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**SMALLPOX FACT SHEET**

**Information on Live Virus Vaccines and Vaccinia**

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The vaccinia virus is the "live virus" used in the smallpox vaccine. It is a "pox"-type virus related to smallpox. When given to humans as a vaccine, it helps the body to develop immunity to smallpox. The smallpox vaccine does not contain the smallpox virus and it cannot cause smallpox.

**For more about smallpox, see...**

- [Smallpox Basics](#)

**What is a "live virus" vaccine?**

- A "live virus" vaccine is a vaccine that contains a "living" virus that is able to give and produce immunity, usually without causing illness.
- Because the virus in the smallpox vaccine is live, it can be transmitted to other parts of the body or to other people and so the site must be cared for carefully.
- For most people with healthy immune systems, live virus vaccines are effective and safe.
- Sometimes a person getting a live vaccine experiences mild symptoms associated with the virus in the vaccine.
- Other live virus vaccines used include measles, mumps, rubella, and chickenpox.

**Facts about vaccinia**

- The vaccinia virus, the virus in the smallpox vaccine, is another "pox"-type virus.
- Vaccinia is related to smallpox, but milder.
- The vaccinia virus may cause rash, fever, and head and body aches. In certain groups of people, complications from the vaccinia virus can be severe.
- Vaccinia is spread by touching a vaccination site before it has healed or by touching bandages or clothing that have been contaminated with live virus from the smallpox vaccination site.
- This way, vaccinia can spread to other parts of the body or to other individuals. This is called inadvertent inoculation.
- In the past, spreading to other parts of the vaccine recipients' body was the more common form of inadvertent inoculation.
- Careful care must be taken of the site of the vaccine to prevent spreading of the vaccinia virus.

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## Who should NOT get the smallpox vaccine?

People most likely to have side effects are people who have, or even once had, skin conditions, (especially eczema or atopic dermatitis) and people with weakened immune systems, such as those who have received a transplant, are HIV positive, or are receiving treatment for cancer. Anyone who falls within these categories, or lives with someone who falls into one of these categories, should NOT get the smallpox vaccine unless they are exposed to the disease. Pregnant women should not get the vaccine because of the risk it poses to the fetus. Women who are breastfeeding should not get the vaccine. Anyone who is allergic to the vaccine or any of its components should not get the vaccine. Children younger than 12 months of age should not get the vaccine. Also, the Advisory Committee on Immunization Practices (ACIP) advises against non-emergency use of smallpox vaccine in children younger than 18 years of age.

For more about smallpox, see [Smallpox Basics](#).

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**Summary of October 2002 ACIP Smallpox Vaccination Recommendations**  
(Updated October 21, 2002)

CDC asked the ACIP to provide guidance on eight smallpox vaccination implementation issues  
Now joint ACIP-HICPAC recommendations will be forwarded to CDC and DHHS for review and consideration

**Note:** see also the [June 2002 Draft Supplemental Recommendations of the ACIP on the Use of Smallpox \(Vaccinia\) Vaccine](#)

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**Background**

In June 2001, the Advisory Committee on Immunization Practices (ACIP) made recommendations for the use of smallpox (vaccinia) vaccine to protect persons who work with orthopoxviruses, to prepare for a possible bioterrorism attack, and to respond to an attack involving smallpox. This recommendation was followed in [June 2002 with draft supplemental recommendations](#) that extended the ACIP's smallpox vaccination recommendation to include people designated to respond or care for a suspected or confirmed case of smallpox. Specifically, the ACIP recommended voluntary vaccination of people serving on what subsequently have been designated as

1. "Smallpox Public Health Response Teams" and
2. "Smallpox Health Care Teams"

The [June 2002 draft supplemental smallpox vaccine recommendations](#) also clarified and expanded the primary strategy for control and containment of smallpox in the event of an outbreak.

