8gm. powder (2.4 million IU) in 5-ml. vial.	Rheumatic Fever (Prophylaxis) Syphilis	For RF - 0.9 gm (1.2 million IU) every 4 weeks (For patients < 27 kg half the dose) For Syphilis *2.4 Mu 1 dose ** 2.4 mu at 7 days interval for 3 days	Allergic reaction	Hypersensitivity	Administer by deep IM injection, when injections are repeated change site.
4	Cloxacillin cap 250, 500 mg, 500 mg, powder for injection. - Dissolve in water for injection oral suspension.	- Abscesses, osteomyelitis, septicemia - Burns - Pneumonia - Penicillin resistant staphylococcal infection.	Adults & Children > 12 yrs: 0.5 - 1 gm daily in 3-4 divided doses. Up to 25 mg/kg. 6 hrly Children: < 12 yrs: 250 mg 4 times daily Duration: 7-10 days	Allergic reaction		
B TETRACYCLINES						
1	Doxycycline tab 100 mg	Cholera, Urethral discharge, Rickettsia, Chlamydia, Mycoplasma, Spirochetes,	Adults: Start with 2 tab of 100 mg. on day 1 & then 1 tab once a day. Duration: 5-10 days	Abdominal discomfort, Diarrhea Nausea, vomiting,	Pregnant women Lactating women Children < 12 years	

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side Effects	Contraindications	Remarks
		Clostridium, Entamoeba, Plasmodia	Children: 2mg/kg daily.	Intolerance, Yellow staining of teeth.	Impaired liver function	
2	Tetracycline cap/tab 250 mg.	Cholera, Plague, - Bacillary dysentery, UTI, Leptospirosis H. Ducreyi	- 1 cap/tab of 250 mg. 3-4 times daily (1-2 gm./day) Children 9-12 yrs: 25-40 mg/kg daily in divided doses.	— —	— —	
C SULFONAMIDES						
1.	Co-trimoxazole	Cholera, Pneumonia (PCP), Bronchitis, Otitis media, UTI, Bacillary dysentery,	Adults & Children > 12 yrs: Tonsillitis - 2 tab of 480 mg. twice daily Children - (Pediatric tablets) 30-40 mg/kg in 2 divided doses Duration: 7-10 days	Nausea, vomiting Skin rash, Anemia, leucopenia, thrombocytopenia	- Hypersensitivity sulfonamide group - Pregnancy, lactation	
2.	Sulfadiazine	Meningococcal meningitis, - Bacillary dysentery, - UTI Prophylaxis of meningococcal meningitis, Toxoplasmosis	2-3 gm initial dose 1 gm 4-6 hrly later For prophylaxis of meningococcal meningitis 1 gm 12 hrly for 4 doses.	Intolerance, Renal colic, stone -Agranulocytosis, aplastic anemia,		
D MICROLID ANTIBIOTICS						
1	Erythromycin Tab / Cap 250/500 mg. Oral suspension 125 mg/5ml	- Respiratory infection including Diphtheria, Whooping cough, Bronchitis, Pneumonia, sinusitis	Adults & Children > 12 yrs: - 500 mg. 6 hrly daily Children: 25-40 mg/kg in 3-4 divided doses daily Duration: 7-10 days	Diarrhea, Rash Hepatotoxic Allergic reaction Nausea, vomiting, Epigastric pain		Drug of choice for pregnant & lactating women however cautions in first trimester
E AMINO GLYCOSIDES						
1	Gentamycin 20 mg/2ml., 40 mg/ 4 ml., 80 mg. / 2 ml.	UTI Septicemia Osteomyelitis Hospital acquired septicemia Peritonitis Pneumonia, Meningitis (Gram negative bacilli)	Adults & Children > 10 yrs: - 1.5 mg. /kg 8 hrly IV or IM (80 mg 8 hrly), Infants < 2 months: 2.5 mg/ kg IV 12 hrly as infusion, 2 mths - 5 yrs: 2.5 mg. / kg IV 8 hrly as infusion, 6 - 10 yrs: 2 mg. / kg IV 8 hrly as infusion Duration: 7 - 10 days	Nephrotoxic Ototoxic	Patients with renal impairment Pregnancy	For IV infusion -Dilute in 50-100 ml. 5% glucose or NS 0.9% & administer IV over 30 minutes

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
F QUINOLONE ANTIBIOTICS						
1	Ciprofloxacin Tab/cap 25 mg / 500 mg., 500 mg powder for injection	UTI, Respiratory tract infection Cholera, Resistant tuberculosis Shigella, Salmonella	Tab. 500 mg twice daily	Nausea, Headache Hallucinations Epileptogenic	Pregnancy, Children < 14 yrs, Renal failure (Dose to be reduced), Epilepsy	Do not take 2 hrs before or after meals.
2	Nalidixic acid Tab 250, 500 mg.	Shigellosis UTI	1-5 yrs: 250 mg. 6 hrly < 1yr: 125 mg. 6 hrly Adult: 1 gm. 6 hrly	- Nausea, vomiting, diarrhea, Allergy - Hemolytic anemia		
G MISCELLANEOUS ANTIBIOTICS						
1	Chloramphenicol Cap. 250 mg. 1 gm. powder for injection dilute in 10 ml water for injection to give 100 mg in 1 ml.	Enteric fever Pneumonia Meningitis Septicemia UTI Plague	Adults & Children > 12 yrs: 40-50 mg/kg. daily in 3-4 divided doses oral or IV. (500 mg. 4 times daily) Neonates < 2 weeks: 25 mg / kg daily IV in 4 divided doses 2-4 weeks: 25 mg / kg. IV twice daily. 1 - 11 months: 50 mg IV 3-4 times daily 1-2 yrs: 100 mg IV 3-4 times daily 3-6 yrs: 200-300 mg IV 3-4 times daily 7-12 yrs: 400-500 mg IV or orally 3-4 times daily Duration: Do not exceed 10 days	Aplastic anemia Grey baby syndrome Headache, Nausea, vomiting, diarrhea	Pregnancy Lactation	
2	Rifampicin	Anti TB / anti leprosy drug, Prophylaxis of meningitis Brucellosis	Adults & Children > 12 yrs: 600 mg. 12 hrly for 2 days < 3 yrs: 40 mg. 12 hrly for 2 days 3-5 yrs: 75 mg. 12 hrly for 2 days 6-8 yrs: 150 mg. 12 hrly for 2 days 9-12 yrs: - 450 mg. 12 hrly for 2 days Neonates: 40 mg. once			See chapter on RNTCP for more details
3	Nitrofurans	UTI GI infection - Giardiasis, bacillary dysentery	Nitrofurantion: 50-150 mg. 6 hrly Furazolidone: 100 mg 6 hrly	Nausea, Vomiting Skin rashes Polynuria Dysuria		

