

5 Managing an immunization session

About this module...

This module describes the tasks a health worker needs to perform to ensure the quality of an immunization session. It starts with the preparation required at the health centre and the immunization site before the infants arrive. It next discusses the communication needed throughout each encounter with caregivers during the session. It then proceeds with assessment of infants before vaccination, the correct technique for giving vaccines, and instructions for closing sessions and recording data. It concludes with a newly developed checklist that can serve as a reminder to ensure safety before, during and after immunization sessions.

This module touches on topics that are covered in more detail in other modules with references given in the text. It focuses mainly on infant immunization, but the principles may be applied to older age groups.



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1

Preparing for the session

Preparation for sessions should be part of microplanning. This begins well before the day of the session and should continue throughout the session to include feedback for improving the planning of the next sessions.

The main objectives are: a) to inform the community in advance: the community should be aware of the session and those who are due for immunization should know about the location and time; and b) to set up the site for safe immunization: staff should organize adequate quantities of vaccines, safe injection materials, safe disposal containers and reporting tools as well as an adequate cold chain for conserving vaccines.

Some of the preparation steps given below are covered elsewhere in more detail; see references to other modules. The order of the steps may vary by site; for example, for outreach sessions, vaccines have to be packed for transport at the health centre before the workplace is prepared at the remote site. Community staff and/or volunteers should set up as much of the outreach site as possible before the vaccinators arrive.

1.1 Plan the immunization session

Each health centre should have a session plan showing where and when immunizations will be given. This session plan should be developed with and communicated to the community as part of microplanning. Immunization sessions may be held daily, weekly, every two weeks, monthly or quarterly at fixed or outreach sites. The frequency of the sessions depends on the size of the community being served and the workload for staff, as described in Module 4 (*Microplanning for reaching every community*), Section 5.

For outreach, health centre staff should get to know people in the community and learn who can help with arranging the session, including choosing a suitable time (for example, market day) and tracking children who are due and overdue for immunization. Signs should be placed at the site to let people know when immunizations will be given. Module 7 (*Partnering with communities*) contains details on involving the community overall.

1.2 Prepare the workplace

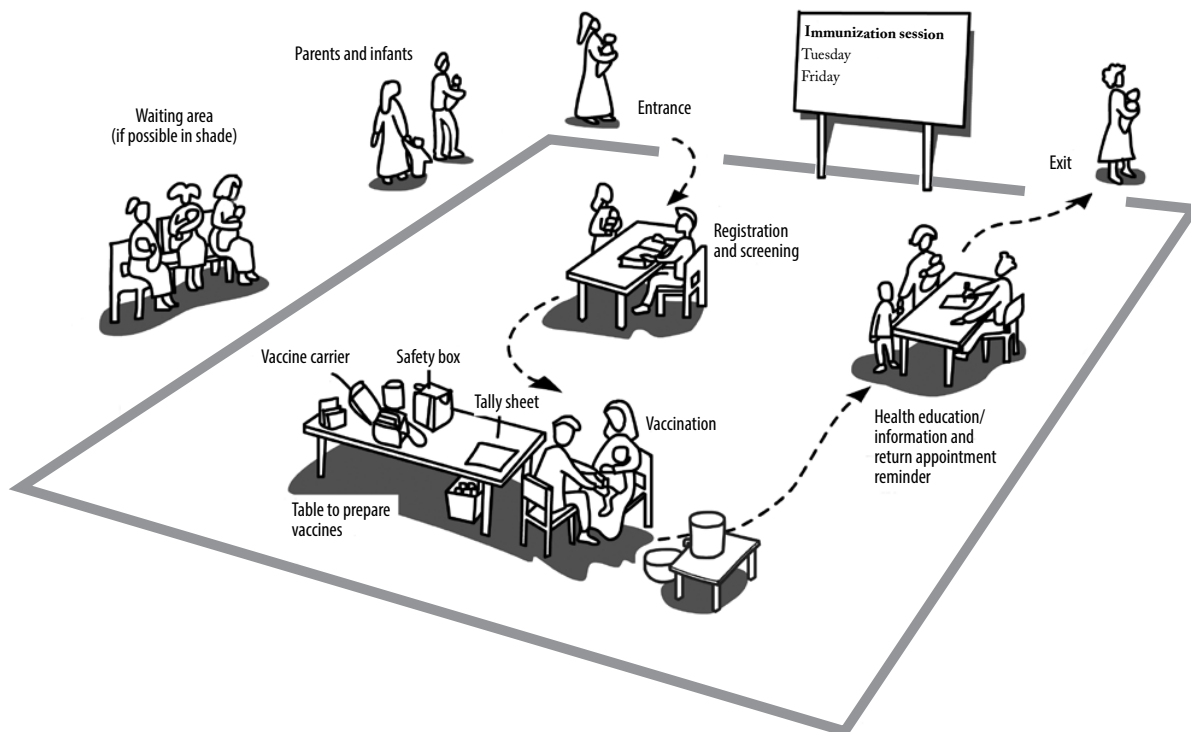
The final arrangement of space for an immunization session will depend on whether it is being held in a fixed health facility or outreach site, and whether other services are being provided (for example, nutrition screening, antenatal care and/or health

education). Figure 5.1 shows an example of the basic requirements for a fixed or outreach site.

The ideal site will be:

- easily accessible and identified with a sign stating “Immunization Clinic”;
- located in the same place each time;
- in a clean area, out of the sun, rain and dust;
- near a sheltered/shaded area where those needing vaccination can wait;
- large enough to provide space to have separate stations for registration and assessment, immunization and record keeping and screening/education on other health issues; and
- quiet enough for health workers to be able to explain what they are doing and to give advice.

Figure 5.1 Immunization session: example workplace arrangement



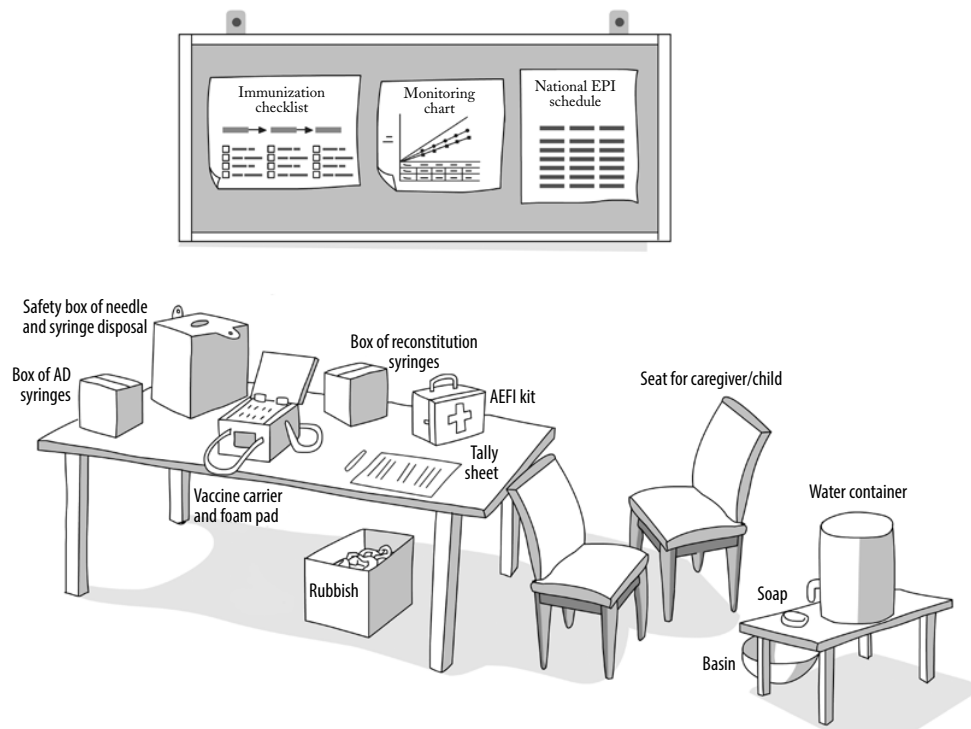
Whenever possible, the immunization station itself should be separated from other activities so that crying children do not cause distress to those waiting. Ideally, the whole circuit should have a separate entrance and exit, and be well marked with signs, ropes and other visual aids through which community members or health workers may guide those attending.

