



Midwifery Level III

NTQF Level III

Learning Guide -30

Unit of Competence: Promoting and Providing Immunization and Managing Cold Chain

Module Title: Promoting and Providing Immunization and Managing Cold Chain

LG Code: HLT MDW3 M08 LO3-LG30

TTLM Code: HLT MDW3 TTLM 0919v1

LO 3: Conduct immunization for children



Instruction Sheet	Learning Guide #03
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This learning guide is developed to provide you the necessary information regarding the following content coverage and topics –

- ✓ Developing schedule and communicating with stakeholders
- ✓ Preparing the required EPI logistics/Materials
- ✓ Conducting Immunization
- ✓ Vaccine Preventable disease
- ✓ Missed opportunities and trace defaulters
- ✓ Vaccine supply and stock management

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to –

- develop and communicate EPI schedule to stake-holders
- Prepare EPI logistics
- Conduct immunization
- describe Vaccine preventable disease
- trace defaulters and missed opportunities
- Supply vaccine and stock management

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 16.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” in page 5.
5. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 1-7).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your trainer for further instructions or go back to Information sheet 1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.
8. Read the information written in the “Information Sheet 2”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
9. Accomplish the “Self-check 2” in page 8.
10. Ask from your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished answering the Self-check 2).
11. Read the information written in the “Information Sheets 3”. Try to understand what are being discussed. Ask your trainer for assistance if you have hard time understanding them.
12. Accomplish the “Self-check 3” in page 11.
13. Ask your trainer the key to correction (key answers) or you can request your trainer to correct your work. (You are to get the key answer only after you finished



answering the Self-check 3).

14. Read the "Operation Sheet 1 and try to understand the procedures discussed.

Information Sheet-1	Developing schedule and communicating with stakeholders
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1.1. Developing schedule and communicating with stakeholders

- Communications to stakeholders may consist of either good news or bad news. ... reports, meetings, online databases, online schedules, and project websites. ... as possible so that as you and your team develop project planning documents.
- **Communicating with Stakeholders:**
 - 1.Exhibit you have a basic understanding of their work and domain and be able to empathize.
 - 2.Apply the right format at the right time with the right audience. ...
 - 3.Leverage your teammates when the time is right. ...
 - 4.Constantly educate stakeholders. ...
 - 5.Build relationships outside of work meetings
 - Why is communication important with stakeholders?
- ✓ Communicating regularly with stakeholders and creating a positive understanding can help you build effective long-term relationships with key groups. A strong relationship brings a range of benefits. Communicating with customers can put you in a strong position when customers are making purchasing decisions.
 - What is a stakeholder communication plan?
- ✓ In its simplest form, a stakeholder communications plan outlines who you need to communicate with, about what, how you're going to do it, and how often.
 - How do you communicate with external stakeholders?

Keep Your Stakeholders Engaged

- ✓ Listen when they speak: Communication is a two-way street. ...
- ✓ Give credit where it's due: Acknowledge your stakeholders when they comment and provide feedback. ...
- ✓ Set realistic expectations: ...
- ✓ Provide regular updates
 - How can you communicate effectively?

Ways to Create Effective Communication in the Workplace

- ✓ Open Meeting. It is easier to communicate your passion and how you feel to your team via open meetings. ...



- ✓ Emails. ...
- ✓ One on One. ...
- ✓ Create a Receptive Atmosphere. ...
- ✓ Communication via Training. ...
- ✓ Display Confidence and Seriousness. ...
- ✓ Use Simple Words. ...
- ✓ Use Visuals.

Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. a stakeholder communications plan describes(3 points)
 - A. who you need to communicate with,
 - B. about what you communicate with
 - C. About how you're going to do it
 - D. all of the above

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

MCQ

1. _____



Information Sheet-2

Preparing the required EPI logistics/Materials

2.1 . Preparing the required EPI logistics/Materials

Different levels within the health care system need different equipment for transporting and storing vaccines and diluents at the correct temperature.

Primary vaccine stores need cold or freezer rooms, freezers, refrigerators, cold boxes, and sometimes refrigerator trucks for transportation.

Intermediate vaccine stores, depending on their size/capacity, need cold and freezer rooms, and/or freezers, refrigerators, and cold boxes.

