

Smallpox Vaccinee Evaluation and Follow-up

Department of Health and Human Services
Centers for Disease Control and Prevention
December 2002



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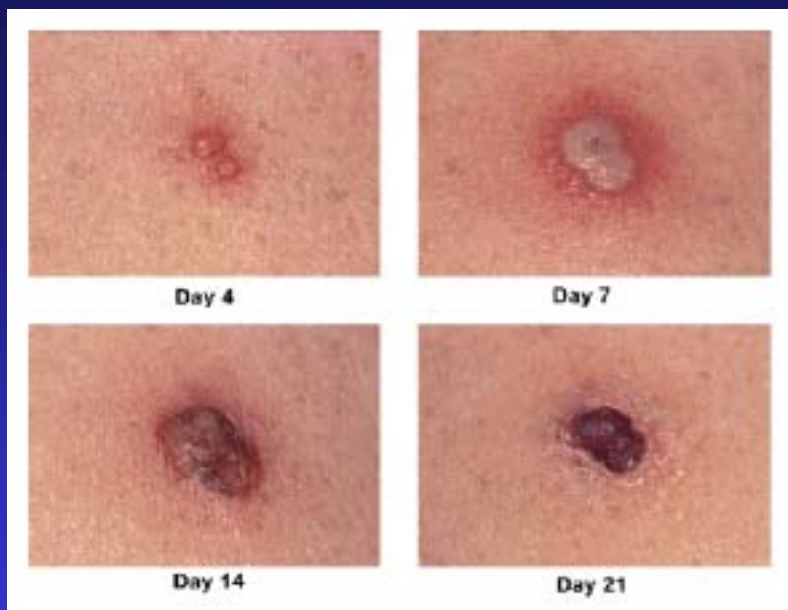
Live broadcast presentation was preceded by 12 minute segment on smallpox vaccine administration, response, and site care from vaccine administration videotape.

During the next few minutes, I will review the information needed to provide follow-up care to vaccinees. Vaccinees should have their vaccination site evaluated 7 to 8 days after vaccination to document that they have responded to the vaccine. A positive response to the vaccine is often called a "take".

Smallpox Vaccinee Evaluation and Follow-up

- **Learning Objectives:**
 - Describe the “take” that can be expected after vaccination
 - Describe the care of the vaccination site
 - Describe the management of vaccinees after vaccination





Progression of smallpox vaccination site in a non-immune person



Vaccinees should have their vaccination site evaluated 7 to 8 days after vaccination to document that they have responded to the vaccine. A positive response to the vaccine is often called a "take." Here we see photos of the normal progression of the vaccination site. By day 4, vesicles have appeared. The lesion evolves into a pustule by day 7. The presence of a pustule at that time verifies that the vaccinee has responded to the vaccine and has a "positive take." By day 14, the pustule has dried and a scab has formed. By day 21, the scab has thickened and will soon separate, usually by 28 days post-vaccination.

If the vaccinee has not responded to the first vaccination attempt, he should be vaccinated again, as soon as possible. This second vaccination may be placed on the same arm as the first attempt, although if possible, at least a centimeter from the first vaccination site.

Clinical Response to Vaccination

- **First Vaccination**
 - **Vesicular or pustular lesion**
 - **Area of definite palpable induration surrounding a central crust or ulcer**

WHO Expert Committee on Smallpox, 1964



For those patients receiving their first smallpox vaccination, a vesicular or pustular lesion should develop with an area of definite palpable induration surrounding a central crust or ulcer.

For those patients who are being revaccinated, there will be a less pronounced lesion with more rapid progression. A revaccinated patient is considered to have had a major reaction if they produce a pustular lesion or have an induration surrounding a central crust or ulcer.

Clinical Response to Vaccination

- **Revaccination**
 - **Less pronounced and more rapid progression**
 - **Pustular lesion or induration surrounding a central crust or ulcer**

WHO Expert Committee on Smallpox, 1964



For those patients receiving their first smallpox vaccination, a vesicular or pustular lesion should develop with an area of definite palpable induration surrounding a central crust or ulcer.

For those patients who are being revaccinated, there will be a less pronounced lesion with more rapid progression. A revaccinated patient is considered to have had a major reaction if they produce a pustular lesion or have an induration surrounding a central crust or ulcer.

Major Reaction

- **Swelling and tenderness of axillary lymph nodes, usually during 2nd week**
- **Fever and malaise common**



Individuals receiving their first dose of vaccine normally experience tenderness, redness, and swelling at the vaccination site. Primary vaccination may also be associated with fever for a few days and enlarged, tender lymph nodes in the axilla of the vaccinated arm.

Equivocal Reaction

- **All responses other than major reactions**
- **Caused by partial immunity, insufficiently potent vaccine, vaccination technique failure**
- **Vaccination should be repeated ASAP, if possible**



Equivocal reactions are all response other than that described under the major reaction. It usually indicates partial immunity from previous doses, or could indicate that the vaccine was compromised or that the vaccination technique wasn't correct.

