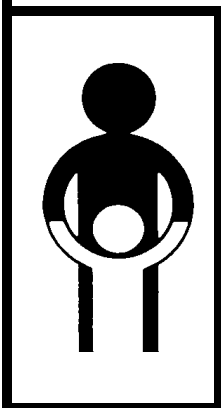


# Module 7:

## During a session: preparing vaccines



GLOBAL PROGRAMME FOR VACCINES AND IMMUNIZATION

EXPANDED PROGRAMME ON IMMUNIZATION



*World Health Organization, Geneva, 1998*

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# About this module

**This module describes how to prepare vaccines for an immunization session and how to reconstitute BCG, measles and yellow fever vaccines. Follow the instructions carefully to provide clients with safe and effective immunizations.**

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# 1. Washing hands

By washing your hands with soap you remove microorganisms from them and help to prevent contamination. However, even after thorough washing some microorganisms remain on your hands. You should therefore touch syringes and needles as little as possible.

**Figure 7-A: Washing hands**



*Even after thorough washing, some micro-organisms remain on your hands.*

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## 2. Opening the sterilizer if you have reusable syringes and needles

(See Module 4 for instructions on sterilizing injection equipment.)

**Do not open the sterilizer until you need a sterilized syringe and needle.**

### 2.1 Take off the sterilizer lid

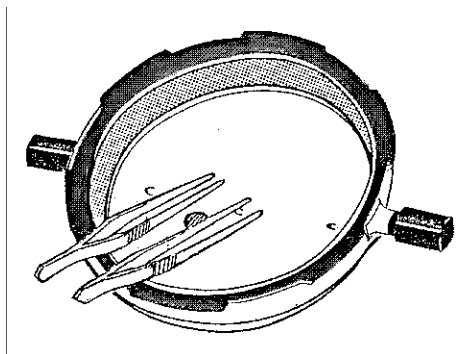
Wait at least an hour after taking the sterilizer off the burner for the equipment inside to cool. Then turn the sterilizer lid anticlockwise until it will not turn any more.

Lift off the lid and put it upside down on the table.

### 2.2 Move the forceps to the sterilizer lid

Move the forceps from the rack lid to the sterilizer lid. Do not touch the tips of the forceps with your hands. Do not let the tips touch anything except the inside of the sterilizer lid.

**Figure 7-B: Forceps on sterilizer lid**



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## 3. Assembling a sterile syringe and needle

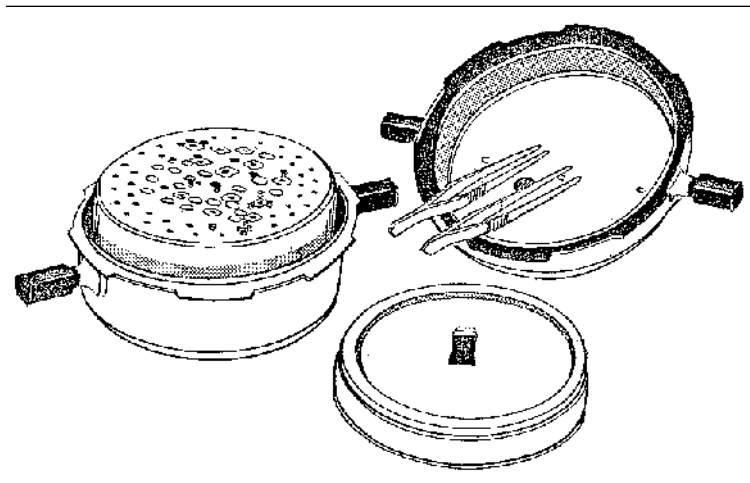
Assemble a syringe and needle only when someone is waiting to be immunized.

### 3.1 Remove the rack lid and put it on the table

Squeeze the clip on the handle of the rack lid and remove it carefully. Put it on the table with its top up as shown below.

The rack itself should remain in the base.

