LifeCare
Life Event Management℠ Services

A LifeCare® Digest on Biological and Chemical Terrorism

This digest is intended to educate you preliminarily about biological and chemical terrorism—and the issues that such threats raise for you and your loved ones. This digest provides basic information only; for specific information, contact your physician or other health care provider as well as the government agencies listed in the *Helpful Resources* section of this digest.

Biological and Chemical Weapons

Although threats of biological terrorism are alarming to everyone, try to remain calm and do not panic. Educate yourself about possible threats and any steps you can take to protect yourself. The Centers for Disease Control and Prevention (CDC) lists six diseases as "high priority" biological agents that pose a risk to national security:

Anthrax: Anthrax is an acute infectious disease caused by the spore-forming bacterium *Bacillus anthracis*. Anthrax most commonly occurs in hoofed mammals and can also infect humans. To cause infection, anthrax organisms must be rubbed into skin, swallowed or inhaled as a fine, aerosolized mist. Symptoms of the disease vary depending on how the disease was contracted, but usually occur within seven days after exposure. There are three serious forms of human anthrax:

Cutaneous anthrax—Cutaneous anthrax is generally transmitted through contact with contaminated animal hides or wool, or soil contaminated by animals ill with anthrax. Cutaneous anthrax often begins with a bump on the hands, arms or head that eventually turns into a sore and coal-black lesion. More severe symptoms may follow, including fever, swelling and headache. Cutaneous anthrax is the most common (and most easily treated) form of human anthrax; it can be treated and usually cured with antibiotics.

Inhalation anthrax—Early symptoms of inhalation or pulmonary anthrax may begin with a cough; this may initially be confused with the flu. Symptoms may also present as muscle aches, fever and headache before the cough. However, the disease rapidly progresses, causing severe breathing problems and shock. To be effective, antibiotic treatment must begin before symptoms show up—symptoms usually appear within one week after exposure, but sometimes take as long as two months to emerge. Inhalation anthrax is a serious form of anthrax and, if left untreated, may be fatal.

Intestinal anthrax—The intestinal form of anthrax, which is extremely rare and difficult to contract, may follow the consumption of contaminated food and is characterized by an acute inflammation of the intestinal tract. Initial signs of nausea, loss of appetite, vomiting and fever are followed by abdominal pain, vomiting of blood and severe diarrhea. Intestinal anthrax can be successfully treated with antibiotics; if untreated, this form of anthrax is deadly 25% to 60% of the time.

The Centers for Disease Control and Prevention have identified two antibiotics—Cipro and doxycycline—to treat those who have been exposed to bio-engineered anthrax (penicillin and macrolide antibiotics may also be effective against certain strains of anthrax). The most frequent side effects of Cipro include nausea, vomiting, diarrhea, abdominal pain, rash, headache and restlessness; in addition, pregnant or nursing women and people who have a history of asthma should not take this drug. Cipro can interfere with other medication, so be sure to check with your physician regarding any possible drug interactions.

The U.S. Department of Defense (DOD) has a supply of an anthrax vaccine for military use; this vaccine was licensed by the Food and Drug Administration (FDA) in 1970 for at-risk veterinary and laboratory workers and livestock handlers. The vaccine is effective if started at least four weeks before exposure. It consists of six doses with annual follow-up shots. At this time, a vaccination against anthrax is not recommended for or available to the general public.

Please note that direct person-to-person spread of anthrax is extremely unlikely. Therefore, there is no need to treat people who are in contact with individuals who have tested positive for anthrax, unless those people were exposed to the same source of infection—for example, if they both touched a letter contaminated with anthrax.

Botulism: Botulism toxin, made by the bacterium *Clostridium botulinum*, is spread when bacteria is inhaled or ingested via contaminated food or water. Food-borne botulism can occur in all age groups. Symptoms include double vision, slurred speech, dry mouth and muscle weakness, which starts at the top of the body and works its way down. Symptoms begin from six hours up to two weeks after exposure. Death can be caused if there is paralysis of the breathing muscles within 24 hours. Botulism is not spread from one person to another. A supply of antitoxin against botulism is maintained by the CDC. The antitoxin is effective in reducing the severity of symptoms if administered early in the course of the disease, and most patients eventually recover after weeks to months of care.