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In September, the Centers for Disease Control and Prevention (CDC) asked the ACIP to provide additional guidance on eight smallpox vaccination implementation issues, including the scope and composition of the Smallpox Health Care Teams. The eight issues were:

1. [types of healthcare workers that should be included in Smallpox Health Care Teams](#);
2. [care of the smallpox vaccination site](#);
3. [need for administrative leave for vaccinated healthcare workers](#);
4. [screening for atopic dermatitis as a contraindication for vaccination](#);
5. [screening for pregnancy as a contraindication for smallpox vaccination](#);
6. [screening for HIV infection as a contraindication for smallpox vaccination](#);
7. [simultaneous administration of smallpox vaccines with other vaccines](#); and
8. [vaccination of smallpox vaccinators](#).

The ACIP's recommendations reflect consultation with CDC's Hospital Infection Control Practices Advisory Committee (HICPAC) and DHHS's National Vaccine Advisory Committee (NVAC). The ACIP recommendations are being forwarded to HICPAC for their review and consideration on October 22 and 23, 2002. The Healthcare Infection Control Practices Advisory Committee provides advice and guidance to CDC and DHHS regarding infection control practices and strategies for surveillance, prevention, and control of health care-associated infections (e.g., nosocomial infections), antimicrobial resistance and related events in settings where healthcare is provided (e.g., hospitals, long-term care facilities, and home health agencies).

In the coming weeks, the joint ACIP-HICPAC recommendations will be forwarded to CDC and DHHS for their review and consideration.

### **Opportunity to Establish Smallpox Health Care Teams**

The [June 2002 Draft Supplemental Smallpox Recommendations](#) recommended that states should designate initial smallpox isolation care facilities (type C facilities) and these facilities, in turn, should pre-designate individuals who would care for smallpox patients for vaccination. However, further discussions with state health officials and hospital administrators identified problems with this approach. It was problematic to designate type C hospitals since suspected smallpox patients are likely to present at the hospitals and health care facilities which are their usual source of care, and not only at designated hospitals. Therefore, health and bio-terrorism officials indicated it was preferable to offer all acute care hospitals the opportunity to establish Smallpox Health Care Teams.

### **ACIP Recommendations: Summary of the Eight Issues (October 17, 2002)**

#### **1. Smallpox Health Care Teams**

The ACIP recommends that in the first stages of a pre-event smallpox vaccination program, each acute care hospital identify a group of healthcare workers who would be vaccinated and trained to provide in-room medical care for the first few smallpox patients requiring hospital admission and to evaluate and manage patients who present to the Emergency Department with suspected smallpox. For the first 7-10 days after patients with smallpox have been identified, this team would be hospital-based and provide care 24 hours a day, using 8-12 hour shifts. Non-essential workers would be restricted from entering into the rooms of patients with smallpox.

The ACIP recommends that Smallpox Health Care Teams include:

1. Emergency Room Staff, including both physicians and nurses
2. Intensive Care Unit staff, including physicians, nurses, and in hospitals that care for infants and children, this encompass pediatricians, pediatric intensivists, and pediatric emergency room physicians and nurses
3. General Medical Unit staff, including physicians, internists, pediatricians, obstetricians, and family physicians in institutions where these individuals are the essential providers of primary medical care
4. Medical house staff (i.e., selected medical, pediatric, obstetric, and family physicians)
5. Medical subspecialists, including infectious disease specialists [this may also involve the creation of Regional teams of subspecialists (e.g., local medical consultants with smallpox experience, dermatologists, ophthalmologists, pathologists, surgeons, anesthesiologists in facilities where intensivists are not trained in anesthesia) to deliver consultative services
6. Infection control professionals (ICPs)
7. Respiratory therapists
8. Radiology technicians
9. Security personnel
10. Housekeeping staff (e.g., those staff involved in maintaining the health care environment and decreasing the risk of fomite transmission).

Overall, each Smallpox Health Care Team might include about 15 emergency room doctors and nurses, 15 intensive care unit doctors and nurses, and a total of 10-15 personnel from the other areas. It is anticipated that the size and composition of a smallpox medical care team will vary according to the individual institutions and their patient populations. Each hospital should have enough teams to ensure continuity of care. Smallpox vaccination would be voluntary.

Clinical laboratory workers are not included in the initial phase of pre-event smallpox vaccination because the quantity of virus likely to be in clinical specimens of blood and body fluids is low. Consistent adherence to standard precautions and ASM/CDC protocols will prevent exposure to virus in clinical specimens. Although it is not recommended that emergency medical technicians (EMTs), as a group, be vaccinated in this first phase, individual hospitals may identify and include hospital-based

EMTs (i.e., personnel who would be dispatched to transport patients with suspected smallpox) on their Smallpox Health Care Teams.