In practice, workplace situations are often less than ideal. Large numbers of people crowding the area may cause safety issues, as well as confusion and stress, not just for the health worker, but also for everyone concerned. Careful preparation and a positive, welcoming manner help ensure a successful immunization session.

1.3 Prepare supplementary materials and equipment

A list of needed materials should be reviewed before all sessions (see Section 7 of this module for a proposed checklist). Figure 5.2 shows an example immunization station.

Figure 5.2 Immunization station: example arrangement



A basic list of supplementary items includes:

- Adverse Events Following Immunization (AEFI) kit
- water container, basin, soap, towel for hand washing and drying
- metal file to open ampoules, if needed
- immunization register
- new immunization/child health cards
- immunization tally sheets
- cotton wool
- container for rubbish that does not go into a safety box
- paper, pencils and pens
- table(s)
- stool(s)/chair(s)
- adhesive tape to repair vaccine carriers if needed.

1.4 Pack required vaccines and safe injection supplies

For sessions at the health facility, required vaccines should be taken from the fridge beforehand to reduce the number of times the fridge is opened.

For outreach, enough vaccine has to be taken to meet demand since the refrigerator will, of course, not be nearby during the session. Extra vaccine should be added to meet unexpectedly high demand at the session. For example, an extra 10% can be added to the estimated need. Ideally, the quantity of each type of vaccine should be calculated from a list of children who are due and overdue. When such lists are not available, the quantity can be estimated based on previous session demand, especially if this is stable. Tables in Module 4 (*Microplanning for reaching every community*), Section 5 show estimated numbers of infants and supplies needed for each session based on example population data.



Verify that vaccines are safe to use

Before opening the refrigerator, estimate the number of each vaccine needed for the session as noted above. When opening the fridge, first check the temperature and the freeze indicator. If there has been freeze exposure, do the Shake Test on the freeze-sensitive vaccines as described in Module 2 (*The vaccine cold chain*), Section 7.

Select vaccines from the refrigerator in the order given below.

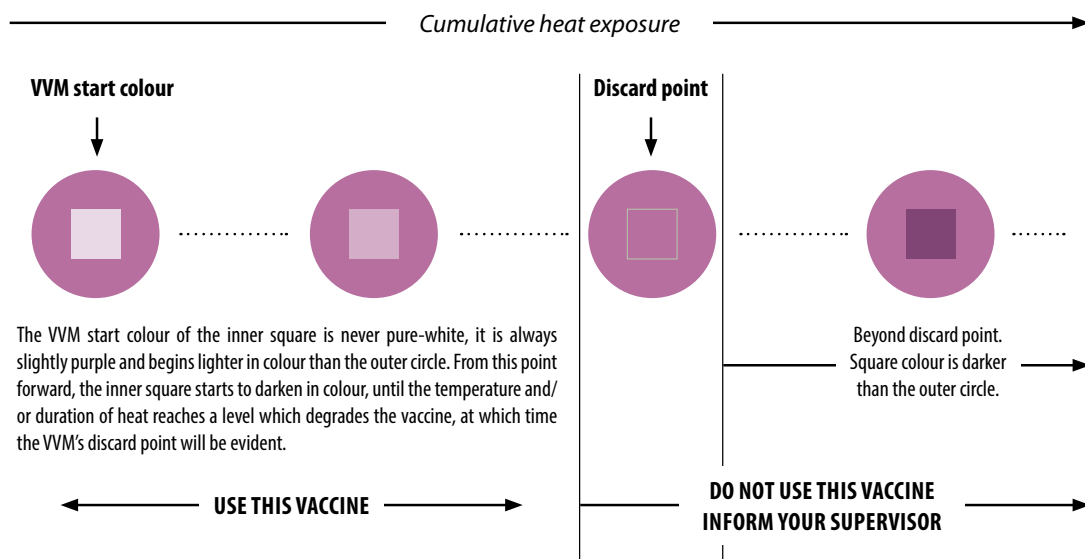
1. Opened vials kept in the “USE FIRST” box in the fridge (if in agreement with national multi-dose vial policy – see Module 2 for WHO policy).
2. Unopened vaccine vials that have been returned from outreach sessions or have been outside of the refrigerator and returned (usually also in the USE FIRST box).
3. Vaccine vials with vaccine vial monitors (VVMs) that have started to change to a darker colour but have not gone past the discard point, as shown in Figure 5.3.


In general, vaccines should be organized in the refrigerator by expiry date, with those with the closest expiry date kept in front and used first.

When selecting vials from the refrigerator, check each vaccine and diluent vial/ampoule and remember to:

- use only vials/ampoules in good condition; discard vials/ampoules that are damaged and/or have no label
- discard any vials/ampoules that have passed their expiry date
- discard any vials/ampoules with VVMs past the discard point
- do not use any vials/ampoules with fluid that has changed colour or contains particles: seek the advice of your supervisor if any are found.

Figure 5.3 How to read a vaccine vial monitor



 **Include an adequate number of auto-disable syringes and safety boxes**

Take one AD syringe for each dose of injectable vaccine and add 10% buffer stock. Note that separate calculations for two types of syringes, AD and BCG AD, are needed in most programmes. Take one reconstitution syringe and needle for each vial of vaccine to be used. Take one safety box for every 100 AD syringes.

 **Ensure correct use of coolant packs and vaccine carriers**

Do not use ice packs for vials that will be out of the cold chain for a limited time at fixed or outreach immunization sessions as the risk of freezing is greater than the risk of damage from heat for vials kept in a vaccine carrier for less than a day. Conditioned ice packs are recommended to avoid freezing vaccines.

Keep open vials inserted in the foam pad of the vaccine carrier during immunization sessions. Do not keep opened vials on ice.

2

Communicating with caregivers

Communication involves giving information verbally (including the tone of voice) and non-verbally (body language). It is an essential part of vaccinator technique needed from start to finish of the interaction with each child and caregiver. Communication during the immunization encounter is also important for giving health education; studies show that health workers are the primary source of such information for caregivers.

This section describes how to prepare for the communication needed to accompany the more technical activities described in Sections 3 and 4. It suggests how to make good communication part of vaccinator technique and, in Figure 5.4, gives a general sequence to match activities during the immunization encounter. The actual content of communication ultimately depends on what caregivers want to know (their own questions) and the key information that must be given, including when to return for the next immunization.

Module 7 (*Partnering with communities*) contains additional discussion on communication about immunization with community members and groups.

2.1 Communication use

Communication that welcomes, calms and reassures anxious children and adults makes vaccination easier and more pleasant. While immunization sessions can be very busy, taking time to give at least the minimum key information at each encounter improves results for all.

