

Vaccination Handling and Administration for Panel Physicians

Vaccines were developed to protect children and adults from potentially disabling and sometimes fatal diseases. If vaccines are improperly handled, they can lose their potency and cannot be used. The need to replace vaccines puts a financial burden on the panel physician. Therefore, proper handling and administration of vaccines is important.

There are three elements needed to ensure vaccines are potent:

1. Appropriate equipment
2. Well-trained staff
3. Standard operating procedures

EQUIPMENT

1. For most clinics, a nondomestic, standard “kitchen-size” side-by-side or top-freeze unit is sufficient for vaccine storage. “Bar-” or “apartment-size” units do not freeze adequately and should not be used. Domestic refrigerators are not recommended because they do not keep the vaccines at the correct temperature. Refrigerators without door racks are recommended.
2. Although most refrigerators have a temperature control setting, independent thermometers are required to monitor both the refrigerator compartment and the freezer compartment. Sometimes manufacturers recommend resetting the controls in summer and winter (wet and dry season).
3. Ice packs and plastic water bottles against the inside walls of the refrigerator and freezer are recommended.
4. A back-up generator might be necessary in some areas, considering the high cost of vaccines and frequency of power outages.
5. A logbook for recording temperatures in refrigerator and freezer compartments twice daily is needed.
6. A book to record vaccine use by month for future ordering purposes is necessary.
7. Needles and syringes of appropriate sizes, preferably disposable, are required. The World Health Organization now recommends using auto-destruct needles with syringes.
8. Appropriate equipment for the safe disposal of used needles and syringes (such as a puncture-resistant container, and possibly including gloves) is needed.
9. A method for the permanent disposal of needles and syringes (incineration preferred) is required.

WELL-TRAINED STAFF

1. One trained person must be assigned to be “in charge” of ensuring the vaccines are handled and administered properly.
2. One person must be assigned to substitute for the “in charge” person if necessary.
3. Staff need to be trained on standard operating procedures for both daily and emergency situations.

STANDARD OPERATING PROCEDURES

It is important to have written procedures for ordering and administering vaccines and disposing of needles and syringes.

CLEARLY WRITTEN PROCEDURES HELP PREVENT MISTAKES IN HANDLING VACCINES.

ORDERING VACCINES

1. A record showing the amount of each vaccine used each month needs to be prepared and updated as needed.

2. Records for same months in the preceding year need to be reviewed to determine the number of vaccines to order for the same period.
3. Only the amount of vaccine to be used and an appropriate reserve are to be ordered. Keeping too much stock increases risk of vaccines reaching expiration dates.
4. Vaccine shipments are to be reviewed as soon as possible after arrival.
5. If there are any discrepancies, the supplier is to be contacted immediately.
6. If any vaccines have passed or are within 6 months of the expiration date, the supplier is to be contacted immediately.
7. Time/temperature tags or color-change monitors, or both, are to be checked to ensure that vaccines have not reached unacceptable temperatures during shipping. For oral polio vaccine (OPV), the vaccine vial monitor (VVM) is to be checked to determine if the vaccine can still be used.

DO NOT OVER ORDER VACCINES OR LET OLD STOCK EXPIRE.

TEMPERATURE

1. Temperatures for both refrigerator and freezer are to be monitored at the beginning and end of each day and recorded in the logbook.
 - a. The refrigerator is never to be less than 2°Celsius [C] (36°Fahrenheit [F]) in the morning and never more than 8°C (46°F) in the afternoon.

REFRIGERATOR TEMPERATURES SHOULD ALWAYS BE FROM 2° to 8°C.

- b. The freezer is to have a minimum temperature of -15°C and should be -5°C for only short periods.
 - c. If the temperature is out of range, appropriate corrections are to be made immediately.
2. Stable temperatures are to be ensured by:
 - d. Placing extra plastic water bottles against the inside walls (sides and back) of the refrigerator.
 - d. Placing ice packs along the inside walls and in the door racks of the freezer. Non-frost free automatic freezers are to be defrosted when the ice exceeds 5 millimeters. A back-up plan to keep vaccines frozen during this procedure is required.
 - c. A generator or other emergency power supply must be used if power outages occur.
 - d. Food, drinks, or medicines are **NOT** to be stored in the vaccine refrigerator or freezer.
 - e. **NO** vaccines are to be stored in the refrigerator door (preferably the refrigerator door will not have racks).
 - f. The refrigerator is to be opened as little as possible daily.
3. The date, time, temperature, and signature of the person taking the reading are to be recorded in the logbook (which should be kept on top of the refrigerator or on the outside of the door.)

