Bioterrorism – FAQs

What is bioterrorism?
Bioterrorism is the deliberate or threatened use of bacteria, viruses, and toxins to cause disease, death, or fear. Bioterrorism could also be directed against livestock, food crops, and environmental resources such as reservoirs.

What is the likelihood of a large-scale attack on the United States?
The likelihood of a large-scale bioterrorist attack is thought to be low. It is not a simple procedure to spread a biologic agent in a way that could infect massive numbers of people. To do so, an individual or individuals would have to have a high level of technical expertise. In Japan, a terrorist group has dispersed airborne formulations of anthrax and botulism throughout Tokyo on at least eight occasions but for unclear reasons, the attacks failed to produce illness. (JAMA. 1999;281:1735-1745)

The heavy coverage of this story by the media and the widespread prescribing of antibiotics to prevent anthrax emphasizes the need for public education to help people put the risk of bioterrorism in perspective. While a major attack could be devastating, preparations will minimize casualties. The importance of planning and preparation cannot be overstated.

Is the U.S. health system prepared for an act of bioterrorism?
Federal, state, and local health authorities (the Centers for Disease Control and Prevention, the Public Health Service, Cook County Public Health Office) routinely conduct surveillance for a bioterrorist event. If an attack occurs, the local health agency (Cook County) would rapidly advise the medical community (the AMA, state medical society, individual physicians) by phone, fax, and the media with recommendations for diagnosis and treatment, as well as preventive measures for the specific biological agent involved.

Our system is not perfect. Much needs to be done and can be done to strengthen it. Federal, state, and local authorities are working with physicians, hospitals, and the pharmaceutical industry to enhance information and communication systems, ensure the availability and rapid deployment of life-saving pharmaceuticals, vaccines, and antidotes; and provide necessary medical supplies to counter the effects of chemical (eg, sarin, mustard gas) and biological agents.

What if fear gets the best of me?
Considering all that has happened since September 11th, it is reasonable and normal to feel anxious. Should fear get to the point that it stops you from normal activities or disrupts your sleep, it may be helpful to talk with someone. Your doctor can help you directly or refer you to a qualified psychiatrist or other health care professional that can provide counseling.

Anthrax and other disease threats

What are the major disease (biological agent) threats and how are they spread and treated?
Any infectious agent could theoretically be engineered for deliberate use as a weapon. While no one knows for sure exactly what microbes a terrorist will use, public health officials are most concerned with the following disease threats:

- **Inhalational anthrax** is the most serious form of anthrax and results from breathing bacterial spores into the lungs. Once in the lungs, the spores germinate into live bacteria that release potent toxins. The disease starts with flu-like symptoms, followed by severe respiratory complications. Death may occur within 2 to 3 days of symptoms. Exposure to airborne anthrax spores could cause symptoms as soon as 2 days after exposure or as late as 6 to 8 weeks after exposure. Once symptoms appear, antibiotics may have limited effectiveness for treatment of inhalational anthrax because it is too advanced.

- **Cutaneous anthrax**, the skin form of anthrax, can cause skin or intestinal disease. It is the most common form of anthrax and results from contamination of the skin with anthrax spores (particularly on exposed areas of the hands, arms, or face). The disease begins with a local

swelling that may look like an insect bite and progresses to a fluid-filled blister. The blister dries, ulcerates, and then forms a coal-black scab (the word anthrax comes from the Greek word for coal). Without antibiotic treatment, the local infection may spread through the body and can be fatal.

- **Smallpox** is a serious viral disease that starts with fever, aches, fatigue, and vomiting, and progresses to a rash with blisters over much of the body. Initially, the rash may be confused with chicken pox. Smallpox spreads directly from person-to-person through airborne transmission. because it is a virus, it does not respond to antibiotics. A vaccine exists but is not available for widespread use.

- **Pneumonic (new-monic) plague** is caused by inhaling the bacteria associated with the "Black Death." It begins as a severe pneumonia with high fever, chills, and cough. Without prescription antibiotics, respiratory failure and death may occur within 12 to 24 hours after the initial symptoms appear. It spreads directly from person to person through the air (e.g., cough, sneeze). A vaccine exists for prevention of bubonic plague (when the lymph nodes are infected instead of the lungs) but is not considered effective against the inhaled (pneumonic) form of this disease.