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
H ANTIHELMINTHIC DRUGS						
1	Mebendazole Tab 100 mg.	Enterobias vermicularis Strongyloides stercoralis T. Saginata, T. solium Ascariasis, Ankylostomiasis	1 tab of 100 mg twice daily for 3 days	Abdominal pain Diarrhea Rash		For children < 2 years do not use Do not use during first trimester of pregnancy
2	Pyrantel Palmoate Tab 250 mg (base) Syrup 250 mg/5 ml (base)	Ascariasis E. Vermicularis Ankylostomiasis	10 mg. / kg. once Maximum dose 1 gm 15 ml for adults.	GI Complaints Headache, Fever Dizziness, Rash		Do not use for children < 6 months & during first trimester of pregnancy
3	Thiabendazole Tab 50 mg. Syrup 100 mg/ml.	Strongyloides Stercoralis Ascariasis, Ankylostomiasis Threadworm, Trichuriasis	50-mg./ kg daily in 2 divided doses for 2-3 days. Chew thoroughly, best given after meal	Nausea, Vomiting, Vertigo Drowsiness Dizziness.	Pregnancy	
4	Praziquantel Tab 150, 600 mg	Taenia Solium T. Saginata	Adults & Children > 5 yrs: 5-10 mg. / kg. once For cysticercosis- Adults & children > 5 years: 50 mg. / kg. Once daily for 14 days	In patient with heavy worm loads: Abdominal discomfort, nausea, headache, Dizziness	Not to use in children below 5 years	
5	Niclosamide Tab 500 mg	Taenia Solium T. Saginata	Adults: 2 gm. single dose in morning. Chewed thoroughly, swallowed with water. Children < 11 kg: 500 mg. 11-34 kg: 1000 mg > 34 kg: 1500 mg. single dose	Rarely abdominal pain. Nausea, vomiting		
6	Piperazine	Ascariasis	5 gm single dose	Nausea, vomiting, diarrhea, Urticaria Vertigo, Convulsions, blurred vision, paresthesia		
I ANTIAMOEBIIC DRUGS						
1	Metronidazole Tab 200, 400 mg.	Amoebic dysentery Liver abscess Giardiasis Trichomonas vaginalis Aerobic infections	Adults: 400-800mg. orally 3 times daily for 7-10 days or 2.4 mg in a single dose, repeated on second day Children: - 35-50 mg /kg orally daily in 3 divided doses for 7-10 days	Nausea, Diarrhea Leucopenia Headache Metallic taste Dizziness, Vertigo,	Patients with H/O blood disorders & active CNS disease Pregnancy	Alcohol should be avoided during treatment

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
			Giardiasis Adults: 200mg. orally 3 times daily for 7-10 days or 2 gm in a single daily dose, for 3 days Children: 15mg /kg orally daily in 3 divided doses for 5-10 days	urticaria		
2	Trindazole 300 mg. 500 mg.	Amoebiasis Giardiasis	Amoebiasis Adults: 2gm as a single dose daily for 3 days. Children: 50-60 mg / kg (max. 2gm) in 4 divided doses daily for 3 days In severe cases may be extended for another 5 days Giardiasis Adults: 2 gm. as a single dose may be repeated once Children: 50-75mg in a single dose		Pregnancy Do not use during first 3 months.	
J ANAPHYLACTIC SHOCK						
1	Epinephrine (Adrenalin) 1 mg./ml. in 1 ml ampoule = 1: 1000 0.5 ml. SC, or IM	- In early anaphylaxis SC or IM route is preferred. In later stages IV route is required - Cardiac resuscitation - Bronchial asthma	Use dilution as 1 ml. (1mg. / ml) with 9 ml of sodium chloride (0.9%) Adults: 0.5 to 1 ml	Pallor, Palpitation, tremors, anxiety, headache Anginal pains Sudden hypertension Arrhythmias		
2	Chlorpheniramine	For supportive treatment of systemic anaphylactic reaction Drug with delayed onset of action & is second line drug	Adults: 10-20 mg SC or slow IV (over 1 minute) Maximum dose 40 mg in 24 hrs Children: Injection rarely indicated 1- 2 yrs: By mouth 1 mg twice daily 2-5 yrs: 1mg 4-6 hrs.	Drowsiness Occasional - Dry mouth, disturbed co-ordination Blurred Vision	- Glaucoma - Prostate hypertrophy	
3	Dexamethasone Inj. 4 mg./ ml.	- Anaphylaxis - Status asthmaticus		Reduced resistance to infection		

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
K DRUGS FOR EYES						
1	Sodium sulfacetamide 10% solution 10% ointment	Bacterial infection of conjunctiva, cornea, eye lids	Ointment 2 times daily or more in acute infection Drops – 2 drops every 2 hours	Short lasting burning	Sulfa allergy	Treat both eyes. Apply treatment until full cure (at least for 10 days) Once opened use within 10-15 days
2	Tetracycline 1% Ointment.	- Conjunctivitis, - Trachoma - Bacterial infection of conjunctiva, cornea, eye lids	Infection – Apply every 4 hrs Trachoma – Every 8 hrs, continue for 2-3 weeks. Thereafter 2 times daily during 5 consecutive days every month for 6 months	Temporary burning after application		
3	Chloramphenicol 0.5% eye drops	Superficial bacterial infectious (Conjunctiva, cornea, eyelids)	1-2 drops every 3-4 years	Very rare – bone marrow damage. Therefore do not exceed 2 weeks treatment	Neonates & babies <5 kg do not use	
OXYTOCIC DRUGS						
1	Oxytocin Inj – 1,5,10 IU / ml.	- For induction of labour - To help labour mainly in primigravida patients.	10 IU to 500 ml of 5% glucose, give IV drip as 5 drops / min. Increase depending on how uterus responds	Overdose may produce frequent & very strong contractions causing fetal hypoxia & death or rupture of uterus	- Hypertonic uterine action - CPD - Fetal distress - Placenta Previa - Failed trial of labour	Use with care in grand multi parity.
2	Ergometrine Inj – 0.2, 0.5 mg / amp.	Prevention & treatment of PPH	0.5 mg IM or IV after delivery of placenta	May cause trapping & death of an undiagnosed second twin.	1 st & 2 nd stage of labour, Severe heart disease Severe Hypertension Sepsis	Tablets have weak potency
L GASTRO-INTESTINAL DRUGS						
1	Cimetidine Tab – 200, 400, 800 mg Inj. 200 mg in 2 ml.	- Benign gastric & duodenal ulcerations - Reflux oesophagitis	Oral Adults: 400 mg twice daily Children: 20-30 mg / kg in divided	Diarrhea, dizziness, rash, bradycardia, tachycardia, mental	- Pregnancy particularly first trimester	Take tablets always with meal

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
			doses Duration: 6-8 weeks Parenteral Adults: 200 mg 4-6 hrly IM or IV slowly Children: 20-30 mg / kg daily in divided doses.	confusion, muscle pain, gynaecomastia, reduced blood counts	- Lactation - Do not use in children	
2	Ranitidine	- Benign gastric & duodenal ulcerations - Reflux oesophagitis	Adult: 150 mg twice daily for 4-6 weeks Children: 2-4 mg / kg, twice daily.	Dizziness, rash, bradycardia.	Pregnancy particularly first trimester, Lactation Children	
3	Omeprazole Cap – 20mg.	Benign gastric & duodenal ulceration Erosive oesophagitis Most effective against Helicobacter Pylori	20 mg daily Duration: Duodenal ulcer – 4 weeks Gastric ulcer – 8 weeks In severe cases increase to 40 mg daily for first 2 weeks. Combination therapy with amoxicillin against Helicobacter pylori Omeprazole as above plus amoxicillin 500 mg. 3 times daily.	Nausea, diarrhea abdominal colic, Dizziness, Paresthesia, Visual disturbance	Pregnancy Lactation In patients with severe liver disease do not exceed 20 mg daily.	Long term use not recommended Use only in severe cases, relapses or where other drugs have failed
4	Aluminium hydroxide Tab 500 mg. Suspension 320 mg / 5ml	Ulcer & non ulcer dyspepsia	1-2 tablets chewed or sucked 4-6 hrly	Very rare nausea, vomiting May be constipating	Severe kidney diseases	
5	Bisacodyl tab – 5 mg Suppositories 10 mg	Constipation	Adult: 1-2 tabs of 5 mg at night orally Suppository of 10 mg in the morning Children < 10 yrs: 1 tablet at night. Suppository of 10 mg in the morning	Long term use cause potassium depletion, atonic non functioning colon	Intestinal obstruction GI infection	Do not give with milk Tablets should be taken on empty stomach.
M ANTIDOTES						
1	Glucose (dextrose) 20%, 50%	Hypoglycemia	20-50 ml. slow IV.	Transitory hyperglycaemia		Condition may recur after long acting insulin or oral drug