## **2. Smallpox Vaccination Site Care**

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. 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.

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.

## **3. Administrative Leave for Vaccinated Health Care Workers**

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, which usually occur at days 8-10 after inoculation.

#### **4. Screening for Atopic Dermatitis as a Contraindication for Vaccination**

Atopic dermatitis, irrespective of disease severity or activity, is a risk factor for developing eczema vaccinatum following smallpox vaccination in either vaccinees or in their close contacts. The majority of providers do not routinely make the distinction between eczema and atopic dermatitis, particularly when describing chronic exfoliative skin conditions in infants and young children. Due to the increased risk for eczema vaccinatum, smallpox (vaccinia) vaccine should not be administered to persons with a history of eczema **or** atopic dermatitis, irrespective of disease severity or activity. Additionally, persons with household contacts that have a history of eczema or atopic dermatitis, irrespective of disease severity or activity, are not eligible for smallpox (vaccinia) vaccination because of the increased risk that their household contacts may develop eczema vaccinatum.

Persons with other acute, chronic, or exfoliative conditions (e.g., burns, impetigo, varicella zoster, herpes, severe acne, or psoriasis) are at higher risk for inadvertent inoculation and should not be vaccinated until the condition resolves. The literature also reports that persons with Darier's disease can develop eczema vaccinatum and therefore should not be vaccinated.

To assist providers in identifying persons that should defer smallpox (vaccinia) vaccination, the ACIP offers the following two screening questions: 1) Have you, or a member of your household ever been diagnosed with eczema or atopic dermatitis—if you answered "yes," you may NOT receive the smallpox (vaccinia) vaccine due to the risk that you or your household contact might develop a severe and potentially life-threatening illness called eczema vaccinatum; and 2) Eczema/atopic dermatitis usually is an itchy red, scaly rash that lasts more than 2 weeks and often comes and goes. If you or a member of your household have **ever** had a rash like this—you should NOT receive the smallpox (vaccinia) vaccine at this time unless you and a healthcare provider are sure that this rash is not atopic dermatitis or eczema. In cases where the dermatological risk factor or diagnosis is uncertain, some organizations, such as the military or CDC, may elect to develop more precise screening tools. These secondary screening tools should weigh the individual's risk of developing an adverse event with the requirement of occupational readiness through safe smallpox vaccination to ensure national security.

## **5. Screening for Pregnancy as a Contraindication for Vaccination**

Fetal vaccinia is a very rare, but serious, complication of smallpox vaccination during pregnancy or shortly before conception. Therefore, vaccinia vaccine should not be administered in a pre-event setting to pregnant women or to women who are trying to become pregnant. Before vaccination, women of child-bearing age should be asked if they are pregnant or intend to become pregnant in the next 4 weeks; women who respond positively should not be vaccinated. In addition, the potential risk to the fetus should be explained and women who are vaccinated counseled not to become pregnant during the 4 weeks after vaccination. Routine pregnancy testing of women of child-bearing age is not recommended.

To further reduce the risk of inadvertently vaccinating a woman who is pregnant, at the time of pre-screening, women of child-bearing age should be educated about fetal vaccinia, and abstinence or contraception to reduce the risk of pregnancy before or within four weeks after vaccination. Any woman who thinks she could be pregnant or who wants additional assurance that she is not pregnant should perform a urine pregnancy test with a "first morning" void urine on the day scheduled for vaccination. Such tests could be made available at the pre-screening and vaccination sites to avoid cost or access barriers to testing.

If a pregnant woman is inadvertently vaccinated or if she becomes pregnant within 4 weeks after vaccinia vaccination, she should be counseled regarding the basis of concern for the fetus. However, vaccination during pregnancy should not ordinarily be a reason to terminate pregnancy. To expand understanding of the risk of fetal vaccinia and to document whether adverse pregnancy outcome may be associated with vaccination, a pregnancy registry should be maintained and any adverse outcomes carefully investigated.