**Figure 7-C: Base and cover and rack cover with forceps on base cover**

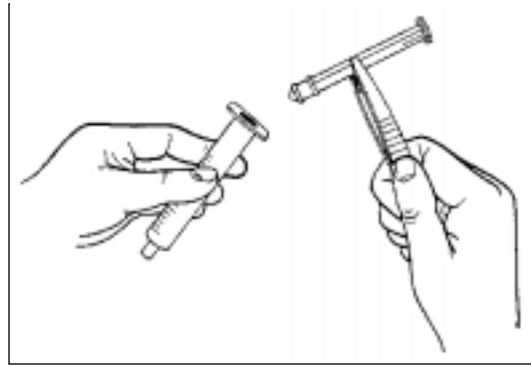


### 3.2 Fit together the parts of one syringe

Take the sterile forceps from the sterilizer lid and use them to pick up a plunger of the size you need from the rack. (See Module 4 for information about syringe and needle sizes.)

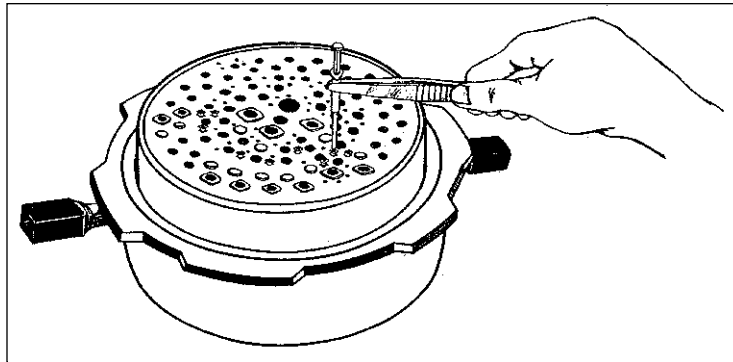
Using the forceps, fit the plunger into a barrel of the same size.

**Figure 7-D: Putting a plunger into a barrel, using sterile forceps**



Using the forceps, pick up the assembled plunger and barrel and fit a needle of the correct size.

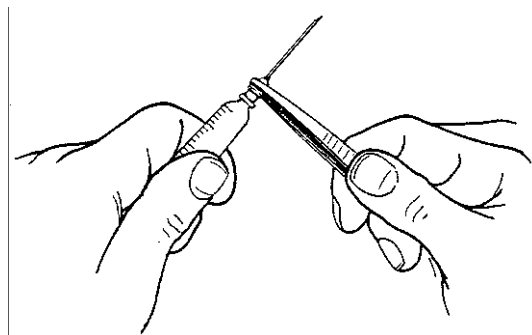
**Figure 7-E: Assembling a syringe and needle**



### **3.3 Twist the needle to secure it**

Hold the needle adaptor with the forceps and rotate it to make sure that it fits securely into the syringe.

**Figure 7-F: Twisting the needle to secure it**

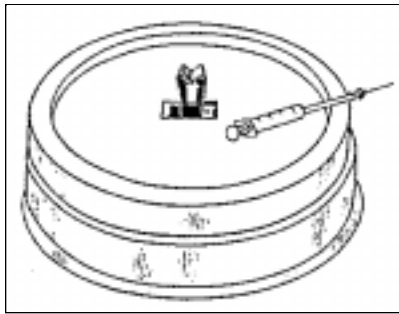


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**3.4 If you need to put the syringe and needle down, place them on the rack lid**

Place the assembled needle and syringe on the rack lid if you need to put them down, and make sure that the needle does not touch the rack lid or anything else.

**Figure 7-G: Syringe and needle on a rack lid**



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## 4. Checking the vaccine and diluent vial labels

Before you use any vaccine or diluent, check the labels.

- Is the label still attached to the vial?
- Is it the right vaccine or diluent?
- Has the vaccine or diluent passed its expiry date?