Health facilities need refrigerators with freezing compartments, cold boxes and vaccine carriers. There are five major cold chain equipment used in health facilities:

- Refrigerators
- Cold boxes
- Vaccine carriers
- Foam pads and
- Ice packs

A. Refrigerators

Health facility refrigerators may be powered by electricity, kerosene, or solar energy. Electric refrigerators are usually the least costly to run and the easiest to maintain, but they must have a reliable electricity supply.

Where the electricity or fuel supply is not reliable, ice-lined refrigerators can maintain the appropriate temperature for 16 hours without power if they operate with power continuously for at least eight hours a day.

Refrigerators have different capacities for storing vaccines and for freezing and storing icepacks. A refrigerator in a health facility should be able to hold:

- A one-month supply of vaccines and preferably diluents in the refrigerator compartment
- A one to two-week reserve stock of vaccines and diluents (an additional 25% to 50% of the one-month supply)
- Frozen ice-packs in the freezer compartment and
- Bottles of water or unfrozen ice packs in the refrigerator compartment (to act as a buffer to temperature changes, especially if there is a power failure).

Half the total space in the refrigerator should be left empty to allow air to circulate around the



vaccines and diluents to keep them cool.

B. Cold Boxes

A **cold box** is an insulated container that can be lined with ice-packs to keep vaccines and diluents cold during transportation and/or short period storage (from two to seven days) depending on the environmental condition we are working in.

Cold boxes are used to collect and transport monthly vaccine supplies from national stores to regional, zonal, district and health facility. They are also used to store vaccines when the refrigerator is out of order or being defrosted and for outreach and mobile sessions in addition to vaccine carriers.

Different models of cold boxes have different vaccine storage capacities. Health facilities usually need one or more cold boxes that can hold:

- a one-month supply of vaccines and diluents; and
- a one-to-two week reserve stock of vaccines and diluents.

In addition to their vaccine storage capacity, cold boxes are selected according to their cold life. Different models have a cold life of two to seven days depending on the temperature outside. When keeping vaccines in a cold box:

- Place conditioned ice packs at the bottom and sides of the cold box before loading the vaccines in cartons or polythene bags.
- Always keep a thermometer inside the cold box.
- Do not place DPT, PCV, Hep B, Rotarix and TT vials in direct contact with conditioned ice packs.
- Do not place weights or other cold boxes on the lid since it will damage the rubber seal.

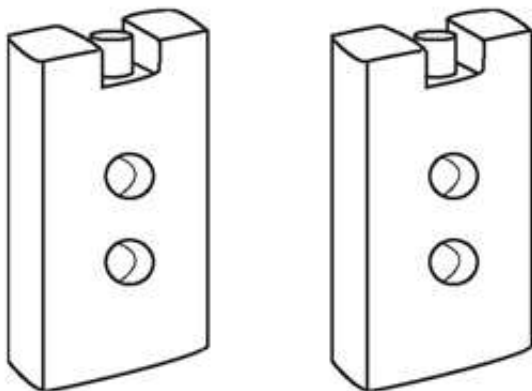
C. Vaccine Carrier

Vaccine carriers, like cold boxes, are insulated containers that, when lined with frozen ice-packs, keep vaccines and diluents cold during transportation and/or temporary storage. They are smaller than cold boxes and are easier to carry if walking. But they do not stay cold as long as a cold box only for a maximum of 48 hours with the lid closed.

Vaccine carriers are used to transport vaccines and diluents to outreach sites and for temporary storage during health facility immunization sessions. In small health facilities they are used to bring monthly vaccine supplies from the district store. Vaccine carriers are also used to store vaccines when the refrigerator is out of order or is being defrosted.

D. Ice Packs

Ice-packs are flat, square plastic bottles that are filled with water and frozen. Ice-packs are used to keep vaccines cool inside the vaccine carrier or cold box. The number of ice-packs required for a cold box or vaccine carrier varies. It is recommended to condition ice-packs before using them in a vaccine carrier.



Every health facility should have minimum two sets of ice-packs for each of their cold boxes and vaccine carriers:

- one in the process of being frozen
- the other in use in a cold box or vaccine carrier.

fig 1 Ice packs

✓ Taking ice-packs out of the vaccine carrier will shorten its cold life. During sessions, it is not recommended to keep vaccines on ice-packs or in cups filled with ice to keep vaccines cool. During sessions, stick the vaccine and diluent vials into the foam pad to keep them cool and to protect them.