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
2	Naloxone Inj 400 microgm / ml	Reversal of narcotic respiratory depression due to morphine, pethidine	Adults: 0.1-0.4 mg IV (SC or IM only if IV route is not feasible) repeated every 2 minute until response Children: 0.01 mg./kg administered as for adults, repeated with 0.1 mg./kg. If no response	Nausea Vomiting	Hypersensitivity	
3	Atropine 0.6 mg./ ml & 6 mg/ ml. 0.5 mg tablets	- Organophosphate poisoning - Colics & dysmenorrhea - Pre anesthetic medication	0.5 mg – 1 mg SC, IV or IM up to 2 mg every 20-30 min (or more often) Stop at first sign of atropine toxicity.	Dry skin Dry Mouth Urinary Retention Blurred vision Worsens glaucoma Constipation, Paralytic ileus	Absolute – Glaucoma Hyperthyroidism Relative Fever, Mitral stenosis, Pregnancy.	If no injection available use tablets (0.5mg) give same dosage
ANTIHISTAMINES						
1	Chlorpheniramine Maleate 4mg Inj. 10 mg / ml Syrup 2 mg / 5ml	- Allergic reactions - Flashes, urticaria, itching - Supportive treatment of systemic anaphylactic reactions - Anti emetic - Motion sickness	Adults: 1 tab 1-4 times daily Inj: 10-20 mg. IM., SC or slow IV (over 1 min). Maximum dose 40 mg in 24 hrs. Children 6-12 yrs: 2 mg every 4-6 hr (max. dose 12 mg. in 24 hrs.) 2-3 days treatment sufficient. Rarely indicated in children. For severe reaction use IV route	Drowsiness Occasional - dry mouth, disturbed coordination, blurred vision, nausea, vomiting	Glaucoma Prostate hypertrophy Avoid during first trimester of pregnancy Not to use in children < 6 years	May impair work performance, therefore should not drive vehicle or operate machinery.
2	Promethazine Tab 10, 25 mg. Inj 25 mg / ml Syrup 5 mg / 5 ml.	- Anti emetic - Sedative - Premedication in anesthesia - Anxiolysis - Motion sickness	Adults: 12.5 –50 mg once or twice daily Children: 1 mg./kg daily in 3 divided doses 1-3 yrs: 2.5 mg. up to 3 times daily 4-6 yrs: 5 mg up to 3 times daily 7-12 yrs: 7.5 mg up to 3 times daily 13-16 yrs: 10-20 mg up to 3 times daily	Marked sedative Disturbed coordination Hypotension Hypersensitivity may manifest as jaundice Dry mouth Blurred vision	Hypersensitivity Coma Epilepsy	May impair work performance, therefore should not drive vehicle or operate machinery.

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
SEDATIVES AND TRANQUILISERS						
1	Diazepam Tab. 2, 5 10 mg IV	Tension anxiety, Epilepsy (status, epilepticus & tetanus) 5-20 mg IV or IM), Preanaesthetic medication, Tranquilliser	Adults: 2-5 mg at bed time or 2-10 mg 3 times daily Children: Calculate dose carefully 0.1 mg/kg by mouth. Usual dose 1-5 mg at bedtime	Addiction Drowsiness Prolonged hangover May cause respiratory depression in overdose Hypo tension	- Drug addiction - During pregnancy long term medication should be avoided - Secreted in breast milk affecting new born	Inform patient to abstain from alcohol
2	Phenobarbital Tab. 30, 100 mg Syrup 15 mg / 5 ml Inj. 200 mg / ml.	Epilepsy Sedative Anti convulsant	Adults: 60-300 mg by mouth at night or in 2-3 divided doses daily. Start with 60 mg daily, increase in daily incremental steps of 60 mg until desired effect Children: 5-8 mg / kg daily Status epilepticus: Adult – 100-200 mg IV slowly, 100 mg. per minute	Drowsiness Ataxia Nausea, vomiting In overdose respiratory & circulatory failure Tolerance Urticaria	Addiction Avoid in patient with liver, pulmonary disease	
3	Phenothiazine Chlorpromazine 10, 25, 50, 100 mg tab. 25 mg/ml	Anti emetic Major psychosis aggressive behavior Anti hicough Pre anesthetic medication Muscle relaxant in tetanus	Dose 10-150 mg	Skin discoloration Intolerance Drowsiness, restlessness Thrombocytopenia Aplastic anemia		
N ANALGESICS						
1	Pethidine Inj – 50 mg in 1 ml Tab 50, 100 mg	Analgesic Pre-operative medication Used in renal or biliary colic	50-100 mg by mouth 4-6 hrly 25-100 mg SC or IM may be repeated 4 hrly	Addiction Respiratory depression Vomiting Constipation	Addiction Impaired respiratory function	Never give IV as pre operative medication in tubectomy patients.
2	Acetyl salicylic acid Tab 100,300,500 mg	Moderate pain in muscles, joints, bones Rheumatic pain Anti pyretic	Analgesic & antipyretic: Adults: 500 mg 6 hrly 6-12 yrs: 250 mg 3 times daily < 6 yrs: Prefer paracetamol	Occult gastro intestinal blood loss, Heartburn, nausea, vomiting	H/O ulcer or gastro intestinal bleeding Do not use in late pregnancy, breast	Use in AMI & stroke in small doses

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
			Anti rheumatic: Adults: 1.5-4 gm daily for long term treatment	Rare – Allergy, linitus Very rare in children: Reye's syndrome (Acute encephalopathy & liver damage)	use paracetamol	
3	Paracetamol Tab 500 mg Syrup 120 mg / 5 ml.	Moderate pain Fever More potent anti pyretic than salicylates without GI irritation	Adult: 0.5-1 gm 4-6 hrly (max. dose 4 gm daily) 6-12 months: 60-120 mg 4 times daily 1-5 yrs: 120-240 mg 4 times daily 6-12 yrs: 250-500 mg 4 times daily	Severe liver & kidney damage when taken for long time or due to over dosage Hemolytic anemia Skin rash	Kidney , liver damage Alcohol dependance	
4	Ibuprofen Tab 200,400 mg	Joint pain	200-400 mg 3-4 times daily	Occult GI blood loss Heartburn, nausea Allergy, linitus Very rarely in children Reye's syndrome	Bronchial asthma Peptic ulcer Children < 6yrs - do not use , Pregnancy Lactation	
0 BRONCHODILATORS						
1	Ephedrine Tab 30 mg Elixir 15 mg/5ml	Bronchospasmodic	30-60 mg orally 6 – 8 days	Tachycardia CNS stimulant Insomnia tremor, nausea, anxiety Addiction	Cautions - Hyperthyroidism Renal impairment Diabetes mellitus IHD, Hypertension Prostate yper trophy Pregnancy	
2	Salbutamol Tab 2,4 mg , 100 microgm inhalation	Bronchial asthma	Adult: 2-4 mg 6-8 hrly 3-11 months: 0.5-1 mg 2-4 times 1-5 yrs: 1-2 mg 2-3 times daily 6-12 yrs: 2 mg 2-3 times daily	Tachycardia Tremor, nausea, headache Over dosage - flush, hypo tension, insomnia, tachycardia	CHD Hypertension	

