

Overview

A biological attack is the deliberate release of germs or other biological substances that can make you sick. Many agents must be inhaled, enter through a cut in the skin or be eaten to make you sick. Some biological agents, such as anthrax, do not cause contagious diseases. Others, like the smallpox virus, can result in diseases you can catch from other people. You can learn more about the most important biological agents by reading the inside contents of this brochure.



If There is a Biological Threat

Unlike an explosion, a biological attack may or may not be immediately obvious. While it is possible that you will see signs of a biological attack, as was sometimes the case with the anthrax mailing in 2001, it is perhaps more likely that health care workers in your area will report a pattern of unusual illness or there will be a wave of sick people seeking emergency medical attention. You will probably learn of the danger through an emergency radio or TV broadcast, or some other signal used in your community. You might get a telephone call or emergency response workers may come to your door.

In the event of a biological attack, public health officials may not immediately be able to provide information on what you should do. It will take time to determine exactly what the illness is, how it should be treated, and who is in danger. However, you should watch TV, listen to the radio, or check the internet for official news including the following:

- Are you in the group or area considered in danger?
- What are the signs and symptoms of the disease?
- Are medications or vaccines being distributed?. Where?
- Who should get them?
- Where should you seek emergency medical care if you became sick?

Protect Yourself

If you become aware of an unusual and suspicious release of an unknown substance nearby, it doesn't hurt to protect yourself. Quickly get away. Cover your mouth and nose with layers of fabric that can filter the air but still allow breathing. Examples include two to three layers of cotton such as a t-shirt, handkerchief or towel. Otherwise, several layers of tissue or paper towels may help. Wash with soap and water and contact authorities.

Symptoms and Hygiene

At the time of a declared biological emergency, if a family member becomes sick, it is important to be suspicious. Do not automatically assume, however, that you should go to a hospital emergency room or that any illness is the result of the biological attack. Symptoms of many common illnesses may overlap. Use common sense, practice good hygiene and cleanliness to avoid spreading germs, and seek medical advice.

Glossary

Bacteria: small free-living, single-celled organisms, most of which may be grown on solid or liquid culture media. They can infect several organs in the body, including the blood. The diseases they produce are often cured with antibiotics. Examples of bacteria include *Bacillus anthracis* and *Yersinia pestis*.

Viruses: organisms that require living cells in which to reproduce. They produce diseases that are not cured with antibiotics. Examples of virus include *Variola major* (smallpox), and viral hemorrhagic fever viruses.

Toxins: poisonous substances produced and derived from living plants, animals, or microorganisms; some toxins may also be produced or altered by chemical means. They may be treated by specific antidotes and selected pharmacological agents. Example: **botulinic toxin** produced by *Clostridium botulinum*.

Category A Agents: high-priority agents, include organisms that pose a risk to national security because they: 1) can be easily disseminated or transmitted from person to person; 2) result in high mortality rates and have the potential for major public health impact; 3) might cause public panic and social disruption; and 4) require special action for public health preparedness (1). Description and diseases produced by category A agents are detailed inside this brochure.

HOW TO REPORT

- 1) Call 911 or your local law enforcement immediately if you see any suspicious package or if you think you have been exposed to any biological agent.
- 2) Contact your physician for assessment of any unexplained illness and also report incident to your local health department.



References:

1. St. Charles County Health Department. Community Health & the Environment, in: <http://www.schealth.org/docs/doche/bt/cats.html>
2. American Academy of Pediatrics. "Anthrax". In: Pickering LK, ed. *Red Book: 2003 Report of the Committee on Infectious Diseases*. 26th edition. Elk Grove Village, IL: American Academy of Pediatrics; 2003: pp 196-199.
3. Office of Epidemiology and Disease Control-Miami-Dade County Health Department: Anthrax Standard Operating Procedures. (Draft). March 2004
4. CDC: Division of Bacterial and Mycotic Diseases—Disease Information: http://www.cdc.gov/ncidod/dbmd/diseaseinfo/botulism_g.htm
5. Braunwald, E., And others: *Harrison's Principles of Internal Medicine*". 15th ed. McGraw-Hill. U.S.A. 2001:

