

## Smallpox

### **What is smallpox?**

Smallpox is a serious, contagious, and sometimes fatal infectious disease. There is no specific treatment for smallpox disease, and the only prevention is vaccination.

### **Is there more than one type of smallpox?**

There are two clinical forms of smallpox. Variola major is the severe and most common form of smallpox, with a more extensive rash and higher fever. Variola minor is a less common presentation of smallpox and much less severe.

### **How contagious is smallpox?**

A person with smallpox is sometimes contagious with onset of fever, but the person becomes contagious with the onset of rash. At this stage, the infected person is usually very sick and not able to move around in the community. The infected person is contagious until the last smallpox scab falls off.

### **Is smallpox fatal?**

Variola major has an overall fatality rate of 30%. Variola minor is generally fatal in only 1% of cases.

### **Is there still smallpox in the world?**

Smallpox outbreaks have occurred from time to time for thousands of years, but the disease is now eradicated after a successful worldwide vaccination program. The last case of smallpox in the United States was in 1949. The last naturally occurring case in the world was in Somalia in 1977. The disease was declared eliminated from the world in 1980 by the World Health Organization. Routine vaccination for smallpox among the general public was stopped because it was no longer necessary for prevention.

### **Where does smallpox come from?**

Smallpox is caused by the variola virus that emerged in

human populations thousands of years ago. Except for laboratory stockpiles, the variola virus has been eliminated. However, in the aftermath of the events of September and October, 2001, there is heightened concern that the variola virus might be used as an agent of bioterrorism. For this reason, the US government is taking precautions for dealing with the smallpox outbreak.

### **How is the disease transmitted?**

Generally, direct and fairly prolonged face-to-face contact is required to spread smallpox from one person to another. Smallpox also can be spread through direct contact with infected bodily fluids or contaminated objects such as bedding or clothing. Rarely, smallpox has been spread by virus carried in the air in enclosed settings such as buildings, buses, and trains. Humans are the only known host of variola. Smallpox is not known to be transmitted by insects or animals.

### **If smallpox is released in aerosol form, how long does the virus survive?**

The smallpox virus is fragile. In laboratory experiments, 90% of aerosolized smallpox virus dies within 24 hours. In the presence of ultraviolet light, as from the sun, this percentage would be even higher.

### **How many people would have to get smallpox before it is considered an outbreak?**

One confirmed case is considered a public health emergency.

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

Vaccination within 3 days of exposure will completely prevent or significantly modify smallpox in the vast majority of people. Vaccination 4 to 7 days after exposure may offer some protection or modify the severity of the disease.

## **What are the first symptoms of the disease?**

About 12 to 14 days on average after exposure, patients experience fever, extreme fatigue, head and body aches, and sometimes vomiting. The fever is usually high, in the range of 101-104° F. This phase lasts two to four days.

## **What is the rash like?**

The rash emerges in the second phase, first as small red spots on the tongue and in the mouth. These sores spread large amounts of the virus into the mouth and throat. At this time the person is most contagious. A rash also appears on the skin, starting with the face and extremities, notably the hands and feet. It usually spreads to all parts of the body within 24 hours. Eventually the rash becomes bumps called pustules. These pustules crust over and then scab about nine days after the onset of the rash. The scabs eventually fall off, leaving pitted scars. The patient is contagious to others until all the scabs have fallen off.

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

Smallpox can be prevented through use of the smallpox vaccine. There is no proven treatment for smallpox, but research to evaluate new antiviral agents is ongoing. Patients with smallpox can benefit from supportive therapy and antibiotics for any secondary bacterial infections that may occur.

## **Is a vaccine still available against smallpox?**

There is still a vaccine which is made from the virus vaccinia, a virus related to smallpox, which helps the body develop an immunity to smallpox. The smallpox vaccine contains the “live” vaccinia virus and therefore the vaccine site must be cared for carefully to prevent the virus from spreading. The vaccine can also have side effects.

## **What are the potential side effects?**

Side effects can include fever, rash, and head and body aches. In certain groups of people, complications from vaccinia can be severe. Based on past experience, it is estimated that 1 to 2 people out of a million vaccinated may die due to complications. It is therefore important to be monitored closely by a doctor after receiving the vaccine.

## **Should I get vaccinated against smallpox?**

The smallpox vaccine is not available to the general public at this time. President Bush may make the vaccine available to the general public in the future. Receipt of the small-

pox vaccine by anyone is strictly voluntary.

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

Past experience indicates that the first dose of the vaccine offers protection from smallpox for 3 to 5 years, with decreasing immunity thereafter. If a person is vaccinated again later, immunity lasts longer.

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

The smallpox vaccine is not given with a hypodermic needle. It is not a “shot,” like many vaccinations. 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 then used to quickly prick the skin 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 usually is given in the upper arm.

## **How do I know if the vaccination is successful?**

If the vaccination is 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 by the third week forming a scar. People who are being vaccinated for the first time may have a stronger “take” (i.e., successful reaction) than those who are being revaccinated.

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

No. The smallpox vaccine does not contain smallpox virus and cannot spread or cause smallpox. However, the vaccine does contain another virus called vaccinia, which is “live” in the vaccine. Because the virus is live, it can spread to other parts of the body or to other people. This can be prevented through proper care of the vaccination site (e.g., handwashing and careful disposal of used bandages).

Questions and comments about smallpox are welcomed and may be addressed to the Bureau of Emergency Preparedness and Response by calling 603-271-4496 or 800-852-3345 x4496. For further information on smallpox, refer to the Centers for Disease Control and Prevention website at [www.cdc.gov](http://www.cdc.gov) or at the New Hampshire Department of Health and Humans Services website at [www.dhhs.state.nh.us](http://www.dhhs.state.nh.us).