

# AMERICAN ACADEMY OF NURSE PRACTITIONERS

Incorporated 1985

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## ***BIOTERRORISM FACT SHEET FOR NURSE PRACTITIONERS***

Nurse Practitioners are on the front line for recognizing evidence of bioterrorism among patient populations. With the heightened risks of biological terrorism arising in the aftermath of the events of September 11, 2001, nurse practitioners need to increase their awareness of the signs and symptoms of potential disease entities that can be spread in this manner. As early as September 11, the Centers for Disease Control (CDC) sent a directive to all state and local health departments asking for the immediate reporting of outbreaks of any syndromes that seem unusual or out of the ordinary for that population and time of year. Of prime concern are the six Category A diseases: Anthrax, Botulism, Plague, Tularemia, Smallpox and Hemorrhagic Fever.\*

***Anthrax*** Anthrax is a bacterial infection caused by *B.anthraxis* that occurs occasionally in wild livestock in the U.S., but is more common in most other regions of the world. The disease is normally contracted through handling products from infected animals, inhaling anthrax spores from contaminated animal products, or eating undercooked meat from infected animals. In the case of bioterrorism, anthrax spores enter the body from contaminated substances other than the above listed sources. There are three methods of entry: through a cut or opening in the skin (cutaneous form), by inhaling spores (inhalation form) and by ingestion (intestinal form).

The cutaneous form enters through a cut or abrasion in the skin. Initially the lesions resemble an insect bite that will in 1-2 days turn into a vesicle, then a painless ulcer approximately 1-8 cm in diameter with a dark necrotizing center. The inhalation form begins like a common cold, which quickly progresses to a pneumonia like syndrome with subsequent shortness of breath. It is usually fatal. The intestinal form starts with nausea, vomiting and fever, followed by abdominal pain, hematemesis and severe diarrhea. Diagnosis is confirmed via smear and culture of sputum, blood or lesion. All three forms are treated with antibiotics. The currently advocated treatment is ciprofloxacin.

Anthrax can be prevented through a vaccine that currently is made available to vulnerable populations that include individuals who work with the organism in laboratories, individuals who handle animal products in areas where anthrax is endemic and military

personnel at high risk for exposure to the organism. It is given in 3 injections 3 weeks apart, followed by three boosters at 6, 12 and 18 months.

***Botulism*** Botulism is caused by the absorption of botulinum toxin of an anaerobe, *Clostridium botulinum* that occurs naturally in the soil. It is contracted through wounds in the skin or ingestion of the toxin through mucosal surfaces in the body with subsequent neurological manifestations of the disease. Of most concern is a man made aerosolized form that can be inhaled. The incubation period for food borne botulism is 2 hours to 8 days; for aerosolized forms, there is limited knowledge, but it could be as little as 12 to 72 hours. In food borne botulism, the initial indications may be abdominal cramps, nausea, vomiting or diarrhea. The condition is manifested by a descending paralysis initially affecting the cranial nerves. Patients complain of difficulty with vision, speaking and swallowing. Initial manifestations include ptosis, gaze paralysis, facial palsy, diminished gag reflex and tongue weakness. Later manifestations include loss of control of head movement and weakness and loss of reflexes in the extremities. There is no fever and the patient remains mentally alert. Treatment includes intravenous immunization with equine botulinum antitoxin and supportive treatment including observation for respiratory failure. Food borne botulism can be prevented by heating suspected food and beverages. While all forms can be prevented through use of botulinum antitoxin, there is some uncertainty regarding its use in exposed populations that have not manifested symptoms.

***Plague*** Plague is an infectious disease caused by *Yersinia Pestis* that is known to be spread by rodent flea bite. It is endemic in certain western states in the U.S. and throughout the world. The incubation period after receiving a flea bite is 2-8 days. In the case of bioterrorism, it is felt that symptoms would be those of primary pneumonic plague: nausea, vomiting, abdominal pain and sometimes diarrhea. Diagnosis is confirmed through sputum, blood or lymph node aspirant cultures. The treatment of choice is streptomycin. Prevention of spread includes isolation

for the first 48 hours of treatment. In mass casualty settings and post exposure prophylaxis, oral Doxycycline or Ciprofloxacin are recommended.