**If the label has come off, throw the vial away.**

**If the vaccine inside has passed its expiry date, throw the vial away.**

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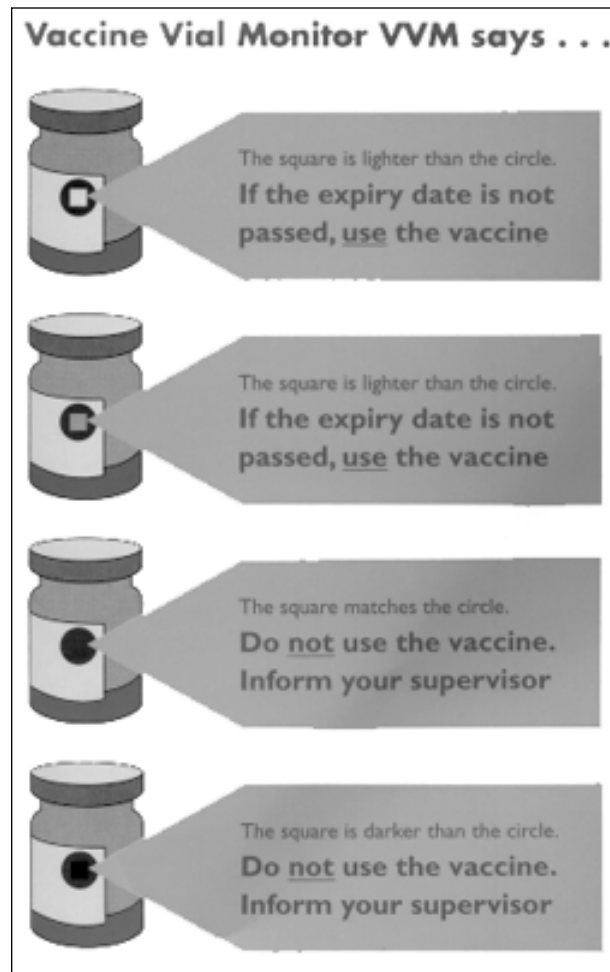
## 5. Checking the vaccine vial monitor

If a vaccine vial has a vaccine vial monitor (VVM) attached, check whether the vaccine has been exposed to excessive heat.

The VVM is printed on the vial label or cap. It looks like a square inside a circle. If it has changed colour the vaccine inside can no longer give protection against disease and you must discard the vaccine.

- If the inner square is lighter than the outer circle **and** the expiry date has not passed, **USE** the vaccine.
- If the inner square is the same colour as or darker than the outer circle, **DO NOT USE** the vaccine.

Figure 7H: Vaccine vial monitors - showing colour changes



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## 6. Cleaning the skin before an injection

Use cotton wool and a small amount of spirit. If you do not have spirit, use soap and water, or water only. Do not use antiseptic.

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# 7. Drawing vaccine from a vaccine vial

When you are ready to give an injection, follow the steps indicated below for drawing the vaccine from a vaccine vial into a syringe:

- 1) Assemble a sterile syringe and needle of the correct size (see section 3). Turn the needle adaptor with forceps to make sure that the needle is fixed firmly to the syringe.
- 2) Draw air into the syringe by pulling back on the plunger. You need the same amount of air in the syringe as the amount of fluid to be taken out of the vial.
- 3) Push the needle through the rubber stopper into the vaccine vial.
- 4) Inject the air into the vial by pushing in the plunger.
- 5) Draw the vaccine out of the vial by pulling back the plunger. The vaccine comes out easily because the air you have injected takes its place.
- 6) Point the needle upwards and press in the plunger to get rid of air bubbles and excess vaccine.

Read the scale on the barrel of the syringe to make sure that you have the correct amount of vaccine.

You are now ready to inject the vaccine (see Module 8 for instructions on administering each vaccine).

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# 8. Reconstituting vaccines

BCG, measles and yellow fever vaccines must be reconstituted before they can be used. Reconstitution means mixing the dry powder form of a vaccine with a fluid called a diluent so that the vaccine can be injected.

Follow the steps indicated below to reconstitute vaccines.

**Do not begin this process until clients have arrived and you are ready to immunize.**

**Reconstituted vaccine lasts only six hours.**

## 8.1 Wash your hands

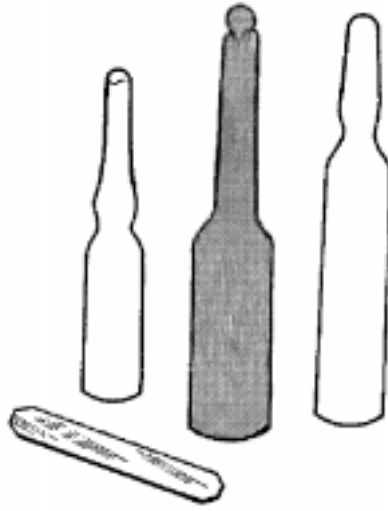
Wash your hands with clean water and soap before reconstituting vaccines.