Pneumonic Plague: Plague is an infectious disease of animals and humans caused by the bacterium *Yersinia pestis*, found in rodents and their fleas. Pneumonic plague occurs when *Y. pestis* infects the lungs. The first signs of illness are fever, headache, weakness and a cough that produces bloody or watery sputum. Pneumonia progresses over two to four days; it may cause septic shock and, without early treatment, death. While there is no vaccine against plague, several antibiotics are effective.

Smallpox: Smallpox is a viral infection that comes in two forms: variola minor and the more deadly variola major. The incubation period is about 12 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 two or three days. The rash starts with flat red lesions that become pus-filled and begin to crust early in the second week. The rash evolves with most lesions remaining in the same stage—whereas chickenpox (another viral infection) demonstrates skin lesions in varying stages (some flat, some small blisters, some crusting over). Smallpox scabs develop, then separate and fall off after about three to four weeks. The majority of patients with smallpox recover, but death occurs in up to 30% of cases. Vaccines exist, but since smallpox was eradicated in the 1970s, they are not currently available to health providers or the public—however, a supply is securely stored for use if a public outbreak occurs. In addition, the U.S. Secretary of Health and Human Services, Tommy Thompson, recently announced plans to accelerate production of a new smallpox vaccine.

Tularemia: The causative agent of tularemia is *Francisella tularensis*, considered one of the most infectious pathogenic bacteria known. Humans can become infected with tularemia through bites by infected arthropods (some spiders or insects), contact with contaminated water or food, and inhalation of infective aerosols. Earlier symptoms of infection by aerosol could be similar to those of influenza or atypical pneumonia. The symptoms can occur within a few days or as long as two weeks after exposure. If untreated, the patient experiences progressive weakness and weight loss and death can result. Common treatment is by antibiotics, and a vaccine is currently under review by the U.S. Food and Drug Administration.

Viral Hemorrhagic Fevers (VHF): Viral hemorrhagic fever (VHF) refers to a group of illnesses caused by several distinct families of viruses. While some of these viruses cause relatively mild illnesses, others cause severe, life-threatening ones, such as Ebola. Many VHF viruses are known to naturally reside in an animal or insect host; however, the hosts of some VHF viruses remain unknown, including that of the Ebola and Marburg viruses. Some VHF viruses can be transmitted by the body fluids of infected people. Reactions vary depending on the type of VHF, but symptoms often include fever, fatigue, dizziness, muscle aches and exhaustion. Severe cases cause bleeding under the skin and in internal organs. Some types of VHF cause kidney failure. Generally, there are no treatments other than supportive therapy for VHFs. Vaccines are available for only two VHFs: yellow fever and Argentine hemorrhagic fever.

Chemical Weapons: In addition to biological weapons, the CDC also describes over two dozen chemical agents that could be used as terrorist weapons, including nerve agents, tear gases, mustard agents and other toxins. The United Nations defines chemical warfare agents as “chemical substances, whether gaseous, liquid or solid, which might be employed because of their direct toxic effects on man, animals and plants.”

Toxins (i.e., poisons produced by living organisms and their synthetic equivalents) are classified as chemical warfare agents if they are used for military purposes. Today, thousands of poisonous substances are known, but only a few are considered appropriate for chemical warfare. Although it may appear that a chemical agent can be “custom-made” for a certain purpose, this is not the case. Instead, there is always some uncertainty about the persistence time, the dispersal and the overall effect of each chemical agent.

How Real Is the Threat?

While it is difficult to determine with accuracy how real the threat of biological and chemical terrorism is, officials say that it is not easy to infect large populations. For instance, experts say it is very difficult to transform anthrax into a weapon that can be effectively dispersed. To develop an anthrax strain in its most lethal form—inhalation or pulmonary anthrax—spores have to be crafted to just the right size. If too small, a person will exhale the spores. If too large, the spores fall to the ground and become ineffective. A bomb carrying anthrax, for instance, would likely destroy the germ as it explodes. Dispersing the bacterium with aerosols is also challenging because, unless it is in spore form, it is a wet substance and can clog sprayers.

Additionally, officials say intentional contamination of the water supply would be difficult and highly unlikely, given that water is chlorinated and tested constantly before being pumped into people’s homes. Plus, it moves in such massive quantities that a biological agent would certainly be diluted and weakened.