**Smallpox** Smallpox (*variola major*) is a physically disfiguring viral disease with a high mortality rate that was at one time endemic throughout the world. Protection via vaccination was established in the 18th century; the disease was considered eradicated in the 1970s and prophylactic vaccination was discontinued. The incubation period is 12-14 days. It is spread via droplet from the nasopharynx after a rash appears. Initial symptoms include high fever, malaise, headache and backache. The rash appears in 1-2 days beginning in the mouth, pharynx, face and arms and spreads to the trunk and legs. Initially the lesions are maculopapular in appearance, changing to vesicles and then deeply embedded pustules, unlike the lesions of varicella which are superficial and erupt in crops over a period of time. The lesions eventually crust and then scar in deep pits. Diagnosis is made through lesion culture in first cases. Treatment is symptomatic. Antibiotics are administered for secondary bacterial infection and vaccination to reduce the severity of impact. Prevention includes vaccination.

**Tularemia** Tularemia is an infectious disease caused by *Francisella tularensis* that is generally carried by wild rodents such as rabbits, and infects individuals who handle the animals or are infected by ticks that have been on the animals. The incubation period is 2 to 10 days. Initial symptoms can be, but are not always, the sudden onset of fever, headache and nausea. A localized lesion that ulcerates will appear with regional tender lymphadenopathy. A man made aerosolized form could present with acute fever, progressing to pharyngitis, bronchiolitis, pneumonia, pleuritis and hilar lymphadenitis. Complications include sepsis, meningitis, pericarditis, perisplenitis or osteomyelitis. If contaminated food is ingested, gastrointestinal symptoms may occur with subsequent splenomegaly, stupor and delirium. Diagnosis is generally confirmed through blood agglutination testing. Respiratory form can be cultured for definitive confirmation. The recognized treatment is streptomycin or gentamicin. Ciprofloxacin, while not yet labeled for use, has been found to be an effective treatment in a number of studies. Aminoglycosides, macrolides, chloramphenicol and fluoroquinolones have each been with used with success in the treatment of tularemia. Prevention includes protection when handling wild rodents and thorough cooking of game that is eaten, prophylactic antibiotic treatment for exposed individuals and decontamination of exposed environments.

**Viral Hemorrhagic Fever** Viral Hemorrhagic Fever is caused by a group of viruses, usually zoonotic, whose reservoir is a rodent or an arthropod. All cause conditions characterized by fever and a bleeding disorder. Individuals contract the viruses through contact with the droppings or secretions of the host, or in the case of arthropods through bite of the host. The virus can be transmitted to other animals and livestock where individuals can contract the virus through contact with that animal. Some can be transmitted from person to person via body secretions or indirectly through contact with contaminated objects such as needles and syringes. In a bioterrorism situation, they could be spread by aerosolized spray. Examples of viral hemorrhagic fever include the Hantavirus and Ebola hemorrhagic fever. While there is some variation, initial symptoms, include fever, dizziness muscle aching, fatigue and weakness. In severe cases, there may be evidence of bleeding under the skin, from body orifices such as the mouth, or from internal organs as well as neurologic symptoms, delirium, seizures and coma. Diagnosis is confirmed serologically. Treatment is supportive although Ribavirin has been found to be successful in some instances. Health Care providers should exercise strict isolation precautions, as the major preventive activity is avoidance of host contact and contaminated objects. Immunization is not yet a reality for the majority of these viruses.

**FOR ADDITIONAL INFORMATION REGARDING THESE CONDITIONS WE SUGGEST YOU EXAMINE THE INFORMATION ON THE CENTERS FOR DISEASE CONTROL (CDC) WEBSITE: [www.bt.cdc.gov](http://www.bt.cdc.gov).**

\* Sources.

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