- **Botulism** is caused by a bacterial protein that has been taken by mouth (eaten) or inhaled. It is one of the most potent toxic compounds known. Affected individuals may have difficulty speaking, seeing, and swallowing. Depending on the severity of exposure, symptoms may progress to general muscle weakness and respiratory failure. Without adequate respiratory care and treatment with antitoxin, death can occur within 24 to 72 hours. Botulism does not spread from person to person. A bioterrorist attack would likely involve airborne or foodborne release of botulinum toxin. Antibiotics are not effective.

- **Tularemia** (too-la-ree-mia) is one of the most infectious bacterial diseases known. A bioterrorist attack would likely involve airborne release of this organism. Fever, headache, and a pneumonia-like illness characterize the disease. Without antibiotic treatment, the disease can progress to respiratory failure, shock, and death. There is no evidence that it can be spread from person to person. A vaccine exists but is not available for widespread use.

- **Viral hemorrhagic fevers** are caused by a diverse group of viruses (e.g., Ebola, Marburg, Yellow Fever, Lassa, Rift Valley). Illness generally begins with flu-like symptoms such as fever, fatigue, dizziness, headache, and muscle aches. After 5 days a rash often develops, which is most prominent on the trunk of the body. Severe infection may lead to death due to complications from massive bleeding and shock due widespread damage to blood vessels. These viruses can be spread from person to person through contact with body fluids (eg, blood). A vaccine is available for prevention of Yellow Fever. Other vaccines are under investigation. No antibiotic is effective against these or any viral diseases.

Immunization

Should I be immunized against anthrax?
The anthrax vaccine is only available to military personnel and those who might come in contact with natural anthrax in their work (special-risk groups such as goat-hair mill or goatskin workers, wool or tannery workers, laboratory workers). Vaccination is not one shot but a series of 6 shots given over 18 months, followed by yearly boosters. Physicians do not have this vaccine and cannot obtain it. In the event of a bioterrorist attack, health authorities would conduct a rapid investigation, determine the place and time of the release, and identify individuals who need antibiotics rather than vaccine. The anthrax vaccine is only recommend for people between 18 and 65 years of age.

Should I be immunized against smallpox?
The last naturally occurring case of smallpox in the world occurred in 1977. The United States stopped routine smallpox immunizations in 1972 and, consequently, drug companies stopped making the vaccine.

The vaccine is not generally available to the public. The CDC says there are approximately 12 to 15 million doses of vaccine remaining in the United States. Although there is no treatment for the disease, the smallpox vaccine provides excellent protection and serves to stop spread of the disease. While many vaccines must be given weeks or months before a person is exposed to infection, the smallpox vaccine is different. It can be protective when given 2 to 3 days after exposure and may prevent death even when given as late as 4 to 5 days after exposure.

There is suspicion that some nations or groups have stolen stocks of the smallpox virus from the former Soviet Union. Since we don't know if terrorists have stolen the virus or (if they have) who they would target, we cannot determine who should receive the vaccine. In the event of a smallpox outbreak, the national vaccine stockpile would be used to control the spread of the disease. The federal government has a contractor developing new vaccine for a larger stockpile. Although rare, the smallpox vaccine can have serious side effects (e.g., severe skin reaction, brain infection, and death). Currently, the benefits and risks of reintroducing of the vaccine are being carefully evaluated. The only way that health authorities would recommend widescale vaccination is if there was clear evidence that the disease had resurfaced and citizens were at risk of becoming infected.

I was vaccinated against smallpox before 1980, can I still get smallpox?
In most people, vaccination wears off after 10 to 15 years but may last longer if the person had been successfully vaccinated on multiple occasions. It is likely that most vaccinated persons are now susceptible to smallpox and would need to be re-vaccinated.

