



# Vaccine Handling, Storage and Administration Guidance for Panel Physicians



Proper handling and storage of vaccines are important to ensure the potency of vaccines. Persons administering vaccines should also take the necessary precautions to minimize the risk of spreading disease. The following checklist of essential information on recommended laboratory equipment and standard operating procedures is provided to panel physicians. (References: *CDC's Epidemiology and Prevention of Vaccine-Preventable Diseases, 10<sup>th</sup> Edition, 2007*; CDC's National Center for Immunization and Respiratory Disease website: <http://www.cdc.gov/vaccines/pubs/vac-mgt-book.htm>, General Recommendations on Immunization: <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5515a1.htm>, and CDC's Vaccine Storage and Handling Tool Kit: <http://www2a.cdc.gov/nip/isd/shtoolkit/splash.html>)

EQUIPMENT	
	<b>Refrigerator and freezer:</b> Although separate stand-alone refrigerator and freezer is recommended, a properly household or commercial-style refrigerator-freezer unit may be used to store vaccines. If a refrigerator and freezer are combined in one unit, the refrigerator and freezer compartments must have separate external doors.
	<b>Thermometer:</b> Use independent thermometers to monitor both the refrigerator compartment and the freezer compartment.
	<b>Ice packs and plastic water bottles:</b> To ensure more stable temperatures, ice packs and plastic water bottles are recommended against the inside walls and in the door racks of the freezer.
	<b>Back-up generator:</b> A back-up plan should be available for storage of vaccines when defrosting the freezer or in case of power outages. If power outages occur, a back-up generator is necessary.
	<b>Logbook:</b> A logbook is necessary for recording temperatures in refrigerator and freezer compartments and for recording vaccine use by month for future ordering purposes.
	<b>Needles and syringes:</b> Use of disposable needles and syringes of appropriate sizes and auto-disable needles with syringes are preferred.
	<b>Gloves:</b> Persons administering vaccinations must wear gloves if they will have contact with potentially infectious body fluids or have open lesions on their hands.
	<b>Equipment for safe disposal of used needles and syringes:</b> To prevent inadvertent needlestick injury, used needles and syringes must be discarded in labeled, puncture-proof containers.
STANDARD OPERATING PROCEDURES	
	<b>Operating procedures:</b> 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.
<i>Cold Chain—Storage and Vaccine Handling</i>	
	<b>Maintain current temperature for refrigerator and freezer within guideline range:</b> The refrigerator should be 2° C (35° F) to 8° C (46° F). The freezer should be at -15° C (5° F) or colder. If the temperature is out of range, corrections should be made immediately. The freezer should be defrosted monthly and when the ice exceeds 5 millimeters. Frost build-up reduces the efficiency of the refrigerator.
	<b>Document refrigerator and freezer temperatures twice a day:</b> Temperatures for the refrigerator (and freezer if in use) should be monitored at the beginning and end of each work day and recorded in the logbook.
	<b>Post warning signs to ensure that the refrigerator and freezer are not unplugged or turned off accidentally:</b> It is recommended that visible signs be posted at the plug and breaker box that warn others not to unplug the unit or break the circuit. The refrigerator and freezer must not be plugged into a wall outlet that can be activated by a wall switch. Use of a safety lock-type plug is recommended.
	<b>Store all vaccines and diluents according to manufacturer's storage requirements:</b> The majority of recommended vaccines require storage temperatures of 35°F-46°F (2°C-8°C) and must not be exposed to freezing temperatures. Oral polio and varicella vaccines must be stored in the freezer, unless otherwise indicated by the manufacturer. Diluents may be stored at room temperature. The following vaccines must

