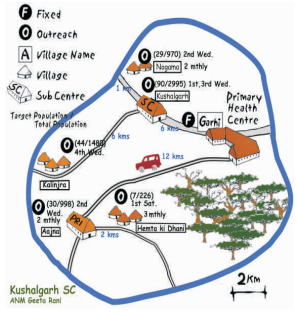
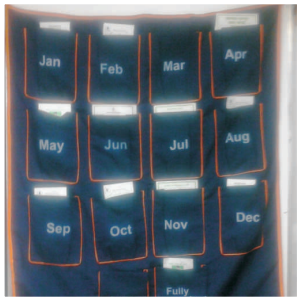


Immunization Handbook for Health Workers



NATIONAL RURAL HEALTH MISSION
राष्ट्रीय ग्रामीण स्वास्थ्य मिशन

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Immunization Handbook for Health Workers

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Your suggestions for improving or enhancing the Immunization Handbook for Health Workers are always welcome and encouraged.

NATIONAL RURAL HEALTH MISSION
राष्ट्रीय ग्रामीण स्वास्थ्य मिशन

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सत्यमेव जयते

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FORWARD

With the launch of Universal Immunization Programme (UIP) in India in 1985, morbidity and mortality patterns from the Vaccine Preventable Disease have shown a declining trend. However, to enhance the quality of immunization service being provided to the community and to increase the overall coverage, proper training of health worker is imperative. In this regard, Ministry of Health and Family Welfare (MoHFW), Government of India has worked with states to ensure that appropriate training is provided to health workers and had published *'The Immunization Handbook for Health Workers and the Facilitator' Guide* in 2006. This hand book and facilitators' guide was extensively used as part of the training material and was appreciated by trainers and participants across the country.

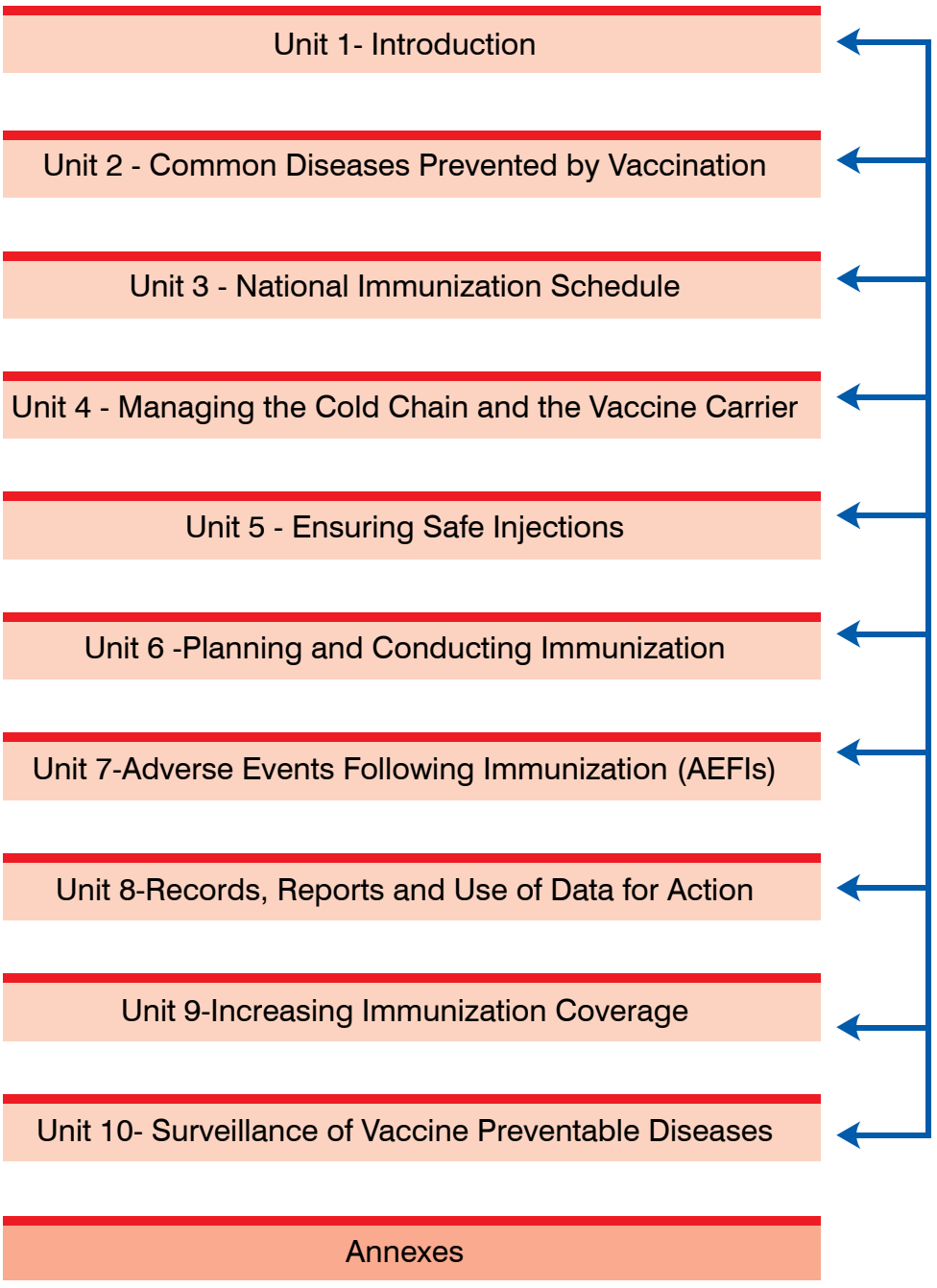
As part of the continuing process of critically assess the quality of immunization services, operations research was conducted in 2009 to assess the level of health worker's performance in providing immunization services following the training. Results from the study noted improvements in the knowledge and skills of health workers. Nonetheless, gaps related to training materials were also observed and required corrective action. Moreover, in the years following the publication, notable changes in the form of DPT replacing DT, VVM for all vaccines, introduction of 2nd dose of measles and expansion of Hepatitis B across the country etc have taken place which necessitated the revision of this module.

This revised edition of the *Immunization Handbook for Health Workers* and the *Facilitators' Guide* is a culmination of efforts of GoI staff and partners, notably WHO-NPSP, NIHFW, UNICEF, USAID/MCHIP, PATH and UNOPS/NIPI, towards continuous betterment of the Universal Immunization Programme. We acknowledge the contribution of our partners, particularly in supporting ongoing capacity building efforts.

It is expected that States will use the revised *Handbook* to provide two day training to their health workers, refresher training to the trainers every year and orientation/induction training for the new staff. I am sure this will strengthen the skills of the health workers working in the field and lead to improved coverage and quality of the universal Immunization Programme.

(Ms Anuradha Gupta)

Overall Handbook Structure



Each unit includes:

- Learning Objectives
- Contents

Table of Contents

Acronyms

ADS	Auto Disable Syringe
AEFI	Adverse Events Following Immunization
AES	Acute Encephalitis Syndrome
AFP	Acute Flaccid Paralysis
ANC	Ante Natal Care
ASHA	Accredited Social Health Activist
AWC	Anganwadi Center
AWW	Anganwadi Worker
BCG	Bacillus Calmette Guerin
CBO	Community Based Organization
CHC	Community Health Center
DIO	District Immunization Officer
DPT	Diphtheria Pertussis Tetanus
DTaP	Diphtheria Tetanus acellular Pertussis
ECR	Eligible Couple Register
HA (M&F)	Health Assistant (Male & Female)
Hep-B	Hepatitis-B
HIV	Human Immune Deficiency Virus
HW	Health Worker
ILR	Ice Lined Refrigerator
JE	Japanese Encephalitis
LHV	Lady Health Visitor
MCH	Maternal and Child Health
MO (PHC)	Medical Officer (PHC)
NGO	Non Governmental Organization
NID	National Immunization Day
NRHM	National Rural Health Mission
OPV	Oral Polio Vaccine
PHC	Primary Health Centre
PMU	Program Management Unit
RH	Rural Hospital
RI	Routine Immunization
SC	Sub Centre
SIA	Supplementary Immunization Activities
SIHFW	State Institute of Health and Family Welfare
SNID	Sub National Immunization Day
TBA	Trained Birth Attendant
TT	Tetanus Toxoid
UIP	Universal Immunization Program
VPD	Vaccine Preventable Disease
VVM	Vaccine Vial Monitor

Unit 1 - Introduction

Learning Objectives

At the end of the unit, you should be able to:

- Describe the importance of immunization and reasons for low immunization coverage.
- List the responsibilities of Health Workers in Routine Immunization.

Contents

1.1 Why immunization?

- Immunization is one of the safest and most effective methods of preventing childhood diseases. Under the Universal Immunization Programme (UIP), significant achievements have been made in preventing and controlling the Vaccine Preventable Diseases (VPDs). Immunization has to be sustained as a high priority to further reduce the incidence of all VPDs, control measles, eliminate tetanus and eradicate poliomyelitis.
- Full immunization (i.e. received one dose of BCG, three doses of DPT, Hep-B and OPV each and one dose of Measles before one year of age) gives a child the best chance for a healthy life. Preventing disease before it occurs saves money, energy, and lives.
- Immunization is a key strategy to child survival. By protecting infants from VPDs, immunization significantly lowers morbidity and mortality rates in children. The security provided to families can lead to lower birth rates.

1.2 Reasons for Low immunization coverage

- ***Failure to provide immunization*** at planned outreach, sub center or PHC sites.
- ***Dropouts:*** Children who receive one or more vaccination, but do not return for subsequent doses.

- ***Unreached populations***
  - ➢ Children whose parents do not know about immunization or face socio-economic barriers to utilize services.
  - ➢ Lack of geographic access: Children who live too far away from a health center or outreach site to realistically complete a full immunization schedule.
- ***Resistant populations***: Children whose parents do not believe in immunization services, even though a health center is within reach.
- ***Missed Opportunities:*** Children who visit the health center for some other reason, but are not screened for immunization by health workers.

1.3 Responsibilities of Health Workers in Routine Immunization

As Health workers, you play a very important role in improving the Immunization coverage of mothers & children. You are expected to immunize all children and pregnant women according to the National Immunization Schedule. Your specific duties include:

- ***Planning for Immunization***
  - ➢ Enumerate all mothers and Children in your area with help of AWW and ASHA.
  - ➢ Prepare map of the subcentre area including all villages and hamlets.
  - ➢ Prepare Sub center Microplan with the help of LHV and AWW.
  - ➢ Prepare due list of beneficiaries by consulting the records of AWW, ASHA and other sources tracking newborns.
  - ➢ Involve ASHAs, AWWs, Panchayat members and school teachers to motivate the families to accept immunization services, inform them about the time and place of the session and mobilize them to attend the session.
- ***Maintaining Cold chain at immunization site***
  - ➢ Ensure that vaccines are brought in a vaccine carrier with 4 conditioned ice packs.
  - ➢ Ensure vaccine carriers are kept in shade and are not opened frequently.
  - ➢ Check the labels for expiry date and VVM of the vaccine vials before use.
  - ➢ Check that T-Series and HepB vaccines are not frozen.

- ***Conducting the immunization session***
  - Attend village health and nutrition day with vaccines and logistics for the session.
  - Set up immunization work area to minimize risk of injury.
  - Greet beneficiaries.
  - Verify the immunization record and age of the child.
  - Screen for contraindications.
  - Explain what vaccine(s) will be given and the disease it prevents.
  - Use Auto Disable Syringe for each injection.
  - After reconstitution, write the time of reconstitution on the label of vaccine vial.
  - Facilitate correct positioning of the child for immunization
  - Administer the vaccines by using correct technique.
  - Educate care givers about the minor AEFIs and how to deal with them.
  - Ask the beneficiaries to wait for half an hour after vaccination to observe for any AEFI.
  - Inform when to come for the next visit and ask them to bring the card.
  - Collect the used needles and syringes for safe disposal as per guidelines.
- ***Recording, Reporting and tracking of drop outs***
  - Record all immunization in a due list cum tally sheet, immunization card and immunization register.
  - Write next date for immunization in the card and communicate to guardians
  - Keep the updated counter foil of the immunization card in tracking bag.
  - Share the list of dropouts with AWW and ASHA to track them.
  - Maintain immunization coverage monitoring chart at the sub center.
  - Report all suspected cases of TB, Diphtheria, Pertussis, Neonatal Tetanus, Measles, AES and AFP to the Medical Officer.
  - Report all AEFIs.

This handbook is developed to help all heath workers including ANM (regular and contractual), Alternate vaccinator, LHV, HW (M), HA (M), Staff Nurse, Pharmacist, Cold chain handler and Data handler to improve their knowledge and skills for providing better immunization services to the community.

Unit 2 - Common Diseases Prevented by Vaccination

Learning Objectives

At the end of the unit, you should be able to:

- List diseases that are preventable by immunization under the Universal Immunization Programme (UIP).
- Describe their mode of spread and how they can be recognized and prevented.

Contents

- Diseases prevented by Immunization under UIP Programme.
- Their mode of spread and how they can be recognized and prevented.

The following are the targeted vaccine preventable diseases under Universal Immunization Program:

- Tuberculosis
- Polio
- Diphtheria
- Pertussis
- Tetanus
- Hepatitis B
- Measles
- Japanese Encephalitis

2.1 Tuberculosis

Tuberculosis (TB) is caused by a bacteria (Mycobacterium tuberculae). It is a highly contagious disease that affects the lungs but can also affect the intestines, bones and joints, lymph glands, meninges, and other tissues of the body. TB can cause serious illness and death.

Figure 2A: A case of TB Meningitis

a) How to recognize the disease?

- A child with fever and / or cough for more than 2 weeks, with loss of weight / no weight gain,
- History of contact with a suspected or diagnosed case of active TB.

b) How is it spread?

TB is spread when individuals come in contact with cough or sneeze droplets of infected pulmonary tuberculosis individuals. A variety of tuberculosis called Bovine tuberculosis occurs due to consumption of raw cattle milk without boiling.

c) How is the disease prevented?

Vaccination with Bacillus Calmette-Guerin (BCG) as per the schedule will prevent serious forms of childhood tuberculosis.

2.2 Polio

Polio is a viral infection that affects the nervous system and can cause severe illness, paralysis, and even death. Due to intensive immunization campaigns, there has been a very significant decline of polio cases in the country since 1999.

a) How to recognize the disease?

Sudden onset of weakness and floppiness in any part of the body in a child less than 15 yrs of age or paralysis in a person of any age in whom polio is suspected.

Figure 2B: A case of Paralytic Poliomyelitis

b) How is it spread?

Polio is transmitted by contact with faecal matter, usually as a result of poor hygiene, or indirectly through contaminated water, milk, or food. More than 80 percent of all cases occur before the completion of 3 years of age.

c) How is the disease prevented?

Immunization with the Oral Polio Vaccine effectively prevents infection. Oral Polio Vaccine (OPV) should be routinely administered as per the immunization schedule and during Supplementary Immunization Activities (NID and SNID) till 5 years of age.

2.3 Diphtheria

Diphtheria is caused by bacteria (Coryne bacterium diphtherae). Diphtheria is an infectious disease that commonly infects the tonsils and pharynx, forming a membrane that can lead to obstructed breathing and death.

Figure 2C: A case of Diphtheria with membrane in throat

a) How to recognize the disease?

Sore throat, mild fever and gray patch or patches in the throat.

b) How is it spread?

The bacteria causing diphtheria inhabit the mouth, nose and throat of an infected person. It spreads from person to person by coughing and sneezing.

c) How is the disease prevented?

The most effective method of prevention is immunization with DPT vaccine in early childhood. Unless immunized, children till 14 years of age are susceptible to repeat diphtheria infections. DPT vaccine should be given as per the immunization schedule.

2.4 Pertussis (Whooping Cough)

Figure 2D: A case of Pertussis with violent cough.

Pertussis, commonly known as whooping cough, is caused by bacteria (Bordetella pertussis). Pertussis is a highly contagious bacterial disease, involving the respiratory tract. It is characterized by repeated cough that may lead to aspiration and possible death, in a few cases.

a) How to recognize the disease?

A history of repeated and violent coughing, with any one of the following: cough persisting for two or more weeks, fits of coughing, cough followed by vomiting, typical whoop in older infants.

b) How is it spread?

Pertussis bacteria live in the mouth and nose of the patient and are spread easily through the air, usually from coughing or sneezing.

c) How is the disease prevented?

DPT vaccine given according to the immunization schedule will prevent Pertussis.

2.5 Tetanus

Figure 2E: A case of Neonatal Tetanus

Tetanus is caused by bacteria (Clostridium tetani). People of all ages can become infected with tetanus.

a) How to recognize the disease?

Neonatal Tetanus presents with a history of normal suck and cry during the first two days of life, onset of illness between 3 and 28 days of life, inability to suck followed by stiffness of neck and body and/or jerking of muscles.

b) How is it spread?

Tetanus is present in dirt, intestines and faeces of animals. It enters the body through cuts, punctures or other wounds/infections (like ear infection) and occurs when bacteria come in

contact with broken skin or injuries, and also unclean cutting and dressing of the umbilical cord. Neonatal Tetanus (NNT) affects newborn babies that lead to death, if not treated. It generally occurs during the first few days of life, when a woman delivers in unsanitary conditions.

c) How is the disease prevented?

Immunizing pregnant women and children with TT/DPT as per the immunization schedule is an effective method of preventing both neonatal as well as tetanus in other age groups.

2.6 Hepatitis B

Hepatitis B is a highly infectious viral disease (40-100 times more infectious than HIV) and is the leading cause of jaundice, fulminant liver disease, cirrhosis and liver cancer.