Asking about families and showing interest and concern will, over time, build trust and respect between health workers and communities. It may also bring to light health problems in the community that need to be reported and addressed.

Most communication is non-verbal. It is conveyed in many ways: posture, facial expression, gestures, eye contact and attitude, for example. Welcoming families to an immunization session with a smile and a calm manner will reassure the anxious, whereas arriving late can communicate a lack of respect. Being bad-tempered, criticizing caregivers, using words that are unfamiliar to the community and hurrying will increase anxiety and reduce the likelihood that people will return willingly for the next sessions.

2.2 Communication tips

Show concern and empathy with the community and, even more importantly, with each individual, treating them with respect and courtesy. Vaccinators have an important role in protecting communities from vaccine preventable diseases, not only by administering the vaccines, but also by creating trust so that children and adults are willing to attend immunization sessions.

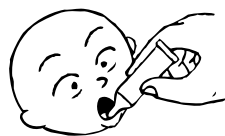
Working with different cultures often presents challenges and individual differences occur within any culture. For an individual health worker, it may help if they:

- understand their own attitude to immunization
- maintain confidence in their ability to talk about the vaccines and the diseases they prevent
- develop skills for giving one or more injections quickly, safely and with little discomfort
- have a genuine interest in each individual
- listen without judgement – immunization may challenge people’s views of health and well-being
- look beyond what is being said – the health worker should observe body language and ask questions to check understanding of what is being said and felt
- check that the caregiver understands the information given, which should be accompanied by giving written and other reminders as appropriate for the situation
- remain patient and kind.

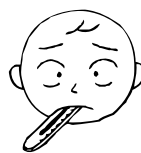
2.3 Communicating accurate information

The essential elements of every encounter are highlighted in Figure 5.4.

Figure 5.4 Essential elements of every encounter



ADVISE
on what is given



ALERT
for possible adverse events
and the response needed



ARRANGE
for when to return

Some caregivers will want detailed information while others will be happy to trust that they are receiving appropriate care, and lengthy explanations may cause them anxiety. Use words that are readily understood rather than technical terms. The following issues may need to be covered, depending on individual needs and understanding:

- vaccine-preventable disease
- vaccines and their schedules, including the number of doses, their timing, the importance of completing the series and due date(s) for the next dose(s)
- route of vaccine administration: oral or injectable
- potential adverse events and what to do if they occur
- explanation and reassurance in response to inaccurate information (for example, contraceptive effect of vaccines)
- vitamin A, if needed and when
- importance of immunization cards and documents and what is written on them
- immunization session locations and times, especially for the next visit.

2.4 Communicating potential adverse events

The following points are important when talking about the potential adverse events of any vaccine.

- Reassure the caregiver that reactions, such as fever, pain or swelling at the injection site, and changes, such as the child being irritable or off colour, are common and indicate a good response to the vaccine.
- Instruct the caregiver to give extra fluids in the form of breast milk or clean water.
- Instruct the caregiver that paracetamol may be given and specify the appropriate dose and timing for the individual infant.
- Remind the caregiver to give extra hugs and attention, but to avoid pressure to the injection site(s).
- Explain that placing a clean, cold, damp cloth can help to ease pain if there is a local injection site reaction.
- Tell the caregiver to bring the infant to the health centre if the infant's condition worsens or the reaction continues for more than a day or two, since the infant may develop an illness, unrelated to immunization, that needs treatment.

After BCG vaccine: Explain to the caregiver that the flat-topped swelling on the infant's arm is normal and indicates that the vaccine is working. Ask the caregiver to return with the infant if the infant develops such signs as abscesses or enlarged glands.

After measles vaccine: Explain to the caregiver that a rash or fever may develop after 6–12 days. Other people will not catch the rash and it will go away on its own. The caregiver should give the infant extra fluids and keep them cool.

See Module 1 (*Target diseases and vaccines*) for more details on vaccines and potential adverse events.

2.5 Communicating other measures to help keep children safe and healthy

Additional specific information to convey depends on the major concerns for children in a community. In general, handwashing, exclusive breastfeeding for the first six months of life and appropriate complementary feeding after the first six months should be promoted. It is also important to explain to caregivers that even if their child receives rotavirus and pneumococcal vaccines, the child may still develop diarrhoea or pneumonia from other causes, and they should be aware of treatment methods and danger signs.

Communication during each encounter

At the start

- Greet the caregiver in a friendly manner. Thank them for coming for vaccination and for their patience if they had to wait.
- Ask the caregiver if they have any questions or concerns and answer them politely.

During assessment (see Section 3 of this module)

- Write the date of the vaccination(s) being given on the immunization card and explain the disease(s) against which the vaccination(s) protect(s) in simple terms (in the local language). If there is a poster or chart, use it to help your explanation.
- Mention possible adverse events and explain how to handle them (see Section 2.4 of this module).
- Explain the need for the child to return for each contact in the immunization schedule to be fully protected. Use the immunization card as an instructional guide, and congratulate the caretaker if the child has completed a series.
- Write the date for the next vaccination on the immunization card and tell the caregiver. If appropriate, associate the date with a well-known occurrence, such as a holiday or seasonal event, that will help them remember to bring the child back.
- Ask the caregiver to repeat the date to be sure it is understood.
- Explain to the caregiver that if the child cannot come on the return date, they can obtain the next vaccination at another location or another date close to the due date.
- Remind the caregiver to bring the immunization card when they bring the child back for the next vaccination.

Proceed with vaccination, including explanation of positioning, as described in Section 4 of this module

After vaccination

- Remind the caregiver when to return with the infant.
- In the event of any out-of-stocks of vaccine at the time of the session, inform the caregiver where and when to return for the next doses.
- Remind the caregiver about other services given during immunization sessions, as per national policy; for example, vitamin A supplementation or tetanus toxoid for women.
- If immunization campaigns are planned in the coming months, inform the caregiver about the date of the campaign, what vaccination is being given, and where the vaccination site will be.
- Offer relevant print information to caregivers who are literate.
- Ask the caregiver if they have any questions or concerns and answer them politely.

3

Assessing infants for vaccination

Before administering a vaccine to an infant, it is important to check which vaccines are due.

3.1 Assess eligibility for immunization

Whenever an infant visits the health facility, they should be screened for immunization and given all the vaccines needed. If there is no immunization session that day, the earliest possible appointment should be made and explained to the caregiver. The steps below should be followed at any health care visit as well as at any immunization session.

1. Verify the infant's age on the immunization card

- If the infant does not have an immunization card, ask the caregiver for the infant's age.
- If the caregiver does not know the infant's age, estimate it by asking if the infant was born during/around a notable community event, for example during a certain season or celebration. A local events calendar can help with this.

2. Verify which vaccines the infant has received by reviewing the immunization card

- If the infant does not have an immunization card but has come to the health facility before, check the register and fill out a new card. If the infant is new to the health facility, ask the caregiver questions to prompt recall of each vaccine the infant should have received and fill out a new card.
- Check for a BCG scar (usually on the left arm/shoulder) if there is no record or recall.
- Proceed to the next step with or without the card, recall or a scar. If immunization status is in doubt and there are no known contraindications (see Section 3.2 of this module), vaccinate the infant.

3. Verify all vaccines the infant needs at this session to allow efficient preparation

Follow the national schedule (see Module 1 (*Target diseases and vaccines*) for WHO recommendations on each vaccine) remembering these general points:

- If the infant is eligible for more than one type of vaccine, it is safe to give the different vaccines at different injection sites during the same session (see Section 4.10).
- Never give more than one dose of the same vaccine at one time.
- If the vaccine is overdue, do not restart the schedule. Simply provide the next needed dose in the series.