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
3	Aminophylline Tab 100 mg Inj 25 mg/ml in 10 ml ampoules		Adults: 100-200 mg orally twice daily Children: > 3 yrs: 12-15 mg /kg daily in 2 divided doses, may be increased after 1 week up to 25 mg / kg Inj: Glucose 5% is used for infusion 5-6 mg / kg IV slowly over 20-30 min (loading dose). Maintenance dose 0.5 mg/ kg per hour.	Nausea, vomiting, epigastric pain, hemelemesis, flushing, irritability, tachycardia, insomnia	Hypersensitivity Epilepsy Cardiac diseases Liver diseases During pregnancy & lactation lowest possible dose	Caffeine containing beverages may increase side effects
0 TOPICAL AND ANTIFUNGAL DRUGS						
1	Whitfield's ointment	Antifungal agent	Apply daily for several weeks – response slow	May cause some discomfort if inflamed	Pregnancy and children – use only on small skin areas, do not exceed 3 weeks	
2	Gentian violet paint 0.5%	Candidiasis infection of mouth & genital region Ulcers & impetigo	Apply to unbroken skin only, paint twice daily	Concentration > 0.5 - 1% can lead to ulceration of area.	T/T of mucous membranes & open wounds not recommended	
3	Clotrimazole cream 1%	Fungal skin infections	Apply twice daily for several weeks			
ANTI-INFECTIVE DRUGS						
1	Tetracycline ointment 3%	Topical application for impetigo Eye ointment as 1%	Apply twice daily	Very low risk of skin allergy		
2	Chlorhexidine 20%, 5%	Effective against wide range of bacteria some fungi, some viruses Not effective against M. TB bacillus, HIV & Hepatitis viruses Disinfection of wounds	Wound, eye, irrigation 0.05%	Skin hypersensitivity		

Sr No.	Name of Medicine	Use / Indication	Doses and administration	Side effects	Contraindications	Remarks
3	Hydrogen peroxide 3% solution	Cleaning of wounds Prevention of bacterial super infection of burns	Use 3% solution		Do not use in body cavities	
4	Hydrocortisone cream /lotion 0.5-1%	Eczema, dermatoses	Topical application	Infections may be masked & can spread. Pregnancy – do not use on large skin areas & not for longer time	Viral, fungal skin infections	
5	Beclomethasone 0.1%	Eczema	Should be used for short term only			
6	Benzyl benzoate 25%	Scabies	Treat all family members with whole body application (except face) for 3 days successively	Itching may go on for a week		
7	Gamma benzene Hexachloride 0.3%, 1%	Pediculosis Scabies	Apply from toes to neck (except face)	Irritant for eyes, nose, throat		
DISINFECTANTS AND ANTISEPTICS						
1	Cetrimide Centrimide + chlorhexidine (savlon)	Routine antiseptics, wound cleaning. Use 2% solution		Inflammatory reaction if applied to eyes		Contact with organic substances or with soap will destroy antiseptic activity
2	Chlorhexidine	Effective against wide range of bacteria, fungi & some viruses (not against TB, HIV, Hepatitis)	Wound cleaning Cleaning instruments Skin preparation (pre operative)	Skin hypersensitivity	Do not use in body cavities	
3	Polyvidone iodine 7.5, 10% Iodine tincture 2-2.5%	Contaminated or infected skin lesions (wounds, burns, ulcers) Preoperative skin disinfection.		T/t of large, damaged area (burns) may lead to excessive absorption of iodine causing poisoning & or goitre	Iodine allergy Hyper thyroidism Pregnancy - treat small areas, do not use during last trimester	

Appendix

Sr No.	Name of Medicine	Use / indication	Doses and administration	Side effects	Contraindications	Remarks
4	Sodium or calcium hypo chlorite	Dressing of wounds ulcer, sinuses	For disinfection of wounds use 0.35% available chlorine solution	Irritant		

* Use of steroid containing eye preparations is dangerous & can lead to corneal perforation, therefore use for corneal ulceration & active ocular infections contraindicated. No indication for use of combination of anti infective & steroids. Should be used by ophthalmologists only.



APPENDIX V

EMERGENCY TRAY

Following are important aspects to be observed by MO regarding emergency drugs:-

1. Emergency medicine tray should be kept at injection room, OT, labour room, ward.
2. Fix the responsibility of checking these trays regularly with either headquarter ANM or HA (F).
3. She should regularly check & replenish the drugs that are used.
4. She should see expiry date of these medicines & when expired it should be replaced immediately.

List of emergency drugs to be kept in emergency tray: (Injectable preparations):

1. Adrenaline
2. Atropine Sulphate
3. Corticosteroides (Hydrocortisone and Dexamethasone)
4. Aminophylline
5. Pethidine
6. Physostigmine
7. Diazepam / Phenobarbitone
8. Pentazocine
9. Sodium bicarbonate (7.5%)
10. Calcium chloride
11. Frusemide
12. Dopamine
13. ASV
14. Ergometrine
15. Oxytocin
16. Misopristol
17. Dextrose 5% in water
18. Dextrose 5% in normal saline
19. Glucose 25%
20. Ringer lactate solution

In addition to this, needles, syringes, IV set, scalp vein set should be kept in the tray.

Venesection tray, oxygen cylinder must be kept ready



**APPENDIX VI
RECORD RELATED TO WATER SUPPLY**

टिसीएल नमुने तपासणी नोंदवही

अ.क्र.	टिसीएल नमुना घेतल्याची तारीख	किती ग्रॅम नमुना घेतला	टिसीएल साठवणुकीची जागा	उत्पादकाचे नाव, उत्पादनाची तारीख व बॅच क्र.	ज्यांचेसमोर नमुना घेतला त्या ग्रा.पं. कर्मचाऱ्यांची स्वाक्षरी	निष्कर्ष	ग्रा.पं. ला निष्कर्ष कळविण्याची तारीख व पत्र क्र.	सुचविलेल्या उपाय योजना	शेरा

पाणी पुरवठा योजना सर्वेक्षण नोंदवही
(प्रत्येक पाणीस्त्रोताचे स्वतंत्र सर्वेक्षण करण्यात यावे)

अ.क्र.	ग्रामपंचायतीचे नाव	वाडी/ वस्ती/तांडा	सर्वेक्षण दिनांक	दिलेल्या प्रमाण पत्राचा प्रकार	लाल प्रमाणपत्र दिले असल्यास		पुनर्तपासणीनंतर दिलेले प्रमाणपत्र	शेरा
					कारणे	पुनर्तपासणीची तारीख		

फोन ::

लोकसंख्या :

ग्रामपंचायतीचे नाव :

[illegible]

अधिकारी यांना अशा पत्राने कळवावे.

सूचना : १) ग्रामपंचायतीला कळवूनही सलग दोन महाने आटा टास्ट नगदाक जाऊन येऊन अशाप्रकारे कळवावे.

2)

प्राणी नमने निष्कर्ष

(प्रत्येक ग्रामपंचायतीसाठी स्वतंत्र पान असावे)

फोन :

लोकसंख्या :

गामपंचायतीचे नाव :

[illegible]

ग्रामपंचायतनिहाय पाणी स्रोतांची नोंद (अ)

अ. क्र.	ग्रामपंचायतीचे नाव	वाडी/पाडा/तांडा	वाडी/पाडा/तांडा नुसार एकूण सार्वजनिक पिण्याचे पाणी स्रोत.						
			साध्या विहिरी	विंध्यन विहिरी	नळ कोंडाळे	पाण्याची टाकी	तलाव	नदी	इतर

ग्रामपंचायतनिहाय पाणी स्रोतांची नोंद (ब)

(प्रत्येक ग्रामपंचायतीसाठी स्वतंत्र पान असावे)

ग्रामपंचायतीचे नाव : _____ लोकसंख्या : _____ फोन : _____
 सरपंचाचे नाव : _____ पत्ता : _____ फोन : _____
 ग्रामसेवकाचे नाव : _____ पत्ता : _____ फोन : _____

अ.क्र.	वाडी/वस्ती	पाण्याच्या स्रोताचा प्रकार (नळकोडाळे)	स्रोताचे ठिकाण	त्यावर अवलंबून लोकसंख्या	पाणीशुद्धीकरण जबाबदार कर्मचारी	पाणी पुरवठा स्रोताची क्षमता	एक वेळ निर्जंतुकीकरण लागणारी टिप्पणीएल पावडर ग्रॅममध्ये	स्रोत बंद पडल्यास पर्यायी स्रोत

जिल्हा परिषद आरोग्य विभाग

प्रपत्र - अ (क्रमांक १/२)

