

# Smallpox

## Traveler Summary

### Key Points

- | Smallpox is a viral infection acquired through the inhalation of infected aerosolized respiratory droplets or via direct contact with infected skin lesions, bodily fluids, or contaminated bedding or clothing.
- | Naturally occurring smallpox has been eradicated. Travelers are not at risk unless a bioterrorism event occurs.
- | Symptoms include fever, muscle aches, fatigue, headache and backache, and a rash (on the face, hands, forearms, and trunk) that progresses to blisters with pus and scabs.
- | Consequences of infection include death in 30% of cases.
- | Prevention includes strict infection control measures.
- | Smallpox vaccine is available only to the military, certain researchers, and designated first responders.
- | Vaccine side effects include fever, headache, and severe injection-site reactions.
- | Duration of vaccine protection is about 5 to 10 years. Booster doses are recommended for certain at-risk groups at intervals that vary according to exposure risk.

### Introduction

Smallpox is a viral infection transmitted from person to person through inhalation of or direct contact with the virus. Travelers are not at risk of smallpox infection (it was declared eradicated in 1980) unless an intentional act of bioterrorism occurs.

### Risk Areas

Naturally occurring smallpox has been eliminated.

### Transmission

Transmission is primarily by direct and prolonged face-to-face contact with a person with smallpox (via inhalation of aerosolized respiratory droplets) or direct contact with infected bodily fluids, lesions, or contaminated bedding or clothing. Rarely, smallpox has been spread via exposure to an aerosol release of the virus, such as in enclosed buildings, buses, or trains.

### Risk Factors

Travelers are not at risk unless a bioterrorism event occurs.

Risk of exposure to smallpox is increased for military personnel, first responders, laboratory workers who work with the vaccinia virus, persons who work with animals contaminated or infected with the vaccinia virus (used in the smallpox vaccine), and health care workers who are involved in clinical trials or who are preselected to care for smallpox cases in the event they occur.

### Symptoms

Symptoms most commonly appear about 12 to 14 days (range: 7-17 days) following exposure and include fever, muscle aches, exhaustion, severe headache and backache, followed by the appearance of a flat red rash on the face and forearms 2 to 4 days later. The rash progresses to raised bumps, blisters containing pus, and scabs and may spread to the trunk, legs, palms, and soles.

### Consequences of Infection

Death occurs in about 30% of cases.

### Need for Medical Assistance

Persons who may have been exposed to smallpox (variola) virus should seek immediate medical attention for evaluation of the need for postexposure treatment.

## Prevention

### Nonvaccine

Persons who work with the virus or who may have been exposed during release events should observe strict infection-control measures.

### Vaccine

Several effective vaccines are available; all are live virus vaccines containing vaccinia virus (not the smallpox virus).

Smallpox vaccine and immune globulin are stockpiled and controlled by national governments. In the U.S., smallpox vaccine is not commercially available to health care providers, but the U.S. government has sufficient quantities of the vaccine to inoculate every person in the country in an emergency. If needed, the vaccine would be distributed by U.S. CDC. Vaccination within 7 days of exposure may reduce symptoms or prevent illness if given even earlier; if a rash has already developed, the vaccine will not provide protection.

Vaccination consists of a single dose; the person vaccinated must return to the health care provider 6 to 8 days after vaccination to determine whether vaccination was successful.

After primary vaccination, protection against smallpox is likely to persist for 5 to 10 years.

Revaccination is routinely recommended for:

- | Certain laboratory workers
- | Persons who administer smallpox vaccine
- | U.S. military personnel (may be required)
- | Designated civilian first responders

In the event of a credible smallpox threat or outbreak, "out-the-door" revaccination is recommended for:

- | Civilian first responders (i.e., previously vaccinated public health and health care volunteers in the U.S. Civilian Smallpox Preparedness and Response Program).
- | Persons administering the vaccine, regardless of interval since last dose.

For travel, vaccination with smallpox vaccine is not recommended unless otherwise indicated.

### Side Effects

Side effects include sore arm with redness, itching, pain, or swelling at the injection site; swollen, tender lymph nodes in the armpit; low-grade fever with headache, muscle aches, nausea, or fatigue.

Serious side effects include myocarditis, generalized spread of the virus in the bloodstream or to the brain, and a life-threatening rash.

Persons with underlying medical conditions or compromised immunity should not receive smallpox vaccine. Speak to your health care provider regarding any concerns about this vaccine.

### Timing

When indicated, 1 dose is given. Timing of revaccination (if needed) depends on the level of risk and ranges from 3 to 10 years.

## Special Considerations

### Care of the Vaccination Site

The live vaccinia virus can shed from the vaccination site and be spread to other parts of the body or to other people. After vaccination:

- | Cover the vaccination site with sterile gauze after inoculation; keep it clean and dry to avoid infection and prevent transmission to other parts of the body or to other people.
- | Apply povidone-iodine ointment to the vaccination site (every 1-3 days starting on day 7 after vaccination) to minimize the

risk of transmission.

- | Wear a long-sleeved shirt over the gauze-covered site.
- | Do not scratch or rub the site.
- | Change the dressing every 1 to 2 days (or if it becomes wet).
- | Carefully discard any gauze in plastic bags.
- | Wash hands thoroughly with soap and water or with disinfecting agents after any contact with the site, the gauze dressing, or materials that have come in contact with the site (clothing, bedding, etc.).
- | Wash clothing or bedding that comes into contact with the vaccination site in hot water.

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