- If there is a delay in starting the immunization schedule, give the vaccine(s) and an appointment for the next dose at the interval recommended in the national schedule.

3.2 Assess possible contraindications

For the first dose of a vaccine, assess the general status of the child to rule out signs of serious illness. For a subsequent dose in a vaccine series, ask the caregiver whether any adverse events, including anaphylaxis, occurred following the previous dose(s).

All infants should be immunized except in these situations:

- Do not give a vaccine if the infant has had anaphylaxis (a serious allergic reaction) or other severe reaction to a previous dose of the vaccine or a vaccine component.
- Refer to Table 5.1 for guidance on vaccinating HIV-infected children.
- Do not give a vaccine if the caregiver objects to immunization for a sick infant after explanation that mild illness is not a contraindication. Ask the caregiver to come back when the infant is well.

Table 5.1 Recommendations for immunization of HIV-infected children

Vaccine	Asymptomatic HIV infection/HIV+	Symptomatic HIV infection/AIDS
RV	Vaccinate	Vaccinate
OPV and/or IPV	Vaccinate	Vaccinate
BCG	Do not vaccinate	Do not vaccinate
Pneumococcal	Vaccinate	Vaccinate
DTP-containing	Vaccinate	Vaccinate
Hepatitis B-containing	Vaccinate	Vaccinate
<i>H. influenzae</i> type b-containing	Vaccinate	Vaccinate
Measles- and/or mumps- and/or rubella-containing	Vaccinate	Do not vaccinate
Yellow fever	Vaccinate	Do not vaccinate*
Japanese encephalitis	Vaccinate	Vaccinate
Tetanus toxoid	Vaccinate	Vaccinate
Meningococcal	Vaccinate	Vaccinate
Influenza (inactivated)	Vaccinate	Vaccinate
HPV	Vaccinate (always 3 doses)	Vaccinate (always 3 doses)

* *pending further studies*

Immunizing sick infants

Many health workers do not like vaccinating an infant who is ill. Infants can have many illnesses, but delaying immunization puts them at risk of vaccine-preventable diseases when they could receive the protection safely.

- For infants with a minor illness and/or fever below 38.5 °C, vaccinate as usual. This includes respiratory tract infections, diarrhoea and similar mild infections without significant fever.
- For very ill infants who need to go to hospital, or infants who have a very high fever, vaccinate if possible. A senior health worker may have to decide in each case, but infants need protecting from diseases that could be transmissible in hospital (measles, for example).
- For malnourished infants, vaccinate as usual. Malnourished infants do develop immunity after vaccination, and when they do not receive vaccines, they are more likely than well-nourished children to die from vaccine-preventable diseases.

Other conditions when infants should be immunized

The following are not contraindications and infants with these conditions or circumstances should be immunized:

- allergies or asthma, with the exception of a known allergy to a specific component of the vaccine as mentioned
- ongoing treatment with antibiotics
- family history of adverse events following immunization
- prematurity or low birth weight
- history of jaundice at birth
- ongoing breastfeeding
- recent or upcoming surgery
- chronic noncommunicable diseases of the heart, lung, kidney or liver
- stable neurological conditions, such as cerebral palsy or Downs syndrome
- family history of convulsions, seizures or fits.

4

Giving vaccinations

Immunization is a routine procedure for health workers, but can be frightening for children and adults attending the session. There are many things a health worker can do to make an immunization experience a safe and positive one. This section focuses on techniques for injection preparation, the comfortable and safe positioning of children, and the safe disposal of materials.

4.1 Preparing to vaccinate

Injectable vaccines can be ready to use or can require reconstitution (mixing) with diluent. Oral vaccines may require manipulation of the packaging to enable administration. With the increasing range of products and presentations available, the aim of this section is to cover general principles that can be adapted to specific vaccines in each programme.

Firstly, use aseptic technique to prepare vaccines:

- start with handwashing – use soap and water and dry your hands thoroughly
- work on a clean table
- prepare vaccines individually for each child; do not prefill syringes.

Whenever possible, prepare the vaccine away from the child and caregiver; be aware that injection materials may cause anxiety. If this is not possible, turn away slightly to shield the preparation. Try to talk to the caregiver while preparing injections as showing interest in the caregiver is reassuring.

4.2 Reconstituting vaccines

Common vaccines that need to be mixed with diluent before use include BCG, yellow fever, measles, MR and MMR. The correct diluent must be used (see box).

Points to remember about diluents

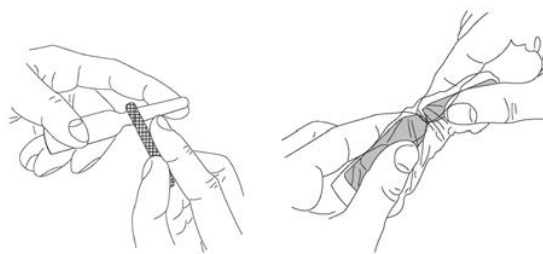
- Always use diluent from the same manufacturer as the vaccine.
- Diluent is not interchangeable, different vaccines have different diluents. Administering a vaccine with the wrong diluent has led to serious adverse events, including death.
- Diluent should be cooled before being mixed with the vaccine.
- Vaccines should be reconstituted with diluent immediately before use.
- Unused reconstituted vaccine must be handled according to national multi-dose vial policy; WHO policy is outlined in Module 2 (*The vaccine cold chain*).

Steps for reconstitution

1. For vials with VVMs, double check that the vaccine can be used.
2. Double check each vial/ampoule to make sure it is not past its expiry date, and read the label carefully.
3. Open the vial. For a metal cap, use a file to lift the pre-cut centre and bend it back; for a plastic cap, flip it off with your thumb or slowly twist it depending on the specific instructions for the type of vial.

4. Open the glass ampoule by holding the ampoule between the thumb and middle finger and supporting the top with the index finger; scratch the ampoule neck with a file, then gently break off the top, taking care to avoid injury from the sharp glass (see Figure 5.5). If you injure yourself, discard the ampoule since the contents may have been contaminated. Cover the wound before opening a new ampoule.

Figure 5.5 Scratching and breaking the neck of the vial



5. Draw all of the diluent out with a new disposable reconstitution needle and syringe.
6. Insert the needle of the reconstitution syringe into the vaccine vial and empty all the diluent – depress the plunger slowly to avoid frothing inside the vaccine vial.
7. Draw the fluid slowly and gently in and out of the vial several times to mix the diluent and vaccine or gently swirl the vial to mix the diluent and vaccine. Take care not to touch the rubber membrane or opening.

8. Remove the reconstitution needle and syringe and discard them in the safety box.
9. Put the reconstituted vaccine vial in the foam pad of your vaccine carrier.

4.3 Making vaccination easier and more comfortable

The way a health worker interacts with children and their caregivers has a huge impact and they will respond positively to a friendly, welcoming attitude.

Recent recommendations for new vaccines and catch-up dose schedules often mean giving two (or more) injections to an infant during the same session. Giving multiple injections at the same time is, of course, more difficult, but it is a skill that must be learnt. With practice, giving injections quickly and safely with little distress to the infant and caregiver will become routine. Even the most experienced vaccinator should take time to review their injection technique and seek out refresher materials that might improve their skills. Vaccinators should also share their knowledge and learn from each other.