## 8.2 Open diluent ampoule

The diluent for reconstituting BCG, measles and yellow fever vaccines is usually held in **ampoules**, which are glass bottles that you open by breaking off their pointed glass tops.

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**Figure 7-I: Ampoules and metal file**



Read the label on the ampoule to be sure that (1) it is the diluent the manufacturer sent with the vaccine you are reconstituting and (2) the expiry date has not passed. Inspect the ampoule for cracks.

**Remember:**

**Use ONLY the diluent that the manufacturer sends with the vaccine.**

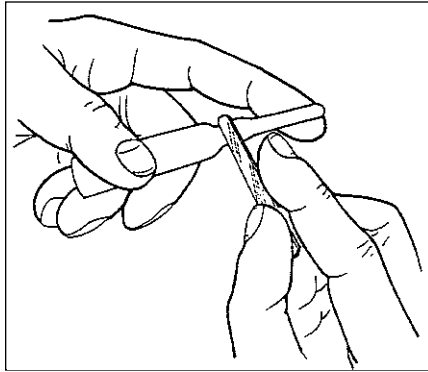
**Use ONLY:**

- **BCG diluent with BCG vaccine;**
- **measles diluent with measles vaccine;**
- **yellow fever diluent with yellow fever vaccine.**

Proceed as follows to open an ampoule.

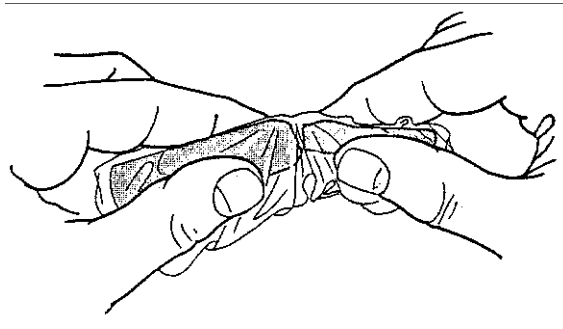
- 1) Hold it between your thumb and middle finger.
- 2) Use your index finger to support the top.
- 3) Take the metal file that is packed with the ampoules and scratch hard around the neck of the ampoule you wish to open.

**Figure 7-J: "Scratching" the neck of the ampoule**



- 4) Wipe the outside of the ampoule with cotton wool and clean water. This removes pieces of glass produced by filing and prevents them from getting into the vaccine.
- 5) Hold the ampoule in a piece of clean cloth and gently break off the top. It breaks where you made the scratch.

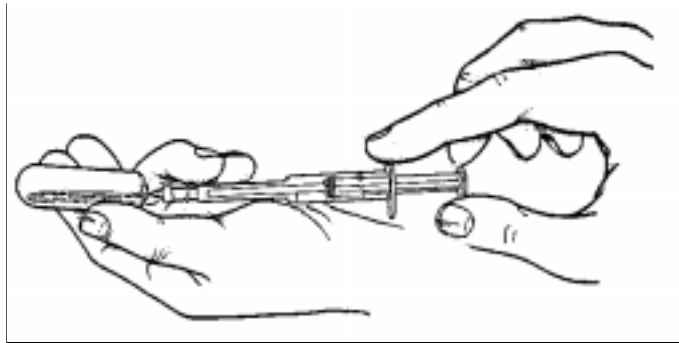
**Figure 7-K: Breaking off the neck of an ampoule**



### **8.3 Draw diluent into syringe**

- 1) Choose a sterile mixing (5 ml) syringe and a sterile mixing (76 mm, 18 gauge) needle and mark the syringe "BCG", "measles" or "YF" so that you use it only for reconstituting one kind of vaccine.
- 2) Put the needle in the open top of the ampoule and pull back the plunger to draw all the diluent from the ampoule into the syringe.