(वैद्यकिय अधिकारी, प्राथमिक आरोग्य केंद्र यांनी सुरक्षित पिण्याच्या पाण्याबाबत द्यावयाच्या प्रमाणपत्राचा नमुना)

प्रमाणपत्र

जिल्हा : _____ तालुका : _____

गाव : _____ जनगणना क्र. : _____

डॉ. _____ वैद्यकिय अधिकारी प्राथमिक आरोग्य केंद्र _____
तालुका _____ जिल्हा _____ प्रमाणित करतो की, _____ गावातील / वाडीतील

- पिण्याच्या पाण्याचे स्रोत सुरक्षित असून ते सुरक्षित ठेवण्यासाठी खालील प्रमाणे पूर्वतयारी कार्यवाही करण्यात आलेली आहे.
- १) पाणी शुद्धीकरणासाठी आवश्यक असलेल्या साधनसामुग्रीचा (टिसीएल पावडर, द्रव क्लोरीन गोळ्या इत्यादी) पुरवठा ग्रामपंचायतीकडे उपलब्ध आहे.
 - २) पाणी शुद्धीकरण सामुग्रीचा उपलब्ध साठा प्रमाणित असल्याची पडताळणी ग्रामपंचायतीने केलेली आहे.
 - ३) पाणी शुद्धीकरणाची कार्यवाही करण्यासाठी जबाबदार कर्मचाऱ्यांची / व्यक्तीची निवड / नियुक्ती ग्रामपंचायतीने केली आहे.
 - ४) नळ पाणी पुरवठा योजनेच्या ठिकाणी पाणी शुद्धीकरणाची उचित व्यवस्था करण्यात आलेली आहे. नळांमधील गळत्यांची दुरुस्ती करण्यात आलेली आहे.
 - ५) सोबत जोडलेल्या यादीनुसार विहिरींच्या कठड्यांची व परिसराची आवश्यक तेथे दुरुस्ती सक्षम यंत्रणेने केलेली आहे.
 - ६) हातपंप बोअरवेल इत्यादी पाणी पुरवठ्याची साधन व परिसर सुरक्षित ठेवण्याची व्यवस्था सक्षम यंत्रणेने केलेली आहे.
 - ७) ज्या पिण्याच्या पाण्याचे स्रोत असुरक्षितच राहणार आहेत अशा ठिकाणी ते स्रोत पिण्याच्या पाण्यासाठी असुरक्षित असल्याचे फलक लावण्यात आलेले आहेत.
 - ८) अन्य महत्वाच्या बाबी.

वैद्यकिय अधिकारी, प्राथमिक आरोग्य केंद्र

- वैद्यकिय अधिकार्यांच्या मते महत्वाचा असणारा इतर कोणताही तपशील,

उदा. पाण्याचे नमुने.

टिप : सदर प्रमाणपत्र हे क्र. १ चे स्वरूपात ऑक्टोबर ते जानेवारी या कालावधीत सर्वेक्षणाचे आधारे तर क्रमांक २ चे स्वरूपात मे / जून महिन्यात फेर सर्वेक्षणाअंती द्यावयाचे आहेत.

शासन परिपत्रक क्रमांकग्रापपू १०९४/सीआर८९६/३९-अ, दिनांक १४-६-१९९४ चे सहपत्र

जिल्हा परिषद आरोग्य विभाग

प्रपत्र - ब (क्रमांक १/२)

(वैद्यकिय अधिकारी, प्राथमिक आरोग्य केंद्र यांनी असुरक्षित पाणी पुरवठ्याबाबत द्यावयाच्या प्रमाणपत्राचा नमुना)

प्रमाणपत्र

जिल्हा : _____ तालुका : _____

गाव : _____ जनगणना क्र. : _____

श्री. _____ वैद्यकिय अधिकारी प्राथमिक आरोग्य केंद्र _____

तालुका _____ जिल्हा _____ प्रमाणित करतो की, _____ गावातील / _____

पिण्याच्या पाण्याचे स्रोत सुरक्षित नाहीत. हे पाण्याचे स्रोत सुरक्षित ठेवण्याची आवश्यकता असलेली व खाली नमूद करण्यात आलेली पुरवठ्याची / कार्यवाही करण्यात आलेली नाही.

- १) पाणी शुद्धीकरणासाठी आवश्यक असलेल्या साधनसामुग्रीचा (टिसीएल पावडर, द्रव क्लोरीन गोळ्या इत्यादी) पुरवठा _____ उपलब्ध नाही.
- २) पाणी शुद्धीकरण सामुग्रीचा उपलब्ध साठा प्रमाणित असल्याची पडताळणी ग्रामपंचायतीने केलेली नाही.
- ३) पाणी शुद्धीकरणाची कार्यवाही करण्यासाठी जबाबदार कर्मचाऱ्यांची / व्यक्तीची निवड / नियुक्ती ग्रामपंचायतीने केली नाही.
- ४) नळ पाणी पुरवठा योजनेच्या ठिकाणी पाणी शुद्धीकरणाची उचित व्यवस्था करण्यात आलेली नाही. नळांमधील गळतीची _____ करण्यात आलेली नाही.
- ५) सोबत जोडलेल्या यादीनुसार विहिरीच्या कठड्यांची व परिसराची आवश्यक तेथे दुरुस्ती सक्षम यंत्रणेने केलेली नाही.
- ६) हातपंप बोअरवेल इत्यादी पाणी पुरवठ्याची साधने व परिसर सुरक्षित ठेवण्याची व्यवस्था सक्षम यंत्रणेने केलेली नाही.
- ७) ज्या पिण्याच्या पाण्याचे स्रोत असुरक्षितच राहणार आहेत. अशा ठिकाणी ते स्रोत पिण्याच्या पाण्यासाठी असुरक्षित असल्याचे _____ लावण्यात आलेले नाहीत..
- ८) अन्य महत्त्वाच्या बाबी.

वैद्यकिय अधिकारी, प्राथमिक आरोग्य केंद्र

- वैद्यकिय अधिकार्यांच्या मते महत्त्वाचा असणारा इतर कोणताही तपशील,

उदा. पाण्याचे नमुने.

टिप : सदर प्रमाणपत्र हे क्र. १ चे स्वरूपात ऑक्टोबर ते जानेवारी या कालावधीत सर्वेक्षणाचे आधारे तर क्रमांक २ चे स्वरूपात महिन्यात फेर सर्वेक्षणाअंती द्यावयाचे आहेत.

APPENDIX - VII

REPORTS/FORMATS RELATED TO EPIDEMICS

प्राथमिक अहवाल

१) लागणग्रस्त विभागाचे नाव :

२) लागणग्रस्त गावाचे नाव :

३) लागणग्रस्त गावाची लोकसंख्या :

४) जवळील आरोग्य केंद्राचे नाव :

उपकेंद्र

अंतर :

प्राथमिक आरोग्य केंद्र

अंतर :

५) प्रथम लागण दिनांक :

६) एकूण लागण व मृत्यू (तारीखवार) :

७) पाणी पुरवठा एकूण साधने :

८) मागील तीन महिन्यांतील त्या गावातील पाणी नमुने माहिती :

अ.क्र.	महिना	पाणी नमुने	
		तपासले	दुषित आढळले
१			
२			
३			

९) साथ उद्भवण्याचे कारण :

१०) मृत्यू झाला असल्यास मृतांची पूर्ण नावे, वय, पत्ते इ :

११) साथ उद्भवल्यानंतर केलेली उपाययोजना :

सही -

वैद्यकीय अधिकारी,

प्राथमिक आरोग्य केंद्र.