4.4 Good general techniques

Welcome the family: Put them at ease by smiling and maintaining a kind, reassuring manner. Ask if they have any questions or concerns and take time to answer them. Complete the assessment as described in Section 3 of this module and, if more than one injection is needed, explain this and confirm that the caregiver agrees that it is better to vaccinate according to the schedule than to miss the opportunity.

Be prepared: After assessing the infant as described in Section 3 of this module, prepare the necessary vaccines and place them close at hand in the order of administration. The order in which vaccines should be given will depend on national guidelines; see Table 5.2 for an example sequence.

Take time to position the infant with the caregiver: Explain what will happen. This will help plan movements. Always have the infant's whole limb(s) for injection bare before starting. The vaccinator needs to move from one site to another, with minimum delay. See Section 4.5 of this module.

Follow a preset sequence for administering the vaccines based on national guidelines: National guidelines may specify the sites and the order in which to give vaccines. Countries often choose one site for each vaccine (for example, pneumococcal vaccine or PCV should always be given in the left anterior thigh and pentavalent always in the right anterior thigh). Using the same site for each infant can help during follow-up (for example, if the card is lost and recall questions need to be asked, or if any adverse events occur). The order in which vaccines are given to each infant can

help make administering them easier; in general, the suggestion is to give oral vaccines first, while the infant is still calm, and then follow with the injectable ones. The choice of whether to give a new vaccine first or last usually depends on local factors. Table 5.2 shows a suggested order based on the current WHO schedule. Note that rotavirus vaccine comes before polio since it has a larger volume and it may be better to give it when the infant is most calm. Also note that some programmes may not use all the vaccines listed in the table. Always refer to national guidelines.

Remember that spending a little time, particularly on welcoming and positioning, will help the procedure go more smoothly and efficiently.

Table 5.2 Example sequence for giving infant vaccines based on current WHO schedule

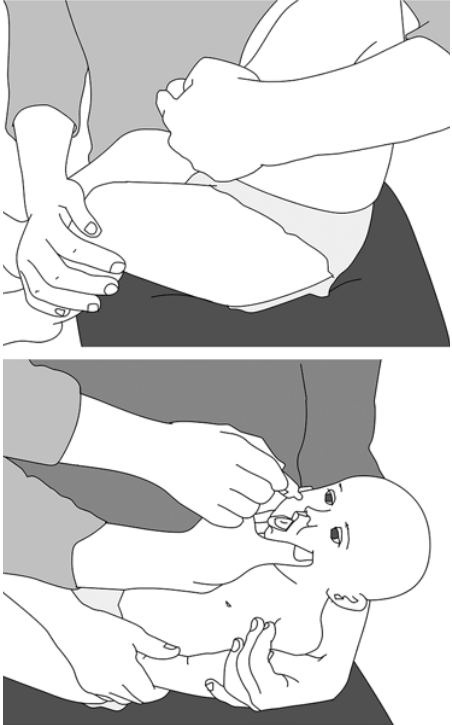

Order in which to give the vaccine	Route	Vaccine
1	Oral	Rotavirus
2	Oral	Polio
3	Injectable/ID	BCG
4	Injectable/IM	Pneumococcal
5	Injectable/IM	Pentavalent or Hib-containing
6	Injectable/IM	DTP, if not using pentavalent
7	Injectable/IM	HepB, if not using pentavalent
8	Injectable/SC	Measles- and rubella-containing
9	Injectable/SC	Yellow fever
10	Injectable/SC	Japanese encephalitis
11	Injectable/IM	Meningococcal

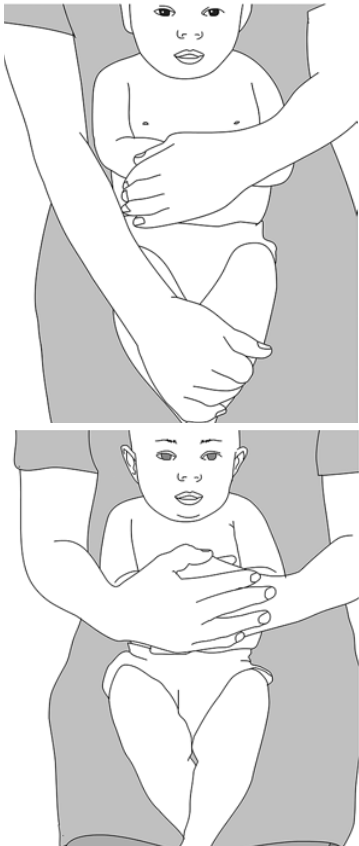

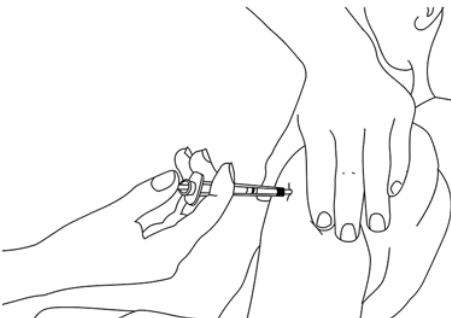
4.5 Positioning the infant for vaccination

The choice of position will depend on the number of vaccines to be given, the age of the child and the materials available. The aim of positioning is to keep the child still and the caregiver and vaccinator comfortable. Table 5.3 shows different positions for vaccinating. The first three are for infants and the fourth and fifth are for children aged 12 months or older and adolescents/adults respectively. Reviewing the positions and picturing movements to give vaccinations will help you be more confident during the actual immunization encounter. You should try different positions to find the one that suits you best.

Check that the caregiver is willing to hold the child while the injection/s is/are given. If they are not willing, ask someone else to help.

Table 5.3 Vaccination positions, their advantages and disadvantages

Position	Illustration	Directions for caregiver	Advantages	Disadvantages
<p>Cuddle position: Semi-recumbent on caregiver's lap</p>		<p>Sit on a chair holding the infant sideways on lap with one arm behind infant's back.</p> <p>Tuck the infant's inside arm around their own back or against their body.</p> <p>Bring their arm around the infant's back to hug the shoulders and upper body close to their body.</p> <p>Tuck the infant's legs between their own to secure them or hold them with their other arm.</p> <p>Vaccinator should position themselves to avoid strain while giving vaccines at the correct angle.</p>	<p>Infant's arm and legs securely held by caregiver.</p> <p>Infant comforted by close contact and eye contact with caregiver.</p> <p>Leg and arm injections possible without position change.</p>	<p>Delay between injections if 2 IM injections given.</p> <p>Possibility that secure restraint may not occur after position change.</p>
<p>Bed position: Lying on back on flat surface</p>		<p>Lay the infant, with both legs bare, on a flat surface.</p> <p>Stand on the other side of the bed and hold the infant's hands and arms.</p> <p>Vaccinator should stand at the infant's feet and use non-injecting hand to gently cup the slightly bent knee of the leg to receive the vaccine.</p>	<p>Infant's arms held securely by caregiver.</p> <p>Infant comforted by close contact and eye contact with caregiver.</p> <p>Injection in both legs possible without change in position of infant.</p>	<p>Vaccinator responsible for restraint of the legs.</p>

