

Smallpox Vaccine Administration

Department of Health and Human Services
Centers for Disease Control and Prevention
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Smallpox Vaccine Administration

- **Learning Objectives**
 - Describe appropriate vaccine administration techniques



Dryvax Smallpox Vaccine

- Prepared from calf lymph containing live vaccinia virus
- Contains polymyxin B, streptomycin, tetracycline and neomycin
- Distributed as freeze-dried powder
- Diluent is 50 percent glycerin and phenol as a preservative



Currently available smallpox vaccines are distributed as freeze-dried powder and must be reconstituted before use.

New Smallpox Vaccines

- **Live vaccinia virus produced using cell culture technology**
- **Distributed as a freeze-dried powder**
- **Do not contain antibiotics**
- **Diluent contains glycerin and phenol**



Smallpox Vaccine Reconstitution

- **Diluent and instructions for reconstitution will be supplied with vaccine**
- **Vaccine may be used for 30 days following reconstitution**

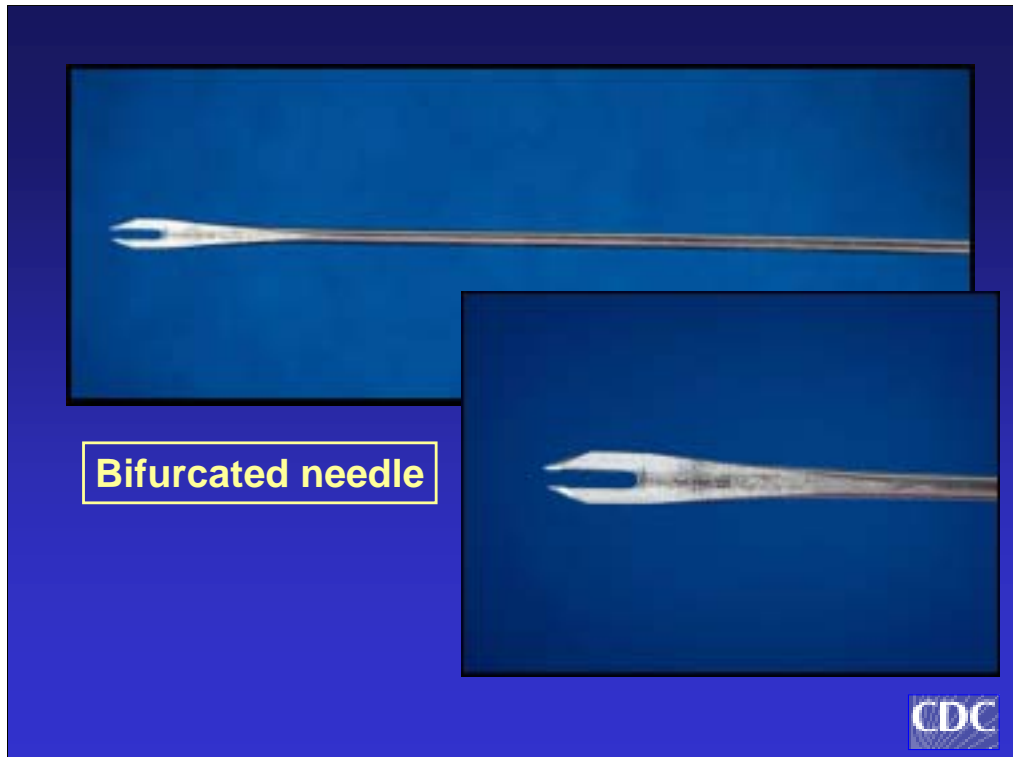


Only the diluent supplied with the vaccine should be used for reconstitution. Vaccine reconstituted with any other diluent should be discarded. Reconstituted vaccine should be kept at refrigerator temperature, 2-8 C. Once reconstituted, the vaccine may be used for 30 days if kept at the recommended storage temperature.

Smallpox Vaccine Administration

- Use of gloves is recommended
- Persons administering smallpox vaccine should be vaccinated
- Healthcare workers with a contraindication to vaccination should not handle or administer the vaccine





