manual on

IMMUNISATION

GENERAL PRINCIPLES OF IMMUNITY

INTRODUCTION

The dictionary meaning of immunity is 'security' and the term immunity relates to the resistance of the body to the deleterious effect of (pathogenic) agents such as bacteria/viruses etc. Immunisation has played a significant role in the reduction of morbidity and mortality from bacterial and viral infections in many countries. The measurement of any immunisation programme can only be made in the field—the index being the reduction in the number of cases. The process of immunisation plays a dual role. The individual participating in the programme achieves a degree of immunity sufficient to resist infection and if sufficient number of individuals in a community are made resistant this way, the cycle of infection and contact is broken and the remaining susceptibles are protected probably by virtue of a 'herd' immunity against the related communicable diseases.

2. TYPES OF IMMUNITY

2.1 *Natural*: Immunity may be natural (innate) defence mechanism to resist infection. It is part of the complex mechanism by which a normal body protects itself, It is of tremendous importance and includes mechanical barriers to the entry and spread of bacteria, viruses and substances capable of killing them and present in the body fluids and secretions and many specialised cells concerned in the defence mechanism.

2.2 *Acquired*: The resistance is developed in the body through experience of actual infection or Immunisation. For example; a person who has suffered from smallpox is not likely to get the reinfaction in his life span and again smallpox can well be prevented by vaccination. Acquired or active immunity takes time to develop, but lasts longer.

2.3 *Passive* : The resistance is supplied readymade to the body e.g., immunity by maternal antibodies in the infants and protection in adults by giving serum and anti-toxins providing greater immunity.

3. DURATION OF IMMUNITY

Immunity may be long-lasting or may wane quickly, depending upon the nature of the immunising agent, body reaction, nutritional status and many other factors. If the immunising agent is made of live attenuated organisms, such as polio vaccines, BCG vaccine, allowing its reproduction in the body, the resultant resistance is of long duration. When the immunising agent is a suspension of the corresponding dead pathogenic organism, the resultant resistance is of short duration and requires frequent boosters. The resistance can be increased by addition of adjuvants.

4. HERD IMMUNITY

Communicable diseases may break out in an explosive manner (epidemics) in isolated pockets or may simmer on undetected in persons who do not suffer in the classical manner. This may be due to sub-clinical infection, carrier state or may result from man to man transmission of live attenuated organisms used in immunisation as in the case of oral polio vaccine. Such conditions are likely to produce a degree of resistance in the community who otherwise would neither have suffered nor have acquired resistance through active immunisation.

5. TYPES OF IMMUNISING AGENTS

The immunising agents can be divided into the following groups:—

1. The killed suspension of viruses/bacteria.
2. The live attenuated viruses/bacteria.
3. Toxoids with or without adjuvants.

The broad differences between No. 1 and 2 are that the former, being a killed suspension, requires very high concentration of particles and frequent booster doses to produce satisfactory resistance. In contrast, the live attenuated agents reproduce in the body simulating a natural infection and thereby produce a more durable resistance.

6. VACCINE ASSOCIATION

Combination of different vaccines has a clear advantage in the mass immunisation. Combination limits the procedures,

speeds up administration and assists in better coverage with lesser manpower. The combination can be made between vaccines of the same group, combining toxoids and killed suspension or live attenuated bacteria or viruses. For example, Triple Vaccine.

7. CARE AND HANDLING

All vaccines must be handled and stored carefully as these may deteriorate if not kept at the recommended temperature. Liquid vaccines are readily damaged whereas freeze-dried vaccines and toxoids are relatively stable. The potency of each *vaccine is guaranteed for a specific period only.*

The vaccine must, therefore, be used before the date of expiry.

8. PRECAUTIONS

While immunising, certain precautions have to be taken. Some precautions are mandatory; some are desirable and may be discouraged under logistic and epidemiological limitations. Certain generally accepted contra-indications are:

1. acute illness;
2. extreme malnutrition; and
3. while under steroid therapy.

9. RECOMMENDED SCHEDULE OF IMMUNISATION

Right from birth children are exposed to various health, hazards including communicable diseases. The natural resistance of the body to fight disease is of low order with the result that children fall an easy prey to diseases.

Immunisation builds up the resistance of defence mechanism in the children and this enables the body to fight and overcome infections. A child needs to be protected against infections through immunisation. Immunisation should be done early in life and repeated periodically.