Position	Illustration	Directions for caregiver	Advantages	Disadvantages
<p>Upright position: Sitting upright on caregiver's lap, facing straight outwards</p>		<p>Sit on a chair holding the infant sitting facing straight outwards on their lap. Rest the infant's back against their chest. Encircle (hug) the infant's upper body and arms with one arm and use the other arm or their knees to hold the infant's lower legs (lower legs and feet one behind the other between the caregiver's knees).</p> <p>Vaccinator should stand on the side of the first injection and at the level where it can be given at a 90 degree angle.</p>	<p>Infant's arms and legs held securely by caregiver. Multiple injections possible without change in position.</p>	<p>Security of leg restraint dependent on caregiver – if too tight, muscles tense, if too loose leg may jerk out of restraint. No eye contact with caregiver.</p>
<p>Straddle position: Child >12 months of age vaccinated sitting upright on caregiver's lap, facing towards them with legs straddling over theirs</p>		<p>Sit on a chair holding the child facing them and sitting astride their knees. Encircle (hug) the child's upper body and arms with their arms. If necessary, use one arm to secure the child's leg. Vaccinator should stand on the side of the injection.</p>	<p>Child's arms tucked securely under caregiver's arms. Child comforted by close contact with caregiver. Multiple injections possible without change in position.</p>	<p>Thigh muscles may be tense. Vaccinator responsible for restraint of legs (unless caregiver helps).</p>
<p>Independent position: Adolescent/ adult vaccinated sitting on chair</p>		<p>See Section 4.11 of this module.</p>	<p>Good access to deltoid.</p>	<p>Restraint, if required, dependent on vaccinator.</p>

4.6 Good oral administration technique

This example is based on one rotavirus vaccine and OPV, but it also applies to other oral vaccines.

1. **Position:** Use the cuddle position on the caregiver's lap with the head supported and tilted slightly back. Vaccinator stands to one side (see Table 5.3).
2. **Administration:** Open the infant's mouth by gently squeezing the cheeks between your thumb and index finger using gentle pressure. Firm squeezing can cause distress.
 - For rotavirus vaccine in tubes, angle the tube towards the inner cheek. Administer the entire contents by squeezing the tube several times.
 - For OPV, let two drops of vaccine fall from the dropper onto the tongue. Do not let the dropper touch the infant.
3. **Disposal:** Discard the used oral vaccine tube into the rubbish.

4.7 Good injection technique

Good injection technique includes administering all injectable vaccines with an auto-disable (AD) syringe. To use AD syringes correctly, remember that the plunger of an AD syringe can only go back and forth once; so:

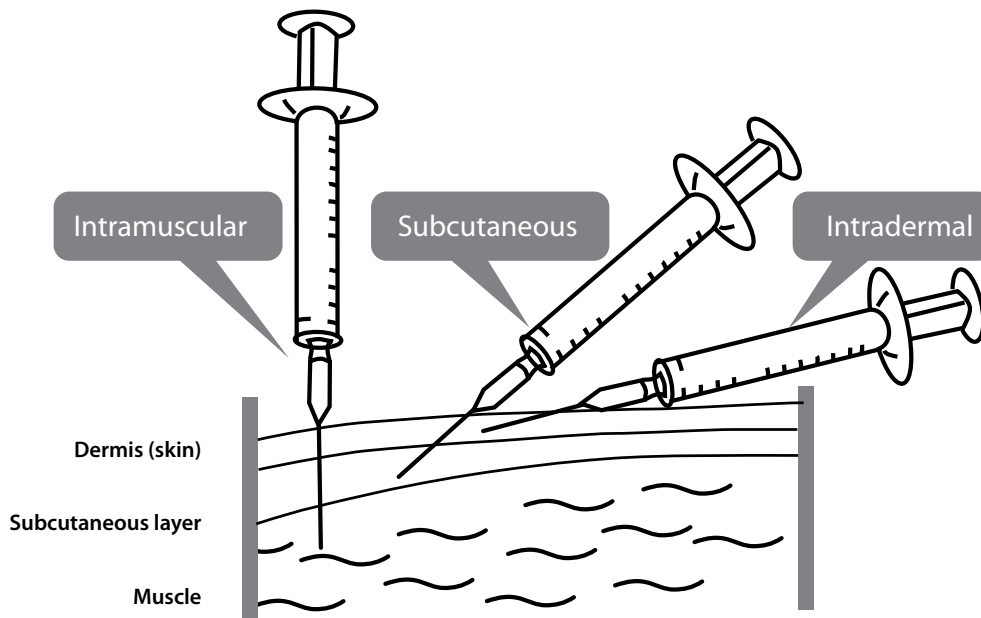
- do not draw up air to inject into the vaccine vial when filling the AD syringe;

Summary of injection steps

1. Wash skin that looks dirty with water. Swabbing clean skin is not necessary.
Do not use alcohol to clean the skin before giving vaccinations.
2. Hold the syringe barrel between the thumb, index and middle fingers. Do not touch the needle.
3. For intradermal (ID) injections, gently stretch and support the skin with the thumb and forefinger. Lay the syringe and needle almost flat along the infant's skin. Gently insert the needle into the top layer of the skin (see Figure 5.6).
4. For subcutaneous injections (SC), gently squeeze the skin. Insert the entire needle at a 45 degree angle (towards the shoulder) with a quick, smooth action (see Figure 5.6).

5. For intramuscular injections (IM), gently stretch and support the skin between thumb and forefinger. Push the entire needle in at a 90 degree angle with a quick, smooth action (see Figure 5.6).
6. For all injections, depress the plunger slowly and smoothly, taking care not to move the syringe around.
7. For all injections, pull the needle out quickly and smoothly at the same angle that it went in.
8. For all injections, the caregiver may hold a clean swab gently over the site if it bleeds after injection.
9. For all injections, dispose of the needle and syringe immediately in the safety box.
10. For all injections, soothe and distract the child when all the vaccines have been given.

Figure 5.6 Needle positions for ID, SC and IM injections



4.8 Intradermal (ID) injection

BCG is the only vaccine that is injected intradermally (into the layers of the skin) for slow absorption. It is usually given in the left upper arm. To measure and inject the very small dose (0.05 ml) accurately, a special syringe and needle are used (see Figure 5.7).

How to give BCG intradermally

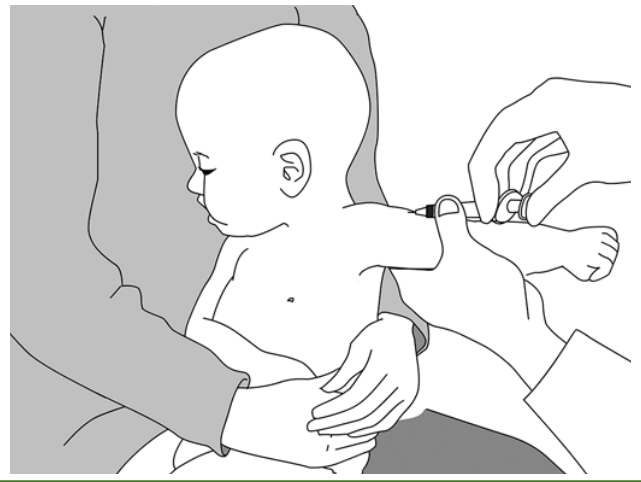
1. Position: Cuddle position on caregiver's lap (BCG recommended for infants only).