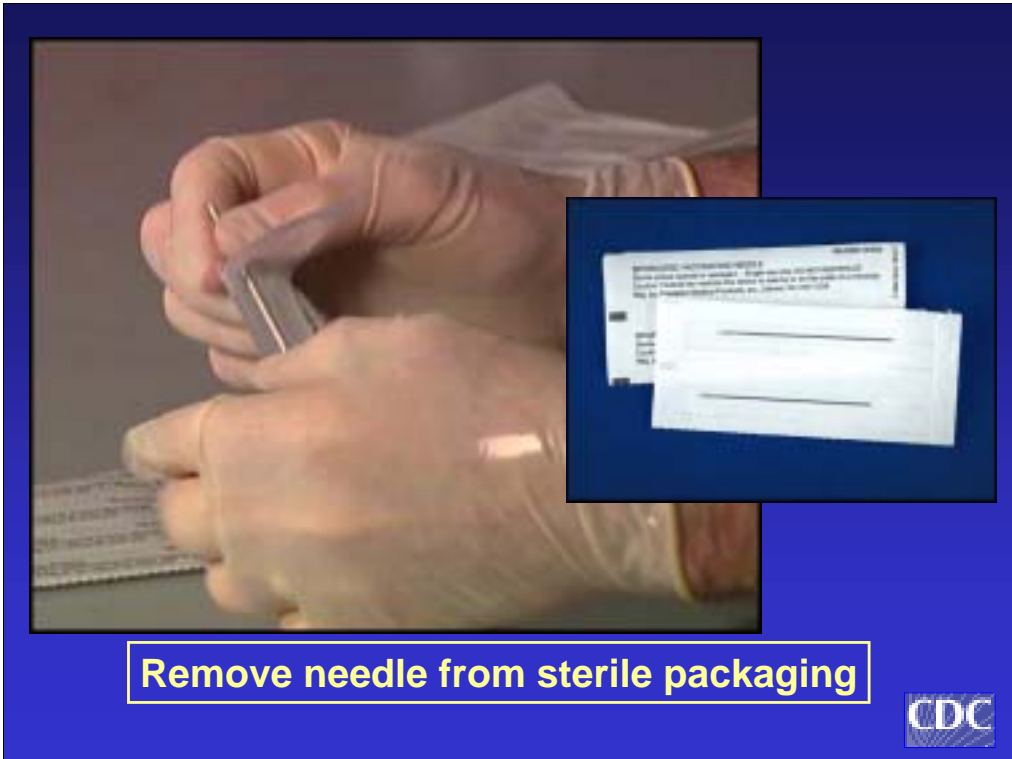
To administer the smallpox vaccine, a special bifurcated needle is used. No other vaccine uses this type of needle, and smallpox vaccine must never be administered with by any other method. You should review the package insert or protocol that is provided with the vaccine for any additional instructions regarding vaccine administration.

Vaccination Site Preparation

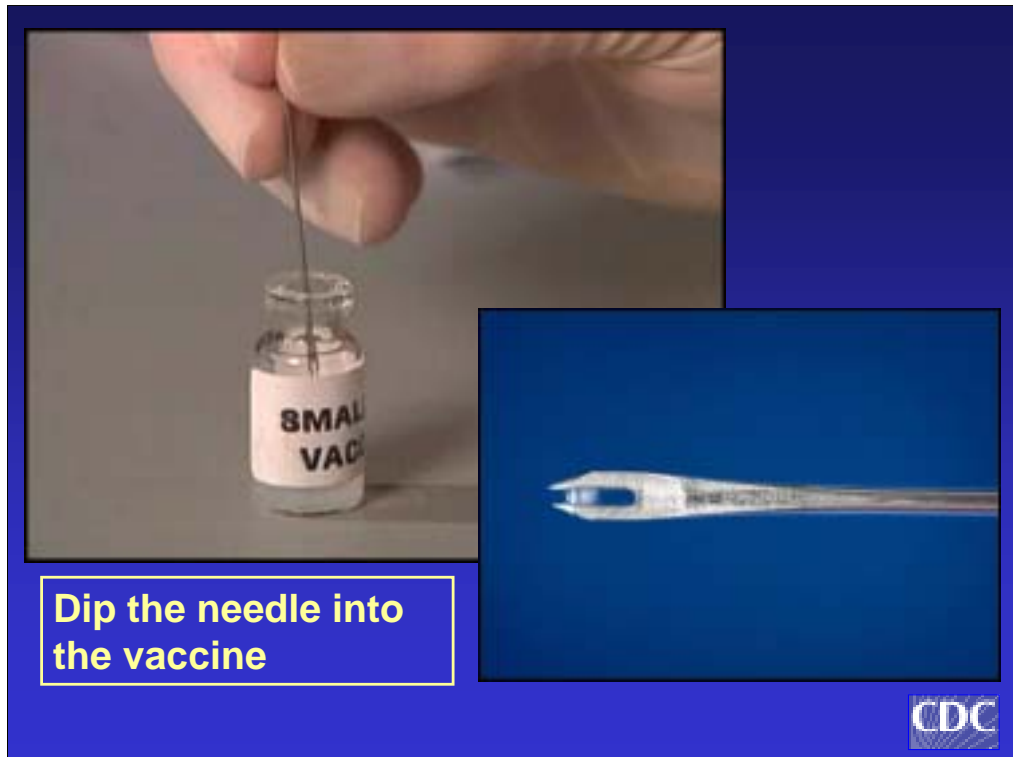
- **Alcohol, soap and water, or chemical agents are not needed for preparation of the skin for vaccination unless grossly contaminated**
- **If needed, soap and water are the preferred cleaning agents**
- **Skin must be thoroughly dry in order to prevent inactivation of the vaccine.**