These patients should receive another dose, preferably from another vial, unless they have written documentation of a dose received within the prior year.

Vaccination Site Care

- **Virus can be recovered at site from time of papule until scab separates**
- **Site should be kept dry**
- **Normal bathing can occur if covered by waterproof bandage**



Vaccinia virus may be cultured from the site of primary vaccination beginning at the time of development of a papule (2 to 5 days after vaccination) until the scab separates from the skin lesion (14 to 21 days after vaccination). During this time, care must be taken to prevent spread of the virus to another area of the body or to another person. The vaccination site may be left uncovered or can be covered with a porous bandage, such as gauze, until the scab has separated and the underlying skin has healed.

No salves or ointments should be used on the vaccination site. Contaminated bandages should be placed in sealed plastic bags before disposal in the trash. Clothing or other cloth materials that have had contact with the site can be decontaminated with routine laundering in hot water with bleach.² The vaccination site should be kept dry, although normal bathing can continue if covered by waterproof bandage.

Vaccination Site Care

- **HCWs should keep site covered**
- **Use gauze or similar absorbent material**
- **Cover this with semi-permeable dressing**



Following smallpox vaccination, the ACIP recommends that health-care workers involved in direct patient care should keep their vaccination sites covered with gauze or a similar absorbent material in order to absorb exudates that would develop. This dressing should, in turn, be covered with a semi-permeable dressing to provide a barrier to vaccinia virus.

Vaccination Site Care

- **Hand hygiene immediately after handling dressing or contact with site CRITICAL to preventing spread**
- **Other infection control precautions to prevent contact with site**
- **Clothing over site**



Vaccinia is generally transmitted by direct person-to-person and close contact (within 6 feet), and infection control precautions should be taken to reduce this likelihood. The most critical measure in preventing inadvertent implantation and contact transmission from the vaccinia vaccination site is thorough hand-hygiene after changing the bandage or after any other contact with the vaccination site. Hospitals should include a site-care component to their smallpox vaccination programs in which designated, vaccinated staff would assess dressings for all vaccinated health-care workers daily (whether involved in direct patient care or in other duties), determine if dressings needed changing, and then change the dressing if indicated. This designated staff would assess the vaccination site for local reactions and for vaccine take. They should also use the opportunity to reinforce messages to vaccinees about the need for meticulous hand-hygiene.

Transmission of vaccinia is also a concern in other settings when close personal contact with children or other persons is likely—for example, parenting of infants and young children. In these situations, the vaccination site should be covered with gauze or a similar absorbent material, and a shirt or other clothing should be worn, and careful attention to hand hygiene (hand washing) practiced.

Vaccination Site Care

- **Do NOT use semi-permeable dressing alone**
- **Could cause:**
 - Maceration of vaccination site
 - Prolonged irritation and itching
 - Increases touching/scratching, thereby contaminating hands
- **Designate staff to assess dressings daily**



Use of a semi-permeable dressing alone could cause 1) maceration of the vaccination site and 2) increased prolonged irritation and itching at the site, thereby increasing touching, scratching and contamination of the hands. Products combining an absorbent base with an overlying semi-permeable layer can be used to cover the vaccination site. The vaccination site should be covered during direct patient care until the scab separates.

Administrative Leave

- **Do not need to place HCWs on leave, unless:**
 - **Physically unable to work due to systemic signs and symptoms**
 - **Extensive skin lesions or vaccination site that can not be covered**
 - **HCWs do not adhere to infection control precautions and recommendations**



With respect to administrative leave for health care workers, the ACIP does not believe that health care workers need to be placed on leave because they received a smallpox vaccination. Administrative leave is not required routinely for newly vaccinated healthcare workers unless they are physically unable to work due to systemic signs and symptoms of illness, extensive skin lesions which cannot be adequately covered, or if they do not adhere to the recommended infection control precautions. It is important to realize that the very close contact required for transmission of vaccinia to household contacts is unlikely to occur in the healthcare setting.

However, it is also recommended that vaccination of Smallpox Health Care Team members be phased in, starting with a small number of hospitals. Within a single institution, it would be prudent to designate a small proportion, e.g. 20-30% of the candidate healthcare workers, for the first phase of vaccinations to allow institutions to gain experience in post-vaccination management. The ACIP recognizes that the incidence of adverse events following vaccination of previously vaccinated persons is substantially less than in primary vaccinees, and therefore recommends that when feasible, previously vaccinated health care workers be included in this stage 1 vaccination program. It is also advisable to stagger vaccination of healthcare workers within an individual patient care unit by three weeks in order to minimize the number of vaccinated individuals who would be on sick leave concurrently in association with systemic effects of the vaccine.

For More Information

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