2. Administration:

- Hold the syringe barrel with fingers and thumb on the sides of the barrel and with the bevel (hole) of the needle facing upwards.
- Lay the syringe and needle almost flat along the infant's skin.
- Insert the tip of the needle under the surface of the skin just past the bevel.
- Keep the needle close to the skin at the same angle as you inserted it.
- Place your other thumb on the lower end of the syringe near the needle to hold the needle in position, but do not touch the needle.
- Hold the plunger end of the syringe between the index and middle fingers. Press the plunger in slowly with the thumb. If you feel no resistance to the plunger, you are not in the right place and should reposition (see below).
- A pale flat-topped swelling with small pits like an orange peel should appear on the skin.
- Remove the needle smoothly at the same angle as it went in.
- The caregiver may hold a clean swab gently over the site if it is bleeding. Do not rub or massage the area.
- Soothe the infant.

3. Disposal: Discard the needle and syringe straight into the safety box.

Figure 5.7 BCG injection



When an intradermal injection is given correctly, the syringe plunger is hard to push. If the plunger goes in too easily, the injection may be too deep. Stop injecting immediately, correct the position of the needle, and give the remainder of the dose, but no more. If the whole dose has already gone in, count the infant as having received a dose of vaccine, even though it was given subcutaneously rather than intradermally.

Do not repeat the dose.

The risk of side effects, such as abscesses or enlarged glands, is greater if the vaccine is given incorrectly, so the technique is very important. It is better to ask for help from a supervisor or other colleague than to continue giving BCG incorrectly.

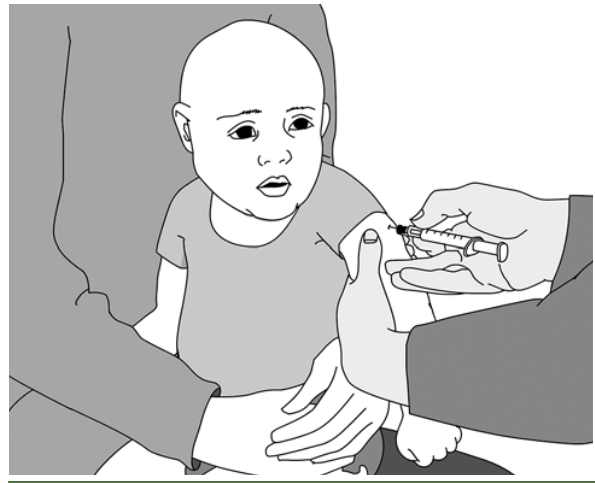
4.9 Subcutaneous (SC) injection in the upper arm

The injection is given into the layer below the skin on the upper arm. The exact injection site (right arm or left arm) used for particular vaccines may be specified in your country. Be sure to check and always use the side specified (see Figure 5.8).

How to give a subcutaneous injection

1. Position: The position depends on the age of the child, the number of vaccinations to be given and what is easiest and most convenient for the vaccinator.
2. Administration:
 - Hold the syringe barrel with fingers and thumb on the sides of the barrel and with the bevel (hole) of the needle facing upwards.
 - Quickly push the needle into pinched-up skin; the needle should point towards the shoulder at a 45 degree angle.
 - Depress the plunger smoothly, taking care not to move the needle under the skin.
 - Pull the needle out quickly and smoothly at the same angle as it went in.
 - The caregiver may hold a clean swab gently over the site if it is bleeding. Do not rub or massage the area.
 - Soothe and distract the infant.
3. Disposal: Discard the syringe and needle straight into the safety box.

Figure 5.8 Subcutaneous injection



4.10 Intramuscular (IM) injection in infants

The muscle on the upper outer part of the thigh is large and safe for intramuscular injections. See Figures 5.9 and 5.10.

In children aged less than 15 months the deltoid muscle of the upper arm is not safe to use since it is not developed enough to absorb the vaccine and the radial nerve is close to the surface. The deltoid muscle may be used in older children, adolescents and adults (see Section 4.11).

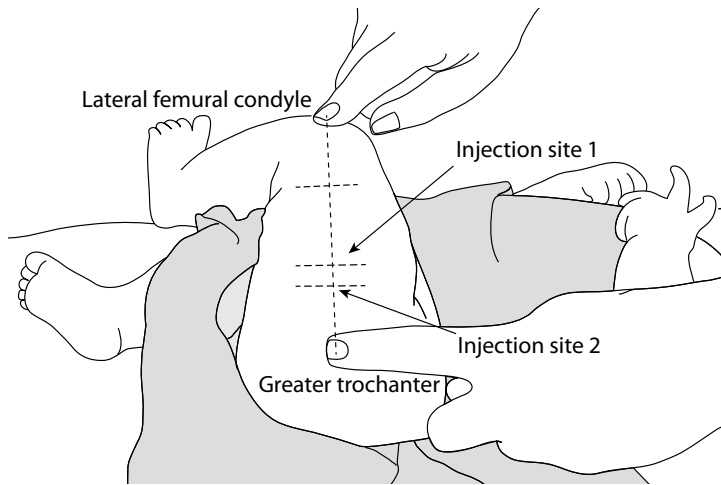
How to give an intramuscular injection to an infant

1. Position: The position depends on the age of the child, the number of vaccinations to be given and what is easiest and most convenient for the vaccinator.
2. Administration:
 - Hold the syringe barrel with fingers and thumb on the sides of the barrel and with the bevel (hole) of the needle facing upwards.
 - Gently stretch and support the skin on the upper, outer thigh with the other hand and quickly push the needle at a 90 degree angle down through the skin into the muscle.
 - Depress the plunger smoothly, taking care not to move the needle under the skin.
 - Pull the needle out quickly and smoothly at the same angle as it went in.
 - The caregiver may hold a clean swab gently over the site if it is bleeding. Do not rub or massage the area.
 - Soothe and distract the infant.
3. Disposal: Discard the needle and syringe straight into the safety box.

WHO recommendation on IPV administration and multiple IM injections

- For IM injections in infants below 12 months of age, the deltoid injection site (upper arm) should NOT be used due to its inadequate muscle mass.
- When three IM injections are scheduled at the same time in an infant under 12 months of age, it is correct and safe to give two injections in the same thigh as follows:
 - one thigh – PCV + IPV, separated by 2.5 cm (shown in Figure 5.10);
 - the other thigh – pentavalent

Figure 5.9 Intramuscular injection sites in infants



Source: New Zealand Ministry of Health

Figure 5.10 Intramuscular injection



4.11 Intramuscular injection in adolescents and adults

Unlike infants, adolescents and adults may suffer stress of anticipation prior to immunization. If they have had a previous bad experience, this anxiety may be more severe. Observe the group waiting for immunization. Watch for signs of anxiety; if anyone is crying, pale or showing any other signs of distress, it is best to take them aside to be reassured, comforted and immunized first to reduce the potential for anxiety to spread among the others.

Allow time for discussion about the vaccine and the disease(s) it protects against, if this is what is wanted. Ask if there are any questions. Complete your own pre-immunization check.

Unless it is against national policy, allow the person to choose in which arm they would like to receive the injection. Choice gives a feeling of being in control in what may be a frightening situation for them.

Talk quietly and be patient. They might like to have a support person with them, or a fellow vaccinator who is able to calm and distract them.

Provide privacy for the administration of vaccines; a screen, even if just a curtain, will help.

Explain what you will say when you are going to give the injection and how it may feel. Some will liken it to a minor sting or prickle. Use words such as booster rather than needle or shot.