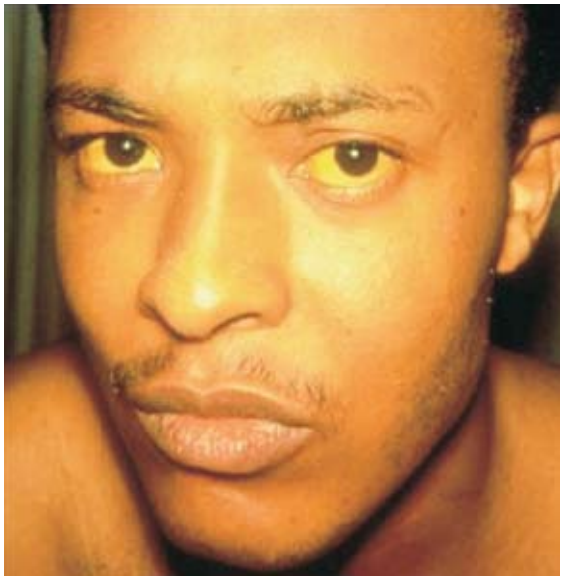


Figure 2F: Case of Hepatitis with Jaundice

a) How to recognize the disease?

Clinical signs and symptoms include fever, headache, nausea, vomiting, jaundice (yellowish eyes) and light or gray stools. Final confirmation is done by laboratory tests.

b) How is it spread?

The disease spreads through contact with infected blood or body fluids. It can be acquired during childbirth, through unprotected sex, use of unsterilized needles and sharing of tooth brushes or razors.

c) How is the disease prevented?

By immunizing children with Hep B vaccine as per immunization schedule, we can prevent infection and its complications.

2.7 Measles

Measles is a highly infectious illness caused by a virus that can be found in the nose, mouth or throat of an infected person. Infection is characterized by fever, cough and spreading rash that may lead to death due to secondary infections like diarrhoea and pneumonia.

a) How to recognize the disease?

A history of fever with rash with cough or running nose or red eyes.

b) How is it spread?

The virus is transmitted through the air by respiratory droplets expelled by infected individuals during coughing and sneezing.

c) How is the disease prevented?

The measles vaccine is effective in preventing measles and should be given according to the immunization schedule.

Figure 2G: Case of Measles

2.8 Japanese Encephalitis

Japanese encephalitis (JE) is caused by a virus. It is one of the most deadly forms of viral encephalitis in India. It is prevalent in certain geographical areas in some of the states.

a) How to recognize the disease?

Acute onset of fever with change in mental status (such as confusion, disorientation or coma) and/or seizures.

b) How is it spread?

JE is spread by mosquitoes. The virus normally infects birds and domestic animals, especially pigs. Children get the disease when bitten by mosquito that has bitten an infected animal.

c) How is the disease prevented?

Following the campaigns targeting all children in the age group of 1-15 years in the high risk districts, the vaccine is integrated into the UIP of the district. Children between 1-2 years are targeted for one dose of JE.

Figure 2H: Case of JE

Unit 3 - National Immunization Schedule

Learning Objectives

At the end of the unit, you should be able to:

- Identify vaccines administered in the National Immunization Programme, the ages at which they are given, the number of doses along with the site and route of administration

Contents

- National Immunization Schedule
- Frequently Asked Questions on the Immunization Schedule

A Fully immunized infant is one who has received BCG, three doses of DPT, Hep-B and OPV each and Measles before one year of age

National Immunization Schedule for Infants, Children and Pregnant Women				
Vaccine	**When to give**	**Dose**	**Route**	**Site**
For Pregnant Women				
TT-1	Early in pregnancy	0.5 ml	Intra-muscular	Upper Arm
TT-2	4 weeks after TT-1*	0.5 ml	Intra-muscular	Upper Arm
TT- Booster	If received 2 TT doses in a pregnancy within last 3 yrs*	0.5 ml	Intra-muscular	Upper Arm
For Infants				
BCG	At birth or as early as possible till one year of age	0.1ml (0.05ml till 1mth age)	Intra-dermal	Left Upper Arm
Hepatitis B	At birth or as early as possible within 24 hours	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
OPV-0	At birth or as early as possible within the first 15 days	2 drops	Oral	Oral
OPV 1,2 & 3	At 6 weeks, 10 weeks & 14 weeks	2 drops	Oral	Oral
DPT 1,2 & 3	At 6 weeks 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Hep B 1, 2 & 3	At 6 weeks 10 weeks & 14 weeks	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles	9 completed months-12 months.	0.5 ml	Sub-cutaneous	Right upper Arm
Vitamin-A (1stdose)	At 9 months with measles	1 ml (1 lakh IU)	Oral	Oral
For Children				
DPT booster	16-24 months	0.5 ml	Intra-muscular	Antero-lateral side of mid-thigh
Measles 2nd dose	16-24 months	0.5 ml	Sub-cutaneous	Right upper Arm
OPV Booster	16-24 months	2 drops	Oral	Oral
Japanese Encephalitis**	16-24 months	0.5 ml	Sub-cutaneous	Left Upper Arm
Vitamin-A***				
(2nd to 9th dose)	16 months. Then, one dose every 6 months up to the age of 5 years.	2ml (2 lakh IU)	Oral	Oral
DPT Booster	5-6 years	0.5 ml.	Intra-muscular	Upper Arm
TT	10 years & 16 years	0.5 ml	Intra-muscular	Upper Arm

*Give TT-2 or Booster doses before 36 weeks of pregnancy. However, give these even if more than 36 weeks have passed. Give TT to a woman in labour, if she has not previously received TT.

** JE Vaccine, in select endemic districts after the campaign.

*** The 2nd to 9th doses of Vitamin A can be administered to children 1-5 years old during biannual rounds, in collaboration with ICDS.

Frequently Asked Questions on the Immunization Schedule

BCG vaccine

Why give BCG vaccine only on the left upper arm?

BCG is given on the left upper arm to maintain uniformity and for helping surveyors in verifying the receipt of the vaccine.

Why do we give 0.05ml dose of BCG to newborns (below 1 month of age)?

This is because the skin of newborns is thin and an intra-dermal injection of 0.1ml may break the skin or penetrate into the deeper tissue and cause local abscess and enlarged axillary lymph nodes. Dose of 0.05 ml is sufficient to elicit adequate protection.

Why is BCG given only up to one year of age?

Most children acquire natural clinical/ sub-clinical tuberculosis infection by the age of one year. This too protects against severe forms of childhood tuberculosis e.g. TB meningitis and miliary disease.

If no scar appears after administering BCG, should one re-vaccinate the child?

There is no need to revaccinate the child even if there is no scar.

OPV

Till what age can a child be given OPV?

OPV can be given to children till 5 years of age.

Can OPV and vitamin A be given together with DPT-Booster dose?

Yes.

Can an infant be breastfed immediately after OPV?

Yes.

DPT VACCINE

Why DT is replaced by DPT vaccine for children above 2 years of age?

As Pertussis cases were reported in higher age group children and the risk of AEFIs was not found to be more after DPT vaccine as compared to DT vaccine.

If a child could not receive DPT1, 2, 3 and OPV 1, 2, 3 according to the schedule, till what age can the vaccine be given?

The DPT vaccine can be given until 7 years of age and OPV can be given till 5 years of age. If a child has received previous doses but not completed the schedule, do not restart the schedule and instead administer the remaining doses needed to complete the series.

Why should there be a minimum gap of 4 weeks between two doses of DPT?

This is because decreasing the interval between two doses may not obtain optimal antibody production for protection.

Why give the DPT vaccine in the antero-lateral mid thigh and not the gluteal region (buttocks)?

DPT is given in the antero-lateral mid-thigh and not the gluteal region to prevent damage to the sciatic nerve. Moreover, the vaccine deposited in the fat of gluteal region does not invoke the appropriate immune response.

What should one do if the child is found allergic to DPT or develops encephalopathy after DPT?

A child who is allergic to DPT or develops encephalopathy after DPT should be given the DTaP / DT vaccine instead of DPT for the remaining doses, as it is usually the P (whole cell Pertussis) component of the vaccine which causes the allergy/encephalopathy. It may be purchased with locally available resources.

TT VACCINE

If a girl received all doses of DPT and TT as per the NIS till 16 years of age and she gets pregnant at 20 years, should she get one dose of TT during pregnancy?

Give 2 doses of TT during the pregnancy as per the schedule.

Is TT at 10 years and 16 years is meant only for girls?

No, it is to be given to both boys and girls.

Can TT be given in the first trimester of pregnancy?

Yes, it should be given as soon as pregnancy is diagnosed.

HEPATITIS B VACCINE

Can Hepatitis B vaccine be mixed in the same syringe with DPT and given as one injection?

No, DPT and Hepatitis B vaccine (if supplied separately) cannot be mixed or administered through the same syringe.

Until what age can Hepatitis B vaccine be given?

According to the National Immunization Schedule, Hepatitis B vaccine should be given with the first, second and third doses of DPT till one year of age.

Why give the birth dose of Hepatitis B vaccine only within 24 hours of birth?

The birth dose of Hepatitis B vaccine is effective in preventing peri-natal transmission of Hepatitis B if given within the first 24 hours.

MEASLES VACCINE

Why give the Measles vaccine only on the right upper arm?

The Measles vaccine is given on the right upper arm to maintain uniformity and to help surveyors in verifying the receipt of the vaccine.

If a child has received the Measles vaccine before 9 months of age, is it necessary to repeat the vaccine later?

Yes, the Measles vaccine needs to be administered, according to the National Immunization Schedule i.e. after the completion of 9 months until 12 months of age and at 16-24 months. If not administered in the ideal age for Measles vaccine, it can be administered until 5 years of age.

What is a measles catch-up campaign?

A measles catch-up campaign is a special campaign to vaccinate all children in a wide age group in a state or a district with one dose of measles vaccine. The catch-up campaign dose is given to all children, both immunized and un-immunized, who belong to the target age group. The goal of a catch-up campaign is to quickly make the population immune from measles and reduce deaths from measles. A catch-up campaign must immunize nearly 100% of target age group children.

Why 2nd dose of Measles vaccine is introduced in the National Immunization Program?

Measles is highly infectious disease causing illness and death due to complications as diarrhoea, pneumonia or brain infection. One dose of measles vaccine at 9 months of age protects 85% of infants. With 2nd dose we aim to protect all the children who remain unprotected after first dose.

If a child comes late for the first dose, then can it get the second dose?

All efforts should be made to immunize the children at the right age i.e. first dose at completed 9 months to 12 months and second dose at 16 -24 months. However if a child comes late then give two doses of Measles vaccine at one month interval until 5 years of age.

If a child received one dose of Measles vaccine during an SIA campaign, should it receive the routine dose of Measles vaccine?

Yes, the child should receive routine doses of Measles vaccine according to the Immunization schedule irrespective of the measles SIA dose.

Why the amount of diluent provided by Manufacturers is more than the amount of vaccine doses to be administered?

The manufacturer provides more quantity of diluent than required, e.g. for 5 dose measles vial the diluent is more than 2.5 ml and for 10 dose BCG vial, it is more than 1ml. The reason for this is to take care of the unavoidable vaccine wastage which occurs due to:

- Some dead space in the hub and needle
- Sticking of the vaccine to the inner wall of the vaccine and
- Inefficiency of the HWs to draw entire amount of vaccine from the vial.

Therefore, it is important to draw the entire amount of diluent from the ampoule and use it to reconstitute the vaccine.

JE VACCINE

If a child 16-24 months of age has been immunized with JE vaccine during an SIA, can it receive the JE vaccine again, as part of RI?

No, currently this is a single dose vaccine and should not be repeated.

If a child above 2 years (24 months) of age has not received the JE vaccine through either RI or an SIA, should s/he be given the JE vaccine?

Yes, the child is eligible to receive a dose of the JE vaccine, through RI, till the age of 15 years.

VITAMIN A

How many prophylactic doses of vitamin A should be given and till what age?

A total of 9 prophylactic doses of vitamin A should be given till 5 years of age.

What should be the minimum gap between two doses of Vitamin A?

The minimum gap between any two doses of vitamin A should be 6 months.

How should Vitamin A syrup be administered?

Vitamin A syrup should be administered using only the spoon/dispenser provided with each bottle. The half mark in the spoon indicates 100,000 IU and a level full spoon contains 200,000 IU of Vitamin A.

What is the treatment schedule for children with clinical signs of vitamin A deficiency?

Administer 200,000 IU of Vitamin A immediately after diagnosis, followed by another dose of 200,000 IU, 1-4 weeks later.

What are the storage guidelines for un-opened bottles of Vitamin A solution?

Vitamin A solution must be kept away from direct sunlight and can be used until the expiry date.

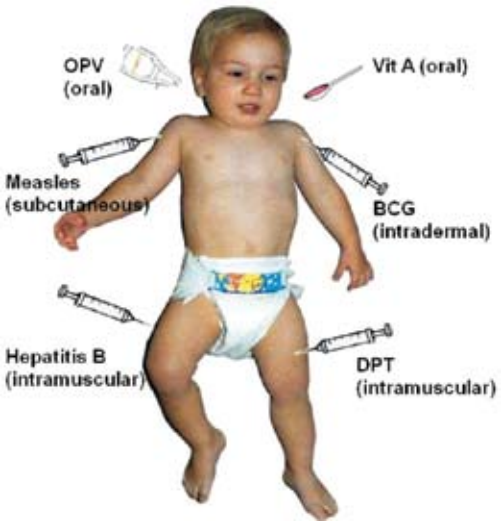
How long can a bottle of Vitamin A be used, once opened?

A Vitamin A bottle, once opened, should be used within 8 weeks. Write the date of opening on the bottle.

Other than Vitamin A supplementation, what are other policy guidelines to prevent vitamin A deficiency?

These are promotion of:

- Early and exclusive breast feeding, including feeding of colostrum, rich in vitamin A.
- Regular consumption of dark green leafy vegetables or yellow and orange fruits and vegetables like pumpkin, carrots, papaya, mango, oranges along with cereals and pulses to a weaning child
- Consumption of milk, cheese, curd, ghee, eggs, liver etc.



ZINC

How does Zinc help in reducing the frequency of diarrhoea?

Zinc is a micronutrient. It helps in early recovery from diarrhoea, less watery stools, less frequency of stools and reduction in child deaths and hospitalization.

What is the dose of Zinc to be used along with ORS in the treatment of diarrhoea?

The dose of zinc for infants aged 2-6 months is 10 mg of dispersible tablet in expressed breast milk for 14 days. For children 6 months to 5 years of age, it is 20 mg of dispersible tablet for 14 days.

ALL VACCINES

If a child who has never been vaccinated is brought at 9 months of age, can all the due vccines be given to a child on the same day?

Yes, all the due vaccines can be given during the same session but at different injection sites using separate AD syringes. It is safe and effective to give BCG, DPT, Hepatitis B, OPV and Measles vaccines and Vitamin A at the same time to a 9 months old child who has never been vaccinated.

If the mother/caregiver permits administration of only one injection during an infant's first visit at 9 months of age, which vaccine should be given?

At 9 months of age, the priority is to give measles vaccine with OPV and Vitamin-A.

Which vaccines can be given to a child between 1-5 years of age, who has never been vaccinated?

The child should be given DPT1, OPV-1, Measles and 2ml of Vitamin A solution. It should then be given the second and third doses of DPT and OPV at one month intervals. Measles second dose is also to be given as per the schedule. The Booster dose of OPV/DPT can be given at a minimum of 6 months after administering OPV3/DPT3.

Which vaccines can be given to a child between 5-7 years of age, who has never been vaccinated?

The child should be given first, second and third doses of DPT at one month intervals. The Booster dose of DPT can be given at a minimum of 6 months after administering DPT3 up to 7 years of age.

Should one re-start with the first dose of a vaccine if a child is brought late for a dose?

Do not start the schedule all over again even if the child is brought late for a dose. Pick up where the schedule was left off. For example: If a child who has received BCG, HepB-1, DPT-1 and OPV-1 at 5 months of age, returns at 11 months of age, vaccinate the child with DPT-2, HepB-2, OPV-2 and Measles and do not start from DPT-1, HepB-1 again.

Why is it not advisable to clean the injection site with a spirit swab before vaccination?

This is because some of the live components of the vaccine are killed if they come in contact with spirit.

Emphasize on the need for full immunization NOT necessarily adhering to the date. e.g. if a child comes beyond the due date for a vaccine, the child should receive all the due vaccines.

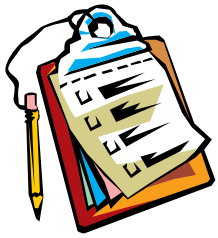
Vitamin A deficiency can be prevented by taking milk, green vegetables and yellow/orange fruits.

Unit 4 - Managing the Cold Chain and the Vaccine Carrier

Learning Objectives

At the end of the unit, you should be able to:

- Describe the importance of the cold chain.
- Describe which vaccines are sensitive to heat /light and freezing.
- Demonstrate how to check vaccines for exposure to heat or freezing.
- Demonstrate how to prepare ice packs and pack a vaccine carrier properly.



Contents

4.1 What is the cold chain?

The “cold chain” refers to the people, equipment, and procedures designed to maintain appropriate temperatures for vaccines from the time they leave the manufacturer, through transportation and storage, until the point of use. Health workers are responsible to maintain the temperature of vaccines at the peripheral level. If a vaccine is exposed to too much heat, light or cold, it can be damaged and lose its potency or effectiveness. If that happens, all the effort to give the vaccine to the child is lost.

4.2 Vaccine sensitivities

As indicated in the chart below, ***DPT, TT, and Hepatitis B vaccines will lose their potency if frozen. Reconstituted BCG, measles and JE vaccines are the most heat and light sensitive***. Since these live vaccines do not contain preservatives, there is risk of contamination with staphylococcus aureus leading to Toxic Shock Syndrome and, therefore, they ***should be used within 4 hours of reconstitution*** (2 hours for JE vaccine).