## **6. Screening for HIV Infection as a Contraindication for Vaccination**

Persons with HIV infection or AIDS are at increased risk of progressive vaccinia (*vaccinia necrosum*) following vaccinia vaccination. Therefore, vaccinia vaccine should not be administered to persons with HIV infection or AIDS. Before vaccination, potential vaccinees should be educated about the risk of severe vaccinia complications among persons with HIV infection or other immunosuppressive conditions; persons who think they may have one of these conditions should not be vaccinated.

The ACIP does not recommend mandatory HIV testing prior to smallpox vaccination, but recommends that HIV testing should be readily available to all persons considering smallpox vaccination. HIV testing is recommended for persons who have any history of a risk factor for HIV infection and who are not sure of their HIV infection status. Because known risk factors cannot be identified for some persons with HIV infection, anyone who is concerned that they could have HIV infection also should be tested. HIV testing should be available in a confidential or, where permitted by law, anonymous setting with results communicated to the potential vaccinee before the planned date of vaccination. Persons with a positive test result should be told not to present to the vaccination site for immunization. Information about local testing options should be

provided to all potential vaccinees, including sites where testing is performed at no cost.

### **7. Simultaneous Administration of Smallpox Vaccine with Other Vaccines**

Vaccinia vaccine may be administered simultaneously with any inactivated vaccine, such as influenza vaccine, to encourage appropriate receipt of all indicated vaccines, e.g., in populations such as health care workers. With the exception of varicella vaccine, vaccinia vaccine may be administered simultaneously with other live virus vaccines. To avoid confusion in ascertaining which vaccine may have caused post-vaccination skin lesions or other adverse events, and facilitate managing such events, varicella vaccine and vaccinia vaccine should only be administered  $\geq 4$  weeks apart.

### **8. Vaccination of Smallpox Vaccinators**

In order to minimize the clinical impact of inadvertent inoculation, should it occur, ACIP recommends that persons who will be handling and administering smallpox vaccine in the proposed pre-event smallpox vaccination program be vaccinated. Vaccination of this group will also contribute to preparedness for smallpox response, should a smallpox release occur, with development of a cadre of vaccinated, experienced vaccinators who could immediately be deployed for outbreak response.

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**Vaccine Overview**

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**The Smallpox Vaccine**

The smallpox vaccine helps the body develop immunity to smallpox. The vaccine is made from a virus called *vaccinia*

which is a "pox"-type virus related to smallpox. The smallpox vaccine contains the "live" vaccinia virus—not dead virus like many other vaccines. For that reason, the vaccination site must be cared for carefully to prevent the virus from spreading. Also, the vaccine can have side effects (see the section "[Smallpox Vaccine Safety](#)" in this fact sheet). The vaccine does not contain the smallpox virus and cannot give you smallpox.

**For more about smallpox, see...**

- [Smallpox Basics](#)

Currently, the United States has a big enough stockpile of smallpox vaccine to vaccinate everyone in the country who might need it in the event of an emergency. Production of new vaccine is underway.

**Length of Protection**

Smallpox vaccination provides high level immunity for 3 to 5 years and decreasing immunity thereafter. If a person is vaccinated again later, immunity lasts even longer. Historically, the vaccine has been effective in preventing smallpox infection in 95% of those vaccinated. In addition, the vaccine was proven to prevent or substantially lessen infection when given within a few days of exposure. It is important to note, however, that at the time when the smallpox vaccine was used to eradicate the disease, testing was not as advanced or precise as it is today, so there may still be things to learn about the vaccine and its effectiveness and length of protection.

**Receiving the Vaccine**

The smallpox vaccine is not given with a hypodermic needle. It is not a shot as most people have experienced. The vaccine is given using a bifurcated (two-pronged) needle that is dipped into the vaccine solution. When removed, the needle retains a droplet of the vaccine. The needle is used to prick the skin a number of times in a few seconds. The pricking is not deep, but it will cause a sore spot and one or two droplets of blood to form. The vaccine usually is given in the upper arm.