	also be protected from light: measles-mumps-rubella (MMR) vaccine, rotavirus vaccine, meningococcal conjugate vaccine, varicella vaccine, zoster vaccine, and trivalent inactivated influenza vaccine.
	<b>Store the same type of vaccines together:</b> Oldest dates in front and newest dates in the back. Stock of vaccines should be rotated so that oldest dated vaccines are used first. Enough room is to be left between stacks for air and cold to circulate. Packing any refrigerator too tightly will affect the temperature.
	<b>Ensure that all vaccines are within the expiration date:</b> To ensure potency, vaccines must be used before the expiration date. Check expiration dates at least monthly. If any vaccine at time of delivery has passed or is within 6 months of its expiration date, the supplier must be contacted. For oral polio vaccine (OPV), the vaccine vial monitor (VVM) must be checked to determine if the vaccine can still be used. Vaccines with expired dates or OPV with VVM showing color change must be discarded appropriately.
	<b>Keep updated record of amount of vaccine used:</b> A record should be maintained showing the amount of vaccines used each month. An appropriate amount of vaccines must be available. Reviewing records for the same months during previous years will help determine the number of vaccines needed for the order period. Keeping too much stock increases the risk of vaccines reaching expiration dates.
	<b>Ensure that no food, drinks or medicine are stored in the vaccine refrigerator or freezer:</b> Keeping food, drink and medicines in the refrigerator where vaccines are stored may lead to frequent opening of the refrigerator and a greater chance for temperature fluctuations.
	<b>Have a method of testing if there is power failure or interruption of cold chain maintenance:</b> To test if there has been a power failure during the evening, an ice cube in a container in the freezer can be observed for any signs of having melted. If the ice cube has changed shape, it means that it temporarily thawed and that the freezer did not maintain a stable, low temperature.
	<b>Require that vaccines obtained from dispensary for individual use be transported in a cold chain insulating container:</b> A cold insulating container (e.g., Styrofoam or polyurethane foam insulating material) must be used and the temperature must be monitored.
	<b>Check vaccines as soon as they arrive, and administer them immediately, or place them in the refrigerator or freezer:</b> The shipment date, temperature of the vaccines, and package condition must be checked as soon as they arrive. Vaccine seals should be intact. If vaccines are not administered immediately, they should always be placed in a refrigerator or freezer, as appropriate, as soon as they arrive. Vaccines that require refrigeration should be cool to the touch on arrival, and those that must be frozen should be frozen on arrival.
	<b>Assign trained persons responsible for storing and handling of vaccines:</b> Staff must be trained in proper procedures for storing and handling of vaccines. One trained person must be assigned to be “in charge” of ensuring the vaccines are handled and administered properly. One person must be assigned to substitute for the “in charge” person if necessary.
<b>Administration Technique</b>	
	<b>Wash hands before and after seeing each applicant:</b> Persons administering vaccines should take the necessary precautions to minimize the risk of spreading disease. At the least, they must wash their hands before seeing each applicant. They are not required to wear gloves when administering vaccines unless there is contact with potentially infectious body fluids or there are open lesions on their hands. Wearing gloves is not a substitute for hand washing.
	<b>Use appropriate size sterile needle and syringe for each vaccine administered:</b> Use of disposable needles and syringes of appropriate sizes and autodestructible needles with syringes are preferred. The recommended route of administration, injection site, and needle size are included in the package inserts of vaccines. Needle size depends on the amount of fluid to be administered and amount of tissue to be penetrated. The needles used for intramuscular (IM) injections should be long enough to reach the substance of the muscle. Depending on the age of the recipient, needle length may vary from 5/8 inch to 1.5 inches (1.6 to 3.8 centimeters). A 22- to 25-gauge needle is appropriate for most IM vaccines. For subcutaneous injections, a 23- or 25-gauge needle, 5/8 to 3/4 inch (1.6 to 1.9 centimeters) in length is recommended.
	<b>Reconstitute and draw up vaccines according to manufacturer’s recommendations:</b> Only the diluent supplied with the vaccine must be used. Instructions for reconstitution of the vaccine should be recorded.
	<b>Draw up vaccine for one applicant at a time and administer it immediately or according to manufacturer’s recommendations:</b> Some vaccines should be used immediately or within a certain period of time after reconstitution. When a vaccine is removed from its original container, the risk of introducing

	bacterial contamination exists. If the vaccine is injected immediately after being drawn into a syringe, the possibility of bacterial overgrowth is less likely to occur. It is best not to draw up vaccines ahead of time, if possible.
	<b>Do not mix vaccines in the same syringe unless licensed for such use:</b> DTaP vaccine and PRP-T Hib vaccine, manufactured by sanofi pasteur have been licensed for mixing in the same syringe.
<b>Safety Measures</b>	
	<b>Disinfect area of skin to be injected with alcohol/other disinfectant:</b> Using a circular motion, wipe from the center out and allow the skin to dry.
	<b>Do NOT recap needles:</b> To prevent inadvertent needlestick injury or reuse, needles must be discarded immediately and not recapped. Recapping introduces the risk to the vaccinator of needlestick injury and exposure to blood-borne pathogens.
	<b>Sterilize equipment used (needles and syringes):</b> Use of disposable needles and syringes is preferred. If disposable needles and syringes are not available and need to be reused, the equipment must be sterilized appropriately.
	<b>Discard used needles and syringes in labeled, puncture-proof containers for short-term disposal:</b> To prevent needlestick injury or reuse, needles and syringes must be discarded immediately after use in labeled, puncture-proof containers. Placement of disinfectant within containers is not required. Containers must be exchanged for new ones according to waste disposal procedures.
	<b>Has method of long-term disposal of used needles and syringes:</b> For long-term disposal, incineration of used needles and syringes is recommended. Other methods of disposal are autoclaving or burial of container with no access guaranteed. In places where medical waste is buried, soaking the medical waste in a 1:10 dilution of bleach for at least 10 minutes before disposal is recommended.