✓ Ice melts quickly and vials may become contaminated if they float in water from melted ice and labels may fall off the vials. You can avoid this by putting the vials in a sealed plastic bag. Consider open vials that have been under melted water to be contaminated and discard them.

E. Foam Pad

A foam pads a piece of soft foam that fits on top of the ice-packs in a vaccine carrier. There are some cuts on it to allow vaccines to be inserted in the foam. During immunization sessions, the foam pad serves as a temporary lid to keep unopened vaccines inside the carrier cool while providing a surface to hold, protect and keep cool opened vaccine vials. Previously, ice packs were used to keep vaccines cool during immunization sessions outside of vaccine carriers. It is now recommended to use the supplied foam pads for this purpose.



Fig 2: Foam pad cuts to hold vaccine vials



Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

2. Cold box usually holds (3 points)
 - A. a one-month supply of vaccines and diluents
 - B. a one month reserve stock of vaccines and diluents
 - C. a one -to -two weeks supply of vaccine and diluents
 - D. All of the above

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

MCQ

1. __



Information Sheet-3	Conducting Immunization
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3.1. Conducting Immunization

- Table 1 -Schedule of the immunization

Contact	Vaccine	Age of child
1 st vaccination	Polio-o & BCG	at birth
2 nd Vaccination	DPT1-HepB- Hib, PCV1, polio-1 and Rotarix 1	6wks
3 rd Vaccination	DPT2-HepB- Hib, PCV2, polio-2 and Rotarix 2	10 wks
4 th Vaccination	DPT3-HepB- Hib, PCV3 & polio-3	14 wks
5 th Vaccination	Measles	9 and 15 months



Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Measles vaccine administered at ---(3 points)

A. 9 and 15 months

B. 14 months

C. 4 and 6 months

D. all of the above

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

MCQ

1. ____



Information Sheet-4	Vaccine Preventable disease
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4.1. Vaccine Preventable disease

4.4.1 Measles

Is a highly infectious disease caused by a virus?

Kills more children than any other vaccine preventable diseases

Tends to occur in epidemic form causing more children among malnourished children

▪ **Mode of spread**

Airborne droplets released when an infected person sneezes or coughs

Contact with nose and throat secretions of infected people

Cases can infect others for several days before and after they develop symptoms

Spreads easily in overcrowded areas (schools, military barracks, health facilities etc)

▪ **Signs and symptoms**

High fever which begins approximately 10 -12 days after exposure and lasts for several days

◆ i.e. Runny nose,

◆ Cough,

◆ Red eyes

◆ watery eyes

◆ Small white spot inside the cheeks

After several days ,slight raised rash develops usually on the face and neck

Over a period of three days the rash spreads to the body and then to the hands and feet

Lasts three to five days and fades

The incubation period from exposure to the onset of the rash averages 14 days (range 7 -18 days)

▪ **Complications**

Unimmunized children < 5 years and infants are at highest risk of measles and its complications.

Infected infants may develop severe diarrhea, otitis media, and respiratory tract infections

Pneumonia is the most common cause of death as the virus weakens the immune system

Encephalitis

Blindness

▪ **Treatment**

General nutritional support and rx of dehydration

Antibiotics only to ear and severe respiratory infection

Vitamin a two doses in 24 hours

Prevention

Measles vaccine

Global accelerated disease control strategy

 Increase routine measles coverage

 Secondary opportunity (routine or campaign)

 Measles surveillance



Improved case management

4.4.2 Poliomyelitis

Is a crippling disease caused by any one of the three related viruses (1, 2 and 3)

Signs and symptoms

Most infected children never feel ill.

5% of those infected show flu –like symptoms (upset stomach, fever, headache, sore throat, loose stool)

Immunity is life long

Paralytic polio begins with mild symptoms and fever

Severe muscle pain and paralysis follows usually in the 1st week.

Victims may lose the function of one or both legs or arms

Respiratory muscle paralysis may occur

- **Diagnosis**

Confirmed by laboratory testing of the stool specimen

- **Complications**

Crippling disease because of paralysis

Death due to paralysis of respiratory muscles

- **Prevention**

Immunization with oral polio (opv) or inactivated polio vaccine (ipv)

Oral polio is less expensive, safe and easy for health workers/volunteers to administer

Eradication goals and strategies for polio

High infant immunization coverage 4 doses

Supplementary doses of polio vaccine for the < 5 year children

Surveillance for wild polio virus through reporting and laboratory testing of all cases of afp in < 15yrs

