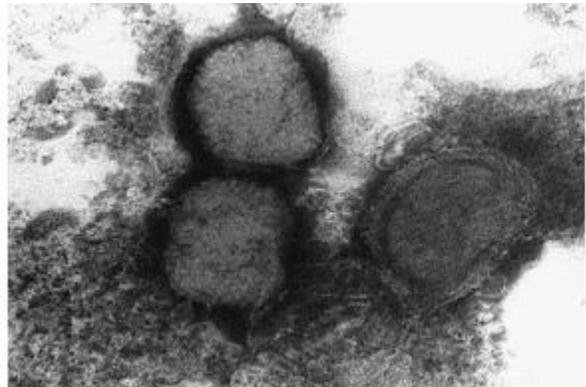


## What is smallpox and what should I know about it?

Smallpox is a very serious, contagious and sometimes fatal disease caused by a virus (variola); it characteristically includes skin lesions and scabs that, at times, have been confused for chickenpox. The disease occurs only among humans and is passed from person to person. Smallpox can cause a severe rash over the whole body that can leave scars. Other symptoms include high fever and severe headache or body aches. Death occurs in about 30 percent of infected people. Some survivors may suffer blindness.



*Variola (smallpox) as viewed through a microscope.*

## How common is smallpox?

The disease was declared eradicated from the Earth in 1980 following a worldwide vaccination program. The last naturally acquired case of smallpox in the world occurred in 1977 in Somalia. The last case in the United States was in 1949 and the last cases in Illinois were recorded in 1947. All known variola virus stocks are held frozen in secure facilities at the U.S. Centers for Disease Control and Prevention (CDC) and at a state research center in Russia.

## Why should I be concerned about smallpox?

At this time, there is no evidence of an imminent threat that terrorists might use smallpox as a biological weapon. However, the events of September and October 2001 heightened awareness of the possibility of deliberate terrorist attacks that could include smallpox or other biological agents. Because of the potential that secret stockpiles of smallpox might exist in other countries and could fall into the hands of terrorists, it is important that the American people are protected against the threat of a smallpox attack and that health care workers and others are familiar with the clinical features of the disease. While the possibility of an intentional release of smallpox virus is low, the consequences of an outbreak would be great.

## Is there a vaccine for smallpox?

Yes. The vaccine is made from a live virus related to smallpox that helps the body develop immunity to smallpox. The vaccine does not contain smallpox virus and cannot spread the disease. The government reserve of vaccine, which was produced in the 1970s, is sufficient to inoculate every American in the event of a smallpox attack. Production of a new smallpox vaccine is underway and is expected to be available by 2004. Routine vaccinations in the U.S. were discontinued in 1972 because it was no longer necessary for prevention.

### **Are smallpox vaccinations going to resume?**

President George W. Bush recently unveiled a plan to immediately begin to vaccinate 500,000 military personnel who may be deployed in high threat areas. In addition, beginning in 2003, the vaccine will be offered to as many as 10 million civilian public health and hospital workers, including 10,000 in Illinois, who will make up special smallpox response teams. A second phase, starting in the spring of 2003, includes offering the vaccine to all hospital workers not included in the first phase and to first responders (firefighters, police officers and emergency medical service personnel). A third phase, beginning sometime in 2003, would make the vaccine available to the general public.

### **What will the public health response teams do?**

These individuals would investigate and evaluate suspected cases of smallpox and initiate measures to control an outbreak. Public health personnel at the state, regional and local levels would investigate/control a possible or actual smallpox case or outbreak, or would be available to vaccinate others. The hospital workers who form health care teams would diagnose and treat possible or actual cases of smallpox. Participation on these teams and in the vaccination program is voluntary.

### **Why can't the public get the vaccine?**

While it has been strongly recommended that the public not seek the vaccination now, because there is no imminent danger of a smallpox attack, President Bush has said plans are being formulated to accommodate those adult members of the public who insist on being vaccinated.

### **How safe is the smallpox vaccine?**

The smallpox vaccine is the best protection you can get if you are exposed to the smallpox virus. However, without evidence of an actual case of smallpox,

the vaccine is not recommended because it does have serious side effects. Based on data from 1968 when the vaccine was widely given, federal health authorities have predicted that, for every million people vaccinated, one or two people may die from the vaccination, 14 to 52 would experience life-threatening reactions and about 1,000 would develop serious, but not life-threatening, reactions. In addition, the vaccine requires a series of pricks that create an open sore and, until the sore forms a scab, the vaccinia virus can spread and cause infection in the person who received the vaccine or in family members and other close contacts.