Table 4.1: Summary of Vaccine Sensitivities			
Vaccine	**Exposure to heat/light**	**Exposure to cold**	**Temperature at PHC**
Heat and light sensitive vaccines			
OPV	Sensitive to heat	Not damaged by freezing	+2°C to +8°C
Measles	Sensitive to heat and light	Not damaged by freezing	+2°C to +8°C
BCG	Relatively heat stable, but sensitive to light	Not damaged by freezing.	+2°C to +8°C
Freeze Sensitive Vaccines			
Hepatitis B	Relatively heat stable	Freezes at -0.5°C (Should not be frozen)	+2°C to +8°C
DPT	Relatively heat stable	Freezes at -3°C (Should not be frozen)	+2°C to +8°C
TT	Relatively heat stable	Freezes at -3°C (Should not be frozen)	+2°C to +8°C
At the PHC level, all vaccines are kept in the ILR for a period of one month at temperature of +2°C to +8°C			
Thermo-sensitivity of Vaccines			
Vaccines sensitive to heat • **BCG (after reconstitution)** • **OPV** • **Measles** • **DPT** • **BCG (before reconstitution)** • **TT, HepB, JE**	Most ↓ Least	Vaccines sensitive to freezing • **Hep- B** • **DPT** • **TT**	Most ↓ Least

4.3 How to maintain the correct temperature of vaccines?

All vaccines are sensitive to heat. BCG and Measles vaccines are also light sensitive. Hepatitis B, DPT and TT vaccines lose their potency if frozen. Therefore correct temperature should be maintained when packing vaccines, transporting them from the PHC to the immunization session and storing them during the session. Vaccines need to be checked both for damage from excessive heat as well as from freezing.

a) How to check for heat damage?

Vaccine vial label has a small white square inside a blue circle, called a Vaccine Vial Monitor (VVM) that indicates cumulative exposure of that particular vaccine to heat. Read the VVM (Figure 4A) and determine whether the vaccines have been damaged by heat. If these vaccine vial monitors show change in colour to the discard point, then discard the vaccines.

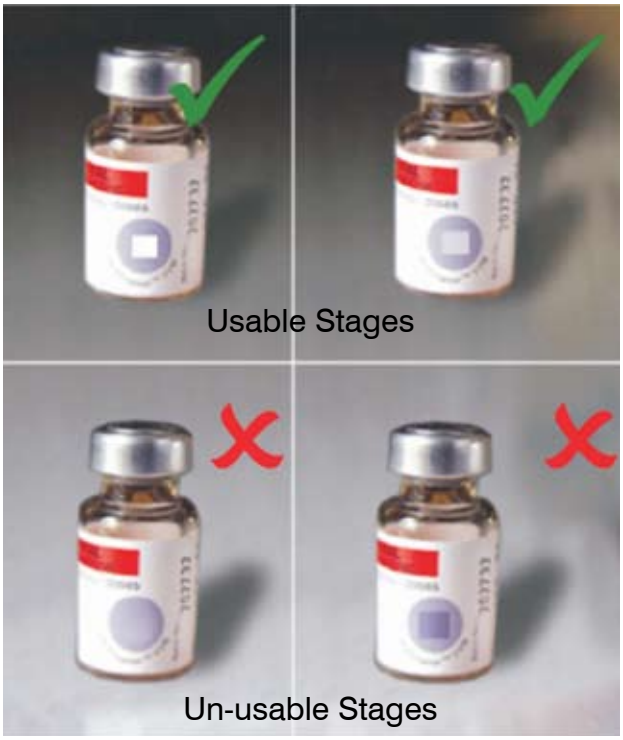


Figure 4A: Different stages of the VVM

Reading the VVM

1. The inner square is lighter than the outer circle. *If the expiry date has not been passed : **USE** the vaccine*
2. The inner square is still lighter than the outer circle. *If the expiry date has not been passed: **USE** the vaccine*

Discard Point:

3. The colour of the inner square matches that of the outer circle: ***DO NOT** use the vaccine*

Beyond the Discard Point:

4. The colour of the inner square is darker than the outer circle: ***DO NOT** use the vaccine*

b) How to check for cold damage (freezing)

To check for damage due to freezing (which can also take place due to direct contact of these vaccine vials with the ice packs). Discard the vial if it is frozen or it contains floccules.

Discard T-series vaccines and Hepatitis B, if

- ***Frozen***
- ***Floccules after shaking***

4.4 What are vaccine carriers?

Vaccine carriers are used for carrying vaccines (16-20 vials) to sub-centres or to villages. They maintain the cold chain during transport from the PHC for one day's use in the field. Vaccine carriers have thick walls and lids and are made of a special material that prevents heat from passing through and reducing the potency of vaccines.

Figure 4B: Vaccine

The inside temperature of a vaccine carrier is maintained between +2°C to +8°C with 4 conditioned ice packs for one day (if not opened frequently and foam pad is kept inside).

- ***Only vaccine carriers with 4 conditioned ice packs should be used. Day carriers with 2 ice packs should not be used.***
- ***Do not leave vaccine carriers in the sunlight; this spoils vaccines that are sensitive to heat and light.***
- ***Do not open the lid unnecessarily as this can allow heat and light into the carrier, which can spoil vaccines.***
- ***Never use any screw driver or any other sharp shaft to open the lid of vaccine***

4.5 What are ice packs and how to use them?

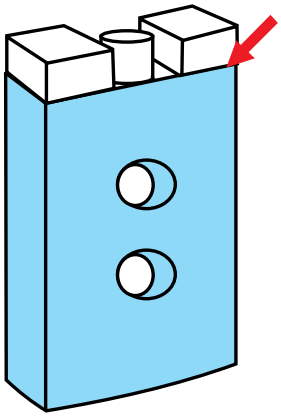


Figure 4C: Ice Pack

- Ice packs are plastic containers filled with water. These are hard frozen in the deep freezer. Do not add salt to water.
- Ice packs are kept along the walls of the vaccine carrier and the cold box to keep them and their contents cold.
- **Fill the ice pack with water up to the mark as shown in the Figure 4C and close the cap tightly.**
- Clean the outer surface of the ice packs with dry cloth before putting these in the deep freezer for freezing.

4.6 How to pack the vaccine carrier?

The vaccines should be collected on the day of immunization.

1. Check the vaccine carrier and make sure the lid fits tightly. Check the insulation for cracks.
2. **Conditioning of Ice packs**- Icepacks come out of the freezer at a temperature of about -20°C. They need to be kept at room temperature for a period of time to allow the ice at the core of the icepack to rise to 0°C. This process is called 'conditioning'. Follow these steps:

   ➢ Leave a 5 cm space all round each icepack.

   ➢ Lay out icepacks, preferably in single rows but never in more than two rows.

   ➢ Wait until there is a small amount of liquid water inside the icepacks.

   This will take up to one hour at +20°C and rather less at higher temperatures. Shake one of the icepacks every few minutes. The ice is conditioned as soon as it begins

to move about slightly inside its container. This prevents freezing of vaccines that may come in contact with the ice-packs.

3. **Place four conditioned ice packs** against the sides of the vaccine carrier.

4. Take the required amount of Measles, OPV, BCG TT, DPT and Hepatitis B vaccine, plus one vial of diluent for every BCG and measles vial (JE if reqd.) and place inside a plastic zipper bag. Place this bag in the centre of the vaccine carrier as shown in Figure 4D. This will prevent direct contact of the vaccine vials with ice packs and also prevent labels from peeling off from the vaccine vials. Keep the dropper for OPV also inside the vaccine carrier in the plastic bag.

Figure 4D: Packing Vaccine Carrier

5. Close the lid securely.

4.7 How long can vaccines be kept in the vaccine carrier?

Usually, vaccines can be stored in a vaccine carrier for one working day only. However this depends on the condition of the ice-packs and the ambient temperature. Vaccines can be kept safely in a vaccine carrier only as long as the ice packs remain at least partially frozen.

- ***Only use the diluent provided by the manufacturer with the vaccine.***
- ***Store the diluent in the ILR at +2°C to +8°C at least 24 hours before use to ensure that the vaccine and diluent are at the same temperature when being reconstituted.***
- ***Keep the diluents and droppers with the vaccines in the plastic zipper bag inside the vaccine carrier during transportation.***
- ***Do not drop or sit on the vaccine carrier: this can damage the carrier.***
- ***Do not carry vaccines in handbag as this can spoil vaccines, sensitive to heat.***

4.8 How to keep vaccines cold during immunization session?

Figure 4E: Re-constituted vaccine kept on icepack

Taking ice packs out of the vaccine carrier will shorten its cold life. During the immunization session, **only one Ice pack can be taken out for keeping reconstituted BCG and Measles vaccines in the holes of the ice pack**. The ice pack, once

taken out, should not be put inside the carrier till the end of the session. However, **DPT, TT or Hep B vaccines should never be kept on the ice pack**.

In most areas, the temperature in a vaccine carrier will stay below +8 oC for one day. In order to achieve this:

- Keep the carrier in the shade and a cool place
- Keep the lid closed during the immunization session
- Reconstituted BCG and measles vaccine can be kept at +2°C to +8°C for a maximum of 4 hours (2 hrs for JE)
- Write the time of reconstitution on the label of the vaccine vial and discard at the end of four hours (2 hrs for JE)

Figure 4F: Noting time of reconstitution.

- ***Send all vaccines from PHC to the session site in the vaccine carrier with 4 conditioned ice-packs on the day of the immunization session.***
- ***Return the unused vaccine vials from session sites to the PHC on the same day in the cold chain through alternate vaccine delivery.***
- ***Keep a box labeled "RETURNED UNUSED" in the ILR for all unused vaccines that can be used in subsequent sessions.***
- ***Discard vaccines that have been returned unopened more than thrice.***
- ***Do not keep any used vials in the cold chain.***

4.9 What are Cold Boxes?

Cold boxes are used to collect and transport monthly supplies of vaccines from district stores to the health facility. They are also used to store vaccines when the ILR is out of order and when defrosting the freezer to keep conditioned ice packs.

Before the vaccines are placed in the cold box, conditioned ice packs should be placed at the bottom and sides of the cold box. Thereafter, vaccines should be placed in cartons or polythene bags and placed in the cold box. The vaccines should be covered with a layer of conditioned ice packs before the cold box is closed.

Note that vaccines should be transported or stored in cold boxes only with a sufficient number of conditioned ice packs. In such a case, vaccines can be stored for around six days in a cold box. The temperature of the cold box should be monitored by keeping a dial thermometer inside the cold box.

4.10 What are Deep freezers?

Deep Freezers are kept at the PHC (small) and district (large) level. The cabinet temperature is maintained between -15°C to -25°C. In case of power failure, they can maintain the cabinet temperature for 18 to 22 hours. ***At the PHC level, Deep freezers are used only for preparation of ice packs and are not to be used for storing UIP vaccines***. About 20-25 icepacks can be prepared by a 140 Litre DF in 24 hours with at least 8 hours of continuous electricity supply.

4.11 What are Ice-lined Refrigerators (ILRs)?

ILRs are kept at the PHC (small) and district (large) level. The cabinet temperature is maintained at +2°C to +8°C. ***At the PHC level, ILRs are used for storing all UIP vaccines***. ILRs are lined with tubes or ice packs filled with water which freezes and keeps the internal temperature at a safe level despite electricity failure. ILRs can keep vaccines safe with as little as 8 hours continuous electricity supply in a 24-hour period. Since ILRs are top-opening, they can hold the cold air inside better than a front-opening refrigerators. All vaccines must be kept in the basket of the ILR along with diluents as shown in Figure 4G.

If baskets are not available, store vaccines (other than OPV and Measles) over two rows of empty ice-packs kept flat on the platform of the ILR. Measles and OPV can be kept over two rows of empty ice-packs on the floor of the ILR.

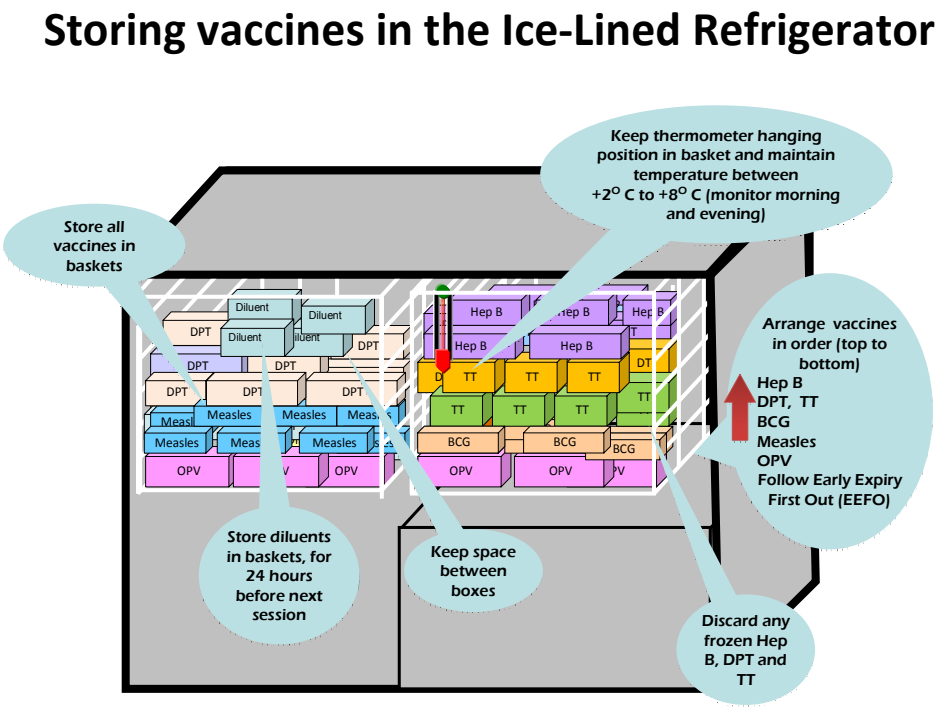


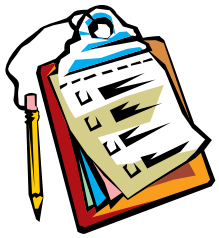
Figure 4G: Correct Placement of Vaccines in the Ice-Lined Refrigerator

Unit 5 - Ensuring Safe Injections

Learning Objectives

At the end of the unit, you should be able to:

- Explain the importance and advantages of safe injection practices.
- Demonstrate how to use AD Syringes.
- Demonstrate safe disposal of immunization waste.



Contents

- The importance of safe injection practices.
- Simple ways to improve injection safety.
- Giving safe injections using AD syringes.
- Guidelines for Safe disposal of Immunization Waste.

5.1 What is a safe injection?

A safe injection is an injection that does not cause harm to the recipient, the provider, or the community. Health workers should assume that all used injection equipment is contaminated and should not be used. They should take the necessary precautions to ensure that no person is potentially exposed to infection or accidental needle-stick injuries.

5.2 What are the risks associated with unsafe injections?

As health workers, we understand that reusing syringes and needles can cause cross-infection and put people at risk. The most common, serious infections transmitted by unsafe injections are Hepatitis B, Hepatitis C, and HIV (the virus that causes AIDS). Poorly administered injections can also cause injuries or drug toxicity when the wrong injection site, vaccine, diluent, or dose is used. It is important to prevent the risks of accidental needle-stick injury, and necessary to dispose off used syringes and needles safely to prevent risks to the community at large.

5.3 Simple ways to improve injection safety

- **Keep hands clean before giving injections**

  - ➢ Wash or disinfect hands prior to preparing injection material.
  - ➢ Avoid giving injections if the skin at the site of injection of the recipient is infected or compromised by local infection (such as a skin lesion, cut, or weeping dermatitis).
  - ➢ Cover any small cuts on the service provider's skin.

- **Use sterile injection equipment, every time**
  - ➢ Always use ADS for each injection and a new disposable syringe to reconstitute each vial of BCG and measles.
- **Prevent the contamination of vaccine and injection equipment**

  - ➢ Prepare each injection in a designated clean area where contamination from blood or body fluid is unlikely.
  - ➢ If the injection site is dirty, wash with clean water
  - ➢ Always pierce the rubber cap of the vial with a sterile needle.
  - ➢ Follow product-specific recommendations for use, storage, and handling of a vaccine.

  - ➢ Do not touch the needle or rubber cap of vial with your finger.
  - ➢ Discard any needle that has touched any non-sterile surface.
- **Assume all used equipment is contaminated**
  - ➢ Cut the used syringe at the hub immediately after use.
- **Practice safe disposal of all medical sharps waste**
  - ➢ Used sharps (needles) must be collected in a hub cutter and then carried to the PHC for safe disposal.

- **Prevent needle-stick injuries**
  - ➢ Do not recap or bend needles.
  - ➢ Collect sharps in a puncture proof container (Hub cutter).
  - ➢ Anticipate sudden movement of the child.

5.4 Auto-Disable Syringes

a) Features of AD Syringes

- Pre-sterilized in a sealed pack
- Have a fixed needle
- Available in two sizes with vaccine drawing capacity of 0.1 ml. and 0.5 ml.

b) Advantages of AD syringes

- AD syringes are designed to prevent the re-use of non-sterile syringes.
- The fixed-needle design reduces the empty space in the syringe that wastes vaccine and eliminates chances of entry of air bubbles into the syringe due to loose fitting of the needle.
- AD syringes are dose-specific (0.5 ml and 0.1 ml) and hence, drawing the plunger to the full length to the specified marking ensures the correct dose.
- AD syringes are pre-sterilized therefore eliminating the need to carry bulky equipment such as pressure cookers, stove, kerosene, etc. to the session site and help save time.

If you touch any part of the needle, discard the syringe and needle and use a new, sterile syringe.

c) Injection technique of AD Syringes

In AD syringes the plunger can go back and forward only once. The plunger gets locked after the complete dose of vaccine is pushed in. ***Do NOT draw in air to inject it into the vial before drawing the vaccine.*** See Figure 5A for using the AD syringes correctly.

d) Handling syringes and needles safely

Do not touch any part of the needle at the time of drawing and administering the vaccine.

e) Setting up the immunization work area to minimize risk of injury

You should plan the layout of your work-space so that:

- The vaccine carrier is in the shade.
- Tally sheets can easily be used.
- Your position is between the child and all needles or sharp objects.