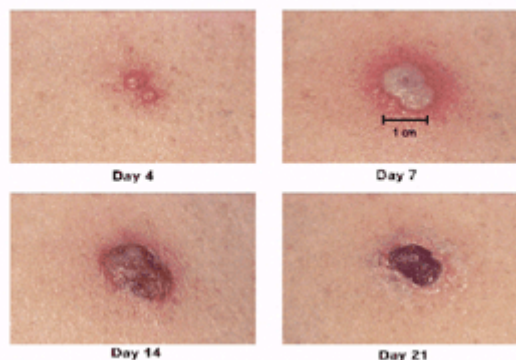
If the vaccination is successful, a red and itchy bump develops at the vaccine site in three or four days. In the first week, the bump becomes a large blister, fills with pus, and begins to drain. During the second week, the blister begins to dry up and a scab forms. The scab falls off in the third week, leaving a small scar. People who are being vaccinated for the first time have a stronger reaction than those who are being revaccinated. The following pictures show the progression of the site where the vaccine is

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given.

### Smallpox vaccination site Days 4 through 21



[View enlarged image.](#)

### Post-Vaccination Care

After vaccination, it is important to follow care instructions for the site of the vaccine. Because the virus is live, it can spread to other parts of the body, or to other people. The vaccinia virus (the live virus in the smallpox vaccine) may cause rash, fever, and head and body aches. In certain groups of people (see the section "[Smallpox Vaccine Safety](#)" in this fact sheet), complications from the vaccinia virus can be severe.

### Benefit of Vaccine Following Exposure

Vaccination within 3 days of exposure will prevent or significantly lessen the severity of smallpox symptoms in the vast majority of people. Vaccination 4 to 7 days after exposure likely offers some protection from disease or may modify the severity of disease.

### Smallpox Vaccine Safety

The smallpox vaccine is the best protection you can get if you are exposed to the smallpox virus. Anyone directly exposed to smallpox, regardless of health status, would be offered the smallpox vaccine because the risks associated with smallpox disease are far greater than those posed by the vaccine.

There are side effects and risks associated with the smallpox vaccine. Most people experience normal, usually mild reactions that include a sore arm, fever, and body aches. However, other people experience reactions ranging from serious to life-threatening. People most likely to have serious side effects are: people who have had, even once, skin conditions (especially eczema or atopic dermatitis) and people with weakened immune systems, such as those who have received a transplant, are HIV positive, are receiving treatment for cancer, or are currently taking medications (like steroids) that suppress the immune system. In addition, pregnant women should not get the vaccine because of the risk it poses to the fetus. Women who are breastfeeding should not get the vaccine. Children younger than 12 months of age should not get the vaccine. Also, the Advisory Committee on Immunization Practices (ACIP) advises against non-emergency use of smallpox vaccine in children younger than 18 years of age. In addition, those allergic to the vaccine or any of its components should not receive the vaccine.

In the past, about 1,000 people for every 1 million people vaccinated for the first time experienced reactions that, while not life-threatening, were serious. These reactions included a toxic or allergic reaction at the site of the vaccination (erythema multiforme), spread of the vaccinia virus to other parts of the body and to other individuals (inadvertent inoculation), and spread of the vaccinia virus to other parts of the body through the blood (generalized vaccinia). These types of reactions may require medical attention. In the past, between 14 and 52 people out of every 1 million people vaccinated for the first time experienced potentially life-threatening reactions to the vaccine. Based on past experience, it is estimated that 1 or 2 people in 1 million who receive the vaccine may die as a result. Careful screening of potential vaccine recipients is essential to ensure that those at increased risk do not receive the vaccine.

### **Smallpox Vaccine Availability**

Routine smallpox vaccination among the American public stopped in 1972 after the disease was eradicated in the United States. Until recently, the U.S. government provided the vaccine only to a few hundred scientists and medical professionals working with smallpox and similar viruses in a research setting.

After the events of September and October, 2001, however, the U.S. government took further actions to improve its level of preparedness against terrorism. One of many such measures—designed specifically to prepare for an intentional release of the smallpox virus—included updating and releasing a [smallpox response plan](#). In addition, the U.S. government ordered production of enough smallpox vaccine to immunize the American public in the event of a smallpox outbreak. Right now, the U.S. government has access to enough smallpox vaccine to effectively respond to a smallpox outbreak in the United States.

For more about smallpox, see [Smallpox Basics](#).