**साथीचा अंतिम अहवाल
सर्वसाधारण माहिती**

- १.) साथीच्या आजाराचे नाव : २) साथग्रस्त गावाचे नाव
व लोसंख्या
- ३) तालुका : ४) जिल्हा :
- ५) हे गांव जोखीमग्रस्त आहे का ? होय / नाही
- ६) प्राथमिक आरोग्य केंद्राचे नाव : ७) साथग्रस्त गावापासून
प्रा. आरोग्य केंद्राचे अंतर :
- ८) (अ) आरोग्य केंद्रातील मंजूर पदे : आरोग्य सेविका : आरोग्य सेवक :
(ब) रिक्त असल्यास केव्हापासून :
- ९) (अ) आरोग्य केंद्रातील वैद्यकीय अधिकाऱ्यांची मंजूर पदे :
(ब) वैद्यकीय अधिकाऱ्यांची नावे
व शैक्षणिक अर्हता :
- (क) पदे रिक्त असल्यास, केव्हापासून :
- (ड) प्रति नियुक्तीवर बॅ. अ. असल्यास
त्यांची नावे व शैक्षणिक अर्हता :
- १०) प्रथम लागण तारीख : शेवटची लागण तारीख :
- ११) आरोग्य कर्मच्यान्याला साथीची माहिती केव्हापासून व कोणाकडून प्राप्ती झाली :
- १२) वयोगट व लिंगानुसार लागण व मृत्यू :

वयोगट	पुरुष		स्त्री		एकूण
	लागण	मृत्यू	लागण	मृत्यू	लागण
० ते १ वर्षे					
२ ते ५ वर्षे					
६ ते १४ वर्षे					
१५ वर्षांवरील					
एकूण					

१३) साथ सुरु होण्यापूर्वीच्या महिन्यात साथग्रस्त गावास भेटीच्या तारखा

आरोग्य सेविका

आरोग्य सेवक

आरोग्य सहाय्यक

वैद्यकीय अधिकारी

१४) मागील एका वर्षात याच गांवात साथ उद्भवली असल्यास त्याचा तपशील :

साथीचा प्रकार	कालावधी	लागण	मृत्यू	साथीचे कारण

१५) साथग्रस्त भागातील पाणी साठ्यांची माहिती :

पाणी साठा प्रकार	साथीच्या भागातील	सर्वसाधारण वॉर्डांतील इतर ठिकाणी
- सार्वजनिक विहीर - खाजगी विहीर - कूपनलिका - नळ योजना - इतर		

१६) साथग्रस्त भागात यापूर्वीच्या महिन्यात घेतलेल्या पाणी नमुन्यांचा तपशील

तारीख	नमुने तपासले	दूषित नमुने	दूषित पाणी नमुन्याच्या अनुषंगाने केलेली कार्यवाही

१७) अ) गांवामधील ब्लिचिंग पावडर साठा (साथीपूर्वीच्या तीन महिन्यातील)

महिना	ब्लिचिंग पावडर साठा	तुरटीचा साठा	नमुना तपासणीची तारखी	निष्कर्ष

ब) साथग्रस्त भागात निर्जंतुकीकरण करणाऱ्या व्यक्तीचे नाव हुद्दा

क) ग्रामपंचायत पाणी पुरवठा विभागाकडून पाण्याचे नियमित शुद्धीकरण करण्यात येते का ?

ड) साथीपूर्वी आठ दिवस दैनंदिन शुद्धीकरण केले होते का ?

Appendix

१८) साथ नियंत्रणासाठी उपलब्ध औषधी / सामुग्री साठा :

प्रकार	साथ सुरु झाली त्या दिवशीचा साठा	साथ कालावधीत जिल्हा स्तरावरून पुरवठा
१) रिंगर्स लॅक्टेट (बाटल्या)		
२) नॉर्मल सलाईन (बाटल्या)		
३) फ्युराझोलीडीन गोळ्या		
४) टेट्रासायक्लीन कॅप्सूल		
५) अॅम्पीसिलीन		
६) पॅरासिटॅमोल गोळ्या		
७) सेप्ट्रान गोळ्या		
८) क्षार संजीवनी पाकीटे		
९) ब्लिचिंग पावडर (किलो)		
१०) मेडीक्लोर (बाटल्या)		
११) सी. बी. मिडीया		

१९) साथग्रस्त भागात क्षार संजीवनी डेपो होल्डर आहेत का ? असल्यास, त्यांच्याकडे असलेला पाकीटांचा साठा

२०) साथ प्रतिबंधक व नियंत्रक उपाययोजनेत दिरंगाई / निष्काळजीपणा झाला का ? असल्यास, कोणत्या स्तरावर

२१) १ ते ६ नमुन्यांची छाननी करून आरोग्य अधिकार्यांनी द्यावयाच्या अभिप्राय

१

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२२) दिरंगाई / निष्काळजीपणाबद्दल आरोग्य अधिकारी / आयुक्त महानगरपालिका यांनी केलेली कार्यवाही

सही /-

वैद्यकीय अधिकारी, प्रा. आ. क.

..... तालुका जिल्हा

तक्ता क्र. २

साथग्रस्त विभागाचा बिंदू नकाशा

नमुना ३ तक्ता "अ"

साथीबाबत सविस्तर माहिती
(माहिती व भेटी)

साथीची माहिती मिळण्याचे / दिल्याचे ठिकाण	माहिती कोणी व कधी कळविली	कळविल्याची तारीख	भेटीच्या तारखा		
			वैद्यकीय अधिकारी	जिल्हा आरोग्य अधिकारी / इतर	उपसंचालक व इतर
१) आरोग्य केंद्र २) मनपा कार्यालय ३) सहसंचालक (आरोग्य) पुणे					

(- कारण -)

साथ उद्भवण्याचे कारण (पाणी दुषित होण्याचे शोधून काढलेले कारण व त्याची मुद्दसूर माहिती)	शुद्ध पाणी पुरवठा करण्यासाठी केलेली उपायोजना (नळ गळत्या / व्हॉल्व्ह दुस्स्ती / टँकरने पाणी पुरवठा / पाणी शुद्धीकरण इ.)
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नमुना ३ तक्ता "ब" (प्रयोगशाळेतील तपासण्या)

साथीमध्ये घेतलेले पाणी, शौच व रक्त नमुने व त्यांचा निष्कर्ष

दिनांक	पाणी नमुने		शौच नमुने		रक्त नमुने		इतर		दुषित शौच नमुन्याचा तपशील		
	तपासले	दुषित	तपासले	दुषित	तपासले	दुषित	तपासले	दुषित	व्हिडीओ कॉलरा	नॉन ०१	एकूण

नमूना क्र. ४

[illegible]

नमुना क्र.५
मृत्यू संशोधन अहवाल

आजाराचे नाव :

१. मयताचे नांव :
२. वय / लिंग :
३. संपूर्ण पत्ता :
- विभाग :
- वॉर्ड :
४. रोग लक्षणे :
५. रोग लक्षण सुरु झाल्याची तारीख :
६. उपचार कोणी केले व कोठे :
७. दवाखान्यात दाखल झाला असल्यास
दाखल झाल्याची तारीख व वेळ :
८. उपचार सुरु केल्याची तारीख व वेळ :
९. दवाखान्यात भरतीच्या वेळी
रुग्णाची स्थिती :
१०. केलेल्या उपचारांचा तपशिल :
११. मृत्यूची तारीख व वेळ :
१२. मृत्यू कोठे झाला?
(घरी दवाखान्यात इ.) :
१३. शौच नमुना घेतला होता का?
घेतला असल्यास निष्कर्ष :
१४. वैद्यकीय अधिकाऱ्याचा अभिप्राय :
१५. आरोग्य अधिकाऱ्याचा अभिप्राय :