Figure 5A: Injection Technique

1. Select the correct syringe for the vaccine to be administered. BCG 0.1ml and all others 0.5ml.
2. Check the packaging. Don't use if the package is damaged, opened, or expired.
3. Peel open or tear the package from the plunger side and remove the syringe by holding the barrel. Discard the packaging into a **black** plastic bag.

4. Remove the needle cover/ cap and discard it into the **black** plastic bag.
5. Do not move the plunger until you are ready to fill the syringe with the vaccine and **do not inject air into the vial as this will lock the syringe.**
6. Take the appropriate vaccine vial, invert the vial, and insert the needle into the vial through the rubber cap. Insert the needle such that the tip is within the level of the vaccine. If inserted beyond you may draw air bubble which is very difficult to expel.
7. **Do not touch the needle or the rubber cap (septum) of the vial.**

8. Pull the plunger back slowly to fill the syringe. The plunger will automatically stop when the necessary dose of the vaccine has been drawn (0.1 or 0.5 ml).
9. **Do not draw air into the syringe.** In case air accidentally enters the syringe, remove the needle from the vial. Holding the syringe upright, tap the barrel to bring the bubbles towards the tip of syringe. Then carefully push the plunger to the dose mark (0.5 or 0.1 ml) thus expelling the air bubble.
10. Clean the injection site (if dirty) with a clean water swab.
11. Administer the vaccine. (BCG: Left upper arm; DPT and Hep B: Antero-lateral aspect (outer side) of mid thigh; Measles: Right upper arm; TT: Upper arm; JE: Left upper arm)

12. Push the plunger completely to deliver the dose. **Do not rub the injection site after vaccine is given.**
13. **Do not recap the needle.** Cut the hub of the syringe immediately after use with a hub-cutter that collects the sharps in a translucent plastic container.
14. Then collect the plastic portion of the cut syringes in a **red** plastic bag.

Follow the guidelines for waste disposal as given under 5.5

5.5 Guidelines for Waste Disposal

Step1 Cut the AD syringe at the hub immediately after administering the injection at the session site using the Hub cutter that cuts plastic hub of syringe and not the metal part of needle. See figure 5B for correct use of Hub cutters.

Figure 5B: Correct use of Hub cutters

Do not touch any part of the needle

Step 2 The cut needles will get collected in the puncture proof translucent container of the hub cutter.

Step 3 Store broken ampoules / vials in a separate white translucent sturdy and puncture proof container or in the same hub cutter in case its capacity is able to accommodate broken vials also.

Step 4 Segregate and store the plastic portion of the cut syringes and unbroken (but discarded) vials in the red bag or container.

Step 5 Send the red bag and the hubcutter to PHC for disinfection and disposal by designated person at the PHC. Dispose off the black bag as general waste

Step 6 Treat the collected material in an autoclave. If autoclaving is not possible, boil the waste in water for at least 10 minutes or provide chemical treatment (using at least 1% solution of freshly prepared sodium hypochlorite for 30 minutes). Ensure that these treatments result in disinfection. However, District Hospital/CHC/PHC etc. will ultimately make the necessary arrangements to autoclave on a regular basis.

Step 7 Dispose the autoclaved / disinfected waste as follows:

- Dispose the needles and broken vials in a safety pit/tank
- Send the syringes for recycling and unbroken vials for landfill.

Step 8 Wash the hub cutters properly for re-use

Step 9 Make a proper record of generation, treatment and disposal of waste at the PHC.

Safe Disposal of Immunization Waste

- I Cut hub of AD and Disposable syringes
- Broken vials and ampoules
- Plastic part of Syringes
- Empty unbroken Vials
- Needle Caps
- Wrappers

Hub cutter

Red Bag

Black Bag

Disinfect with 1% bleaching powder solution (for 30 minutes)

Dispose in Safety Pit

Recycle

Dispose as Municipal Waste

Send to Health Facility at end of Session

Figure 5C: Safe disposal of immunization waste

To prepare **1% Hypochlorite solution**, dissolve 10-15g or 1 tablespoonful of bleaching powder in 1 liter of water, in a well ventilated area. Chlorine solutions gradually lose strength; therefore prepare freshly diluted solutions daily. Use clear water, because organic matter destroys chlorine. Since this bleach solution is also caustic, avoid direct contact with skin and eyes. Use plastic containers as metal containers are corroded rapidly and also affect the bleach.

30 Lt. (24'' x 28'') **Red**/ **Black Plastic Bags** (Biodegradable) HDPE/LLDPE/PP made with virgin, non-chlorinated polymer material with minimum thickness of 55 micron, with easy to hold collar tie/knot arrangement and preprinted as per requirements of Bio Medical Waste Management Rules.

Unit 6 - Planning and Conducting Immunization

Learning Objectives

At the end of the unit, you should be able to:

- Draw a map that identifies the location of all outreach sessions.
- Calculate the requirement of vaccines, syringes and other supplies.
- Prepare Work plan including the immunization session sites and days.
- Make preparations for conducting the immunization sessions.
- Conduct an immunization session using the correct administration techniques for each vaccine.

Contents

- Steps in preparation of a Sub-center Micro plan.
- Alternate Vaccine Delivery System and Alternate Vaccinators
- Preparing for an Immunization session.
- Arranging and conducting the Immunization session.
- Administering vaccines correctly.

6.1 What is the Micro plan for immunization?

It includes:

- An Area Map (with villages/mohalla, hamlets, hard to reach areas, etc.) at the SC-level.
- An estimation of beneficiaries.
- An estimation of vaccines and logistics.
- A work plan, including:
  - Who will provide the services?
  - Who will assist in provision of the services (AWW, ASHA, Social mobilizers, Gram Panchayat members, NGOs etc)

- Where will the services be provided (selection of sites)?
- When will the services be provided (planning of sessions)?

a) Guidelines for selection of immunization sites

- Finalize the session sites after discussions with the AWW, ASHA, TBAs, other service providers and Panchayat/ward members.
- Consult community members and fix a mutually convenient site and time for the immunization session.
- Prefer to use government building (sub-centre or AWC) as Immunization site. In case, both do not exist then select other site such as Panchayat Bhawan, School etc, which is easily accessible to all sections of the community.
- For hard-to-reach areas, with few beneficiaries, plan session at a site close to the community.
- Do not change session sites and times unless required.

ANM should share with AWW and ASHA:

- ***The time and place of the next session***
- ***Due list of beneficiaries, to ensure that they bring them to the session?***

b) Guidelines for estimation of the number of sessions for each sub-centre

Vaccination sessions may be organized at an interval of one, two or three months, depending on the expected injection load per immunization session.

- **Out reach sites** (SC/ AWC etc. without vaccine storage facility)
  - For every 25-50 injections, plan one session per month.
  - For more than 50 injections, plan two sessions per month.
  - For less than 25 injections, plan a session every alternate month.
- **Fixed sites** (PHC/CHC/District Hospital or others where vaccine is stored)
  - For every 40-70 injections, plan one session per month.
  - For more than 70 injections, plan two sessions per month.
  - For a busy CHC/RH, plan daily sessions.

For hard to reach areas, a minimum of 4 sessions in a year (once every quarter) should be held.

- **Hard to reach areas with population of less than 1000**
  - ➢ Plan minimum of 4 sessions in a year (one session every quarter)

c) Steps in preparation of a sub-center micro plan (see table 6.1)

Step 1. List all villages and hamlets in the sub-center area

Step 2. Write the total population of each village based on actual headcount

Step 3. Write Annual target of beneficiaries (pregnant women and infants)

For infants, it is actual headcount. For PW, the headcount provides a point estimate for only 6 months (as pregnancies in the first trimester may be undetected). Hence, multiply the headcount by 2 to arrive at an estimate for 12 months.

Step 4. Write monthly target of beneficiaries (pregnant women and infants)

Divide the annual target of pregnant women and infants by 12 to get the monthly target.

Step 5. Calculate the beneficiaries per month for each vaccine and Vitamin A

For example, if the monthly target for a village is 1 infant and 1 pregnant woman, then the beneficiaries for each vaccine[1] and vitamin A (and injection load) for such a village can be calculated as follows:

- TT = Monthly target of pregnant women x 2 doses (2 injections)
- BCG = Monthly target of infants x 1 dose (1 injection)
- DPT = Monthly target of infants x 5 doses[2] (5 injections)
- OPV = Monthly target of infants x 4 doses[3]
- HepB = Monthly target of infants x 3 doses (3 injections)
- Measles = Monthly target of infants x 2 doses (2 injections)
- JE = Monthly target of infants x 1 dose (1 injection)
- Vit A = Monthly target of infants x 9 doses

Therefore, a total of about 14 injections are required for a target of each infant per month. If the target is 2 infants then the injection load will be 28. This means that one session has to be held every month.

---

[1] Based on the specific needs, add the calculations of beneficiaries for the following doses:
OPV-0 = Monthly target of infants x 1 dose
HepB-Birth = Monthly target of infants x 1 dose.
TT-10 = expected 10 yr old population x 1 dose
TT-16 = expected 16 yr old population x 1 dose

[2] Including 2 booster doses

[3] Including 1 booster dose

Step 6. Calculate the requirement of vaccine vials and Vitamin A per month

- TT/BCG/DPT/HepB = $\frac{\text{Beneficiaries per month X 1.33*}}{10}$
- OPV = $\frac{\text{Beneficiaries per month X 1.33*}}{20}$
- Measles / JE = $\frac{\text{Beneficiaries per month X 1.33*}}{5}$
- Vit A = {(monthly target of infants x 1 ml) + (monthly target of infants x 2 ml x 8)} x 1.11**

* Vaccines = 25% wastage rate or 1.33 WMF (Wastage Multiplication Factor)

**Vit A = 10% wastage rate or 1.11 WMF

- 0.1 ml ADS = Beneficiaries for BCG x 1.11*
- 0.5 ml ADS = Beneficiaries for (TT+DPT+HepB+Measles+JE) x 1.11*
- Reconstitution Syringes = (BCG+Measles+JE vials) X 1.11*

* Syringes = 10% wastage rate or 1.11 WMF (Wastage Multiplication Factor)

Ensure that a minimum of one vial of each vaccine is available for every session. Also ensure that the ampoules of diluents are equal to the required number of BCG, Measles and JE vials.

Step 7. Prepare the Work Plan / Roster

- List all the villages and hamlets in the Sub-Center area as in Step1.
- Write distance of each village from ILR point (last vaccine storage point from where the vaccines are distributed to session sites).
- Write names of AWW and ASHA
- Monthly injection load per village and number of sessions required per month
- Days of immunization session in each village

Step 8. Prepare a map of sub-centre showing:

- All villages and hamlets with their total population and annual target infants.
- All Anganwadi centers, session sites and session days.
- Distance from the ILR point and the mode of transport.
- Landmarks as Panchayat Bhavan, School, Roads etc.

Prepare the map of the sub-center area and display at the sub-center

Figure 6A: Map of a subcentre

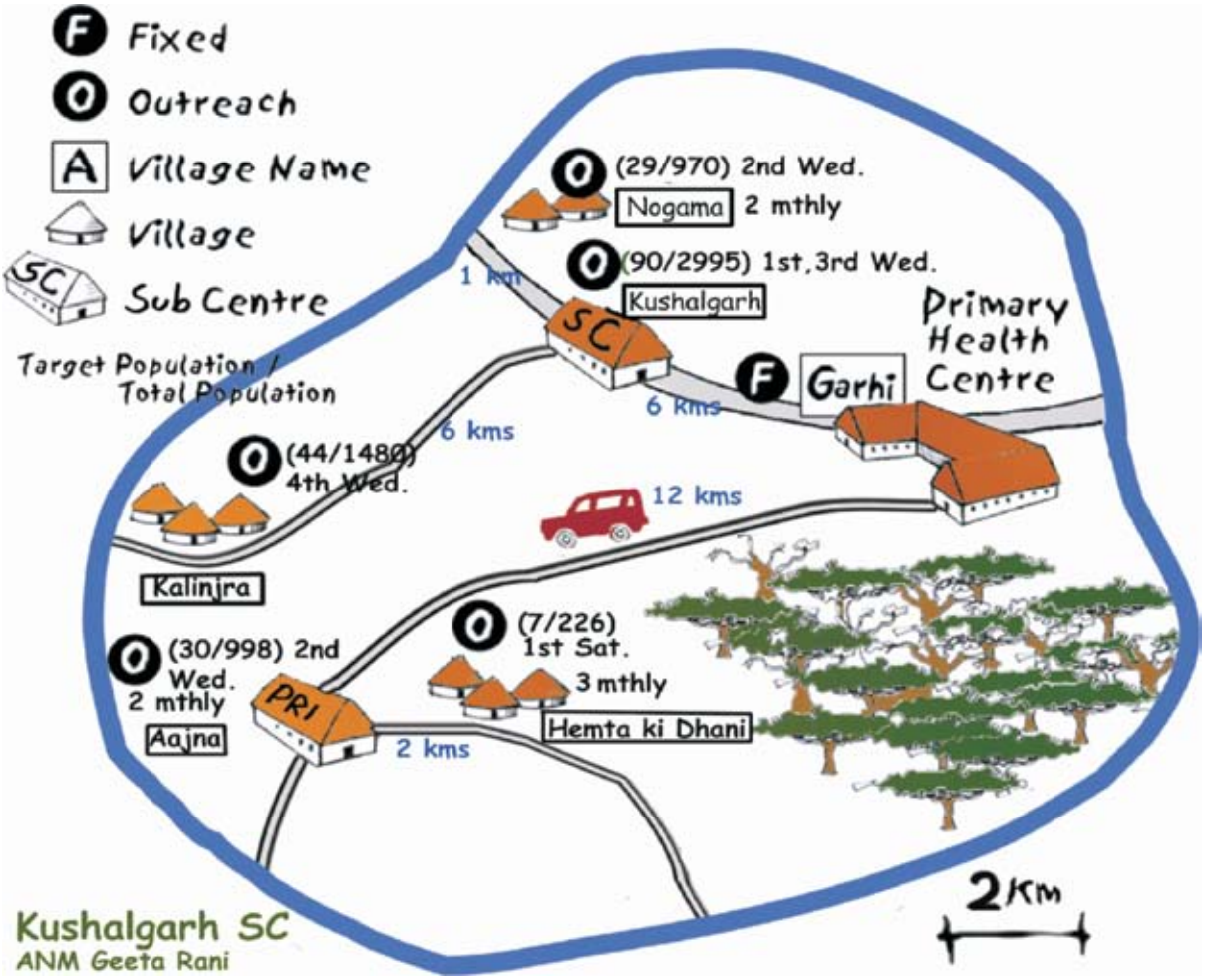


Table 6.1: Sub Center Micro-plan (ANM : Geeta Rani)

		Estimation of Beneficiaries												Estimation of Vaccines and Logistics									
Sl No.	Village	Total Population	Annual Target		Monthly Target		Beneficiaries per month for each vaccine & Vitamin A							Vaccine vials & Vitamin A per month								Syringes per month		
			PW	Infants	PW	Infants	TT	BCG	DPT	OPV	Hepatitis B	Measles	JE	Vitamin A	TT	BCG	DPT	OPV	Hepatitis B	Measles	JE	Vitamin A (in ml)	ADS 0.1 ml	ADS 0.5 ml	Reconstitution
			a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w
Formula		Based on actual headcount	Based on actual headcount x 2	Based on actual headcount	Column a 12	Column b 12	Column c x 2	Column d x 1	Column d x 5	Column d x 4	Column d x 3	Column d x 2	Column d x 1	Column d x 9	(Column e x 1.33) ÷ 10	(Column f x 1.33) ÷ 10	(Column g x 1.33) ÷10	(Column h x 1.33) ÷ 20	(Column i x 1.33) ÷ 10	(Column j x 1.33) ÷ 5	(Column k x 1.33) ÷ 5	{(column d x 1 ml) + (column d x 8) x 2 ml)} x 1.11	Column f X 1.11	(Columns e + g + i + j + k) X 1.11	(Columns m +q+s) X 1.11
1	Kushalgarh (SC)	2995	96	90	8	8	16	8	40	32	24	16	8	72	3	2	6	3	4	5	3	160	9	116	12
2	Nogama	970	32	29	3	3	6	3	15	12	9	6	3	27	1	1	2	1	2	2	1	60	4	44	5
3	Kalinjra	1480	48	44	4	4	8	4	20	16	12	8	4	36	2	1	3	2	2	3	2	80	5	58	7
4	Aajna	998	34	30	3	3	6	3	15	12	9	6	3	27	1	1	2	1	2	2	1	60	4	44	5
5	Hemta Ki Dhani	226	8	7	1	1	2	1	5	4	3	2	1	9	1	1	1	1	1	1	1	20	2	15	4

ANM Work Plan/ Roster

Sl No.	Village	Distance (kms) from ILR point	AWW	ASHA	Injections per month	Sessions required per month	Month 1								Month 2								Month 3							
							Wed				Sat				Wed				Sat				Wed				Sat			
							1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	Kushalgarh (SC)	6	Anupma	Mina	112	Thrice/ a mth	x				x		x		x				x		x		x				x		x	
2	Nogama (AWC)	7	Rukmani	Babli	42	Once/ a mth		x								x								x						
3	Kalinjra (AWC)	12	Shaeela	Laali	56	Twice/a mth			x					x			x					x			x					x
4	Aajna (PRI)	12	Madhavi	Kanta	42	Once/ a mth				x								x								x				
5	Hemta Ki Dhani (AWC)	14	Geeta	Kuribai	14	Once/ 3 mths						x																		

6.2 Micro planning for urban areas

Consider these additional points:

- Formation of Urban Coordination Committee is important for planning.
- Map all administrative zones and wards, with clear demarcation of catchment areas of various public health service providers (Municipal or Health Department).
- Include all NGOs, Private and Charitable hospitals, AWCs etc.
- Include all slums (recognized and unrecognized) and other under-served areas.
- If there is a paucity of ANMs, hire alternate vaccinators, including private doctors, NGOs.
- Also involve local CBOs in social mobilization.
- If there are insufficient AWCs, plan sessions in schools, CBOs, youth clubs etc.
- Plan sessions more frequently, if required due to overcrowding in slums.