CDC public response hotline:

- English: (888) 246-2675
- Español: (888) 246-2857
- TTY: (866) 874-2646

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**SMALLPOX FACT SHEET**

**Reactions after Smallpox Vaccination**

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**Public Inquiries**

English (888) 246-2675  
 Español (888) 246-2857  
 TTY (866) 874-2646  
 Mon-Fri 8am-11pm EST  
 Sat-Sun 10am-8pm EST

**Centers for Disease Control and Prevention**  
 1600 Clifton Rd.

The smallpox vaccine prevents smallpox. For most people, it is safe and effective. Most people experience normal, typically mild reactions to the vaccine, which indicate that it is beginning to work. Some people may experience reactions that may require medical attention.

**For more about smallpox, see...**

- [Smallpox Basics](#)

**Normal, Typically Mild Reactions**

These reactions usually go away without treatment:

- The arm receiving the vaccination may be sore and red where the vaccine was given.
- The glands in the armpits may become large and sore.
- The vaccinated person may run a low fever.
- One out of 3 people may feel bad enough to miss work, school, or recreational activity or have trouble sleeping.

**Serious Reactions**

In the past, about 1,000 people for every 1 million people vaccinated for the first time experienced reactions that, while not life-threatening, were serious. These reactions may require medical attention:

- A vaccinia rash or outbreak of sores limited to one area. This is an accidental spreading of the vaccinia virus caused by touching the vaccination site and then touching another part of the body or another person. It usually occurs on the genitals or face, including the eyes, where it can damage sight or lead to blindness. Washing hands with soap and water after touching the vaccine site will help prevent this (inadvertent inoculation).
- A widespread vaccinia rash. The virus spreads from the vaccination site through the blood. Sores break out on parts of the body away from the vaccination site (generalized vaccinia).
- A toxic or allergic rash in response to the vaccine that can take various forms (erythema multiforme).

**Life-Threatening Reactions**

Rarely, people have had very bad reactions to the vaccine. In the past, between 14 and 52 people per 1 million people vaccinated for the first time experienced potentially life-threatening reactions. These reactions require immediate medical attention:

Atlanta, GA 30333  
USA  
(404) 639-3311



- Eczema vaccinatum. Serious skin rashes caused by widespread infection of the skin in people with skin conditions such as eczema or atopic dermatitis.
- Progressive vaccinia (or vaccinia necrosum). Ongoing infection of skin with tissue destruction frequently leading to death.
- Postvaccinal encephalitis. Inflammation of the brain.

People with certain medical conditions—including people with weakened immune systems or certain skin conditions—are more likely to have these reactions and should not get the smallpox vaccine unless they have been exposed to smallpox.

Based on past experience, it is estimated that between 1 and 2 people out of every 1 million people vaccinated may die as a result of life-threatening reactions to the vaccine.

**Important Note:** Statistical information about smallpox vaccine adverse reactions is based on data from two studies conducted in 1968. Adverse event rates in the United States today may be higher because there may be more people at risk from immune suppression (from cancer, cancer therapy, organ transplants, and illnesses such as HIV/AIDS) and eczema or atopic dermatitis. The outcome associated with adverse events may be less severe than previously reported because of advances in medical care. Rates may be lower for persons previously vaccinated.

For more about smallpox, see [Smallpox Basics](#).

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1. Isolation of smallpox or r/o smallpox case

**At first recognition, place the patient in a private room with HEPA filtration and negative pressure airflow. The patient should be placed immediately in contact and airborne with respirator isolation. All staff must be fit tested prior to wearing the n-95 respirator.**

The patients should remain in this isolation for the duration of his/her stay. All linen and waste is to be handled as infectious waste. All staff entering the room must be vaccinated with the smallpox vaccine and wear the N-95 respirator.

Door should remain closed. Close the department to unauthorized visitors.

Notify supervisor. Supervisor should notify Hospital Administration and Infection Control through the hospital operator.

Hospital Administration will implement the incident command system; the incident commander assigned will coordinate the notification of the local and state health departments.

Hospital Safety and Campus Police will manage the safety and security of the campus.

2. Isolation of patient with smallpox vaccine adverse reaction:

Contact precautions are to be used when in direct contact with patient, dressings or bedding. Follow the contact precautions policy outlined in the infection control manual.