While it is wise to be cautious and aware, keep in mind that the United States and local governments have made protecting Americans from biological terrorism one of their highest priorities. Surveillance systems are set up across the country to detect biological attacks—and new technology is available that helps with detection. Additionally, a portable DNA analyzer is available to quickly identify specific biological agents once an attack is suspected. And a national laboratory has invented a machine that tests the air quality regularly and can sound an alarm if any of several pre-programmed biological or chemical agents are detected.

Finally, the U.S. Postal Service is taking extra precautions to screen mail for potential biological agents and to educate mail personnel nationwide on how to detect suspicious packages. Keep in mind that the U.S. Postal Service delivers approximately 208 billion pieces of mail per year and, presently, there have been only a few confirmed incidents of anthrax bacteria being sent through the mail.

Protecting Yourself

To help ease your fears, remember that U.S. and local governments are doing everything they can to protect Americans—and, in the event of an emergency, the government will notify us how to respond. Here are some additional tips from experts on how to protect yourself:

- **Remain calm.** Although threats of biological war can be alarming, do not to panic. There is nothing to indicate that our immediate health is in jeopardy.

Stay abreast of current news and developments. Listen regularly to reports from the government and reliable news sources. News organizations will cover biological terrorism and any impending threats to Americans.

Focus on the facts. Do not assume that everything you hear is true. Get your facts from trusted, reliable sources, such as government or health agencies, and do not listen to rumors or fabricated stories about what could happen. This can only fuel your imagination and fears.

Follow safety guidelines. Be sure to follow all safety and security measures that are in place to protect citizens. Whether you are at the airport or at your workplace, make sure you are aware of security measures and guidelines intended to protect you.

Report suspicious behavior. While it is wise to be on the lookout for any suspicious activities or behaviors, use your best judgment. Report suspicious activities at the workplace to your employer, and report suspicious activities outside of the workplace to the local police.

Biological terrorism is no joking matter. There have been a few recent reports of individuals making false threats or pretending to have anthrax. This is illegal! Individuals who make false threats or reports of biological agents will be arrested and prosecuted.

Do not take medications unless directed by a doctor. Only those persons determined by a state's Department of Health to be at risk of exposure to biological agents should take antibiotics. Taking antibiotics unnecessarily is not advisable and may cause the development of antibiotic-resistant strains of common bacteria. Antibiotics should only be taken under the supervision of a physician who has done an evaluation, in order to minimize the potential for side effects or interaction with other medications.

Take steps to improve your health and resistance to infection. Eat a well-balanced diet, exercise regularly, reduce stress, don't smoke, cut back on alcohol consumption and get enough sleep—all these steps will help maximize your body's ability to resist and fight infection. If you are in a high-risk group (elderly, compromised immune system, etc.), discuss the flu shot with your physician; this may prevent you from getting influenza, which has symptoms similar to anthrax and other diseases. In addition, regular hand-washing can help prevent person-to-person transmission of infectious agents (but be careful not to overuse antibacterial soaps as they can create strains of bacteria that are harder to fight).

Rely on government sources. People should not be scared into thinking they need gas masks, vaccinations or other preventative treatment. In the event of a public health emergency or biological attack, federal, state and local health departments will inform the public about the actions individuals need to take. In sum, your best protection is education. Continue to listen to government reports and the news on how to protect yourself—or contact reputable organizations listed in the *Helpful Resources* section at the end of this digest.

Check your mail. Given the recent incidents of anthrax being transmitted through the mail, it is wise to check your mail—but do not be afraid to open it unless you find something suspicious. A suspicious letter or package might include some of the following indicators:

- **Origin:** The postmark and/or name of sender is unusual or unknown; no return address is given; the envelope shows a city or state in the postmark that does not match the return address
- **Postage:** Excessive or inadequate postage is used
- **Balance:** The letter is lopsided or unusually thick
- **Weight:** The letter or package seems very heavy for its size
- **Contents:** The contents seem very stiff or springy; contain protruding wires, aluminum foil or other components; feel like they contain a powdery substance (when checking, do not bend the contents excessively)
- **Appearance:** Oily or discolored outer wrapping or envelope; excessive security material such as masking tape, string, etc.; visual distractions, such as stickers; envelope is marked with restrictive endorsements, such as "Personal" or "Confidential"
- **Smell:** Particularly an almond scent or other suspicious odors
- **Writing:** Poorly handwritten or typed addresses; handwriting of sender is not familiar or indicates a style not normally received; common words or names are misspelled; rub-on or block lettering is used
- **Address:** The letter is an unexpected delivery or from someone unfamiliar; addressed to someone no longer with your organization or is otherwise outdated; uses an incorrect business title or has a title, but no name; the return address can't be verified as legitimate