### **Are there other less serious side effects to the vaccine?**

Yes. Up to 20 percent experience headache, fatigue, muscle aches, pain or chills after smallpox vaccination, usually about eight to 12 days later. Some individuals may have rashes that last two to four days. These side effects are usually temporary and go away on their own or with minimal medical treatment, such as aspirin and rest.

### **Are there people who should NOT get the vaccination?**

Some people are at greater risk for serious side effects from the smallpox vaccine and those who have any of the following conditions, or live with someone who does, should NOT receive the smallpox vaccine unless they have been exposed to the smallpox virus.

- Eczema or atopic dermatitis (This is true even if the condition is mild or not currently active, or if it was experienced as a child.)
- Skin conditions such as burns, chickenpox, shingles, impetigo, herpes, severe acne or psoriasis (People with any of these conditions should not get the vaccine until they have completely healed.)
- Weakened immune system (Cancer treatment, an organ transplant, HIV/AIDS or medications, such as steroids, to treat autoimmune disorders and other illnesses can weaken the immune system.)
- Pregnancy or plans to become pregnant within one month of vaccination

In addition, individuals should not get the smallpox vaccine if they are allergic to the vaccine or any of its ingredients, are younger than 12 months of age, have a moderate or severe short-term illness (these people should wait until they are completely recovered) or are currently breastfeeding.

As a precautionary step, if you have been diagnosed by a doctor as having a heart condition with or without symptoms you should NOT get the smallpox

vaccine at this time while experts continue their investigations. These include conditions such as:

- known coronary disease including:
  - previous myocardial infarction (heart attack)
  - angina (chest pain caused by lack of blood flow to the heart)
- congestive heart failure
- cardiomyopathy (heart muscle becomes inflamed and doesn't work as well as it should)
- stroke or transient ischemic attack (a "mini-stroke" that produces stroke-like symptoms but no lasting damage)
- chest pain or shortness of breath with activity (such as walking up stairs)
- other heart conditions under the care of a doctor

In addition, you should NOT get the smallpox vaccine if you have 3 or more of the following risk factors:

- You have been told by a doctor that you have high blood pressure.
- You have been told by a doctor that you have high blood cholesterol.
- You have been told by a doctor that you have diabetes or high blood sugar.
- You have a first degree relative (for example mother, father, brother, or sister) who had a heart condition before the age of 50.
- You smoke cigarettes now.

These may be temporary exclusions and may change as more information is gathered.

The presence of these conditions in a close contact (such as people you live with) is not a reason for you to defer vaccination.

Every person volunteering to receive the smallpox vaccine will be asked detailed questions regarding his/her medical history and physical health.

### **How is the vaccine given?**

The smallpox vaccine is not given with a hypodermic needle and is not a "shot" like many vaccinations given today. The vaccine is delivered 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 then used to quickly prick the skin about 15 times in a few seconds. The pricking is not deep, but it will cause a sore spot and one or two drops of blood to form. The vaccine is

usually given in the upper arm, but can be given in the upper thigh.

If successful, a red and itchy bump develops at the vaccination site in three or four days. In the first week after vaccination, the bump becomes a large blister, fills with pus and begins to drain. During week two, 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 may have a stronger successful reaction than those who are being revaccinated.

### **Are people who were vaccinated in the past protected against smallpox?**

The level of immunity, if any, among persons who were vaccinated before 1972, when routine vaccination against smallpox ended, is uncertain. About half of the U.S. population has been vaccinated and may have partial immunity at best. Immunity can be boosted effectively with a single revaccination. Prior infection with the disease results in lifelong immunity.

### **How long does a smallpox vaccination last?**

Past experience indicates the first dose of the vaccine offers protection from smallpox for three to five years, with decreasing immunity thereafter. If a person is vaccinated again later, immunity lasts longer.

### **Is it possible to get smallpox from the vaccination?**

No, smallpox vaccine does not contain the smallpox virus. Another related live virus, called vaccinia virus, is used in the vaccine to provide immunity.