6.3 Alternate Vaccine Delivery System and Alternate Vaccinators

- Alternate Vaccine Delivery System means that the vaccine carrier is delivered from PHC to the session site by an independent person and ANM has to reach directly at the session site. It helps to start the session on time and the HW doesn't have to come to PHC to collect or return vaccine and other logistics to the PHC at the end of the session.
- Alternate Vaccinators (AVs) can be hired for:
  - Urban Slums
  - Areas with no ANM posted
  - Areas where posted ANM is absent since 2 months (e.g. Sick leave, Maternity Leave of ANM)

In Urban Slums, 1 session per month should be planned for 10,000 population. In other areas mentioned above, sessions should be planned on existing guidelines based on monthly injection load.

Competent Human Resources like retired ANMs or trained and well-qualified nurses, pharmacist can be hired as Alternate Vaccinators. If need be, train (as per the HW training handbook) these vaccinators prior to utilizing their services.

1 hired Alternate Vaccinator can be engaged for a maximum of 4 sessions per month. Alternate Vaccinators thus hired are to be paid an honorarium of Rs. 300 and contingency of Rs. 50 per session (total Rs. 350).

6.4 Making Preparations before an immunization session

a) Choose an appropriate location accessible to the community

Ideally, the immunization session sites should have:

- Adequate space to accommodate beneficiaries before and after being immunized; space for registration, immunizing and recording.
- A table for vaccines and injection equipment
- A seat on which a parent can sit while holding a child for immunization
- A seat for the health worker

b) Arrange for the equipment and supplies required

a. Source of clean water	j. Soap for hand washing
b. Vaccine carrier with 4 conditioned ice packs	k. Metal file to open ampoules
c. Vaccines, diluents and Vitamin A	l. MCH card/ Immunization card
d. AD Syringes	m. Immunization register
e. Disposable syringes	n. Counterfoils pertaining to the session
f. Hub cutter	o. Immunization tally sheets
g. Equipment for waste disposal – Black and Red bags	p. Table, stools and chair
h. Cotton swabs	q. BP apparatus*, Weighing machine*
i. Paracetamol liquid or tablets	r. ORS, Zinc and IFA tablets*
* Items to be included when immunization session is part of Village Health and Nutrition Day (VHND).	

c) Prepare due list of beneficiaries and share with AWW and ASHA to bring them for the session

Prepare the list of due beneficiaries by consulting the following documents:

- Counterfoils of immunization cards
- MCH / Immunization register
- Register of AWW and ASHA
- Newborn tracking booklets of polio rounds.

If needed, use only wet cotton swab for cleaning the injection site

6.5 Arranging the immunization session

Place everything you need within reach

A table is required to hold the equipment and stationery used while giving immunization. On the table you should keep:

- Vaccine carrier
- Hub Cutter
- Immunization cards and records
- Cotton swabs
- Clean water for cleaning the injection site

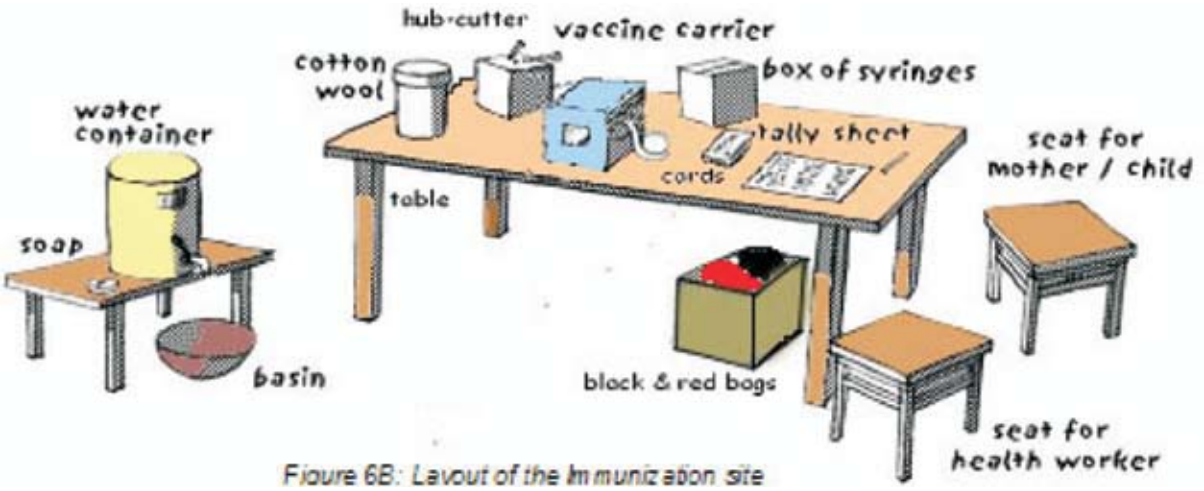


Figure 6B: Layout of the Immunization site

Keep red and black bags near the table, for disposing immunization waste. Also keep a bowl, water and soap for scrubbing your hands clean before beginning the immunization session and every time your hands come in contact with any un-sterile surface.

6.6 Conducting Immunization session

a) Selecting safe and potent vaccines

Before beginning your immunization session, and before giving each vaccine, follow these steps to ensure that every dose that you are going to give is safe and effective

- **Check label**: Make sure the label on the vaccine vial is attached and clear enough to read. If you find that the label is not clear enough to read or has come off, **discard the vial**.
- **Check vaccine and diluent**: Check that the vaccine and diluent being given are the correct one.

- **Check expiry**: Look for the expiry date on the vial. If the expiry date has passed, do not use the vial; **Discard it**.
- **Check the vaccine vial monitor (VVM)** on vaccine vials to make sure that the vaccine is in the usable stage.
- **Shake the T-series and HepB vials** to rule-out freezing or floccules.
- **Note down the batch number** of each vaccine vial and diluent.

b) Contraindications to immunization

All infants should be immunized except in these rare situations:

1. Anaphylaxis or a severe allergic reaction is an absolute contraindication to subsequent doses of a vaccine. Persons with a known allergy to a vaccine component should not be vaccinated.
2. Any serious AEFI reported during previous vaccination to the child with the same vaccine is also a contraindication. e.g. convulsion and encephalitis with a previous dose of DPT
3. High fever

Mild fever, diarrhoea, and cough are not contraindications for immunization

c) Steps in conducting the immunization session (also refer Annex 1 and 2)

You should follow the steps given below while conducting an immunization session:

1. Welcome the beneficiaries.
2. Verify beneficiaries' record and age and check that the beneficiary is due for vaccination today.
3. Screen for contraindications.
4. Explain what vaccine(s) will be given and the disease it prevents.
5. Check the vial label for VVM.
6. Check vial expiry date on the label.
7. **Wash hands** before reconstituting vaccine and conducting the session.
8. For T series vaccines lightly shake the vials before withdrawing the dose.
9. Use only the diluent supplied with the vaccine as it is specifically designed by the manufacturer for the needs of that vaccine, with respect to volume, PH level and chemical properties.
10. Write the time of reconstitution on the vial (BCG, Measles).

11. Maintain aseptic technique throughout.
12. Position the child correctly.
13. Clean the injection site if dirty with clean water swab.
14. Inject the vaccine at the correct site and follow the correct route of administration of the vaccine e.g. Intradermal; sub-cutaneous; intramuscular.
15. Inject the vaccine using steady pressure.
16. Withdraw the needle at the angle of insertion.
17. ***Do not massage the injection site after giving the injection.***
18. Cut the hub of the syringe with the hub cutter. Collect cut needles in the hub cutter and place the cut syringes in the red bag.
19. Explain potential minor side-effects/ problems that may occur due to the vaccine and how to deal with them.
20. Remind parents about the next visit and ask them to bring the card on next visit.
21. Ask beneficiaries to wait for half an hour after vaccination to observe for any AEFI.
22. Fully document each immunization in the immunization card, counterfoil, tally sheet and immunization register.
23. Retain the counter foil in the tracking bag as shown in Unit-8.
24. Ensure disinfection of the needles and syringes followed by their disposal as per guidelines.
25. Leave the list of children vaccinated in a session with the AWW/ASHA and request them to be alert and report AEFIs. Share contact details of self and PHC.

- ***BCG & Measles vials should be opened even for one beneficiary.***
- ***Spend approximately 5-10 minutes for each child for immunizing, recording, communicating etc.***

d) Reconstituting vaccines

BCG and measles vaccines are freeze-dried (dry powder) and must be reconstituted with diluents before use. Keep the diluents in the ILR for at least 24 hours before use to ensure that vaccines and diluents are at the same temperature (+20 to + 80 C) at the time of reconstitution. Otherwise it can lead to thermal shock i.e. the death of some or all the essential live organisms in the vaccine. Keep diluents with vaccines in plastic zipper bag in the vaccine carrier during transportation.

- Diluents for BCG are normal saline.
- Diluents for measles are pyrogen-free, double-distilled water.
- Diluents for JE are phosphate buffer solution.

Figure 6C: VVM on cap of vial

When reconstituting vaccines, follow these steps carefully:

- Double check that you have chosen the correct diluent, which has been supplied by the manufacturer for the specific freeze-dried vaccine you are going to mix.
- Check expiry date on the label and VVM on the cap of vaccine vial. This VVM indicates whether the dry vaccine is usable or not. ***Once reconstituted, VVM is of no use as the vaccine has to be used with in 4 hours (2 hrs for JE).***
- Reconstitute the vaccine even when only one eligible child is present.
- Use a new 5ml disposable syringe for each reconstitution. Do not use it for injecting.
- Open the vaccine vial and open an ampoule of diluent.
- Draw the entire quantity of the diluent into the mixing syringe.
- Insert the reconstitution needle into the vaccine vial, inject the diluent from the syringe into the vial and remove the needle.
- Cut the mixing syringe at the hub with the hub cutter.
- To mix the vaccine and diluent, shake the vial gently by holding at the neck.
- Write the time of reconstitution on the vial label.
- ***Use the reconstituted vaccine, within four hours of reconstitution. At the end of four hours, discard the vaccine and reconstitute a new one if required.***

e) Positioning the child for immunization

The correct positioning of a child for immunization is to ask the mother (or caregiver) to sit with the baby on her lap with one arm around the back of the baby, holding the baby's hand and leg steady. The baby's other arm should wrap around the mother's side.

Figure 6D: Correct position of the child

f) Giving the injection

Vaccine administration is the key to the successful outcome of any immunization programme. The ease and efficiency with which vaccine administration is done goes a long way towards establishing confidence in the minds of beneficiaries and helping to achieve the goal of full coverage. The following are critical to delivery of safe and effective immunization services.

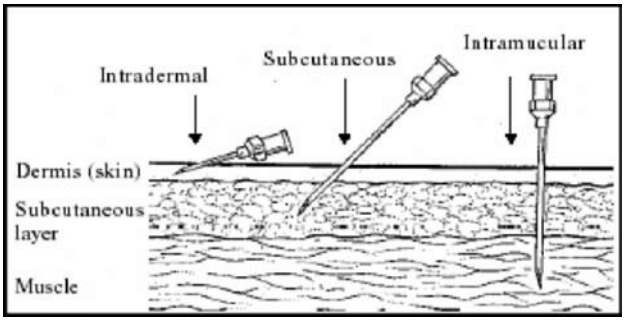


Figure 6E: Various Needle Positions

Intra-dermal injection (BCG)

An Intra-dermal injection is one given directly into the dermis (skin) layer. Carry out the following steps when giving an intra-dermal injection:

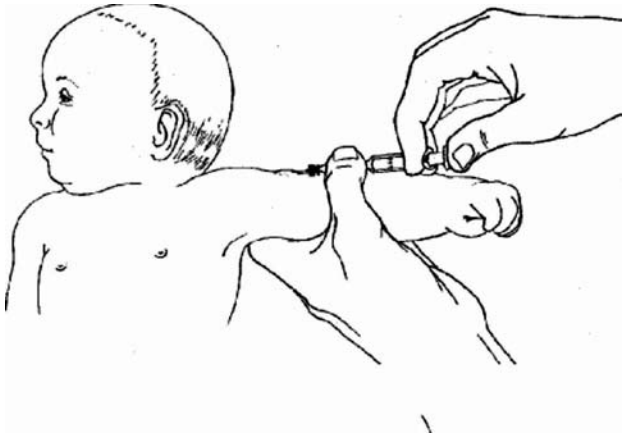


Figure 6F: Intra-dermal Injection

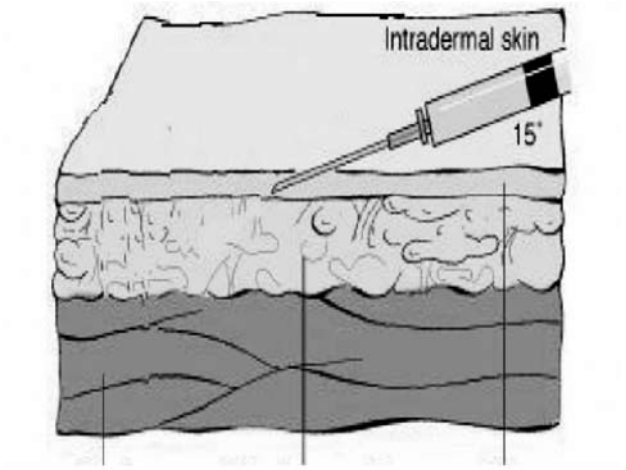


Figure 6G: Intra-dermal Needle Position

1) Position the baby, and load the reconstituted BCG vaccine 0.05 ml for infants under one month and 0.1ml for infants older than one month.
2) Position your left hand under the child's left arm and gently pull the skin under the arm to stretch the skin at the injection site.
3) Hold the syringe in your right hand with the bevelled edge of the needle pointing up
4) Insert the tip of the needle into skin-just the bevel and a little bit more at 150 angle.
5) Do not push too far, and do not point downward (**This way, the needle will go under the skin and will make the injection subcutaneous, instead of Intradermal)**
6) Put your left thumb over the needle-end of the syringe (not on the needle itself) to hold it in position.
7) Hold the plunger end of the syringe between the index and middle fingers of your right hand and press the plunger in with your right thumb. When an intradermal injection is given correctly the plunger is hard to push.

8) Inject vaccine (0.05/0.1 ml as required) and withdraw the needle.

9) Cut the hub of syringe with the hub cutter and put plastic portion of the syringe into the red bag.

10) If you have injected BCG correctly, a flat-topped swelling appears on the skin. The swelling may look pale with very small pits (like an orange peel).

After 2-3 weeks of a correct injection, a papule develops which increases slowly in size up to 5 weeks (4-8mm). It then subsides and breaks into a shallow ulcer. Healing occurs spontaneously within 6-12 weeks, leaving a permanent tiny round scar, 4-8 mm in diameter. This is a normal reaction. When the technique is incorrect (the vaccine will go in easily and no swelling will be visible).

1. If the whole dose has been delivered under the skin, consider the child vaccinated. Do not repeat the injection.
2. If the whole dose has not been administered, reposition the needle and give the remaining dose.
3. Follow-up for side effects such as abscess and enlargement of the glands.

Intra-muscular injection (DPT, TT and Hepatitis B)

Intra-muscular injections are injections given into the muscle tissue. All intramuscular injections should be given in the anterolateral aspect of mid thigh. Pregnant women should be injected on the outer aspect of the upper arm. Carry out the following steps when giving an intra-muscular injection:

Figure 6H: Intra-muscular Injection

1. Check the VVM on the vaccine vial.
2. Position the child on the mother's lap.
3. Load the vaccine into a 0.5 ml AD syringe (throw the AD syringe wrapper and plastic cap in the black bag).
4. If necessary, expel excess air from the syringe by tapping the syringe.
5. Make sure you have exactly 0.5 ml of vaccine in the syringe (no more, no less).
6. Put the finger and thumb of your left hand on either side of the injection site.
7. Stretch the skin flat between finger and thumb.
8. Hold the syringe like a pen in the right hand and push the needle straight down at 900 (as it will traumatize fewer muscle fibres) through the skin between finger and thumb.

Do not massage the injection site after vaccination

Penetrate deep into the muscle, but not all the way to the bone.

9. Press the top of the plunger with the thumb to inject the vaccine.
10. Withdraw the needle and press the site of injection with a dry cotton swab.
11. Cut the hub of syringe with the hub cutter and put the plastic part of the syringe into the red bag.

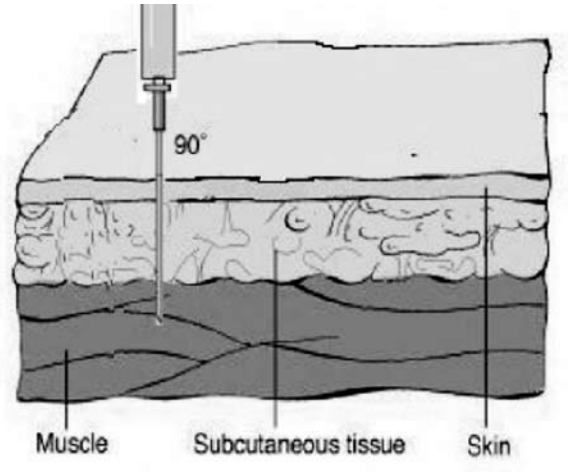


Figure 6I: Intra-muscular Needle Position

Caution: Infants should never be given injections in the buttock as evidence indicates that there is risk of damaging the nerves in the area. The vaccine will also be less effective if injected deep into fatty tissues.

Subcutaneous injection (Measles and JE)

A subcutaneous injection is one that is given into the thin layer of tissue between the dermis (skin) and the muscle. The injection should be given in the right arm on the deltoid site of the skin. Carry out the following steps when giving a sub-cutaneous injection:

Figure 6J: Sub-cutaneous Injection

1. Make sure the reconstituted vaccine has not expired (To be used with in four hours of reconstitution)
2. Position the child on the mother's lap.
3. Load the vaccine into a 0.5ml AD syringe (put the AD syringe wrapper and plastic cap in the black bag)
4. If necessary, expel excess air from the syringe by tapping the syringe.