SCHEDULE OF VACCINATION

Age	*Vaccination*
Pre-natal	
16-20 weeks	— Tetanus toxoid — 1st dose
20-24 weeks	— -do- — 2nd dose
36-38 weeks	— -do- — 3rd dose
Children	
3-9 months	— Smallpox vaccine — BCG vaccine — Diphtheria - Pertussis - Tetanus (Triple Vaccine) 3 doses at an interval of 1-2 months. — Polio (Trivalent oral vaccine) 3 doses at an interval of 1-2 months.
9-12 months	— Measles vaccine: One dose.
18-24 months	— Diphtheria - Pertussis - Tetanus (triple vaccine) Booster dose. — Polio (Trivalent oral vaccine) — Booster dose.
5-6 years (School entry)	— Diphtheria-Tetanus (bivalent vaccine)—Booster dose. — Typhoid (Monovalent or bivalent vaccine)—One dose. — After an interval of 1-2 months the typhoid vaccine—one dose.
10 years	— Tetanus Toxoid—Booster dose. — Typhoid (Monovalent or bivalent vaccine)—Booster dose.
16 years	— Tetanus Toxoid—Booster dose. — Typhoid (Monovalent or bivalent vaccine)—Booster dose.

Pre-natal: When mothers are registered late in pregnancy atleast two doses of Tetanus Toxoid should be given. For a mother who has been immunised, one booster dose of Tetanus Toxoid should be given in subsequent pregnancy preferably four weeks before the expected date of delivery.

Children: Ages indicated are considered to be the best times. However if there is any delay in starting the first dose of triple vaccine the ages may be adjusted accordingly. It should be the aim to ensure that child receives smallpox, BCG, DPT, and polio-vaccination where available, before it reaches one year of age. The different vaccines indicated against the various age groups can be given simultaneously: example: BCG, Triple vaccine and polio vaccine; smallpox, triple vaccine and polio; etc.

When typhoid vaccine is being given for the first time two doses at an interval of 1-2 months are required to be given.

10. RECORDS & REPORTS

It is important to keep correct records of vaccinations done. Personal data to identify the person receiving the vaccination, the batch of the vaccine used and the signature of the vaccinator should be recorded. In some places family folders or family registers are maintained which contain pages for recording the immunisation status of each member of the family. In other areas, special cards are kept for children and pregnant mothers. Such child health and antenatal cards provide columns for recording the particulars of immunisations given to the child or pregnant mother. Appropriate entries should be made on such cards immediately after the vaccination is given either at home or in a clinic. Where the course of immunisation comprises of more than one dose of vaccine e.g., triple vaccination, the date for the subsequent dose of vaccine should also be indicated.

Records of receipts, issues and balance of the vaccine available with the workers should be kept in the stock register prescribed for the purpose.

Monthly reports on the number of beneficiaries covered under each type of immunisation with their age break-up, as also, the position of receipts of vaccine, quantity used and balance on hand at the end of the month should be submitted in the prescribed form.

Chapter II

BCG VACCINATION

BCG stands for Bacillus Calmette Guerin. The principle of BCG vaccination is the substitution of being primary infection for a virulent and potentially dangerous one. BCG prepares the body to enable it to stand up to the "invaders" i.e., the virulent tubercle bacilli capable of producing TB disease and nullify their destructive operation.

2. FREEZE DRIED VACCINE

BCG vaccine is produced in the BCG Vaccine Laboratory in Guindy, near Madras. The vaccine to be supplied for rural programme will be in freeze dried form which is prepared from concentrated liquid BCG vaccine first by freezing it followed by drying. Soon after drying the ampoules of freeze dried BCG vaccine are heat-sealed under vacuum. Freeze dried BCG vaccine cannot be used in powder form. It has to be re-suspended or reconstituted by dissolving it in normal saline.

3. PRESERVATION

Freeze dried BCG vaccine in powder form can be stored for six months in a refrigerator. If ice chests are used it should not be stored for more than three months. In areas where ice is not available and it has to be stored at room temperature, stocks sufficient for about 2 to 4 weeks should only be kept. It is always better to preserve it in a refrigerator. Whether in powder or liquid form (after suspension) the freeze dried BCG vaccine must be protected from light. After dissolving the vaccine for vaccination, the vaccine may be used only the same day. After completion of vaccination on the same day, the balance, if any, should be destroyed and should not be carried over for use next day even if kept in a refrigerator.

4. OPENING OF FREEZE DRIED BCG VACCINE AMPOULES AND RECONSTITUTION

4.1 The ampoules of freeze dried BCG vaccine are sealed

under vacuum i.e., there is no air or very little air in the ampoules. The method of opening the ampoules to avoid rush in of air and reconstitution are described below :

4.2 First open the saline ampoule. Hold the ampoules in the left hand securing it firmly between fingers. Make a transverse scratch with the file on the ampoule and break off the neck of the ampoule at the scratch.

4.3 Fill the sterilised 5 cc syringe with the saline as follows :

(i) Hold the opened ampoule in the left hand. Flame the needle and the mouth of the ampoule.

(ii) Lower the needle of 5 cc syringe held in the right hand into the ampoule.