Antibiotics

Should I ask my doctor for antibiotics to have on hand in case of a bioterrorist attack?
No. Indiscriminant use of antibiotics could be harmful, particularly for pregnant women and children. Many antibiotics are effective for a variety of diseases but there is no antibiotic that is effective against all diseases. Antibiotics can cause side effects and should only be taken with medical supervision. This type of inappropriate use of antibiotics may lead to increased antibiotic resistance in bacteria that cause other common infections (e.g., otitis media, pneumonia, urinary tract infections), which can complicate treatment. Keeping a supply of antibiotics on hand poses an additional problem because they have a limited shelf life and will lose potency over time.

What is the "National Pharmaceutical Stockpile" that health officials talk about on the news?
This is a large reserve of antibiotics, chemical antidotes, and other medical supplies set aside for emergencies. The Centers for Disease Control and Prevention reports that it can move stockpiled material to affected areas in the United States within 1 to 2 hours of notification from a state's Governor.

Gas masks

Should I purchase a gas mask?
No. A gas mask provides a false sense of security and would only be protective if you were wearing it at the exact moment of a bioterrorist attack. Since such an attack would be unannounced and initially undetected, the mask would have to be worn continuously to be protective. In other words, in order to be protected, you would have to wear this mask 24 hours a day, seven days a week - never removing it. This is impractical, if not impossible. Gas masks can actually be dangerous for persons with pre-existing heart or lung problems; there have been reports of accidental suffocation when people have worn masks incorrectly.

Also, to work effectively, a gas mask must be specially fitted to you and you must be trained in its use. This is usually done for the military and for workers in industries and laboratories who are routinely exposed to hazardous chemical and biological agents. Purchasing a gas mask from an Army surplus store or off the Internet carries no guarantee of effectiveness.

Exposure and what to do

Who do I contact regarding a possible exposure?
If you believe you have been exposed to an infectious bioagent or if you develop symptoms that you believe might be associated with such an exposure, immediately contact a physician. Your physician may choose to contact the local health department to determine the best course of action based on the circumstances of the exposure.

What can I do to protect my family and myself?
Although there is little that you as an individual can do in advance to protect yourself from a bioterrorist attack, there is much we can do as a country. The best protection is a strong and prepared public health system; well-trained physicians and other medical personnel who can recognize an illness caused by a bioterrorist agent; coordinated planning between medical, public health, emergency management, and law enforcement personnel; and an informed public. Government agencies, health care institutions, and public health agencies can and are doing more to improve capacity to protect the public following a bioterrorist attack. We can all educate ourselves about this issue, make family preparations for a disaster, and find out ahead of time what our local communities suggest we do.

Furthermore, in the event of a disaster, every family should have the following emergency supplies on hand:

- A battery-powered radio and flashlight, with plenty of extra batteries
- Bottled drinking water (1 gallon per day per person, with a 3 to 7 day supply recommended). Store water in sealed, unbreakable containers. Note the storage date and replace every 6 months.
- A supply of nonperishable canned and sealed packaged foods that do not require refrigeration or cooking (at least enough for 3 to 7 days) and a can opener
- A change of clothing, rain gear, and sturdy shoes
- A blanket or sleeping bag for each family member
- First-aid kit, including any special prescription medications
- Toilet paper and paper towels
- Extra set of car keys
- Credit cards and cash
- Tools
- Special items for infants (e.g., disposable diapers), elderly, or disabled family members
- Extra eye glasses; contact lenses and supplies
- A list of physicians and their telephone numbers
- A list of important family information, important documents, and telephone numbers; copies of family immunization and health records; and the style and serial number of medical devices such as pacemakers

Careful planning and sufficient resources are critical for any response to an emergency, be it a natural disaster or a terrorist attack. Inquire about emergency plans for your children's school or day care center. Consider becoming involved in your community emergency response team.

What more can be done nationally and globally?
National and international institutions are working together to strengthen the public health infrastructure, to more effectively monitor the threat of biological weapons, to identify actions likely to prevent the proliferation of bioweapons, and develop a coordinated plan for monitoring the worldwide emergence of infectious diseases. Investment in the public health system is the best possible defense against any outbreak of infectious disease, whether natural or deliberate. Given the ease of travel and increasing globalization, an outbreak anywhere in the world should be considered a threat to all nations.