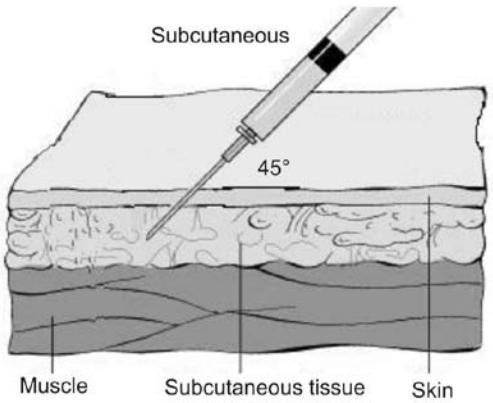


Figure 6K: Sub-cutaneous Needle Position

5. Make sure you have exactly 0.5ml vaccine in the syringe (no more, no less).
6. Pinch the skin of the right upper arm through the left index finger and thumb.
7. Push the needle in a slanting position at 450 angle into the pinched-up skin. Do not push the needle too far in.

8. Press the plunger with your thumb to inject the vaccine.
9. Withdraw the needle and press the site of injection with a dry cotton swab.
10. Cut the hub of syringe with the Hub cutter and put the plastic part of the syringe into the red bag.

Oral administration (OPV)

The Oral Polio Vaccine (OPV) comes in a glass/ plastic vial with a sterile dropper. The vaccine is given orally; two drops in the child's mouth.

1. Check VVM on the vial before use
2. Remove the metal or rubber cap on the vaccine vial.
3. Fit the dropper on the vial.
4. Put two drops directly in the mouth of the child. Take care that the dropper does not touch the mouth.

Figure 6L: OPV Administration

5. Make sure the child swallows the vaccine. If it is spit out, give another dose.

Role of health workers in the Pulse Polio Immunization programme

Pulse Polio Immunization is one of the strategies to eradicate Poliomyelitis, beside AFP surveillance, Routine Immunization and Mop-up campaigns for Polio.

As health workers you should:

- Be involved in micro planning of booth and house-to-house activity
- Work as vaccinators for immunizing children with OPV vaccine, fill up tally sheet and mark the left little finger with indelible ink /ink pen provided.
- Lead the team for booth and house to house activity
- Visit all houses assigned to your teams and immunize all children.
- Mark all houses with the P/date for the house where you immunized all children and X/date if any child is left unimmunized.
- Use the tally sheet to record all houses visited and children immunized.
- Take all precautions to keep vaccine potent.
- Inform the community about the Pulse Polio booth day and place banners, posters and other IEC materials at prominent places, before the pulse polio round

Hold YOUR baby correctly for vaccination...

1. The baby's left arm embraces the parent's back and is held under the parent's right arm.
2. The parents' hands firmly hold and control the baby's head and the baby's right arm.

Measles

1. The baby's right arm embraces the parent's back and is held under the parent's left arm.
2. The baby's left arm and legs are controlled the parent's right arm and hand.

BCG

1. One of the baby's arms embraces the parent's back and is held under the parent's arm.
2. The other arm and legs are firmly controlled by the parent's hand.

DPT

Unit 7 - Adverse Events Following Immunization (AEFIs)

Learning Objectives

At the end of the unit, you should be able to:

- Identify common adverse events.
- Prevent adverse events from occurring in your service delivery area.
- Manage an adverse event.

Contents

7.1 What is an Adverse Event Following Immunization?

An Adverse Event Following Immunization (AEFI) is a medical incident that takes place after an immunization, causes concern, and is believed to be caused by immunization. An AEFI may occur because of program error or sensitivity to vaccine or it may occur coincidentally. Whatever the cause, AEFIs must be taken seriously and the management must be rapid and professional.

Remember: Common, minor side effects, such as a slight fever, pain, swelling or redness at the site of the injection, and irritability usually resolve without any serious consequences. Hence, there is no need to report these reactions as AEFIs on a routine basis. They are normal reactions that become all right with extra fluids, rest and Paracetamol, when necessary.

7.2 Types of AEFIs

There are five categories of adverse events following immunization, depending on how they occur.

Table 7.1: Types of AEFIs		
Type	**Definition**	**Example**
Vaccine reaction	An event caused or precipitated by the active component or one of the other components of the vaccine (e.g. adjuvant, preservative or stabilizer). This is due to the inherent properties of the vaccine.	High grade fever following DPT vaccination
Program Error	An event caused by an error in vaccine preparation, handling or administration.	Bacterial abscess due to un-sterile injection
Coincidental	An event that occurs after immunization but is not caused by the vaccine. This is due to a chance temporal association	Pneumonia after oral polio vaccine administration
Injection Reaction	Event caused by anxiety about, or pain from the injection itself rather than the vaccine	Fainting spell in a teenager after immunization
Unknown	The cause of the event cannot be determined	

Vaccine Reactions

All vaccines are extremely safe but like medicines, they also have some side effects or adverse effects. Common minor vaccine reactions can be managed through reassurance and symptomatic treatment. One very rare and serious adverse effect is anaphylaxis (1 in 10 lakh doses) which requires immediate medical attention. You can identify it as follows:

Clinical Progression	Signs and symptoms of anaphylaxis
Mild, early warning signs	Itching of the skin, rash and swelling around injection site. Dizziness, general feeling of warmth
	Painless swelling in parts of the body e.g., face or mouth. Flushed, itching skin, nasal congestion, sneezing, tears. Hoarseness of voice, nausea, vomiting Swelling in the throat, Difficult breathing, abdominal pain
Late, life-threatening Symptoms	Wheezing, noisy, difficult breathing, collapse, low blood pressure, irregular weak pulse

Program Errors

The most common adverse events following immunization are a result of program errors which can be avoided. Below is a list of common program errors and their consequences.

Table 7.2: Common Program errors leading to AEFIs

Program Errors	Possible AEFI
Non-sterile injection	
• Contact of needle with unsterile surface e.g. finger, swab, table etc. • Contaminated vaccine or diluent • Administering injection over clothes	Infection e.g. local abscess at site of injection, sepsis
• Use of reconstituted vaccines beyond the stipulated 4 hours (2 hrs for JE) • Reuse of reconstituted vaccine at subsequent sessions	Toxic shock syndrome or death.
• Reuse of disposable syringe & needle	Blood-borne infections e.g. HepB, HIV, HepC etc., abscess
Reconstitution error/ Wrong vaccine preparation	
• Reconstitution with incorrect diluent	Less vaccine effectiveness
• Drug substituted for diluent	Drug reaction; Death
• Inadequate shaking of T-series vaccines	Local abscess
Injection at incorrect site/route	
• Injection into gluteal region (buttocks)	Sciatic nerve damage, paralysis
• BCG/T series vaccine given subcutaneously	Local reaction or abscess
Vaccine transportation/storage incorrect	
• Administration of frozen and thawed freeze-sensitive vaccine	Local reaction such as sterile abscess
Contraindications ignored	
• DPT2 given after H/O convulsions with DPT1	Convulsions

7.3 Elicit past history of AEFIs

Ask parents about the history of any adverse reaction following earlier vaccinations, such as convulsion after DPT vaccination.

7.4 How to minimize AEFIs in your area?

As most adverse events are caused by program errors, you can minimize the chances of occurrence of an adverse event following immunization by adhering to the following procedures:

Ask beneficiaries to wait for half an after vaccination to observe for any AEFI.

- Use a separate site for each vaccine.
- Use auto-disable syringes for all immunization injections.
- Use new disposable syringe for each reconstitution. ***Never reuse it.***
- Always check the label for the name of vaccine/diluent, expiry date and VVM before use.
- Shake the T series and Hep-B vaccine vials before drawing the dose.
- Reconstitute vaccines only with diluents supplied by the manufacturer for that vaccine
- Record the time of reconstitution of vaccine on the vial label.
- ***Use Measles and BCG vaccine within 4 hours and JE within 2 hours of reconstitution.*** If they could not be used with in stipulated time then discard the reconstituted vials, irrespective of number of doses remaining in the vials. Otherwise, there is risk of contamination with bacteria leading to toxic shock syndrome, a deadly and completely avoidable adverse event.
- ***Never carry and use reconstituted vaccine from one session site to another.***
- Do not store other drugs or substances in the ILR. These refrigerators are only meant for vaccines.
- ***After injection, do not attempt to re-cap or bend the needle.***
- Ask the beneficiaries to wait for half an hour after vaccination to observe for any AEFI.
- Leave the list of children vaccinated in a session with the AWW/ASHA and request them to be alert and report AEFIs. Share contact details of self and PHC.

7.5 What to do if an AEFI occurs?

- When a serious adverse event e.g. convulsions or anaphylaxis occurs, the health worker should immediately:
  - Give primary care: lay child flat; ensure airway is clear. If child is unconscious, put in semi-prone position.
  - Refer immediately to the MO (PHC) or nearest AEFI management centre for prompt treatment. Accompany the patient if needed.
  - Telephonically, inform the AEFI management centre about the referral.
  - Inform immediately to the supervisor/ MO (PHC)/ DIO and assist in investigation of AEFIs

- In case of minor vaccine reactions, follow the guidelines per Table 7.3 below:

Table 7.3: Minor Reactions due to vaccines (Normal and not required to be reported)

Mild vaccine reactions	Treatment	When to report
Local reaction (pain, swelling, redness)	• Cold cloth at injection site • Give Paracetamol	• In case of an abscess
Fever > 38.50C	• Give extra fluids • Give tepid sponging • Give Paracetamol	• When accompanied by other symptoms
Irritability, malaise and systemic Symptoms	• Give extra fluids • Give Paracetamol	• When severe or unusual

Events to be reported immediately and Investigated

- Death, Hospitalization, disability or other serious and unusual events that are thought by HWs or the public to be related to immunization
- Events occurring in a cluster
- Anaphylaxis
- Toxic shock syndrome (TSS)
- Anaphylactoid (acute hypersensitivity) reaction
- Encephalopathy
- Sepsis
- Any event where vaccine quality is suspected
- Acute Flaccid Paralysis (AFP)[4]

Events to be reported monthly

- Report deaths, injection site abscesses and other complications in the monthly report.
- Mention in the report any non-occurrence of AEFI. A nil report is also important.

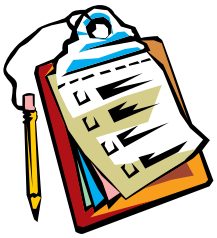
[4] Any case of AFP will be reported through the current system for AFP surveillance and reporting

Unit 8 - Records, Reports and Use of Data for Action

Learning Objectives

At the end of the unit, you should be able to:

- Describe the importance of record keeping
- Screen children for immunization using the immunization card
- Record the information accurately in the prescribed registers
- Correctly file and use counterfoils to track beneficiaries
- Maintain records and submit reports in a timely manner



Contents

- Importance of record-keeping
- Infant Immunization Card & counterfoil
- Mother and Child Register/ Immunization Register
- Name based due list and Tally Sheet
- Coverage Monitoring Chart
- Monthly Progress Report

8.1 Importance of Record-Keeping

Accurate, reliable, and timely information is critical to the success of any activity. The following records are the foundation of all the health information generated at the sub- center and higher levels:

- Infant immunization card
- Mother and child register / Immunization Register
- Name based due list and Tally Sheet
- Coverage Monitoring chart
- Monthly progress report

Remember that the information from the Sub centers is the one that is compiled and sent upwards to the National level for policy and planning

8.2 Infant immunization card and Counterfoils

A correctly and completely filled Infant immunization card contains mother's and child's name, date of birth, complete address and immunization status. The immunization card is important for the following reasons:

- Reminds the parents which vaccines have been given and which vaccines are due
- It helps the health worker to monitor an individual pregnant woman and child's progress towards full immunization.
- Provides information about vaccination status if the beneficiary is from another area.

How to use the card properly?

For Beneficiaries coming for the first time:

- Issue a new immunization card to the pregnant woman at the time of first ANC visit.
- Assign a unique running number, such as ECR survey number or ANC number.
- Inform the mother that the same card would continue for her child too, hence it is important to keep it safe as she keeps other important documents like the ration card.

Figure 8A: Immunization Card

- Record the date, month and year of all entries clearly.
- **Write date of birth of the infant and not the age in months.**
- If the beneficiary cannot give the exact date, try to get the exact dates using local calendar/ fairs and festivals.
- Do not leave any cells or columns blank.
- After filling up all the columns, retain the smaller portion of the card (counterfoil).
- Give the rest of the filled-in card to the parent of the child after immunization and ask her to bring the same card during her subsequent visits to the health centre in future.
- File the counter foils according to the procedure described later in this section

For the beneficiaries coming subsequently

- Ask to see each child's immunization record before giving immunization.
- Look for missed doses (if any) and complete according to the schedule.

Do not start the doses all again even if the gap between the DPT / OPV doses is more than a month. If the child has not crossed the age of 7 years, give the next dose of DPT. Remember that a minimum gap of 4 weeks must pass between every injection/dose of DPT

- After every dose, ensure that the parent is informed of the next immunization date.
- Fill the counterfoil and the immunization card section meant for the parents.
- Give back the card to mother/parent of the child following immunization.
- Tell the mother that the card must be kept in a good condition. She must bring the card whenever the child is brought to the session site for immunization.
- At the end of each session, keep the counterfoils in the appropriate pocket of your tracking bag.
- Each month, look at the counterfoils in the tracking bag and make sure those children come for immunization. If they miss the session, ask the ASHA/AWW to follow-up with those families and ensure they attend the next session.

- ***Do not refuse vaccination for not bringing the card***
- ***If the guardian informs that the card is lost, issue a new card with the information available from the immunization register or the counterfoil.***

Counter foils

It is observed over several years that the counter foil is not given due importance by the health worker and is neither issued, filed nor preserved properly. It is important because it helps in:

- Preparing a session wise name based list of due beneficiaries for sharing with ASHA / AWW / Mobilizer.
- Estimating the vaccine requirement for next sessions.
- Tracking the dropouts.
- Providing information, if the immunization card of the beneficiary is lost.

The counterfoils need to be filed separately for each session site. A cloth tracking bag with 14 pockets is a simple, easy to use tool for filing the counterfoils. The first 12 pockets indicate

each of the 12 months of the year. The 13th pocket is for those who left/ died during the period and the 14th pocket is for fully immunized children.

Once a beneficiary is immunized, the counterfoil would be placed in the month (pocket) due for the next dose. For example, if a child comes for DPT-1 in January, DPT-2 is due in February. Update and place the counterfoil in the February pocket. When the DPT-2 dose is given in February, update the counterfoil and move to the pocket for March. When the DPT-3 dose is given in March, then update and place the counterfoil in September/ October pocket since the child has to return then for measles. If some cards are left in the pocket at the end of the month, it indicates that the beneficiaries are the dropouts, move these cards to next month pocket and track them.

Figure 8B: Tracking Bag

In case no tracking bag is available, counter foils for each month can be separately tied with different rubber band and labelled. File counterfoils for each session site separately and do not forget to carry them to the session.

- ***Prepare due list of beneficiaries from the counterfoils and the register and note the names of infants eligible for immunization.***
- ***Share the due list of beneficiaries with ASHA and AWW to track them for the session.***
- ***Track the due beneficiaries who have not visited the session.***

8.3 Mother and Child Register / Immunization Register

The Mother and Child register tracks every pregnant woman and child born in the sub center area and is used to monitor pregnancy and immunization. Every mother and child's immunization record must be entered in this register. It contains a number of columns for recording the immunization details, and the details about the health status of the mother and child. Use the Mother and Child register as follows:

- Allocate different pages of the register to different session sites. This would help you to easily locate the data of beneficiaries returning for subsequent vaccinations.

- Before each immunization session, update the register to include new pregnancies and births from the records of AWWs and ASHAs.
- Do NOT create a new entry in the register each time the mother returns with the infant for immunization. Update the register on the basis of counterfoils filled during the session.

Please note:

- If the beneficiary is not from your area, prepare and issue a new card and give vaccination. Enter the same in the MCH register in the non-resident column.
- If the beneficiary receives the immunization from private practitioners, record the same in the MCH register and the immunization card and write 'P' after the date.

Ask the AWW/ASHA for the name of the new borns and record them in the register so that they are not left out.

8.4 Name based list of due beneficiaries and Tally Sheet

For each session, these forms record the names of beneficiaries due for each vaccine, antigen-wise coverage by gender and age as well as vaccines and syringes issued and consumed. Use them as follows:

- Use counterfoils in tracking bags and the MCH register to prepare the list of due beneficiaries before each session.
- Share the due list of beneficiaries with ASHA and AWW to track them for the session.
- Use copy of the same sheet to record every dose of vaccine given.
- Cross check the list of due beneficiaries with the remaining counterfoils at the end of the session. Try to find out the reasons for drop outs.
- Administer the dose first and then record the coverage in the tally sheet.
- Use the completed tally sheets to prepare the monthly progress report.