(iii) Pull the piston very slowly so that barrel of the syringe is filled with saline. *Do not touch other part of the piston.*

(iv) Take out the needle from the syringe and check whether it is completely filled. If not, flame the mouth of the saline ampoule and the needle again and fill the syringe exactly upto 5 cc mark. After it is thus filled, keep the syringe in the syringe box.

4.4 Now take the ampoule of freeze dried BCG vaccine. Whenever a new consignment of freeze dried BCG vaccine is received, the vaccinator should check each one of the ampoules. If 15% or more of these show vaccine sticking to the side walls of the ampoule or there is a change in its colour or consistency, or there is a crack in the ampoule, or there is no label on the ampoule, or the date of expiry is over, the entire consignment should be discarded.

(i) If all the above conditions are found in order, the ampoule is to be opened. Tap the ampoule gently so that most of the powder is at the bottom of the ampoule and no powder left in the neck.

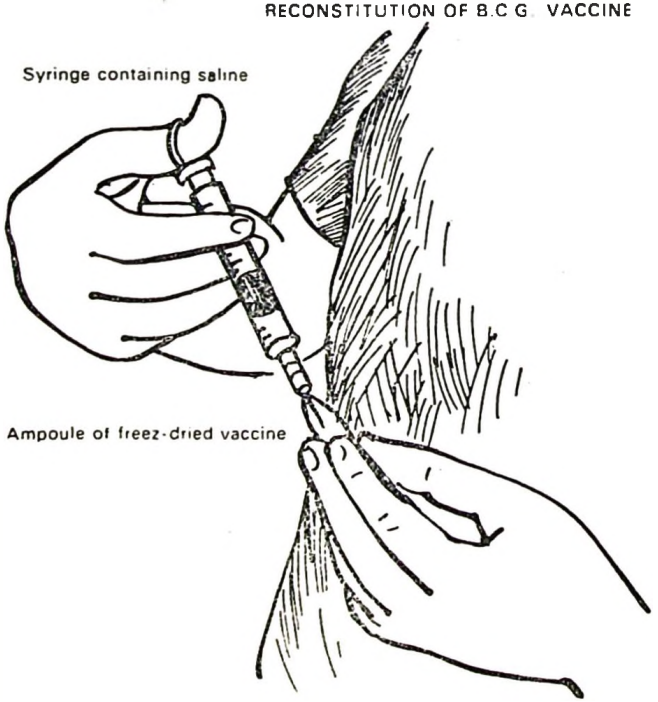
(ii) After holding the ampoule in the left hand, make a transverse scratch in the middle of the neck of the

ampoule with a sharp cutting file. Now flame the neck of the BCG ampoule and cover the neck and the upper part of the bulb of the ampoule with a *plastic sheet*, so that the scratch faces the technician and there is as little as possible air between the plastic sheet and the ampoule and in between the folds of the sheet.

(iii) Break the ampoule now but do not be in a hurry to remove the plastic sheet as soon as the neck is broken. Wait for 2 to 3 seconds and then remove plastic sheet with the broken end of the neck of ampoule gently, so that small pieces of glass do not fall into the open ampoule. *Do not use the ampoule if any glass pieces are seen in the ampoule.*

(iv) Now take 5 cc syringe filled with saline in the right

RECONSTITUTION OF B.C.G. VACCINE



hand, flame its needle and mouth of vaccine ampoule held in the left hand. Insert the needle into the

ampoule and release 1 cc of saline. Take out the needle and shake the ampoule gently and see that no part of the vaccine remains in dry form.

(v) Flame the mouth of the ampoule and syringe needle again. Now slowly release 2 cc of saline into the ampoule, rotating it constantly so that no part of the powder remains stuck to the saline of the ampoule particularly near the neck or in the neck. After taking out the needle, shake the ampoule gently again, add 2 cc again and shake gently. It is ready for use. Cover the ampoule with black paper and put it into the wooden block to protect it from light. *If quantity of saline released into the ampoule is not exactly 5 cc and some is spilt over, do not use it for vaccination.*

5. EQUIPMENT

In the kit containing equipment the detailed list of the equipment has been provided. The following will be the main equipment :

1. 1 cc Omega microstat syringes for BCG vaccination.
2. Steel needles for 1 cc. microstat Omega syringes.
3. A metal box containing these syringes.
4. Metal shields.
5. Block for holding the opened BCG ampoule.
6. Mantoux ruler for measuring the weal caused by 3.1 cc vaccine.
7. 5 cc. syringe with needles for reconstitution of freeze dried vaccine.
8. A small plastic sheet for opening the ampoule.
9. Spirit lamp, and
10. A bottle of spirit.

6. STERILISATION OF THE EQUIPMENT

The sterilisation should be carried out before proceeding for the field work. Syringes, needles and their box, forceps are to be sterilised by boiling in water for 20 minutes.

The red rubber rings and sections of rubber tubing meant for protection of vaccine from light are not to be boiled but should only be washed with soap and water.