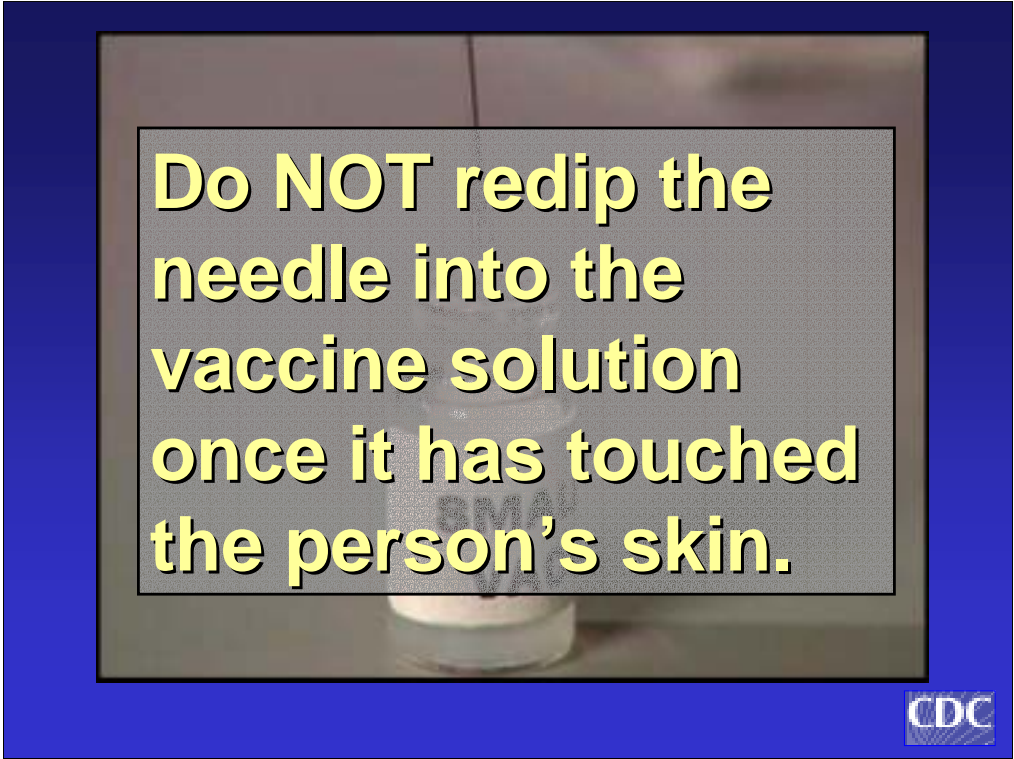
In general, alcohol, soap and water, or other chemical agents are not needed for preparation of the skin for vaccination unless the area is grossly contaminated. If needed, soap and water are the preferred cleaning agents. If any cleaning agent is used, the skin must be thoroughly dry in order to prevent inactivation of the vaccine.



Remove the bifurcated needle from its packaging. The needle is sterile, so be careful not to touch the bifurcated, pointed end.



Dip the bifurcated point of needle into the vaccine solution- so that the needle is perpendicular to the floor. The needle will pick up a drop of the vaccine in the space between the two prongs. Inspect the needle tip after dipping to assure that vaccine is present between the prongs. DO NOT shake the needle after it has been dipped into the vaccine vial. If no vaccine is between the prongs of the needle, and the needle has not touched the skin of the vaccinee (i.e., it is still sterile), it may be dipped again.



**Do NOT redip the
needle into the
vaccine solution
once it has touched
the person's skin.**

CDC

A single dip into the vaccine will prevent contamination of the vaccine vial.



Proper position of hands



Pull the skin on the arm taut, rest your wrist on the arm, and prick the skin the recommended number of times. This should be done rapidly, perpendicular to the skin, within an area 5 millimeters in diameter. The intention is to break the skin and introduce the vaccine into the skin. The wrist of the vaccinators should be resting on the arm while pricking the skin.