Table 8.1: Sample Combined Name-based List of Due Beneficiaries and Tally Sheet

Date: Session Site: Sub Center: PHC:

Name of beneficiary	Sex	Age in mths	Name of Father / Mother	Caste			Vaccine due	Vaccination and Vitamin A doses given																			Remarks
								TT (PW)			BCG	OPV					DPT				Measles		JE	DPT Booster-2	TT		Vit A	
				SC	ST	General		1	2	B		0	1	2	3	B	1	2	3	B	1	2			10yr	16yr		
Guddan	M	2	Ram Narayan				DPT1, OPV1																					Left village
Simran	F	10	Mangesh Singh			✓	Measles/Vit .A														✓						✓	
Tahir	M	17	Md. Nizamuddin			✓	DPT /OPV B, M, JE									✓				✓		✓	✓					
Priyanka	F	4	Kiran Devi			✓	DPT3, OPV3								✓				✓									
Total	Less than 1 year		Male																									
			Female																									
	More than 1 Year		Male																									
			Female																									

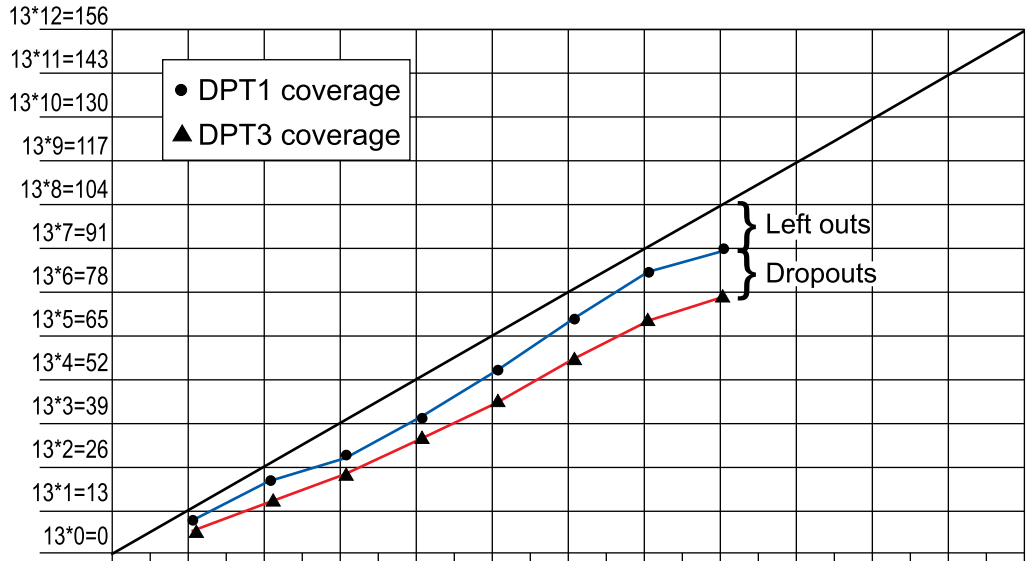
Item	0.5ml ADs	0.1ml ADs	5ml Disp. Syrinegs	BCG vials	OPV vials	DPT vials	HepB Vials	Measles Vials	JE Vials	TT Vials
Received										
Consumed										
Returned										

Name of ANM: Geeta Devi	Signature of ANM:
Name of AWW/ASHA/Mobilizer : Babli	Signaure of AWW/ASHA/Moblizer:

File counterfoils of each session separately for tracking of dropouts

8.5 Coverage Monitoring Chart

Coverage monitoring chart is a useful tool, which provides at-a-glance information on target figures and the immunization coverage, particularly in terms of left-outs and dropouts. The supervisor should plot the immunization data on the chart during visits to the sub-centre (as given in the Figure 8C). It should be updated every month. Here is an example for calculating coverage, dropouts and Left outs for DPT-1 and DPT-3. A similar chart can be prepared for other vaccines.



FILL IN AT THE END OF EACH MONTH	April	CUM TOT.	May	CUM TOT.	Jun	CUM TOT.	Jul	CUM TOT.	Aug	CUM TOT.	Sep	CUM TOT.	Oct	CUM TOT.	Nov	CUM TOT.	Dec	CUM TOT.	Jan	CUM TOT.	Feb	CUM TOT.	Mar	CUM TOT.
TOTAL IMMUNIZATION DPT1	10	10	12	22	7	29	12	41	14	55	15	70	14	84	7	91								
TOTAL IMMUNIZATION DPT3	8	8	9	17	8	25	10	35	11	46	12	58	12	70	6	77								
DROPOUT NUMBER (DPT1-DPT3)		2		5		4		6		9		12		14		15								
DROPOUT %(DPT1-DPT3)		20		23		14		15		16		17		17		16								

Figure 8C: Monitoring Chart

The coverage monitoring chart has a vertical and a horizontal axis. Vertical axis is divided into 12 equal parts, each representing the monthly target. Write cumulative target against each month. If the yearly target of infants in a Sub-centre is 156 children, then the monthly target is 156/12 = 13 children. Therefore, the cumulative target for April will be 13; for May it will be 26 (13 + 13); for June it will be 39 (13 + 13 + 13); for July it will be 52 (13 + 13 + 13+ 13), etc.

On the horizontal axis, the months of the year are given starting from April to March. In the rows below each month, write the total number of children immunized with DPT1 and DPT3 during that month and also cumulative till that month. On the graph, plot the cumulative total of DPT1 for each month (on the right side of the column). Similarly, plot for DPT 3 in a different colour in the same column.

Calculate the total number of dropouts and the Dropout Rate (%) as follows:

$$= \frac{\text{(DPT1cumulative total - DPT3 cumulative total) x100}}{\text{DPT1 Cumulative total}}$$

8.6 Monthly Progress Report

The Monthly Progress Report is a report of the sub-centre submitted by the ANM at the end of each month. It contains information related to number of target beneficiaries, sessions planned and held, sessions held with alternative vaccine delivery, mobilizers engaged to mobilize children, sessions held with hired alternate/private vaccinators, coverage by sex, age and cases of VPDs and AEFIs seen.

The data reflected in this report is based on correctly filled tally sheets, MCH register and other records. The cumulative coverage will enable you to calculate the coverage of each antigen and the dropout rates. Since this is the basis of obtaining all coverage and epidemiological data at State and National levels, the data must be recorded completely and correctly as follows:

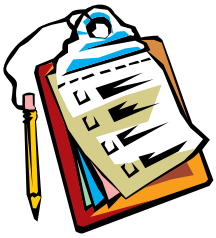
- Yearly target of infants must be based on actual head count.
- Immunization with each antigen dose needs to be filled in correctly.
- In the event of an adverse event following immunization (AEFI), make note of the same and report it to the PHC for follow-up.
- All VPDs seen by you including AFPs need to be reported to the PHC and this will enable your seniors to take action.

Unit 9 - Increasing Immunization Coverage

Learning Objectives

At the end of the unit, you should be able to:

- Involve community to support immunization
- Describe methods of increasing coverage through dealing with dropouts, left-outs and missed opportunities,
- Use Interpersonal communication methods to inform the community.
- Use community self monitoring tool.



Contents

- Involving community to support immunization
- What are the reasons for dropouts, missed opportunities, left-outs and how to deal with them?
- Using interpersonal communication to increase demand.
- Holding effective community meeting
- Using community self monitoring tool- “My Village is my Home”

9.1 Introduction

As a health worker you are responsible for immunization services in your sub-center area. Your goal is to ensure that all children in your area are fully immunized before their first birthday. This also means that children should be protected against neonatal tetanus through the immunization of their mothers. In terms of immunization, the community where you work can typically be divided into three groups. The three groups can be represented as shown in figure 9.1.

- **Dropouts** are children who receive one or more vaccination, but do not return for subsequent immunization.
- **Left outs/un-reached population** are children and women who do not utilize the immunization services for reasons including lack of geographic access.

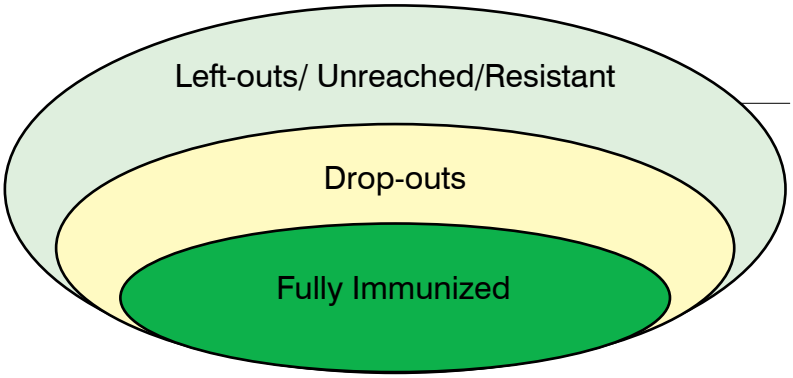


Figure9A: Three Types of Behavior Groups

Your aim, as a health worker, is to expand the inner circle to cover the entire universe of eligible children.

9.2 Involving community to support immunization

Community members can support the immunization programme by:

- Helping decide the place and time of the sessions to ensure a convenient service
- Arranging a clean outreach site (school, Panchayat Bhawan, etc.)
- Informing other community members about the immunization sessions (e.g. through announcements, messages from community volunteers, flags or banners at session sites informing about the day and time of the immunization sessions)
- Registering patients, crowd-control, and making waiting areas more comfortable (by providing shade and organizing space and seating)
- Identifying and referring newborns and/or infants who have recently arrived in the community and sharing the list with HW to include in the Immunization register
- Motivating fellow community members to use immunization services
- Transporting vaccines and HWs
- Identifying dropouts and left-outs, making home visits when children are behind schedule, to explain immunization and to motivate caregivers
- Communicating with local people and informing HWs about suspected Vaccine-Preventable Diseases (VPDs) and Adverse Events Following Immunization (AEFIs)

Why bother about dropouts?

People who "drop-out" of the immunization system are the easiest to reach and convince to return for full immunization. If you focus your efforts on reducing dropouts, you can increase coverage significantly in your area

9.3 What are the reasons for Drop-outs and how to deal with them?

Possible Reasons	*Possible Interventions*
Parents do not return because sessions are not held as planned or vaccines are unavailable	• Ensure that each planned immunization session is held despite holidays and in case of HW's leave, by alternate vaccinators.
Parents are not told what vaccines are due, when they are due and why they are needed	• HW /AWW/ASHA to always tell 4 key messages to mothers using simple language understood by parents. • HWs to provide filled in immunization cards to all beneficiaries and to write the next due date on the card. • Ask caregivers to repeat the information given to them in order to increase the chance that they will remember when to return. • Publicize the immunization schedule.
HWs do not know which children are due and what vaccines are due	• Prepare due list of beneficiaries from immunization registers and counterfoils in tracking bags. • Involve community teams (AWW, ASHA, NGOs etc) and share with them the list of dropouts to remind parents about the importance of full immunization and inform them about the date and time of the next session.
HWs have not shown parents respect or conveyed an interest in the child's health (e.g. long waits, HWs shouting at mothers for forgetting the card or bringing the baby in late)	• Communicate with and treat parents with respect, warmth and friendliness. • Show concern for the parents' particular situation. • Praise and encourage the parents for bringing their children for immunization. Encourage parents to ask questions.
Session timings are not suitable for the community	• Re-schedule immunization session timings, as per the convenience of the beneficiaries e.g. If you find that parents leave for work on farms during 7am to 1 pm, you can hold the session from 2 pm to 5 pm.
Parents develop misconceptions about immunization	• Visit dropouts before the next session to find out the reasons why they missed the session. Often, people have misconceptions about immunization, particularly with measles. Talk to them, answer their questions and doubts, and provide advice accordingly.
AEFI in the community discourages parents to immunize their children	• HWs to always tell mother/care-givers about common side effects that may occur and what to do should they occur.
Children and mothers are not immunized when coming to the HWs for curative care **(missed opportunities)**	• When providing other services, always keep an eye out for eligible children visiting the session with a parent or sibling. • Ask about their immunization status or refer to the list of due beneficiaries and provide services, as appropriate. • Put a reminder about immunization in the facility's waiting area.
HWs do not understand/explain to caregivers that immunization may be given to mildly ill children **(false contraindication)**	• HWs should convince parents about the fact that immunization can be safely provided to mildly ill children.
Families leave the village	• Provide immunization services to children from outside the area, if they are brought to the session, and provide their parents with a follow-up schedule.

9.4 What are the reasons for Left-outs / Un-reached population and how to deal with them?

Possible Reasons	*Possible Interventions*
All newborns and infants not identified and listed	• Involve AWW/ASHA/TBA to identify and share lists of newborns and children.
Parents not motivated to immunize children because of their poor understanding of its purpose and importance	• Orient community leaders and encourage them to talk to parents about immunization. • Provide talks and counseling on the importance of immunization. • Teach about immunization in health fairs and other events. • Use other Communication channels such as local cable television, Wall paintings and posters, Mosque and temple announcements.
Session site too far away (e.g. border populations)	• Include all the areas in the micro plan by consulting polio micro-plans and prepare list of eligible children. • Plan to visit remote sites at least once every two or three months (plan at least 4 immunization sessions a year).
Refugees/ Families that fear contact with government (e.g. lack proper documents)/ scheduled castes or tribes/ poor Migrants/Nomadic groups/Homeless families/ Urban slums/street children	• Determine where these populations reside. • Visit the communities and work with local mobilizers /educators and community groups/leaders to discuss reasons why they have never accessed immunization services. • Provide information on the importance of vaccination, the date, time and place of the nearest session. • Develop a list of children who have never accessed immunization services in the area.
Sessions too infrequent or timings and days not convenient/ not understood	• Plan sessions after consulting the community (e.g. early in the morning/late evening).
Cultural or Religious reasons for refusal of vaccination (myths, rumors and misconceptions)	• Find out the reasons for reluctance by talking directly to communities/ leaders. • Try to address their misconceptions, doubts, and fears by listening to them and offering support. • Involve community leaders, ASHA, AWW and other staff working within that particular community in order to encourage their fellow members to have their children immunized.
Financial or gender barriers to immunization (e.g. husbands disallow wives to attend sessions because of time/lost labor, expense and/or fear of side effects)	• Counsel opinion leaders and influential persons about the danger of VPDs and the benefits of immunization. • Encourage peer counseling by fathers of children who accept immunization. • Publicize the fact that immunization services are entirely free.

How can you deal with lack of geographic access?

You can bring the issue to the attention of your MOPHC, and supervisors and request them to reorganize your catchment area in order to provide immunization services to unreached populations. Sometimes, the best solution will be to visit the remote site once every two or three months and conduct at least 4 immunization sessions in a year.

9.5 Using Inter-Personal Communication to increase demand

As a health worker you are in direct contact with parents and caregivers, perhaps the most important contribution you can make towards increasing demand is by being a friendly, efficient, interested person, who sincerely cares. Smile, be friendly, and reassure both parents and children. This ensures that parents will listen to your advice, change their behaviour, and return for a full course of immunization for their children.

Tips for effective communication with parents at the facility or outreach session

- ***Act respectfully towards the mother/parent.***
- ***Praise parents/caregivers for bringing their children for immunization.***
- ***Give clear information on side effects and the date for next visit.***
- ***Encourage them to continue bringing their child to the immunization session and bring the vaccination card until fully vaccinated.***
- ***Keep information simple and clear and be sure to write the reminder date for the next vaccination in the card and say it to the parent.***
- ***Encourage parents to ask questions.***

Remind parents about four key messages as follows:

1. **What vaccine was given and what disease it prevents**
2. **When and where to come for the next visit.**
3. **What are the minor side effects and how to deal with them.**
4. **To keep the immunization card safe and to bring it along for the next visit.**

Use the vaccination card to remind parents when to return with their child

Vaccination cards for each child are important communication tools. Educated parents can determine from the cards, the type of vaccine and dosage given and the dosage due. For those less educated, recognizing a vaccine by how it is delivered is one way of keeping abreast of their child's schedule.

- ***Information on immunization is easier to understand when one vaccine at a time is discussed.***
- ***In addition to being a health care provider, you are also a health educator.***
- ***In most situations, one-to-one, interpersonal communication is best when providing specific information.***

9.6 Holding an effective community meeting

- Hold at a convenient time and place (e.g. on market days or close to places of worship)
- Identify local community representatives who would participate in the meeting
- Provide a comfortable and welcoming environment for the discussion.
- Listen to the community, find out what the community already knows about vaccine-preventable diseases and immunization
- Provide information, using basic language, on the importance of immunization, the status of the immunization program and where and when services are available. Dispel misinformation and doubts that sometimes surround immunization
- Encourage them to ask questions so that everyone can be better informed.
- Use stories, short plays, songs and visual aids to hold the group's attention and make meetings interesting
- Involve as many group members as possible in the discussion and ask them to suggest solutions to problems
- Help mobilize resources for immunization

Prepare the roster of immunization sessions and display at session site and sub-center

9.7 Using Community self monitoring tool "MY VILLAGE IS MY HOME"

In each village, the names of all the infants can be written on a chart paper in the form of bricks of a house as shown below. Start with oldest infant as number 1, second oldest as number 2 and so on. Keep on adding the names of newborns at the top with a number. Write the name of the village, the year of head count and number of infants counted. As the infant completes the immunization, put a mark or colour in the related row with the name. Hang the chart on the wall of AWC/Panchayat Bhawan in each village. This tool can be used by community workers to motivate and remind families to get their children immunized.

Name of Infant (less than 1 yr)	DOB	Birth Wt.	BCG	OPV				DPT			Msl	Vit A '1'
				0	1	2	3	1	2	3		
26.												
25.												
24.												
23.												
22.												
21.												
20.												
19.												
18.												
17.												
16.												
15.												
14.												
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12.												
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10.												
9.												
8.												
7.												
6.												
5.												
4.												
3.												
2.												
1.												
Example: Reena Kumari, d/o Bhim Kumar	*20/1*	*2 kgs*	*7/2*	*7/2*	*21/3*	*18/4*	*16/5*	*21/3*	*18/4*	*16/5*		

Prepare this chart every year with infants and add new live births. Display the chart in the AWC/Panchayat Bhawan/School.

Unit 10 - Surveillance of Vaccine Preventable Diseases

Learning Objectives

At the end of the unit, you should be able to:

- Describe importance of surveillance in the Immunization Programme.
- Describe how to conduct surveillance for the VPDs.

Contents

- The role of surveillance in the immunization program.
- How to conduct disease surveillance.
- Surveillance for acute-flaccid paralysis, neo-natal tetanus and measles and Acute Encephalits Syndrome (AES).
- The surveillance report.