### **Can you get vaccinia from the vaccination?**

Because the vaccinia virus is live, it can spread to other parts of the body or to other people from the vaccine site. It is spread by touching the vaccination site before it has healed or by touching bandages or clothing that have become contaminated with live virus from the vaccination site. Vaccinia is not spread through the air. To prevent the spread of vaccinia, don't touch the vaccination site or materials that touched it. If you do touch the site or materials that have been in contact with the site, wash your hands right away. Don't let others touch your vaccination site or materials that have touched it.

### **What are the symptoms of vaccinia?**

Symptoms may include rash, fever, and head and body aches.

## **If you are exposed to smallpox, is it too late to get a vaccination?**

Vaccination within three days of exposure will completely prevent or significantly modify smallpox in the vast majority of persons. Vaccination four to seven days after exposure likely offers some protection from the disease or may moderate the disease's severity.

## **If someone receives the vaccine now, will they need to be revaccinated if there is an attack?**

In a post-attack emergency, to ensure everyone is protected as rapidly as possible, all exposed persons will be vaccinated regardless of smallpox vaccine history.

## **Who would get smallpox vaccine in the event of an actual smallpox attack?**

Anyone directly exposed to the smallpox virus should get the vaccine, regardless of their health status, because a negative reaction to the vaccine would be less severe than developing smallpox. Illinois public health officials, working with federal health authorities, have developed a plan to vaccinate everyone in the state in the event of smallpox outbreak. There is enough smallpox vaccine to vaccinate everyone who would need it in the event of an emergency.

## **How is smallpox transmitted?**

In most cases, smallpox is spread by an ill person to others through infectious saliva droplets. Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. People with smallpox are most infectious during the first week of illness because that is when the largest amount of virus is present in saliva. However, some risk of transmission lasts until the disappearance of all scabs. Contaminated clothing or bed linen also could spread the virus. Special precautions need to be taken to ensure all bedding and clothing of those infected are cleaned appropriately with bleach and hot water. Disinfectants such as bleach can be used for cleaning contaminated surfaces.

If used in biowarfare, smallpox virus could be dispersed in the air and potential victims in the area of the release would breathe in the virus, or infected persons could be sent into a crowded area to attempt to spread the disease to others. If an aerosol release of smallpox occurs, 90 percent of the virus will be

inactivated or dissipated in about 24 hours. Smallpox is not known to be transmitted by insects or animals.

### **What are the symptoms of smallpox?**

**Incubation period** (duration 7-17 days; not contagious) Following exposure to the virus, there is an incubation period of about 12 days during which a person usually feels fine.

**Initial symptoms** (prodrome) (duration 2-4 days; sometimes contagious) The first symptoms of smallpox to emerge are fever (101 degrees F to 104 degrees F), malaise, head and body aches and, sometimes, vomiting.

**Early rash** (duration about 4 days; most contagious) A rash begins to first emerge as small red spots on the tongue and in the mouth. These spots develop into sores that break open and spread large amounts of virus into the mouth and throat. The person becomes contagious at this point.

As the sores in the mouth begin to break down, a rash appears on the skin, starting on the face and spreading to the arms and legs and then to the hands and feet. Usually the rash spreads to all parts of the body within 24 hours. As the rash appears, the fever usually falls and the person may start to feel better.

By the third day, the rash becomes raised bumps. By the fourth day, the bumps fill with a thick, opaque fluid and often have a depression in the center that resembles a bellybutton. (This is a major distinguishing characteristic of smallpox.) Fever often will rise again at this time and remain high until scabs form over the bumps.

**Pustular rash** (duration about 5 days; contagious) The bumps become pustules – sharply raised, usually round and firm to the touch as if there's a small round object (for example, a BB pellet) under the skin.