Targeted “mop –up” campaigns once wild polio virus transmission is limited to a specific focal area

4.4.3 Diphtheria

Caused by the bacterium corynebacterium diphtheriae

Produces a toxin that can destroy human body tissues and organs

One type affects the throat and the tonsils

Another type common in the tropics causes skin ulcer

- **Mode of spread**

Person to person through close physical and respiratory contact

Cause infection of the naso-pharynx which may lead to breathing difficulties and death

- **Signs and symptoms**

Early symptoms include:

Sore throat

Loss of appetite

Mild fever

Bluish –white or grey membrane forms in the throat and tonsils

Patient may recover within 6 – 10 days

Severe diphtheria may cause swollen neck and obstructed airway and death

- **Complications**

Abnormal heart beats which may lead to heart failure

Inflammation of heart muscles and valves (lead to chronic heart disease and heart failure)

The most severe complication is respiratory obstruction followed by death.

- **Treatment:**

Antitoxin and antibiotics (penicillin, erythromycin)



Prevention –DPT vaccine.

Maintain high level of immunity in the community with three doses of DPT in the routine immunization or in the form of penta-valent

4.4.4 Pertussis (whooping cough)

Pertusis or whooping cough is a disease of the respiratory tract caused by bacteria, *bordetella pertusis*, that lives in the mouth, nose and throat.

Many children that contract pertusis have coughing spells that lasts for eight weeks

The disease is most dangerous in infants

Mode of spread

Spreads very easily from child to child by droplets produced by coughing or sneezing
In many countries the disease occurs in regular epidemic cycles of three to five years

Signs and symptoms

Incubation period is 5 -10 days

Common cold-like symptoms (runny nose, cough, watery eyes, sneezing, fever)

The cough worsens and become spasmodic

Child may turn blue during a long burst of coughing

Vomiting and exhaustion follow the coughing attacks

▪ Complications:

Bacterial pneumonia

Convulsion and seizures due to fever or brain anoxia.

This may be by the coughing spells or toxins released by the bacteria

Loss of appetite ,otitis media, dehydration and anorexia

▪ Treatment

Antibiotics usually erythromycin

Plenty of fluids

Prevention = DPT

4.4.5 Tetanus

Acquired through exposure to the spores of the bacterium *clostridium tetani*

Universally present in the soil

Potent neurotoxin produced during the growth of bacteria in dead tissue

The disease is common and serious in new borns

Most babies who get the disease die

Neonatal tetanus is common in rural areas where the deliveries are at home.

▪ Mode of spread

Not transmitted from person to person

A person becomes infected when dirt enters a wound or cut

Grows in deep cut wounds

Women have additional risk due to child birth/abortion

A new baby may get infected when the umbilical cord is contaminated with dirty hands, knives, razor etc.

▪ Signs and symptoms

Time between the infection and symptoms is usually 3 -10 days. (3 weeks)

The shorter the incubation period, the higher the risk of death

Muscular stiffness of the jaw is the first symptom

Stiffness of the neck, abdominal muscles, spasms, sweating, fever etc

Newborn babies are normal at birth but stop sucking between 3 – 28 days

Stop sucking and bodies become stiff and death often occurs

▪ Complications



Respiratory distress

Difficulty of feeding

- **Prevention**

Immunization of infants with three doses of DPTt or penta-valent vaccines.

Immunizing women of child bearing age women during or outside pregnancy

Clean delivery practices

Those who recover from infection don't develop natural immunity

Global accelerated disease control issues

2005 target d for elimination of NNT.

To reduce the incidence of case to 1: 1000 per year in every district

Increase TT coverage

TT campaign in high risk areas

Promote clean delivery

Improve surveillance & reporting of neonatal tetanus

As the bacteria also survives in the environment, eradication is not feasible and vaccination has to continue after the goal

4.4.6 Hepatitis b

Cused by a virus that affects the liver

Adults who get hepatitis b usually recover

Infected infants become chronic carrier

Carry the virus for many years and can spread the virus to others

- **Mode of transmission**

Unsafe injection or needle stick

Mother to child during birth

Through cuts during contacts

Sexual intercourse

Sign and symptoms

Jaundice

- **Complications**

Chronic hepatitis, cirrhosis, liver cancer

Prevention = mono hep b, pentavalent

4.4.7 Haemophilus influenzae

Signs and symptoms

Pneumonia and meningitis are the most important diseases caused by Hib bacteria

Hib disease should be suspected in the case of any child with signs and symptoms of meningitis and pneumonia

- **Complications**

Infants who survive Hib meningitis develop neurological disability (brain damage, hearing loss, mental retardation)

- **Treatment for Hib**

Specific antibiotics

Prevention

Effective vaccines when given during infancy (Hib mono-valent or penta-valent

Temporary redness at the injection site.