If you receive a suspicious package or letter at work, notify your building security official or an available supervisor. If you are home, notify the local police. Here are some additional tips if you receive a suspicious package or if you suspect nuclear or biological release:

- Do not shake or empty the contents of the envelope or package.
- Attempt to verify the sender and/or the legitimacy of the package (i.e., ask the recipient if he or she was expecting a package that matches the suspicious package's size and shape)
- Place the envelope or package in a plastic bag or some other type of container to prevent leakage of contents. If you do not have a container, then cover the envelope or package with something (e.g., clothing, paper, trash can, etc.) and do not remove this cover. If the package leaks, do not try to clean up the material—just cover it as much as possible.

- Leave the room immediately and leave the envelope or package covered in its original location—do not take it with you. Close the door or section off the area to prevent others from entering.
- Wash your hands with soap and water.
- Make a note of people who were in the room or area, especially those who had actual contact with it. Give this list to the local public health authorities (so that proper instructions can be given for medical follow-up) and to law enforcement officials for further investigation.
- Contain the potential impacted individuals in one area to ensure that they receive proper medical attention.
- Remove all non-impacted individuals from the area as quickly as possible.
- Remove heavily contaminated clothing as soon as possible, and place it in a plastic bag or some other container that can be sealed. This clothing bag should be given to the emergency responders for proper handling.
- Shower with soap and water as soon as possible, and make sure that everyone who has touched the mail immediately washes his or her hands with soap and water. Do not use bleach or other disinfectant on your skin.
- You may want to contact your personal physician to inform him or her of your possible exposure. If medical personnel prescribe medication and/or antibiotics, take it until otherwise instructed or it runs out. Be sure to tell the prescribing physician of all medications you take (prescribed as well as over-the-counter treatments, vitamins, herbs, etc.) to avoid potential drug interactions.
- Contact the Centers for Disease Control's Emergency Response department at 770-488-7100 for answers to any questions you may have.

Helpful Resources

The following organizations can provide additional information on anthrax and other biological threats:

Centers for Disease Control and Prevention (CDC)
1600 Clifton Road
Atlanta, GA 30333
Emergency Response Department: 770-488-7100
Public Inquiries: 404-639-3534, or 800-311-3435
http://www.cdc.gov

The CDC web site provides information on biological threats, the status of preventative vaccines and the potential need for antibiotics, as well as general information on specific diseases such as anthrax or smallpox.

Environmental Protection Agency (EPA)
800-424-8802 (to report oil or chemical spills)
http://www.epa.gov

The EPA site provides links, tips and information on what to do if you encounter an environmental threat or hazard.

Federal Emergency Management Agency (FEMA)
500 C Street, SW
Washington, D.C. 20472
202-646-4600
http://www.fema.gov/

The Federal Emergency Management Agency (FEMA) is an independent agency of the federal government, reporting to the President. FEMA's web site provides general information and resources on what to do if you have been affected by a natural disaster or an emergency situation.

National Institutes of Health (NIH)
Bethesda, Maryland 20892
http://www.nih.gov/index.html

The NIH is one of eight health agencies of the Public Health Services that, in turn, is part of the U.S. Department of Health and Human Services. The NIH offers public health information, drug trials and research, and includes links to resources for more help.

U.S. Department of Health and Human Services (HHS)
200 Independence Avenue, SW
Washington, D.C. 20201
877-696-6775 (toll-free)
202-619-0257
http://www.hhs.gov/
http://www.healthfinder.gov/

The HHS web site provides information and resources on a variety of medical conditions, including anthrax, its symptoms and treatment, as well as other biological and chemical threats.

U.S. National Library of Medicine (NLM)
8600 Rockville Pike
Bethesda, MD 20894
888-346-3656 (toll-free)
301-594-5983
http://medlineplus.gov/

The NLM web site offers links to many helpful articles and resources on medical conditions, including anthrax, its symptoms and treatment.

U.S. Postal Service (USPS)
475 L'Enfant Plaza, NW
Washington, D.C. 20260
800-ASK-USPS (800-275-8777)
http://www.usps.com/

The USPS web site includes helpful information and tips on how to recognize suspicious mail and steps to take if you feel you have received a threat.

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