Bioterrorism Guide Category A Agents



List of Category A Agents

- Anthrax (*Bacillus anthracis*)
- Botulism (*Clostridium botulinum* toxin)
- Plague (*Yersinia pestis*)
- Smallpox (*Variola major*)
- Tularemia (*Francisella tularensis*)
- Viral hemorrhagic fevers (*Filoviruses* – e.g. *Ebola*, *Marburg*; and *Arenaviruses*- e.g. *Lassa*, *Machupo*)

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DISEASE	SOURCE OF INFECTION INCUBATION PERIOD (TIME FROM INFECTION TO SYMPTOMS)	CLINICAL MANIFESTATION (SIGNS AND SYMPTOMS)	MODE OF TRANSMISSION	PREVENTION AND CONTROL	TREATMENT VACCINE
ANTHRAX	Infection caused by <i>Bacillus anthracis</i> , occurs primarily in herbivores. Humans become infected occupationally (during skinning/ butchering of infected cattle, sheep, or wild animals), through contaminated fly bites, accidentally by consumption of contaminated meat, or lately, intentionally (bio-terrorism), through contact with material contaminated with anthrax spores. Incubation Period: Inhalational: 1-13 days (up to 60 days). Gastrointestinal: 3-5 days Skin (Cutaneous): 1-12 days	Skin (Cutaneous): Starts as a usually painless, itchy bump-like lesion that enlarges and ulcerates in 1-2 days; then, a black eschar (crust) appears. There may be fever, malaise, and headache. Inhalational: Most lethal. Initially resembles a severe cold (fever, chills, nonproductive cough, headache, body ache). 2-5 days later: difficult breathing, low oxygen levels, blood infection. Chest x-rays show important changes. Death may occur in 24 h Gastrointestinal: Presents as throat (throat ulcer, neck swelling, grown ganglia) and intestinal (nausea, loss of appetite, vomiting, fever, severe abdominal pain, bloody vomiting and diarrhea)	Skin (Cutaneous): After contact with infected animals or contaminated animal products. Introduction of spore through cuts or abrasions, or by biting flies Inhalational: After inhalation of anthrax spores Gastrointestinal: From consumption of contaminated meat (rare). No person to person transmission.	Natural: avoid contact with infected animals or contaminated animal products, annual immunization (vaccine) of livestock in endemic areas. Report animal outbreaks to agriculture and public health officials. Burn or deeply bury carcasses and bedding; monitor dairy herds' temperatures in outbreak areas. Intentional: Risk of inhalational anthrax from unopened mail is very low. Handle mail properly; avoid handling suspicious packages; hold the letter or package away from direct exposure to the face; contact law enforcement if contact considered threatening. Prophylaxis (preventive treatment) : Antibiotics for at least 60 days following exposure.	Antibiotics. Length of treatment depends on the disease form (shorter for natural cutaneous; longer for intentional inhalational, gastrointestinal, or the one affecting the brain) Vaccine: recommended for employees in high-risk industries and laboratory personnel working with <i>B. Anthracis</i> cultures, and for military personnel.
BOTULISM	Serious progressive paralytic illness caused by a nerve toxin that is produced by the bacterium <i>Clostridium botulinum</i> . Botulism can be food-borne, infant, and wound. Incubation: Food-borne: 12-48 hours. Infant: 3-30 days. Wound: 4-14 days	Double and blurred vision, drooping eyelids, difficulty swallowing, dry mouth, and muscle weakness. Infants are lethargic, feed poorly, are constipated, and have a weak cry and poor muscle tone. There can be progression to paralysis of the arms, legs, trunk and respiratory muscles.	Food contaminated with spores, preserved or stored improperly (home-canned food, honey); wound contamination. Black-tar heroin use. No person-to-person transmission.	Careful home food processing and preparation (boiling canned food for 10 min.) Discard food cans with bulging lids or off-odors. Avoid feeding honey to infants less than 12 months old. Seek medical care for wounds. Avoid using injectable street drugs. Discard any food suspect of being contaminated. Always remember: "when in doubt, throw it out"	Antitoxin (as soon as possible) that blocks the action of the toxin. Good supportive care in a hospital, possibly with the use of a ventilator (breathing machine), removal of contaminated food from guts. Vaccine: 1 dose