7. TECHNIQUE OF VACCINATION

7.1 *Filling of vaccine in the Syringe* : Vaccine ampoules are kept in wooden blocks and syringes have to be filled in without taking the ampoules out. While tilting the wooden blocks for flaming the mouth of the ampoule or filling the syringe therefrom, the wooden block will have to be held by the middle finger and the little fingers below and supported by part of the palm of the left hand. The vaccine syringes must be covered with rubber tubings. Before every filling the ampoules along with the wooden block should be shaken and the mouth of the ampoules and the needle of the syringe must be flamed. Only one vaccine syringe should be filled at a time and in no case should any part of contents of the syringe be used for more than 15 minutes after filling the syringe.

7.2 *Injection of BCG Vaccination* : BCG vaccinations are given intradermally or intracutaneously (i.e. in the superficial layers of the skin) in the middle of deltoid region (below the shoulder). Care should be taken that vaccination is not given high up at or near the shoulders. When an intradermal injection is given, hair follicles are seen as small pits on the wheal produced. *This wheal should be clearly seen for all intradermal injections.* When correct volume (0.1 cc) of vaccine is injected the wheal produced has a diameter of 8 mm. It is not possible to inject exactly 0.1 cc of vaccine with the record syringes, so technicians should see that diameter of wheal is not less than 8 mm. *To maintain this uniformity, every tenth wheal should be measured with mantoux rulers provided in the kit.* If diameter of a wheal is 6 mm instead of 8 mm, the vaccine injected will not be 3/4th of the volume needed, but only about half.

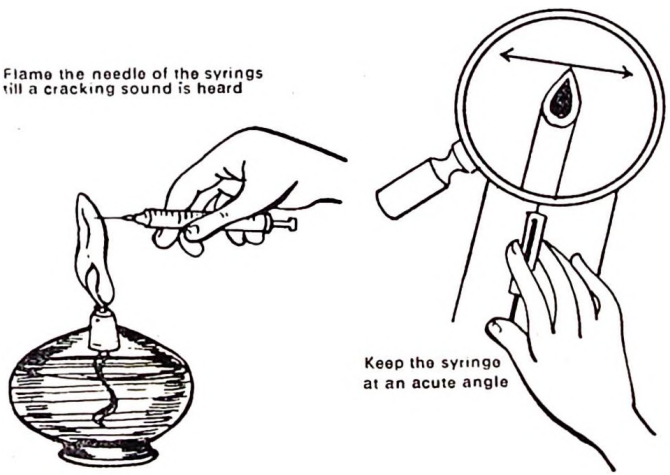
7.3 *The Procedure of Vaccination is given below :*

(i) Hold the arm of the person to be vaccinated at the deltoid region (near the shoulder) in your left hand. Stretch the skin over the deltoid region between thumb and index finger. The remaining three fingers of your hand should grip the arm on the inner aspect. No special preparation of the skin is necessary before

giving BCG vaccination, i.e. washing with disinfectants, like alcohol, dettol, etc. is not to be done.

(ii) Hold the barrel of the syringe between the middle (below) and index finger (above) so that both fingers touch the rubber ring in front and the thumb supports the ring from behind opposite to index finger. Do not touch the piston.

(iii) Flame the needle of the syringe till a crackling sound is heard. Eject out a few drops of vaccine to discard the heated vaccine and to cool the needle.



(iv) With the eye of the needle facing towards you (towards the vaccinator) prick the skin at the maximum stretch, keeping the syringe at as acute an angle as possible with the arm of the person, to ensure a superficial injection.

See that the syringe is away from the thumb, stretching the skin or just touching its tip and not astride it. It is very important to see the needle pricks only the superficial layers of the skin.

If the needle slips and does not prick the skin or if it goes deep, flame the needle again, eject a few drops, attempt the prick again at a fresh site.

(v) Push the syringe a little so that the eye of the needle completely penetrates into the skin Now, move the thumb of the right hand from the rubber ring of the syringe to the end plate of the piston. Push the piston a little and see whether the wheal is being formed. If so, push the piston more to obtain a wheal of 8 mm diameter. However, when Omega syringe or some other long barrelled syringe is used, 0.1 cc of vaccine should be injected, as measured from the markings on the barrel of the syringe.

(vi) *The vaccination should not be given in bright sunlight and should preferably be given indoors, or at least in shade. Ampoules and filled syringes should preferably be covered with black paper when not actually in use.*

8. FOLLOW-UP OF VACCINATION

A proper intradermal injection will cause a wheal about 8 mm in diameter. The wheal is absorbed in 20 to 90 minutes and would disappear and nothing will be seen at the site injection for some days. By about the 3rd or 4th week an area of infiltration (induration) may be felt at the site of vaccination which increases to a lump or a papule, 5 to 8 mm in diameter. It is generally not painful but is tender to touch. The papule increases in size and reaches its maximum by about the 6th week when its average diameter is 6 to 10 mm. The nodule softens with formation of pus which may later escape leaving a tiny ulcer which heals by itself without any special treatment. At the end of about 10 to 12 weeks all that is visible is

a tiny scar about 5-7 mm in diameter with a little pigmentation at the spot.

