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## BIOTERRORISM THREATS

*Due to the events of September 11, 2001, we have received numerous requests for information on potential bioterrorism threats. Anthrax, smallpox, and botulism are among the diseases that the government has been most concerned with. The information below is compiled from the Centers for Disease Control website.*

### **ANTHRAX**

#### ***What should I know about anthrax?***

Our course of action for preventing anthrax after exposure in the civilian population would be with antibiotics. Vaccination is not recommended, and the vaccine is not available to health care providers or the general public. We do not recommend that physicians prescribe antibiotics for anthrax at this time. We currently have enough antibiotics to prevent the disease in 2 million persons exposed to anthrax, therefore we could rapidly get preventive medicine to those who may be affected by this disease, which cannot be transmitted between people.

#### ***What are the signs and symptoms of anthrax?***

Symptoms vary depending on how the disease was contracted, but symptoms usually occur within 7 days.

- Cutaneous anthrax is the most common naturally occurring, type of infection (>95%) and usually occurs after skin contact with contaminated meat, wool, hides, or leather from infected animals. The incubation period ranges from 1-12 days. The skin infection begins as a small papule, progresses to a vesicle in 1-2 days followed by a necrotic ulcer. The lesion is usually painless, but patients also may have fever, malaise, headache, and regional lymphadenopathy. Most (about 95%) anthrax infections occur when the bacterium enters a cut or abrasion on the skin. Skin infection begins as a raised bump that resembles a spider bite, but (within 1-2 days) it develops into a vesicle and then a painless ulcer, usually 1-3 cm in diameter, with a characteristic black necrotic (dying) area in the center. Lymph glands in the adjacent area may swell. About 20% of untreated cases of cutaneous anthrax will result in death. Deaths are rare if patients are given appropriate antimicrobial therapy.

- Inhalational anthrax is the most lethal form of anthrax and results from inhaling 8,000-40,000 spores of the bacteria. The incubation period of inhalational anthrax among humans is unclear, but it is reported to range from 1 to 7 days, possibly ranging up to 60 days. Initial symptoms may resemble those of a common cold, such as sore throat, mild fever, muscle aches, and malaise. After several days, the symptoms may progress to severe breathing problems and shock, with meningitis frequently developing. Inhalation anthrax is often fatal.

#### ***How is anthrax diagnosed?***

Anthrax is diagnosed by isolating *B. anthracis* from the blood, skin lesions, or respiratory secretions or by measuring specific antibodies in the blood of persons with suspected cases.

#### ***Should people ask their physicians to write a prescription for ciprofloxacin, so they have it on hand in case it is needed?***

No. Antibiotics from the nation's stockpile will be made available if they are needed. In the meantime, ciprofloxacin should not be prescribed unless there is a clearly indicated need.

#### ***Is the anthrax vaccine available to the public? Is this vaccine available?***

Not at this time. A protective vaccine has been developed for anthrax. For civilians, vaccination is recommended only for those at high risk, such as workers in *B. anthracis* laboratories.<sup>1</sup>

## **SMALLPOX**

### ***What should I know about Smallpox?***

Vaccination is not recommended, and the vaccine is not available to health providers or the public. In the absence of a confirmed case of smallpox anywhere in the world, there is no need to be vaccinated against smallpox. There also can be severe side effects to the smallpox vaccine, which is another reason we do not recommend vaccination. In the event of an outbreak, the CDC has clear guidelines to swiftly provide vaccine to people exposed to this disease. The vaccine is securely stored for use in the case of an outbreak. In addition, Secretary of Health and Human Services Tommy Thompson recently announced plans to accelerate production of a new smallpox vaccine.

### ***Are we expecting a smallpox attack?***

We are not expecting a smallpox attack, but the recent events that include the use of biological agents as weapons have heightened our awareness of the possibility of such an attack.

### ***Is there an immediate smallpox threat?***

At this time we have no information that suggests an imminent smallpox threat.

### ***If I am concerned about a smallpox attack, can I go to my doctor and request the smallpox vaccine?***

The last naturally acquired case of smallpox occurred in 1977. The last cases of smallpox, from laboratory exposure, occurred in 1978. In the United States, routine vaccination against smallpox ended in 1972. Since the vaccine is no longer recommended, the vaccine is not available. The CDC maintains an emergency supply of vaccine that can be released if necessary, since post-exposure vaccination is effective.

### ***Are there plans to manufacture more vaccine in case of a bioterrorism attack using smallpox?***

Yes. In 2000, CDC awarded a contract to a manufacturer to produce additional doses of smallpox vaccine.

### ***If someone comes in contact with smallpox, how long does it take to show symptoms?***

The incubation period is about 12 days (range: 7 to 17 days) following exposure. Initial symptoms include high fever, fatigue, and head and back aches. A characteristic rash, most prominent on the face, arms, and legs, follows in 2-3 days. The rash starts with flat red lesions that evolve at the same rate. Lesions become pus-filled after a few days and then begin to crust early in the second week. Scabs develop and then separate and fall off after about 3-4 weeks.

### ***Is smallpox fatal?***

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

### ***How is smallpox spread?***

In the majority of cases, smallpox is spread from one person to another by infected saliva droplets that expose a susceptible person having face-to-face contact with the ill person. 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 all scabs have fallen off.