PLAGUE	Infection caused by the bacterium <i>Yersinia pestis</i> . It is usually transmitted by animals (zoonotic), but can also be used as a bio-terrorism weapon. There are 3 types of infection: bubonic, pneumonic (lung) and septicemic (blood infection) Incubation: 1-6 days	Bubonic: chills, fever, body ache, headache, weakness, pain in ganglia, and probably a flea bite with an ulcer Pneumonic (lung): cough, fever, shortness of breath, chest pain, bloody sputum; nausea, vomiting, belly pain; respiratory failure, shock. The chest x-rays reveal lung damage. Septicemic: Bleeding from puncture wounds and natural body openings; gangrene	Bubonic: infected rodent flea bites. Pneumonic: breathing in respiratory droplets from infected human or animal, in a laboratory, or aerosol n a bio-terrorist attack. Septicemic: complication of bubonic plague, or direct contact with infectious materials. Person to person transmission	Avoid known highly plague-affected areas; use repellents, insecticides, and protective clothing when at risk of exposure to rodents' fleas; wear gloves when handling animal carcasses. Short-term antibiotic prophylaxis in persons exposed to a patient with pneumonic plague; elimination of rodent food (garbage, pet food) and habitats (brush piles, junk heaps, woodpiles) from houses and surroundings, and in working environments).	Antibiotics Prophylaxis: Antibiotics
SMALLPOX	Infection caused by the virus <i>Variola</i> . There are two clinical forms: <i>variola major</i> , which is severe; and the <i>variola minor</i> , less severe . Incubation: 7-17 days	High fever, headache, backache, prostration, chills, vomiting, abdominal pain, followed by deep-seated red rash beginning on face & extremities. Progressive stages of lesions: spots → fluid-filled bumps with depression in the center ("belly button") → puss filled hard bumps → scab → scars	Spread through direct, prolonged face-to-face contact. Can also be spread through direct contact with infected bodily fluids or contaminated objects (e.g. bedding or clothing) and rarely by air in enclosed settings Person to person transmission	Avoid contact with infected persons (most contagious when rash first appears, but remain contagious until scabs fall off). After contact with an infected person, seek medical advice for vaccine administration within 3 days of exposure.	No proven specific treatment Supportive care and antibiotics for secondary bacterial infections. Vaccine: Available in case of emergency and for high-risk groups, should be given 4-7 days after exposure
TULAREMIA	Primarily a disease of wild animals, caused by the bacterium <i>Francisella tularensis</i> , found in ticks, tabanid flies, wild rabbits, and other wild animals. Common in Arkansas, Oklahoma, and Missouri. Incubation: Usually 3-5 days (1-14 days)	Often starts with a sudden onset of fever, chills, headache, and body ache. Ulcer and inflammation at the site of penetration of the infection. Inflammation of ganglia (nodes) on the neck and behind the ear (children), or in the inguinal area (adults). Infectious inflammation of the eye with accompanying inflamed ganglion in the frontal part of the ear. Inflammation of the throat. There can be pneumonia (infection of the lungs) due to this bacterium.	Spread through the bites of infected ticks and by handling infectious animal parts: hares, rabbits, deer, etc. Lab infections. Aerosol inhalation could be used in bio-terrorism No person-to-person transmission.	Avoid exposure to biting and blood-sucking insects, especially ticks and deerflies. Avoid skinning wild animals, especially rabbits. Wear face mask, gowns and gloves if working in labs with <i>Francisella tularensis</i> . Use insect repellents, and remove attached ticks promptly, wear gloves while handling animal carcasses.	Antibiotics for 7 to 10 days Vaccine: Available for high-risk groups, including laboratory personnel who handle the bacterium <i>F. tularensis</i>
Viral Hemorrhagic Fever (VHF)	Group of illnesses that are caused by a distinct group of viruses. Characteristically the overall circulatory system is damaged, and the body's ability to regulate itself is impaired. Some examples are Ebola and Yellow Fever. Incubation: 4-21 days (varies with virus)	Specific signs and symptoms vary by the type of VHF, but initial signs and symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. In severe cases VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears.	Contaminated mosquito bites, direct contact with infected people and their blood, bodily fluids, and mucous membrane. May be spread by aerosol or after contact with contaminated items from another person. Person to person transmission	Avoid close physical contact with infected persons. Avoid contact with host species (rodents, some insects, monkeys)	Antiviral medications in some cases, with medications that boost the immune system. Supportive care and management of low blood pressure. Vaccine: only for Yellow Fever