9. ELIGIBILITY FOR VACCINATION

Efforts have to be made to offer BCG vaccination to all children, between 3-9 months. All persons below the age of 19 years who have not received BCG vaccination earlier are also to be offered vaccination.

10. CONTRA-INDICATIONS

BCG vaccination may not be given to an individual if he is known to be a case of tuberculosis or if two or more than two scars are seen at the site of vaccination. It may also be not given to children who are highly emaciated or, who have extensive skin disease or have high fever or look acutely ill.

11. RECORDS

Cards and registers for the immunisation programme will be common for all vaccinations and relevant columns indicating full identity of the person concerned, namily, head of the family, age of the infant/child/person vaccinated, date of vaccination, vaccine batch number, etc., will have to be fully recorded.

Chapter III

IMMUNISATION AGAINST DIPHTHERIA, WHOOPING COUGH AND TETANUS

1. DIPHTHERIA

1.1 *Susceptible Age Group* : Children in the age group 1 to 5 years are susceptible to diphtheria. Occasional cases may occur among adults. The maximum incidence is in the age group between two and five years. The disease may occur in seasonal outbreaks. The mortality is very high especially in rural areas where facilities for prompt treatment do not exist.

1.2 *Natural Immunity—Schick Test* : Children who are extremely susceptible to the disease in the younger age groups acquire immunity against it as they grow up. This is brought about through repeated contacts with small doses of diphtheria bacilli which do not produce the clinical disease. The susceptibility of individuals to diphtheria can be determind by the 'Schick Test'.

1.3 *Active Immunisation* : The purified absorbed diphtheria toxoid when administered at suitable intervals gives a high degree of protection against Diphtheria. All children below 10 years should be actively immunised. A preliminary Schick Test is not considered necessary for this age group. Experience of Western countries shows that the disease can be eradicated by immunising susceptible individuals.

2. WHOOPING COUGH

2.1 *Susceptible Age Group* : Susceptible age group in children is below five years. The disease is most severe when it occurs in younger children and mortality is at its maximum in the first year of life. Besides, the complications and sequelae of the disease undermine the health and nutrition of children and affect their later growth and development.

2.2 *Active Immunisation :* The disease can be prevented by immunising infants with a vaccine containing dead whooping cough (Pertussis) bacilli.

TETANUS

3.1 *Susceptible Age Group* : Tetanus affects all age groups, but appears to be more in persons below 40 years of age. Pregnant women and new-born infants are found to be more vulnerable to tetanus infection on account of non-availability of skilled midwifery service for the majority of women, especially in rural areas.

3.2 *Active Immunisation* : Protection against tetanus infection can be got by active immunisation with purified tetanus toxoid.

An adequate course of immunisation consists of three injections of the toxoid given at intervals of 8 to 12 weeks. A person who is protected by the basic course of immunisation can enjoy protection against tetanus throughout life by taking booster doses at 5 to 10 yearly intervals or when he suffers a tetanus-prone injury.

3.3 *Immunisation of Pregnant Mothers* : Immunising pregnant mother against tetanus will protect not only the mother but also the new-born infant. The antibodies circulating in the mother's blood pass through the placenta into the blood circulation of the foetus so that the new-born infant is protected. This is of special interest to us in view of the fact that large majority of child-births in the country are still being assisted by untrained traditional midwives.

4. COMBINED IMMUNISATION AGAINST DIPHTHERIA-WHOOPING COUGH AND TETANUS (WITH TRIPLE VACCINE)

Children can be immunised against the three diseases—diphtheria, whooping cough and tetanus by a combined vaccine—the triple vaccine. This vaccine contains the toxoid of diphtheria and tetanus bacilli adsorbed on a mineral carrier like aluminium phosphate and dead Pertussis (Whooping Cough) bacilli. The combination of the three together into one vaccine increases the production of antibodies and the length of protection, much more

than when the vaccines are given individually. Triple vaccine is meant for children below 5 years of age. The vaccine is marketed in rubber capped vials containing 20 or 10 doses and also in single dose ampoules.

5. COMBINED IMMUNISATION AGAINST DIPHTHERIA & TETANUS (BIVALENT VACCINE)

Bivalent vaccine containing the toxoids of diphtheria and tetanus bacilli adsorbed on a mineral carrier like aluminium phosphate are also available in the market. This vaccine is meant for older children of 5-10 years of age. The whooping cough component is not required for children over five years of age.

The vaccine is available in rubber capped vials containing 20 or 10 doses and in single dose ampoules.