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- **Prior to administration of smallpox vaccine, please refer to the package insert for number of bifurcated needle punctures to administer**



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- **Apply strokes perpendicular to the skin**
- **Prick the skin in about 3 seconds within an area of 5 millimeters**
- **Apply sufficient pressure to visibly push down the skin**





**Pressure should be sufficient to visibly
push down the skin**



Administering the strokes rapidly, within about 3 seconds, also helps induce enough pressure by the needle to produce this small amount of bleeding and assure that the vaccine was administered appropriately. This method allows the live vaccinia virus to penetrate the superficial layers of the skin so that viral multiplication can occur and produce immunity.



**A trace of blood should be present
after 10-20 seconds**





**Dispose of used needle immediately
into sharps container**



Bifurcated needles should never be re-used.



Cover site with sterile dressing



Cover the vaccination site to prevent dissemination of the virus. The site should be covered by a gauze pad then tape applied over the gauze. For hospital personnel, the gauze should in turn be covered by a semi-permeable occlusive dressings. Semi-permeable dressing alone should not be used because it cause skin maceration and may increase the risk of secondary bacterial cellulitis.

Instructions are included with each vaccine shipment that outline the vaccination procedure.

The instructions also contain other important information about smallpox vaccine.

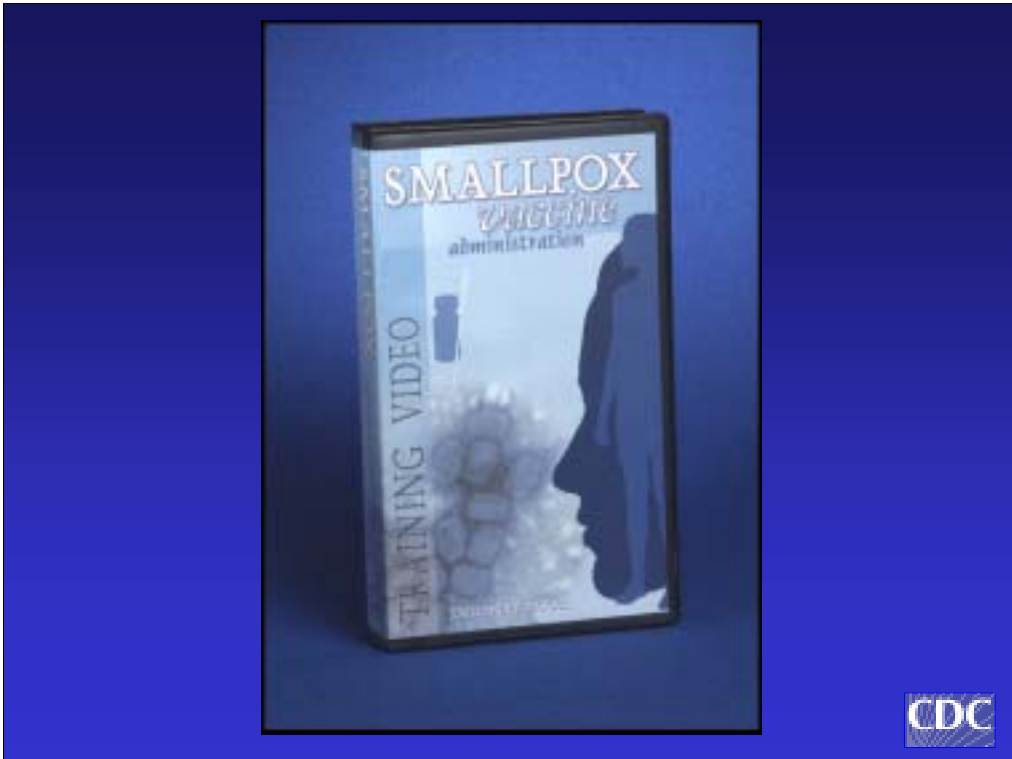


Smallpox Vaccine Administration

- Vaccinia virus may be cultured from the site of a primary vaccination from 2-3 days after vaccination until the scab separates
- Care must be taken to prevent spread of the virus to other parts of the body or other persons
- Hands must be washed after every contact with the vaccination site or any materials (clothing, dressing, etc) that has come into contact with the vaccination site.



Additional information on this topic in the module entitled Vaccinee Evaluation and Follow-up



A videotape demonstrating smallpox vaccine administration is available from the Public Health Foundation.

For More Information

- **CDC Smallpox website**
www.cdc.gov/smallpox
- **National Immunization Program website**
www.cdc.gov/nip