Contaminated clothing or bed linen could also spread the virus. Special precautions need to be taken to ensure that all bedding and clothing of patients are cleaned appropriately with bleach and hot water. Disinfectants such as bleach and quaternary ammonia can be used for cleaning contaminated surfaces.

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

If the vaccine is given within 4 days of exposure to smallpox, it can lessen the severity of illness or even prevent it.

### ***If people got the vaccination in the past when it was used routinely, will they be immune?***

Not necessarily. Routine vaccination against smallpox ended in 1972. The level of immunity, if any, among

persons who were vaccinated before 1972 is uncertain; therefore, these persons are assumed to be susceptible. For those who were vaccinated, it is not known how long immunity lasts. Most estimates suggest immunity from the vaccination lasts 3 to 5 years. This means that nearly the entire U.S. population has partial immunity at best. Immunity can be boosted effectively with a single revaccination. Prior infection with the disease grants lifelong immunity.

### ***Is there any 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 (e.g., intravenous fluids, medicine to control fever or pain) and antibiotics for any secondary bacterial infections that may occur.

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

The smallpox virus is fragile and in the event of an aerosol release of smallpox, all viruses will be inactivated or dissipated within 1-2 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 2 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 such as quaternary ammonias are effective in killing the virus on surfaces and should be used for disinfecting hospitalized patients' rooms or other contaminated surfaces. Although less desirable because it can damage equipment and furniture, hypochlorite (bleach) is an acceptable alternative. In the hospital setting, patients' linens should be autoclaved or washed in hot water with bleach added. Infectious waste should be placed in biohazard bags and autoclaved before incineration.

## **BOTULISM**

### ***What is botulism?***

Botulism is a muscle-paralyzing disease caused by a toxin made by a bacterium called *Clostridium botulinum*. There are three main kinds of botulism:

- Foodborne botulism occurs when a person ingests pre-formed toxin that leads to illness within a few hours to days. Foodborne botulism is a public health emergency because the contaminated food may still be available to other persons besides the patient.
- Infant botulism occurs in a small number of susceptible infants each year who harbor *C. botulinum* in their intestinal tract.
- Wound botulism occurs when wounds are infected with *C. botulinum* that secretes the toxin.

With foodborne botulism, symptoms begin within 6 hours to 2 weeks (most commonly between 12 and 36 hours) after eating toxin-containing food. Symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, dry mouth, muscle weakness that always descends through the body: first shoulders are affected, then upper arms, lower arms, thighs, calves, etc. Paralysis of breathing muscles can cause a person to stop breathing and die, unless assistance with breathing (mechanical ventilation) is provided. Botulism is not spread from one person to another. Foodborne botulism can occur in all age groups. A supply of antitoxin against botulism is maintained by CDC. The antitoxin is effective in reducing the severity of symptoms if administered early in the course of the disease. Most patients eventually recover after weeks to months of supportive care.

### ***What kind of germ is Clostridium botulinum?***

*Clostridium botulinum* is the name of a group of bacteria commonly found in soil. These rod-shaped organisms grow best in low oxygen conditions. The bacteria form spores which allow them to survive in a dormant state until exposed to conditions that can support their growth. There are seven types of botulism toxin designated by the letters A through G; only types A, B, E and F cause illness in humans.

### ***How common is botulism?***

In the United States an average of 110 cases of botulism are reported each year. Of these, approximately 25% are Public education about botulism prevention is an ongoing activity. Information about safe canning is widely available for consumers. State health departments and CDC have persons knowledgeable about botulism available to consult with physicians 24 hours a day. If antitoxin is needed to treat a patient, it can be quickly delivered to a physician anywhere in the country. Suspected outbreaks of botulism are quickly investigated, and if they involve a commercial product, the appropriate control measures are coordinated among public health and regulatory agencies. Physicians should report suspected cases of botulism to a state health department.

There are several misunderstandings about botulism. For example, many people believe that freezing food kills botulism poison. Freezing food does slow the growth of the germ, but does **not** kill the germ or destroy the poison. If the botulism germs are not killed, they can continue growing and produce toxin when the food is thawed out. They will grow best if the food is kept in a warm container or a plastic container with a tight-fitting lid. Another misunderstanding is that foods like soda pop, fried chicken, and candy cause botulism or that eating modern foods with traditional fermented foods can cause botulism. Eating fermented foods and drinking soda pop can cause an upset stomach, but that is not what causes botulism. Botulism is caused by eating **any** food containing botulism poison. It is not the food combinations that cause botulism.

Some people also believe that botulism is caused by chemicals dumped into the water. Botulism germs live naturally in soil, in water, in fish, and in animals, and we all probably eat botulism germs from time to time. But, if the germs do not have that ideal growing situation, they don't make poison, and we don't get sick.

If you have botulism, be sure to quickly see your doctor or health aide. Also, save the food so it can be tested to determine if it contains botulism poison.

*The philosophy of AirCare International and FACTS® Training International has always been to be proactive in any emergency. Bioterrorism is no different. Be aware of your surroundings, watch for things that "don't fit", and report any concerns to the proper authorities... Remember your safety and security training!!! It's not paranoia... It's a heightened state of awareness.*

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### References and additional information:

<sup>1</sup>Interview with Dr. Jeffery P. Koplan, Director of the Centers of Disease Control and Prevention, October 18, 2001  
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