6. TETANUS TOXOID

Mineral adsorbed tetanus toxoid is available in rubber capped vials containing 20 or 10 doses and in single dose ampoules.

The Central Research Institute, Kasauli, is the main centre for the production of the vaccines. In addition, Haffkine Institute, Bombay, Glaxo Laboratories, Bengal Immunity Co. and a few other pharmaceutical firms also produce them.

7. STORAGE OF VACCINE

Most of the vaccines lose potency with age, particularly if exposed to heat and light. Instructions on the label should be followed strictly *DPT, DT and TT should be stored in a refrigerator between +4°c and 10°c.* When issued to the sub-centre, the vaccine should be used up within a period of 8 to 10 days. *The vaccine will* loose potency if kept at room temperature over a longer period. *The vaccine should be used before the date of expiry indicated on the vial.* If on account of any unforeseen circumstances the vaccine gets stored beyond the date of expiry, the vial should be sent to the Director of Central Research Institute, Kasauli, to test its potency. Some of the vials may retain potency and could be used after testing.

8. SCHEDULE OF IMMUNISATION

8.1 The primary course of triple immunisation should be started when the infant is three months old. The ideal is to give three doses at intervals of four to eight weeks.

The immunity produced by the primary course of injection should be reinforced by booster doses as the child grows older. The first booster dose should be given when the child reaches ½-2 years of age with one dose of triple vaccine and the second booster dose with one dose of diphtheria—tetanus vaccine, at five years of age—at school entry or immediately thereafter.

8.2 In actual practice the majority of children do not receive the triple vaccine during infancy as scheduled. Therefore, all children under four years of age may have to be given the primary immunisation with three doses of triple vaccine as described above. Such children should receive their first booster dose with one dose of diphtheria—tetanus (DT) vaccine (at five years of age) at school entry or immediately thereafter.

9. IMMUNISATION OF PREGNANT MOTHERS AGAINST TETANUS

Pregnant mothers can be immunised effectively by giving three doses of Tetanus Toxoid as indicated below:—

16-20 weeks	1st dose
20-24 weeks	2nd dose
36-38 weeks	3rd dose

When mothers are registered late in pregnancy, at least two doses of Tetanus Toxoid should be given.

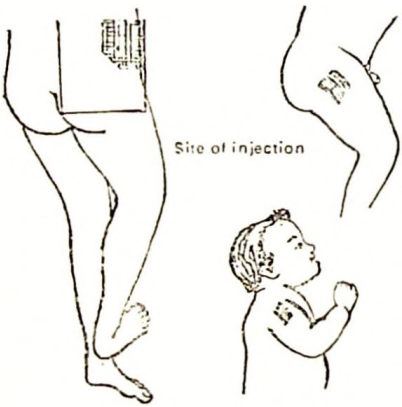
Mothers who received their primary immunisation with two doses of Tetanus Toxoid during pregnancy should be given a booster dose of Tetanus Toxoid during subsequent pregnancies and when they are exposed to tetanus-prone injury.

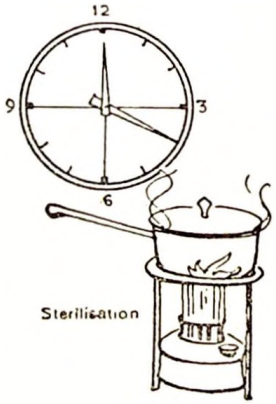
10. DOSE

Usual dose is 0.5 ml or 1.0 ml of the vaccine as prescribed by the manufacturer. *The dose is the same for all age groups.*

11. SITE OF INJECTION

The injection should be given in the lateral part of the thigh, upper and outer quadrant of the buttocks or over the shoulder (deltoid muscles).