Steps for intramuscular injections in adolescents and adults:

- 1.** Position: Most will be comfortable sitting on a chair (see Table 5.3). Those who are known to be prone to fainting may feel better lying down.
- 2.** Administration:
 - With your palm resting on their shoulder, hold the injection site gently with thumb and forefinger. This touch is comforting to the person and it will alert you of any potential movement. Talk about how important it is for them to remain still and then distract them by chatting about non-related subjects like their favourite school subject or hobby.
 - Holding the barrel of the syringe and, using a dart-like (quick, smooth) action, insert the needle at a 90 degree angle all the way down through the skin to the muscle. Keep chatting while you do this. Distraction is an important aid to reduce injection discomfort.
 - Depress the plunger smoothly and steadily, taking care not to move the needle.
 - Pull the needle out, quickly and smoothly, at the same angle as it went in.
 - Do not rub the arm. A clean swab may be held over the site.
 - Give comfort, reassurance and distraction.
- 3.** Disposal: Discard the needle and syringe straight into the safety box.

5

Closing the session

Materials must be stored safely or disposed of after immunization sessions. Equipment and sites must be cleaned and maintained for their next use.

5.1 Discard or store opened vials depending on vaccine type

Refer to national policy on open multi-dose vials and act accordingly; WHO multi-dose vial policy is included in Module 2 (*The vaccine cold chain*).

After outreach sessions, the following steps are required for vaccines and supplies.

1. Pack the vaccine carrier:

- Check the coolant packs to make sure that the ice has not melted. If conditioned ice packs have completely melted and/or the thermometer in the vaccine carrier shows a temperature above +8 °C, all vaccines inside the vaccine carrier should be discarded unless they have VVMs that show they are still safe to use; so check each vial.
- Place unopened vaccines and opened vials for which the multi-dose vial policy is applicable inside the carrier.
- Put empty vials and opened vials of reconstituted vaccines in a separate container for transport to a disposal site.

2. Return vaccines to the refrigerator:

- Return vaccines with acceptable VVMs to the use first box in the refrigerator. If the conditioned ice packs in the vaccine carrier have melted during the trip back to the health centre, discard the vaccine vials unless the VVMs indicate that they are safe to use.
- Put the coolant packs from the carrier into the freezer and record the temperature of the refrigerator.

3. Clean the vaccine carrier:

- Wipe the carrier with a damp cloth and check it for cracks. Repair any cracks with adhesive tape and leave the carrier open to dry.

4. Return other supplies:

- For example, place immunization registers, unused AD syringes and immunization cards in their designated storage areas.

5.2 Dispose of used vaccine vials and injection equipment safely

Safety boxes containing used needles and syringes must be disposed of properly – see Module 3 (*Ensuring safe injections*).

5.3 Leave the site clean and tidy

Specifically after using an outreach site:

- Do not leave anything behind that might be a health threat to the community.
- Clean and return tables, chairs and other equipment to their owners.
- Thank the local people who have helped to organize the session and remind them of the date of the next session.

6

Recording data

Accurate and reliable records are vital, not only for the individual child but also to track the immunization status of communities through monthly and annual reporting (see Module 6 (*Monitoring and surveillance*) for details). During a session, individual immunization cards and health centre records – such as registers, reminder cards and tally sheets – have to be completed. Tally sheets need to be totalled after the session and these totals need to be added to programme monitoring data.

6.1 Complete the infant immunization and reminder cards

Follow these steps to complete infant immunization and reminder cards:

1. Write the date for each vaccine administered in its corresponding section on the card.
2. Mark the next immunization due date on the card if another dose is needed, and ensure that the caregiver understands when and where to return for the next dose(s) of vaccine(s).
3. If new vaccines are not included on immunization registers and/or cards, ask your supervisor for instructions about how to record them on all reporting tools.
4. Use the immunization card to update the reminder card/due list kept in the health facility as shown in Module 6 (*Monitoring and surveillance*), Section 1.
5. Return the immunization card to the caregiver.
6. Explain to the caregiver that the immunization card must be kept in good condition since it is an important document for future health care visits.
7. Remind the caregiver that the card should be taken to all of the child's health care visits for review.

Do not miss any opportunity to immunize; health workers should be in the habit of asking for and reviewing immunization cards for each child at each visit regardless of the reason for coming.

6.2 Prepare a summary of the session

Calculate total numbers of vaccines given, supplies used and stock remaining for inclusion in monthly report data, as described in Module 6 (*Monitoring and surveillance*).

6.3 Prepare a defaulter tracking list

At the end of each session, use the immunization register and/or reminder cards to make a list of children who were due for vaccines but did not attend the session. The format for the list is shown in Module 6 (Figure 6.4). The list should be used for defaulter tracking and for programme monitoring activities (as described in Modules 4 and 6). Inform community members who help with defaulter tracking of the infants on the list; ask them to mobilize the defaulters for the next immunization session.

7

Using the immunization session checklist

Figure 5.11 shows a checklist that can help ensure safety before, during and after immunization. This checklist is a reminder of key points in preparation, vaccination and closure of sessions that are described above, and is meant to reinforce positive actions. Health workers should be familiar with national immunization schedules, vaccine administration, waste disposal, data collection and other details of standard operating procedure from relevant national programme documents and be able to quickly recognize and complete the checklist items. A printed copy of this checklist can be posted on a wall in the immunization area for easy viewing throughout sessions.

Figure 5.11 Immunization session checklist

Before the immunization session	For selected clients attending the immunization session	After the immunization session
<p>DID YOU:</p> <p>Y N CHECK if sufficient quantities of vaccines and diluents are available for the session?</p> <p>CHECK vials for the following and take appropriate action:</p> <p>Y N Expiry dates?</p> <p>Y N Open vial dates?</p> <p>Y N VVM status?</p> <p>Y N Freezing status?</p> <p>Y N PLACE vials in the appropriate place in the immunization area?</p> <p>ENSURE sufficient supplies are available for the session including:</p> <p>Y N Auto-disable (AD) syringes?</p> <p>Y N Reconstitution syringes?</p> <p>Y N Safety box?</p> <p>Y N AEFI kit?</p> <p>Y N Immunization register?</p> <p>Y N Immunization tally sheets?</p> <p>Y N Blank immunization cards?</p> <p>Y N WASH your hands with soap?</p>	<p>DID YOU:</p> <p>Y N GREET the client and caregiver?</p> <p>Y N REVIEW the client's immunization card?</p> <p>Y N DETERMINE eligible vaccinations based on the national schedule, client's age and possible contraindications?</p> <p>Y N RECONSTITUTE each vaccine with its matched diluent (for lyophilized vaccines)?</p> <p>Y N FILL syringes just before administration using aseptic technique?</p> <p>Y N ADMINISTER each vaccine according to recommended technique and correct injection site?</p> <p>Y N IMMEDIATELY DISPOSE needles/AD syringes in safety boxes after each injection?</p> <p>Y N RECORD all vaccinations in register, tally sheet and immunization card?</p> <p>Y N COMMUNICATE key messages, including potential AEFIs and date of next visit?</p>	<p>DID YOU:</p> <p>Y N CORRECTLY ASSESS if open vials can be used in the next session in accordance with national multi-dose vial policy?</p> <p>Y N DISCARD open vials that should not be used?</p> <p>Y N RECORD date of opening on vials that can be used and PLACE them in the "use first" box in the refrigerator?</p> <p>Y N RETURN unopened vials to the refrigerator?</p> <p>Y N COMPLETE session summary report?</p> <p>Y N LIST the names of children who missed vaccination and require follow up?</p> <p>Y N HANDLE full safety boxes correctly?</p> <p>Y N TAKE appropriate action to ensure sufficient vaccine stock for the next session?</p> <p>Y N INFORM COMMUNITY of date and time of next session?</p>