वैद्यकीय अधिकाऱ्याची सही

आरोग्य अधिकाऱ्याची सही

ANNEXURE – VIII

FORMATS RELATED TO STERILISATION OPERATION

A. CHECK LIST TO BE FILLED IN BEFORE STERILIZATION OPERATION OF A MALE / FEMALE BY THE DOCTOR CONCERNED.

- | | |
|--|--------|
| 1. Whether the age of the client is within laid down norms
(Male clients should be below the age of 60 years, for Female should be below the age of 45 years and above 22 years) | Yes/No |
| 2. Whether information relating to marital status, number of living children and age of the youngest child obtained. | Yes/No |
| 3. Whether the client has been counseled regarding sterilisation so as to help the clients make informed and voluntary decision. | Yes/No |
| 4. Consent form whether the client has understood the consent for and the following relative contraindications. | Yes/No |
| 5. Whether the client has been examined for excluding medical contraindication i.e. psychiatric disorder and physical illness. The surgeon / doctor should examine for the following relative contraindications. | Yes/No |
- a) Psychiatric disorder
 - b) Physical illness
 - i) Acute febrile illness
 - ii) Jaundice or other chronic liver disease
 - iii) Anaemia (hemoglobin less than 8 gm.%)
 - iv) Chronic systemic disease, including tuberculosis, bronchial asthma, blood dyscrasias, heart disease, uncontrolled diabetes, Hypertension and thyrotoxicosis
 - v) Malignancy
 - vi) Skin conditions, including infection involving operative site
 - vii) Pelvic infection, adhesions or mass
 - viii) Severe nutritional deficiency, such as generalised oedema, anaemia and vitamin deficiency
 - c) Allergy to local anaesthesia (alternative anesthesia or procedure must be provided)
 - d) Gross obesity
 - e) The following conditions in post partum clients:
 - i) Puerperal fever
 - ii) Prolonged rupture of membranes (24 hrs.)
 - iii) Pre-eclampsia or eclampsia
 - iv) Ante-partum or post partum hemorrhage resulting in hemoglobin less than 8 gm %
 - v) Trauma to the genital tract
 - vi) History of post partum psychosis.

- 6) Whether assessment and screening of the client has been done as follows:
- 6.1 Whether the client has been physically examined – pulse, blood pressure, respiratory rate, temperature, body weight, general condition and nutritional status, auscultation of heart, lungs, examination of abdomen, pelvic examination and other examination as indicated by the clients medical history or general physical examination
Yes/No
- 6.2 Laboratory Examination: Blood test for haemoglobin, urine analysis for sugar, and albumin and other laboratory examinations.
Yes/No
- 6.3 Final medical assessment of operating surgeons: Whether surgeon has verified fitness of the client including abdominal/pelvic examination before conduction of the surgery.
7. Whether instructions relating to prevention of infection has been followed? Yes/No
- 7.1 Whether cleaning and fumigation of the OT has been done Yes/No
- 7.2 Proper arrangement for decontamination of articles after surgery is available for items that come in contact with blood or other body fluids by placing in solution of disinfectant for 10 minutes (surgical instruments, gloves, needles and syringes, cotton gauze etc.) Yes/No
- 7.3 Sterilisation procedure of equipments/instruments required for surgery has been carried out as laid down in the guidelines. Yes/No

Signature

Name of the Surgeon

Date:

B. APPLICATION FOR STERILISATION OPERATION AND CONSENT FORM

1. Name: Shri/Smt _____
2. Husband's name and address: _____
3. Father's name and address: _____
4. Operation Centre: _____

Dear Sir/Madam,

Kindly make arrangements for my sterilization operation. My age is _____ years and my husband/wife's age is _____ years.

I am married and my husband/wife is alive. We have _____ male and _____ female living children. The age of my

youngest living child is _____ years. I have decided to undergo sterilization operation independently and on my own without any outside pressure, inducement or force. I am aware that other methods of contraception are available to me. I know that for all practical purposes this operation is permanent and that after the operation I will be unable to have any more children. I also know that there are still some chances of failure of the operation for which the hospital/institution and operating doctor will not be held responsible by me or my relative or any other person whomsoever. My husband/wife has not been sterilized previously. I am aware that I am undergoing operation, which carries an element of risk. I have been explained the eligibility criteria for the operation and I affirm that I am eligible to undergo operation according to criteria. I agree to undergo the operation under any type of anesthesia, which the doctor thinks suitable for me. After sterilization operation if I get pregnant, then I shall report within four weeks to the doctor/hospital and will get abortion done free of cost. Under such circumstances, the State Government will pay a compensation of Rs.5000/- to me, which will be acceptable to me. I know that if I am unable to get the pregnancy aborted within four weeks of pregnancy, then I will not be entitled to claim any compensation from any court of law in this regard. I agree to come for follow up to the center/doctor as instructed, failing which I shall be responsible for the consequences, if any.

I have read the above mentioned facts/information* in my own language.

Religion: _____

Age: _____

Business/Occupation: _____

Signature of the acceptor/applicant

Signature of the witness

Full name: _____

Full address: _____

*(Only for those beneficiaries who cannot read and write)

Shri/Smt _____ has been explained other methods of contraception available and the failures associated with other methods have been explained fully.

** Signature of Counselors

Full name: _____

Full address: _____

I know very well Shri/Smt _____ and the information given by me/her is correct. His/her name has been registered with health center/city center at Sal.No _____

Signature of Promotor: _____

Full Name: _____

_____ Full address: _____

C. CERTIFICATE OF MEDICAL OFFICER

I certify that I have satisfied myself that
Shri/Smt_____ is within the eligible age group and is mentally and
medically fit for a sterilization operation. There is no evidence that he/she has undergone a sterilization operation previ-
ously. I have explained all clauses to the client and that this form has the authority of a legal document.

* Signature of operating doctor

Signature of Medical Officer

Name and address

(Name and address)

D. DENIAL OF STERILIZATION

I certify that Shri/Smt_____ is not suitable
client for resterilization/sterilization for the following reasons.

1. _____
2. _____

He/she has been provided the following alternative methods of contraception.

Signature of counselor** or
Doctor making decision

(Name and address)

** Counselor can be any health personnel including doctor.

E. FOR OFFICIAL USE ONLY

To be filled by examining doctor

Note: If the surgeon is himself health examiner, the certificate may be given by him.

Age of the client according to appearance: _____

Urine analysis for sugar: _____

Blood pressure: _____

Whether client has gone sterilisation earlier or not: _____

As per examination by the doctor, the client is mentally and medically fit for sterilization operation.

I have confirmed from the client regarding his/her marital status and number of living children. I have explained pros and cons of the sterilization operation to the client and he himself is mentally ready for the operation.

Signature of the client

Signature of the Surgeon:_____

(Name in capital letter):_____

Present Place of Posting:_____

F. CERTIFICATE OF THE SURGEON

I have performed sterilization operation. During the operation there was no visible signs of earlier sterilization and as per appearance he/she was within the age limit for sterilization. If it is female sterilization, the type of operation performed-
Abdominal/Vaginal/Laparoscopic/Minilap
General/Local anesthesia used.

Signature of the Surgeon

(Name in capital letters)_____

Present place of posting_____

G. ECONOMIC, SOCIAL AND DEMOGRAPHIC DETAILS OF THE CLIENT UNDERGOING STERILIZATION OPERATION.

Monthly report should be accompanied by the following proforma:

1. Name of client_____
2. Name of head of the Family: Shri_____
3. Name of Father/Husband:_____
4. Mohalla_____House No_____
5. PHC/Urban Centre:_____
6. Ward:_____
7. Religion:_____
8. Caste general/SC/ST/NT/VJNT/OBC_____
- Class:_____

Appendix

9. Whether married: Yes/No
10. Age of Applicant (complete years): _____
11. Age of Husband/Wife(complete years) _____
12. No.of alive children: a) Sons _____ b) Daughters _____
13. Age at marriage: Age _____ Months: _____
- Husband _____ Wife _____
14. Educational qualification: Illiterate/Literate/Primary/Junior High School/High School/Graduate & above.
- Husband: _____
- Wife: _____
15. Difference from the last termination of pregnancy (Delivery /abortion): Years _____

Payment Particulars

Amount given to applicant: Rupees.....Paise.....

ForSterilization

Signature of applicant

Date :

Name.....