For example:

Date	Time	Temperature	Signature
1/Apr/2000	7:30	3°C	<i>J. Smith</i>
1/Apr/2000	17:00	7°C	<i>J. Smith</i>
2/Apr/2000	7:45	2°C	<i>J. Smith</i>
2/Apr/2000	18:00	8°C	<i>J. Smith</i>

THERE IS NO WAY TO TELL IF A VACCINE IS HEAT-SPOILED BY LOOKING AT THE VIAL, EXCEPT FOR ORAL POLIO VACCINE (OPV).

STORAGE REQUIREMENTS

(The manufacturer's requirements might be different, if so follow the manufacturer's instructions.)

1. Frozen vaccines (only live vaccines are safely stored in the freezer)
 - a. OPV can be thawed and refrozen up to 10 times if always maintained at less than 8°C (46°F),

and the cumulative time thawed is less than 24 hours. If it is thawed for more than 24 hours, it must be stored in a refrigerator and remain from 2° to 8°C for 1 month or as long as the VVM shows it can be used, and the expiration date is not reached. OPV is still potent even if the color of the vaccine itself changes.

- b. Varicella must be kept at -15°C (5°F), unless otherwise indicated by the manufacturer, and must be used within 30 minutes after thawing, and cannot be refrozen.
- c. MMR (measles, mumps, and rubella) can be stored in the freezer.
If only measles vaccine is being use, it can be kept frozen or refrigerated.
2. Nonfrozen vaccines (toxoids or “killed” vaccines)
 - a. With the exception of MMR, these vaccines are never to be frozen.
 - b. The vaccines are never stored in the refrigerator door (preferably the refrigerator door does not have racks).
 - c. The same types of vaccines are to be stacked in rows together.
 - i. The oldest dates are to be placed in the front and the newest dates in back (or oldest to the left and newest to the right, or visa-versa for Arabic countries).
 - ii. Enough room is to be left between stacks for air and cold to circulate (packing any refrigerator too tightly will affect the temperature).
 - iii. Vaccines with expired expiration dates or OPV with VVM showing color change are to be removed immediately. To dispose of vaccines appropriately, an incinerator or whatever national guidelines exist, is to be used.
3. Diluents
 - a. Diluents may be stored at the 15° to 30°C (59° to 86°F) room temperature.
 - b. Diluents are not to be frozen.
 - c. Only the diluent supplied with the vaccine must be used. Instructions for reconstitution provided by the manufacturer should be followed.
4. Highly heat sensitive vaccines
 - a. Time at room temperature to loss of potency:
 - i. Varicella—30 minutes
 - ii. Pertussis—variable
 - iii. MMR—variable
 - b. Time at 37°C to loss of potency:
 - i. OPV—48 hours

Vaccine Storage	
Refrigerate	Freeze
<ul style="list-style-type: none"> • Diphtheria-tetanus-acellular pertussis (DTaP) • Diphtheria-tetanus-pertussis (DTP) • MMR • <i>Haemophilus influenza</i> type b conjugate (Hib) • Hepatitis B (HepB) • Pneumococcal • Influenza 	<ul style="list-style-type: none"> • OPV • Varicella (unless otherwise indicated by manufacturer) • MMR (optional)

VACCINES OBTAINED FROM A DISPENSARY FOR INDIVIDUAL PATIENT USE

1. Container should be made of expanded polystyrene (styrofoam), polyurethane foam, or other cold insulating material independently tested for transport vaccine to panel physician’s site.
2. Water in icepacks or other form of icepacks that fit into the container must be used.
3. The vaccine should remain in the container, at the appropriate temperature, until ready to administer.