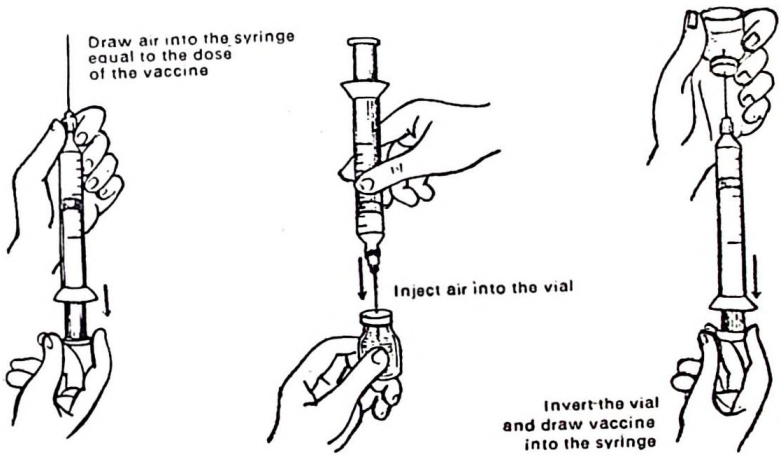




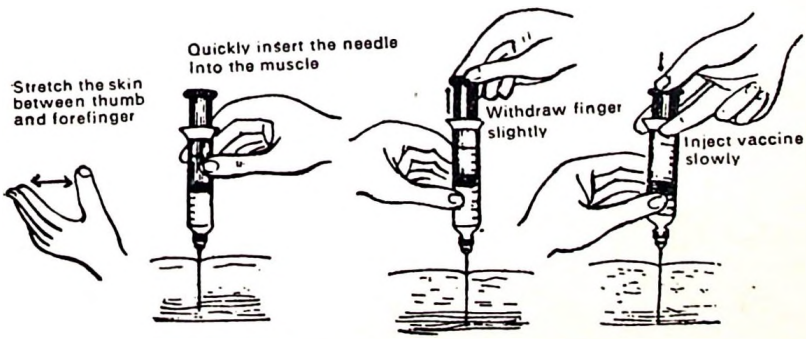
12. STERILISATION

The syringe and needle should be sterilised by boiling in water for 20 minutes. *Sterilised syringes and needles should not be touched*

by unwashed hands, nor kept on unsterile surface. A pair of forceps should be used for picking up the sterilised things. The cap of the



vital containing the vaccine should be sterilised by rubbing it with a swab of tincture of iodine. The skin over the site of injection should be sterilised by painting tincture of iodine.



13. TECHNIQUE OF INJECTION

All vaccines containing mineral carriers or adjuvants should be administered deep intra-muscular. Wash hands with soap and water. Clean the rubber cap of the vial. Draw air into the sterilised syringe equal to the dose of the vaccine (0.5 ml or 1 ml) by pulling back the plunger. Inject the air into the vaccine vial. Invert the vial and withdraw the plunger to draw the dose of vacccine in syringe. Paint the skin over the site to be injected, with tincture of iodine. Stretch it between the thumb and forefinger of left hand. Quickly insert the needle vertically into the muscle with the right hand. Withdraw the plunger a little to make sure that the needle is not in a vein. If the needle has gone into a vein blood will flow into the syringe. Pull the needle up and insert in another direction till you are sure that it is not a vein. Inject the vaccine slowly. Withdraw the needle and massage the area lightly.

14. EXPECTED REACTIONS

In children under five years of age slight to moderate pain at the site of injection with mild fever in an occasional child is all that need be expected. In older children, in the age group 5 to 10 years, the incidence of local pain and fever is likely to be more frequent and more noticeable. These reactions, however, subside within 24 to 48 hours.

15. ABNORMAL REACTIONS

High fever, convulsion etc. are indications of undue reaction which may occur in a very small proportion of vaccinated children due to some unknown factor in whooping cough vaccine. Further doses of vaccine should not be given to such children without strict medical supervision.

Abcess formation at the site of injection or transfer of homologous serum hepatitis cannot be considered to be intrinsic hazards of immunisation. These result from carelessness in maintaining sterility of syringes and needles.

16. CONTRA-INDICATIONS

A medical check up and treatment of illness discovered during such examinations will popularise immunisations. Such an examination will help to exclude children who are likely to react unfavourably to the immunisation procedure. Immunisation of children who are ill should be postponed. The following conditions should be treated as contra-indications for giving Triple/DT innocultions :

1. History of convulsions or central nervous system disease in the child or family.

2. Recent history of infectious disease/fever in the child.
3. History of allergic diseases like urticaria and eczema.
4. History of any hypersensitivity reaction in the past.
5. Children who are on steriod therapy.

17. WHO WILL VACCINATE AND WHERE

The vaccination should be given regularly at the children Clinics and Aute-natal Clinics of Institutions like Primary Health Centres and hospitals. In addition it should be given in the field by collecting children and mothers at sub-centres, office of the B.H. Workers, the office of Panchayats, Mahila Mandals, Youth Clubs, Primary Schools etc. It is desirable to fix a particular day for giving the immunisations which should be made known to the community in advance. All health functionaries working in the area like ANM, BHW, the Vaccinator, the LHV, the Health Inspector should be involved. Teams comprising the LHV and ANM and the Health Inspector and BHW could simultaneously be engaged in giving the vaccination in the selected village so that more children and mothers could be reached. On the day the first dose of the vaccine is given in the village it is desirable that the medical officer is present.

Normally children/mothers should be collected in a pre-determined place for receiving the vaccine. However, in the case of children/pregnant mothers who have defaulted to turn up to receive the second or third dose, the workers should try to contact them in the home during their routine home visits and complete the schedule of two doses which is required to produce immunity.