H.FOLLOW UP

Person concerned with the service of the applicant Name: _____

_____ Post: _____

_____ Place of Appointment: _____

1. Promoter: _____

2. Health Worker: _____

3. Medical Officer PHC: _____

4. Surgeon: _____

If tubectomy, method adopted: Abdominal / Vaginal / Laparoscopic / Laprotomy

Type of anesthesia: General / Local / Spinal

Full name of the person going to give follow up: _____

Present Address: _____

1. OTHER INFORMATION

- 1) Whether any contraceptive method has been adopted earlier: Yes / No
 If Yes: Name of the Method.....
 Period of the method.....
- 2) Whether Promoter of applicant is regional worker of Family Welfare Programme: Yes / No
 If Yes, Whether applicant is inhabitant of the jurisdiction of that worker: Yes / No
- 3) Reason for the application of sterilisation: Limited family / diseases/financial or other

I certify that above mentioned particular is correct.

Place

Signature: _____

Full Name: _____

Present Address: _____

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ANNEXURE-IX ABBREVIATIONS

AEFI	Adverse Events Following Immunisation	Dy. CEO	Deputy Chief Executive Officer
AFB	Acid Fast Bacilli	EC	Eligible Couple
AFP	Acute Flaccid Paralysis	EC	Exposure Code
AIDS	Acquired Immune Deficiency Syndrome	ECG	Electro Cardio Graph
ANC	Ante Natal Care	ECP	Emergency Contraceptive Pill
ANM	Auxilliary Nurse Midwife	EDPT	Early Detection Prompt Treatment
APH	Ante Partum Haemorrhage	ELA	Expected Level of Achievement
ARI	Acute Respiratory Infection	ESR	Erythrocyte Sedimentation Rate
ART	Anti-Retroviral Therapy	FEFO	First Expire First Out
ASFR	Age Specific Fertility Rate	FHAC	Family Health Awareness Campaign
ASV	Anti Snake Venum	FIFO	First In First Out
ATP	Advanced Tour Program	FP	Family Planning
AW	Angan Wadi	FRU	First Referral Unit
AWW	Angan Wadi Worker	FTD	Fever Treatment Depot
BCG	Bacillus Calmette Guerin	FW	Family Welfare
BDO	Block Development Officer	GAD	General Administration Department
BPL	Below Poverty Line	GFR	General Fertility Rate
CAFO	Chief Accounts and Finance Officer	GIS	Group Insurance Scheme
CBR	Crude Birth Rate	GP	Gram Panchayat
CC	Conventional Contraceptives	GPF	General Provident Fund
CCA	City Compensatory Allowance	GRR	Gross Reproduction Rate
CDPO	Child Development Project Officer	HA	Health Assistant
CEO	Chief Executive Officer	HAF	Home Available Fluid
CL	Casual Leave	HAV	Hepatitis - A Virus
CNA	Commuity Needs Assessment Approach	Hb	Haemoglobin
CPR	Couple Protection Rate	HBV	Hepatitis - B Virus
CR	Confidential Report	HCV	Hepatitis - C Virus
CRS	Civil Registration System	HCW	Health Care Worker
CRT	Condensed Radical Treatment	HDV	Hepatitis - D Virus
CS	Civil Surgeon	HEV	Hepatitis - E Virus
CSSM	Child Survival and Safe Motherhood	HIV	Human Immunodeficiency Virus
CTZ	Co-Trimoxazole	HQ	Head Quarter
DA	Dearness Allowance	HRA	House Rent Allowance
DBCS	District Blindness Control Society	HW	Health Worker
DDC	Drug Distribution Center	ICDS	Integrated Child Development Scheme
DDK	Disposable Delivery Kit	IEC	Information Education Communication
DDO	Drawing and Disbursing Officer	IFA	Iron Folic Acid
DEC	Diethyl Carbamazine Citrate	ILR	Ice Lined Refrigerator
DF	Deep Freezer	IM	Intra-muscular
DF	Dengue Fever	IMR	Infant Mortality Rate
DH	District Hospital	IPD	In Patient Department
DHF	Dengue Haemorrhagic Fever	IPPI	Intensive Pulse Polio Immunisation
DHO	District Health Officer	ITDP	Integrated Tribal Development Project
DHS	Directorate of Health Services	IUCD	Intra Uterine Contraceptive Device
DIO	District Immunisation Officer	IV	Intra-Venous
DMC	Designated Microscopic Center	JA	Junior Assistant
DMO	District Malaria Officer	LBW	Low Birth Weight
DOTS	Directly Observed Treatment Shortcourse	LHV	Lady Health Visitor
DPT	Diphtheria Pertussis Tetanus	MB	Multi Bacillary
DR	Death Rate	MCH	Maternal and Child Health
DSS	Dengue Shock Syndrome	MCP	Maternal and Child Health Protection
DT	Diphtheria Tetanus	MCSR	Maharashtra Civil Services Rules

MDT	Multi Drug Treatment	POL	Petrol Oil Lubricant
MICU	Medical Intensive Care Unit	PPH	Post Partum Haemorrhage
MIS	Management Information System	PPI	Pulse Polio Immunisation
MLC	Medico Legal Case	PPM	Parts Per Million
MLEC	Modified Leprosy Elimination Campaign	PS	Panchayat Samiti
MLO	Mosquito Larvicidal Oil	PTLA	Part Time Lady Attendant
MMR	Maternal Mortality Rate	RBC	Red Blood Cell
MO	Medical Officer	RCH	Reproductive and Child Health
MPW	Multi Purpose Worker	RDD	Rural Development Department
MS	Medical Superintendent	RH	Rural Hospital
MTP	Medical Termination of Pregnancy	RL	Ringer's Lactate
MWRA	Married Women in Reproductive Age	RNTCP	Revised National Tuberculosis Control Program
MYP	Mid Year Population	RRT	Rapid Response Team
NGO	Non Government Organisation	RT	Radical Treatment
NLEP	National Leprosy Eradication Program	RTI	Reproductive Tract Infection
NMEP	National Malaria Eradication Program	SAPEL	Special Action Plan for Elimination of Leprosy
NNT	Neo Natal Tetanus	SC	Sub Center
NPCB	National Program for Control of Blindness	SCD-R	Survey of Causes of Death - Rural
NRHM	National Rural Health Mission	SDH	Sub-District Hospital
NRR	Net Reproduction Rate	SHTO	State Health Transport Organisation
NSV	No Scalpel Vasectomy	SPR	Slide Positivity Rate
NVBDCP	National Vector Born Diseases Control Program	STD	Sexually Transmitted Disease
OP	Oral Pill	STI	Sexually Transmitted Infection
OPD	Out Patient Department	TA	Travelling Allowance
OPV	Oral Polio Vaccine	TB	Tuberculosis
ORI	Outbreak Response Immunisation	TBA	Trained Birth Attendant
ORS	Oral Rehydration Solution	TCL	Tropical Chloride of Lime
OT	Operation Theater	TFR	Total Fertility Rate
PB	Pauci Bacillary	THO	Taluka Health Officer
PBS	Peripheral Blood Smear	TT	Tetanus Toxoid
PCV	Packed Cell Volume	TU	Tuberculosis Unit
PEM	Protein Energy Malnutrition	VCTC	Voluntary Counseling and Testing Center
PEP	Post Exposure Prophylaxis	VED	Vital-Essential-Desirable
PH	Public Health	VPD	Vaccine Preventable Disease
PHC	Primary Health Center	VVM	Vaccine Vial Monitor
PHD	Public Health Department	WBC	White Blood Cell
PHI	Peripheral Health Institute	WBCT	Whole Blood Clotting Time
PIH	Pregnancy Induced Hypertension	WHO	World Health Organisation
PM	Post Mortem	WMF	Wastage Multiplication Factor
PMOA	Para Medical Ophthalmic Assistant	ZP	Zilla Parishad
PNC	Post Natal Care		