**Figure 7-L: Taking fluid from an ampoule**

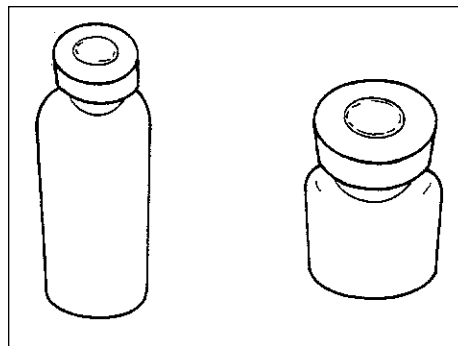


#### 8.4 Open vaccine vial or ampoule

Most vaccines come in **vials**, except for BCG vaccine, which comes in ampoules.

A **vial** is a glass bottle with a rubber stopper held in place by a metal cap. The centre of the metal cap is pre-cut so that it can easily be removed.

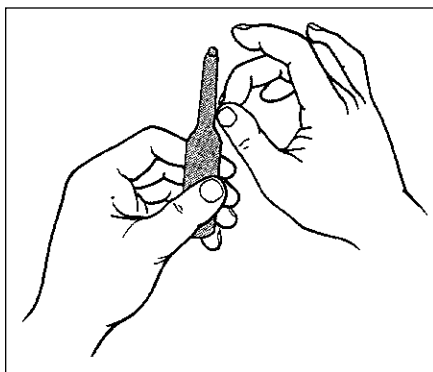
**Figure 7-M: Vials**



- 1) Before opening a vial, check the VVM. Read the expiry date on the label to make sure that you can still use the vaccine.
- 2) Flick the vial to make sure that all the vaccine powder is at the bottom.

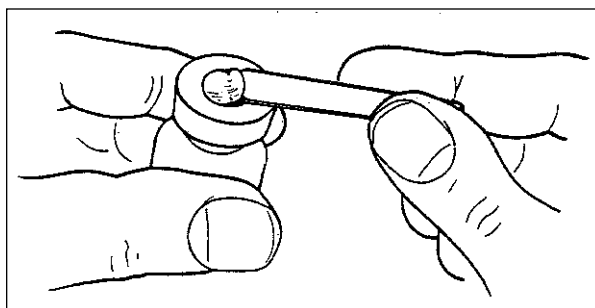
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**Figure 7-N: Flicking a vaccine ampoule**



- 3) Lift the centre of the metal cap and bend it back, using the same metal file as for opening ampoules.

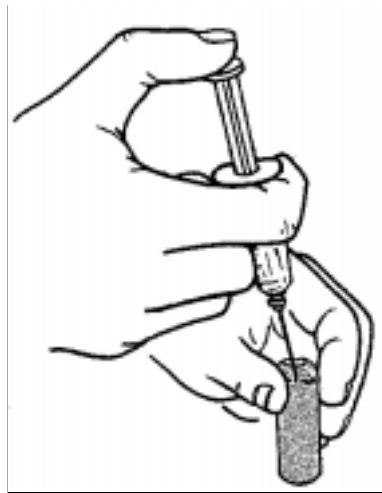
**Figure 7-O: Lifting the metal cap**



## **8.5 Reconstitute**

- 1) Insert the mixing needle into the vaccine vial or ampoule.
- 2) Hold the plunger end of the mixing syringe between your index and middle fingers and push the plunger in with your thumb. This empties the diluent into the vaccine.

**Figure 7-P: Emptying a syringe**



- 3) To mix the diluent and vaccine, draw them slowly up into the syringe and inject them slowly back into the ampoule. Repeat this several times.
- 4) If you think you may need to reconstitute more of the same kind of vaccine during the session.

You can put the mixing syringe and needle on the sterilizer rack lid for use later in the session.

- 5) Wrap the reconstituted vaccine in foil to protect it from dirt and sunlight. Keep it in the shade.  
Put the vaccine on the foam pad of your vaccine carrier.

**Figure 7-Q: Keeping vaccine cold on a foam pad**



- 6) When you no longer need an empty diluent ampoule, dispose of it in a safety box.

**Destroy all reconstituted vaccine after six hours.**