10.1 The role of surveillance in the Immunization Program

Surveillance means data collection for action. Disease surveillance is a regular system of collecting, analyzing and interpreting data and then using it to guide disease-control and immunization strategies. It helps in the following ways:

- Predicting or detecting disease outbreaks for containment (***What*** disease is occurring)
- Identifying high-risk populations (***Who*** gets the disease)
- Identifying areas requiring special attention and where system performance is poor (***Where*** the disease is occurring)
- Determining the frequency of occurrence of a disease in the community and magnitude of the problem (***When*** the disease is occurring and how many get the disease)
- Identifying underlying causes (or risk factors) of the disease (***Why*** the disease is occurring)
- Guiding response activities, including immunization (***How*** the disease can be prevented, controlled or eliminated).

10.2 How to conduct disease surveillance?

The Universal Immunization Program recommends that health workers monitor and report any incidence of the following vaccine-preventable diseases:

- Tuberculosis (in children under 5)
- Diphtheria
- Pertussis
- Polio (Acute Flaccid Paralysis)
- Measles
- Neonatal Tetanus
- Hepatitis B
- Japanese Encephalitis (AES)

To ensure your reporting is done properly, you should carry out the following steps:

Step 1: Learn to recognize the disease

As a health worker, it is important that you understand the definition of a disease and be able to match it up with what your village informant has told you.

Table 10.1: Ready Reckoner for Recognizing Diseases correctly based on symptoms

Disease	Lay Definition (suspect)
Measles	History of fever and rash and any one of the following; cough, running nose, red eyes with in 3 months
Poliomyelitis (acute flaccid paralysis)	Sudden onset of weakness and floppiness in any part of the body in a child less than 15 years of age or paralysis in a person of any age in whom polio is suspected.
Diphtheria	Sore throat, mild fever and grey patch or patches in the throat.
Neonatal Tetanus	History of normal suck and cry during first two days of life, onset of illness between 3 and 28 days of life, inability to suck followed by stiffness of neck and body and/or Jerking of muscles.
Tetanus	History of injury or ear infection followed by difficulty in opening of mouth (or jerking of mouth) or stiffness of the neck or body.
Tuberculosis	A child with fever and / or cough for more than 2 weeks, with loss of weight / no weight gain. History of contact with a suspected or confirmed case of pulmonary tuberculosis.
Pertussis	History of repeated and violent coughing with any one of the following: Cough persisting for 2 or more weeks, fits of coughing, cough followed by vomiting, typical whoop in older infants.
Hepatitis –B	Clinical signs and symptoms include fever, headache, nausea, vomiting, jaundice (yellowish eyes), light or grey stools.
Japanese Encephalitis (AES)	Acute onset of fever with change in mental status (such as confusion, disorientation or coma) and /or seizures.

Step 2: Ensure all cases are reported

When you visit villages, ask about cases of measles, neonatal tetanus and polio, especially since they are often not reported to health centre staff. If you hear about cases, you should visit the patients (neonatal tetanus and polio) or encourage their parents to come to a health facility (measles and AES). If you recognize a case, then report it to the Medical Officer in charge at the PHC. The types of cases that should be included in your monthly report are:

- Cases that come to the health centre for treatment.
- All cases seen and diagnosed by you at outreach sessions.
- Cases that you hear about in the community and verify in person.
- Cases that are treated at non-government health facilities (for example, mission hospitals or private physicians).

Step 3: Avoid double counting

In order to use data effectively, it must be as reliable and accurate as possible. It is important that each case is counted once, and only once. Avoid "double-counting" through the following data collection standards:

- If a child makes two health-centre visits for the same disease episode, count it as one case only.
- Only count those cases that have been diagnosed/seen by you as a health worker. Do not count cases that have been reported to the health centre by community members without verification.

10.3 Acute Flaccid Paralysis

The reporting process is as follows:

- Report the case to the health centre Medical officer as soon as possible.
- The Medical Officer, DIO and SMO will conduct an investigation within 48 hours of reporting.
- Under the guidance of the Medical Officer, you should collect two stool samples, 24 hours apart, within 14 days of onset of AFP. These samples should be forwarded in cold chain to the DIO. The DIO will then forward the sample to a WHO-accredited lab in India for virus isolation.
- Communicate the result of stool examination to the parents.

10.4 Neonatal Tetanus

All cases of suspected neonatal tetanus and deaths-of-unknown-causes should be investigated using a standardized case investigation form. The purpose of investigating neonatal tetanus cases is to identify why the case occurred, so that future cases can be prevented. When investigating a case of neonatal tetanus, ask the mother of the infant who died if she is willing to answer some questions about her infant's illness. Explain that the information she provides will help you prevent future deaths. With the case investigation form in front of you, ask her questions listed in the form and carefully record her responses.

The questions are about:

- The immunization status of the mother.
- Whether the mother received antenatal care.
- Where the baby was born (at home or in an institution).
- In case of a home delivery, whether a skilled birth attendant (SBA) was present at the time of actual delivery.
- Whether the five clean practices were followed (clean surface, clean hands, clean cord tie, clean scissors/knife and clean cord stump).
- Whether the infant sucked normally at birth, and then later developed problems with sucking, convulsions and stiffness.
- Whether the infant was treated in a hospital for the illness.

As all neonatal tetanus cases are to be investigated promptly and correctly, medical officers need to guide the health workers. For example, a Medical Officer may conduct some case investigations him/herself and provide additional training to the health workers regarding the procedures to follow.

Table 10.2: Schedule for Vitamin A Supplementation for Measles' cases

Age	Immediately on diagnosis	Next day
< 6 months	50,000 IU	50,000 IU
6 – 11 months	1,00,000 IU	1,00,000 IU
> 12 months	2,00,000 IU	2,00,000 IU

10.5 Measles

Whenever you go for an immunization session to an area, you should enquire about any case of fever with rash in the locality since your last visit. The information may be collected from local medical practitioners, Anganwadi workers, ASHA, community members etc. If you come across any case of fever with rash, you should note down the name and the complete address of the case. This should be reported immediately to the Medical Officer of the PHC. This information also needs to be documented in your monthly report to the PHC. If the MO PHC decides to do an outbreak investigation in the area, you should assist him/her. If the case is labelled as a suspected measles case, then Vitamin "A" supplementation has to be provided. The schedule is as follows.

Also plan to improve the routine immunization status in the community.

10.6 Acute Encephalitis Syndrome

Report the case to your medical officer incharge. The medical officer will investigate the case according to laid out procedures in the national AES surveillance guidelines.

10.7 The surveillance report

Monthly report of disease incidence and mortality should be prepared in the monthly reporting format. To find out the number of cases and deaths (if any) as a result of the diseases, you will:

- Count the number of VPD cases from your daily diary.
- Ensure that same case or same episode is not recorded more than once (which may happen if you have visited many times or because different informants told you about the same case).
- Fill up the number of cases in appropriate boxes of the report.
- If there are no VPD cases reported, write ZERO in the report.

Even if there are no VPD cases, then report zero in the monthly report

Annex 1: Do's and Don'ts during Immunization Sessions

Do's	Don'ts
Vaccination Schedule	
• It is safe and effective to give BCG, DPT, OPV and Measles vaccines at the same time to a child who has completed 9 months and never been vaccinated. • Give BCG to infants less than 1 yr of age (never give BCG to children above 1 year of age). • If a child is brought late for a dose, pick up where the schedule was left off. For example, if a child left with DPT- 2 and comes after 3 months give DPT-3.	× Withhold the vaccine in case of illness such as cold, cough, diarrhoea or fever.
Cold Chain	
• Check expiry date and VVM label of vaccine vial before immunizing every child. • Keep the vaccines and diluents in a plastic bag/zipper bag in the centre of vaccine carrier with 4 conditioned ice-packs. Make sure that the diluents are also at +2 to +8 centigrade before reconstitution. • Take one ice pack from vaccine carrier and keep reconstituted BCG & Measles vaccines only on the top of the ice pack.	× Leave vaccine carrier in sunlight; this spoils vaccines that are sensitive to heat and light. × Leave the lid open; this can allow heat and light into the carrier, which can spoil vaccines. × Drop or sit on the vaccine carrier: this can damage the carrier. × Carry vaccines in handbag as this can spoil vaccines that are sensitive to heat. × Keep the DPT, DT, TT and Hep. B vaccines on the Ice pack during the session
Vaccine Handling & Administration	
• Welcome beneficiaries. • Wash hands before conducting the session. • Verify beneficiary's record and age of the child. • Screen for contra-indications. • Check label of the vial and expiry date. • Lightly shake the vial of T-Series Vaccine before drawing the dose. • Use a new AD syringe for each injection and new disposable syringe for each reconstitution. • Use correct diluent for reconstitution of vaccine. • Give appropriate vaccine. • Inject vaccine using the correct site and route for the vaccine e.g. Intradermal in left arm for BCG; sub-cutaneous in Right arm for Measles; intramuscular in anterolateral aspect of mid thigh for DPT and Hep. B. • Allow dose to self-disperse instead of massaging. • Explain potential adverse events following immunization and what to do. • Discuss with beneficiaries /parents about next visit.	× Use un-sterile syringe or needle for immunization. × Draw air into AD syringes. × Touch any part of the needle. × Recap the needle. × Leave the needle inside the vial. × Ever inject in the buttock, never do that. × Massage the vaccination site after vaccination. × Use reconstituted measles and BCG vaccine after 4hrs and JE after 2 hrs.. × Use vaccine with VVM in unusable stage or with expiry date.
Recording and Reporting	
• Fully document each immunization in the immunization card, tally sheet and immunization register. Ask parents/guardians to bring the card on next visit. • Retain the counterfoil.	× Turn away beneficiaries for not bringing the card. × Leave any cell blank in immunization card.
Adverse Event Following Immunization (AEFI)	
• In case of serious AEFI refer the patient to appropriate health facility, inform your supervisor immediately – document the type of vaccine(s), batch number, expiry date, and full address of the child • Report all serious AEFIs to the MOI/C.	× Report minor reaction following vaccination (mild fever of less than three days, redness and pain)
Social Mobilization	
• Use vaccination card to remind parents when to return with their child. • Enlist community team like AWW, ASHA, NGOs and other community-based workers to remind parents of the importance of full immunization.	× Leave any community meeting without communicating about immunization session days.

Annex 2: Supervision Checklist for Immunization Session site

Name of ANM: _____Name of Sub centre : _____
Name of CHC/PHC : _____ District: _____
Date of Visit : ___/___/_____ Time of visit: _____
Name and designation of Supervisor: _____

1.	Session Site			☐Sub Center ☐ Anganwadi Center ☐Other
2.	Whether Session held			☐ Yes ☐ No
	a. If 'No', Reason for session not held (See bottom of the format)Δ			☐ A ☐ B ☐ C ☐ D……
	b. If 'Yes', whether the session being held as per Micro plan			☐ Yes ☐ No
3.	What immunization-related IEC material is displayed at site?(tick all that apply)			☐Banner ☐ Wall writing ☐ Tinplate ☐ Poster ☐ Other
4.	Beneficiaries are being mobilized to session site by *			☐ ICDS worker ☐ ASHA ☐ Others ☐ None
5.	How Vaccines & logistics were brought to session site from PHC/Block			☐ AVD# ☐ ANM ☐ Supervisor ☐ Others
6.	Whether all available vaccines & diluents are placed in zipper bag in vaccine carrier having 4 Ice-Packs			☐ Yes ☐ No
7.	What is the condition of icepacks in the vaccine carrier?			☐ Hard Frozen ☐ Semi Frozen ☐ Fully Melted
8.	Which of the mentioned vaccines / logistics are available at the session site* (Tick)			
	☐ BCG	☐ JE	☐ Counterfoils of earlier session	☐ 0.1 ml AD Syringes
	☐ BCG Diluent	☐ JE Diluent	☐ Functional hub cutter	☐ 0.5 ml AD Syringes
	☐ tOPV	☐ TT	☐ Red disposable bag	☐ Disposable Syringes
	☐ DPT	☐ Vit A solution	☐ Black disposable bag	☐ Paracetamol
	☐ HepB	☐ Plastic spoon for Vit A	☐ ORS Packets	☐ Nutritional Supplements
	☐ Measles	☐ Due list cum tally Sheet	☐ Zinc tablets	☐ Weighing machine
	☐ Measles Diluent	☐ Blank Immunization Cards	☐ IFA tablets	☐ B .P .Apparatus
9.	Whether any vaccine vial is found in the mentioned condition, if 'Yes', Tick ☑ and record the vaccine*			☐ Without label / Unreadable label …… ☐ VVM Unusable Stage …… ☐ Expired Vaccine Vial …….. ☐ Frozen Vaccine (DPT, TT, HepB)……
10.	Whether adequate quantity of 5ml Disposable Syringes for reconstitution are available at session site (=BCG + Measles +JE vials)			☐ Yes ☐ No ☐ Not Available
11.	Whether Time of reconstitution written on reconstituted BCG, Measles, JE vials			☐ Yes ☐ No ☐ N/A
12.	Whether AD syringe is used for injectable vaccines			☐ Yes ☐ No ☐ N/A
13.	Whether DPT vaccine given on outer (anterolateral) aspect of mid thigh			☐ Yes ☐ No ☐ N/A
14.	Whether ANM is touching any part of the needle while giving injection			☐ Yes ☐ No ☐ N/A
15.	Whether each used syringe is cut with hub cutter immediately after use			☐ Yes ☐ No ☐ N/A
16.	Whether Session Tally Sheet is being filled for each child vaccinated			☐ Yes ☐ No ☐ N/A
17.	Whether all counterfoils are being updated following each vaccination today			☐ Yes ☐ No ☐ N/A
18.	Whether Four Key Messages are being given to the parents			☐ Yes ☐ No ☐ N/A
19.	Is Vit A being given with a plastic spoon to beneficiaries receiving measles?			☐Yes ☐ No ☐ NA
20.	Is the vaccine carrier distributed from the PHC/Urban Planning Unit today?			☐ Yes ☐ No
21.	What is the ANM sending back at end of session?(tick all that apply)			☐Vaccine vials ☐ Used Syringes ☐ Unused syringes ☐ Report
22.	Has a Supervisor/MO visited sessions in ANM's area in last 1 month?			☐ Yes ☐ No
23.	What made the mother come here for immunization today? (tick all that apply)		Mother 1	☐ANM ☐ AWW ☐ ASHA/link worker ☐ Other
24.			Mother 2	☐ANM ☐ AWW ☐ ASHA/link worker ☐ Other

Δ (Q. 2a): A=*Both ANM/vaccinator as well as vaccines/logistics are not available* ***B***=*ANM/vaccinator present but vaccine/logistics not available* ***C***=*Vaccine/logistics available but ANM/vaccinator absent,* ***D***- *Others (specify)*

(Q. 3): ***AVD***=*Alternate Vaccine Delivery;* * *Multiple responses may be applicable*

Annex 3: Responsibilities of the AWW and ASHA in immunization

Immunization Schedule

- Should be well versed with the National immunization schedule.
- Mobilize all children for immunization.

Planning for Immunization

- Enumerate all mothers and children (including newborn and pregnant mothers) in the village and share the list with ANM.
- Help ANM to identify hard to reach areas and underserved population.
- Conduct home visits to educate parents for immunization.
- Display posters and other IEC materials.
- Display immunization days /dates at the AWC/ Session site.
- Liaise with ANM to ensure that vaccines are available at AWC on immunization days.

Maintaining Cold chain at immunization site

- Arrange suitable place for keeping the vaccine carrier in shade.

Conducting the immunization session

- Ensure all dropouts from previous sessions are brought for immunization.
- Ensure all births occurring after the last session are identified and the newborns are brought to the session.
- Ensure all beneficiaries due for that session are mobilized.
- Greet beneficiaries.
- Assist in verifying age of the child.
- Arrange water for washing hands.
- Arrange space for immunization activity and waiting place for beneficiaries.
- Assist ANM in conducting the immunization session.

  Manage crowds.

Injection safety

- Assist ANM in safe disposal of immunization waste.

Recording and tracking of drop outs

- Update and share immunization register with ANM.
- Visit the houses of drop out children and bring them for the next session.
- Counsel the women about protecting the child's health by ensuring immunization.

Adverse events following immunization

- Report all AEFI if noticed to ANM.

Surveillance of Vaccine Preventable Diseases (VPDs)

- Report all suspected VPDs to ANM.

Pulse Polio

- Help ANM to prepare micro plan.
- Work as Vaccinator during pulse polio days.
- Inform community for pulse polio day and ensure their presence at the booth.
- Assist ANM in coordination for booth establishment and display of IEC materials
- Help track new borns and convince reluctant parents

Perform any other job assigned by higher authorities

Annex 4: Responsibilities of State/District PMU officials and trainers for Immunization training activities

MoHFW and Partners 1. To provide the guidelines, training material and funds. 2. To facilitate the training workshops at the state level. 3. Monitoring and evaluation.	**National Level**
SIHFW and State PMU 1. Assist the State Government in identification of the trainers. 2. Orientation of the State and District trainers. 3. Coordination of the training at the District level. 4. Monitoring of the training at District level. 5. Follow up (on the job) evaluation of the health workers after 6 months of training.	**State Level**
Trainers 1. To prepare a training calendar and invite nominations. 2. To make arrangements for field visit and teaching aids. 3. To confirm the nominations. 4. To give adequate opportunity to the trainees to acquire skills. 5. Evaluate and provide on the job training to the health workers after 6 months of training.	**State/District**
CMO and Districts PMU 1. Ensure that funds are made available at the ANMTC/DTC to conduct the training. 2. To guide and supervise preparation of district training plan and calendar. 3. Nominate the health workers for immunization training and ensure their attendance. 4. Orientation of all Medical officers of PHCs/CHCs during the meetings. 5. Ensure the supply of essential equipment and supplies required for providing good quality of immunization services by the health workers. 6. Monitoring of the training. 7. Provide supportive supervision during field visits.	**District Level**
MO(PHC) 1. To provide supportive supervision to the health workers. 2. To ensure the procurement of essential equipment and supplies.	**PHC Level**

NOTES

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Ministry of Health & Family Welfare
Government of India