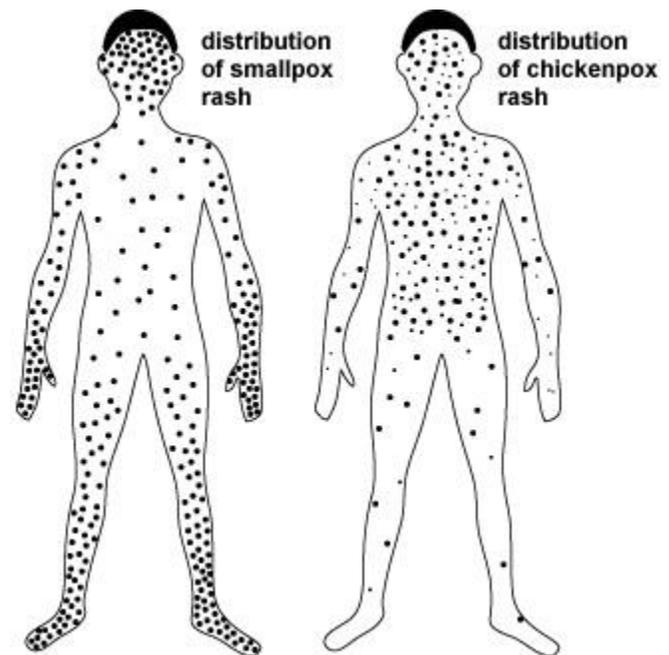
**Pustules and scabs** (duration about 5 days; contagious) The pustules begin to form a crust and then a scab. By the end of the second week after the rash appears, most of the sores will have scabbed over.

**Resolving scabs** (duration about 6 days; contagious) The scabs begin to fall off, leaving marks on the skins that eventually become pitted scars. Most scabs will have fallen off three weeks after the rash appears. The person is contagious until all the scabs have fallen off.

**Scabs resolved** (not contagious) Scabs have fallen off and the person is no longer contagious.

### **If someone has a rash, how do you determine if it is smallpox or chickenpox?**

If someone has a rash, how do you determine if it is smallpox or chickenpox? Smallpox can be confused with chickenpox because of the presence of a rash. There are, however, significant differences in the rash that accompanies each disease. The chickenpox rash, which is usually not preceded by illness, is more prominent on the trunk of the body and is almost never present on the palms of the hands or the soles of the feet. Smallpox lesions, which are almost always preceded by illness with a high fever, are more numerous on the face, arms and legs, and the rash or pocks are usually present on the palms and soles. The chickenpox rash consists of small groupings of fluid-filled blisters that appear and progress to scabs at different rates over the course of the illness. It is not unusual for a person with chickenpox to have both the blisters and the resulting scabs present in the same area at the same time. The smallpox lesions in a specific area, though, all appear to be at the same stage of development.



Chickenpox is generally a mild illness characterized by a slight fever, itchy bumps that turn into blisters and some generalized discomfort. A patient with smallpox is very ill, has a high temperature and, often, is unable to even rise from bed.

### **Is smallpox fatal?**

The majority of patients with smallpox recover, but death may occur in up to 30 percent of cases.

### **Is there a treatment for smallpox?**

There is no proven treatment for smallpox, but research to evaluate new

antiviral agents is ongoing. Patients with smallpox can benefit from supportive therapy (intravenous fluids, medicine to control fever or pain, etc.) and antibiotics for any secondary bacterial infections that occur.

### **If someone comes down with smallpox, how can the spread of the disease be stopped?**

In the unlikely event that smallpox is reintroduced, the public health system would be mobilized to trace all known contacts of the infected person and vaccinate them to prevent more cases of smallpox from developing. You can avoid getting the disease by avoiding contact with people who have the disease. Because a person can spread smallpox from the time he or she develops a rash until the rash has completely healed, these patients should be placed in medical isolation so they will not continue to spread the virus. In addition, people who have come into close contact with smallpox patients should be vaccinated immediately and closely watched for symptoms of the disease. Vaccination and isolation are the strategies to stop the spread of smallpox.

### **If smallpox is discovered or released in a building, how can that area be decontaminated?**

The smallpox virus is fragile. In the event of an aerosol release of smallpox, all virus will be inactivated or dissipated within one to two days. Buildings exposed to the initial aerosol release of the virus do not need to be decontaminated. By the time the first cases are identified, typically two weeks after the release, the virus in the building will be gone. Infected patients, however, will be capable of spreading the virus and possibly contaminating surfaces while they are sick. Therefore, standard hospital-grade disinfectants, which are effective in killing the virus on surfaces, should be used for disinfecting hospitalized patients' rooms or other contaminated surfaces.

### **What should people do if they suspect someone with smallpox or suspect that smallpox has been released in their area?**

Report suspect cases of smallpox immediately to your local health department or to the Illinois Department of Public Health. If you believe there has been an intentional release of smallpox virus, also contact your local law enforcement agency.