Self-Check -4	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. The vaccination type administered during the third vaccination period is (3 points)
A. BCG B. Pentavalent C. Measles D. Polio -0

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

MCQ

1. _____

Information Sheet-5	Informing caregivers on adverse effects
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5.1. Informing caregivers on adverse effects

- vaccines are highly pure. Vaccines represent only a minor stimulation of the infant immune system compared to the large number of potentially dangerous bacteria and viruses babies routinely encounter: starting immediately after a baby is born; thousands of different bacteria begin to live on the skin and the lining of the nose, throat, and intestines. The baby's immune system rapidly launches immune responses to these bacteria that prevent them from invading the blood stream.
- Each ingredient in a vaccine is included for a reason.
- The scientific evidence does not support a link between vaccination and autism or other developmental disorders.
- **Adverse Effects following vaccine administration:**
 - ✓ **Normally** after BCG vaccines have been administered a small raised swelling appears at the injection site. This usually disappears within 30 minutes. After approximately two weeks, a red sore develops which is 10mm in diameter (the size of the end of an unsharpened pencil). The sore remains for another two weeks and then heals. A small scar about 5mm across, resulting from the sore, remains for life. This is a sign that the child has been effectively immunized. Sometimes there is abnormal side effects following BCG immunization like swelling of glands in a child's armpit or near the elbow after BCG vaccine injection, or he / she may develop an abscess.
 - ✓ Following Pentavalent vaccination , mild local reactions are common, rarely, injection-site abscess.
 - ✓ Following PCV administration , mild local reactions (redness, pain and slight swelling at the injection site), rare severe reactions like convulsions, severe allergic reaction (anaphylaxis), swollen lymph glands, and encephalitis



In general , An Adverse event following immunization (AEFI) is any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine. The adverse event may be any un favorable or unintended sign, abnormal laboratory finding, symptom or disease.

Self-Check -5	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. after administering of which type of vaccine a small raised swelling appears at the injection site **(3 points)**
A Measles
B Pentavalent
C.BCG

D. all of the above

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

MCQ

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Information Sheet-6	Missed opportunities and trace defaulters
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6.1. Missed opportunities and trace defaulters

It is common in Ethiopia to see many children and mothers who have been to a health facility, but have not been immunized. Thus, another important strategy is to reduce missed opportunities and trace defaulters.

Improve public awareness and community participation in immunization programs. In the EPI, you are expected to improve public awareness through intensive, regular social mobilization and health education campaigns, in order to:

- Maximize participation of community members in EPI activities
- Increase public demands for immunization and the vitamin A supplements that are routinely given to infants during the immunization programme.

It is very important to involve the whole community, including political and religious leaders,

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through seminars, public meetings and direct contacts. You should aim to work with and fully utilize women's groups, youth associations and idirs (self-help associations at village level), so that they support and help to promote the immunization service

Self-Check -6	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. In order to promote the immunization service political and religious leaders involvement is necessary (3 points) :
- A. True B. False

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

MCQ

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Information Sheet-7	Vaccine supply and stock management
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7.1. Vaccine supply and stock management

- VSSM is an inventory management tool whose overarching goal is to improve management of the supply chain in order that vaccines and diluents and other related commodities neither suffer from being over stocked and avoid that any item is out of stock.
- **Vaccine management** involves estimating the number of vaccine doses, diluents and injection equipment (e.g. syringes, needles) needed for a particular population over a stated supply period. In order to run an efficient and effective immunization session you need to have an adequate supply of vaccines of acceptable quality. This is essentially dependent on reliable planning and monitoring. You might have heard from mothers in the community that the health facility ran out of vaccines and their child could not be immunized. On the other hand, health facilities may have an excess stock of vaccine that has passed its expiry date and has to be thrown away. You should try to ensure that these situations do not arise in your Health Post.



Self-Check -7	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. **Vaccine management** involves estimating the number of vaccine doses, diluents and injection equipment (3 points) :
- A. True B. False

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

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Name: _____

Date: _____

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1.____

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