18. RECORDS AND REPORTS

Triple immunisation and tetanus immunisations do not leave behind any visible or palpable mark in the recipient unlike in the case of Smallpox and BCG. Therefore, it is necessary to give mothers cards writing down the dates on which the vaccine was administered for safe custody and future reference. In addition the child health card and ante-natal card kept at the institutions should record the particulars of immunisation. The dates of immunisation should be recorded in the normal register of children. Stock register showing the receipt and issue of vaccines should be maintained.

Chapter IV

IMMUNISATION AGAINST POLIOMYELITIS

1. INTRODUCTION

There is no programme for mass immunisation of children against poliomyelitis in the country. However, large scale immunisations may have to be done in the event of outbreak of epidemic of the disease in an area. It may also have to be undertaken in selected areas for reasons, such as, high or unusual endemicity, as shown by the presence of crippled children in different age groups, peculiar features in the area rendering personal hygiene measures impracticable, etc. The oral polio vaccine (Sabine vaccine) is used for immunisation.

2. CHARACTERISTICS OF THE VACCINE

The oral polio vaccine is comprised of the three serotypes of polio viruses. It is a living vaccine and its efficiency depends entirely on the administration of live viruses to the individual. If, somehow, any proportion of the living viruses of any of the serotypes is inactivated, the vaccines which contain a significant proportion of inactivated virus, one is only achieving a false sense of security since the proportion of children who would have been successfuly immunised against poliomyelitis is very small.

3. STORAGE AND TRANSPORTATION

To prevent the inactivation of the vaccine before administration to the children it is recommended that it should be stored at sub-zero temperatures. *It is imperative that the suppliers, distributors and the poliovaccine clinics store this vaccine at—20°C in a deep-freeze.* In case a deep-freeze is not available it might be stored in the freezing chamber of the refrigerator During transport the vaccine must be kept either on dry ice (solid carbondioxide) or a freezing mixture.

At the polio-vaccination-clinic, the bottle containing the vaccine should not be frozen and thawed repeatedly since repeated freezing and thawing has a deleterious effect on the potency of oral polio vaccines. It would be preferable to keep the vials of

the vaccine in ice during its administration to children. Every vaccine must be vaccinated with the appropriate volume of the vaccine.

The person responsible for the distribution of vaccine in a clinic must ensure that the nurse is familiar with the amount of vaccine that has to be given to a child.

4. STERILISATION OF SPOONS ETC.

In case, the vaccine is being administered by spoons, disinfectants like dettol or lysol may not be used for the cleaning of spoons. The ideal way would be to boil the spoons in water and to cool individual spoon in ice-water before it is used for administration of polio vaccine to a child.

5. ACTIVE IMMUNISATION

The vaccine may be administered to any one including infants of 3 to 6 months of age. The schedule comprises of three doses of the vaccine to be given by mouth at intervals of 4 to 6 weeks between doses *The dose is the same irrespective of age.* Normally persons over eight years of age need not be immunised.

6. PREPARATION OF THE VACCINEE

Infants should not be breastfed for 4 to 6 hours before and 4 to 6 hours after the administration of the vaccine. During this period the child can be fed artificially and should not be starved. *Hot water, hot milk or hot coffee should not be given for half an hour after the administration of the vaccine.*

7. CONTRA-INDICATIONS

The only contra-indications for the administration of the vaccine are acute infectious diseases, high fever, vomitting and dysentery. Patients suffering from acute leukemia and lymphomas generalised malignancy and receiving corticosteroids and anti-metabolites may not be given oral polio vaccine.

INSTRUCTIONS FOR OFFICIALS RESPONSIBLE FOR DISTRIBUTION OF ORAL POLIO VACCINE

DOs

1. Store the oral polio vaccine in the freezing chamber of the refrigerator or a deep-freeze at sub-zero temperatures.

2. Administer the appropriate quantity of vaccine by withdrawal from the vial through a sterilised syringe.

3. Sterilise the individual spoon in boiling water or steam and *cool* it completely before transferring individual dose to it from the vaccine vial.

DON'Ts

1. Do not freeze and thaw the vaccine container repeatedly.

2. Do not dilute the vaccine in water, milk or syrup before its administration to the child.

3. Breast feeding should be avoided four hours before and 4 to 6 hours after taking vaccine.

4. Do not sterilise the spoon to be used for vaccination with any disinfectant like dettol, lysol or any other antiseptic.

5. Do not administer any batch of oral polio vaccine unless you are sure that the vaccine was kept frozen, during its transport to your organisation/vaccination clinic. Ensure proper transportation by insisting on the transport of oral polio vaccine by the quickest available means of transport such as an aeroplane or a mail train. Both the supplier and the customer are equally responsible for ensuring a sub-zero temperature during the shipment of the vaccine. Ideally dry ice should be used. In case dry ice is not available a freezing mixture may be used.

6. Do not give oral polio vaccine in a hot, humid and crowded room. The vaccine should be given preferably in an airconditioned room.

7. Avoid immunisation during summer and monsoon seasons.

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