

## Staphylococcal Enterotoxin B as a Bioterrorist Agent

**Agent:** Staphylococcal enterotoxin B (SEB) is one of several exotoxins produced by *Staphylococcus aureus*. It may be aerosolized or used to sabotage food supplies. It would not be likely to produce significant mortality rates; however, its ability to incapacitate persons for up to two weeks give it compelling potential as an agent.

**Disease:** Staphylococcal enterotoxin B poisoning

**Incubation Period:** 1-6 hours

**Signs/Symptoms:** From 3-12 hours after aerosol exposure, high fever (103-106°F degrees), chills, headache, myalgia and nonproductive cough may appear. Some patients may develop shortness of breath and retrosternal chest pain. If the patient develops pulmonary edema or adult respiratory distress syndrome (ARDS), there may be a cough with frothy sputum. Fever may last 2-5 days, and cough may persist for up to 4 weeks.

Ingestion of the toxin leads to acute salivation, nausea, and vomiting followed by abdominal cramps and diarrhea. Fever and respiratory involvement are not seen in foodborne SEB intoxication. Higher exposure can lead to septic shock and death if left untreated.

Physical examination is often unremarkable. Postural hypotension may be present, particularly with ingestion of SEB, due to fluid loss. Conjunctivitis may be seen, although it was not present in any of 9 individuals accidentally exposed in a laboratory. Rales may be present.

### **Diagnosis:**

*Differential Diagnosis:* An epidemic of influenza, adenovirus, parainfluenza, or mycoplasma infection could cause fever, nonproductive cough, myalgias, and headache occurring in large numbers of people in a short time. Early clinical manifestations of SEB may be similar to those of inhalation anthrax, tularemia, plague, or Q fever, but the rapid progression of respiratory signs and symptoms to a stable state distinguishes SEB intoxication. Chemical agents, such as mustard gas, would show marked vesiculation of the skin as well as pulmonary injury.

*Laboratory:* During the first 6-12 hours following exposure, a number of tests may be performed to detect toxin. Nasal swabs and induced respiratory secretions may be collected for toxin assays; blood may be collected in tiger-top (SST) or red-top

tubes. Urine may be collected for immunoassays. By about 6 days following exposure, most patients will develop a significant antibody response. Acute and convalescent sera should be drawn in tiger-top (SST) or red-top tubes for immunological testing.

Send specimens for laboratory confirmation in a triple container to the Oregon State Public Health Laboratory, 1717 SW Tenth Avenue, Portland, OR 97201. Prior notification is requested by calling the laboratory at (503) 229-5882 and Acute and Communicable Disease Prevention at (503) 731-4024.

*Supportive Tests:* Chest x-ray, although usually normal, may show increased interstitial markings, Kerley B markings, atelectasis, and possibly overt pulmonary edema or ARDS. A nonspecific neutrophilic leukocytosis and an elevated erythrocyte sedimentation rate may be seen.

**Treatment:** Supportive care with close attention to oxygenation and hydration, and in severe cases, ventilation with positive-end-expiratory pressure and diuretics. Acetaminophen and cough suppressants may make the patient more comfortable.

**Infection Control/Decontamination:** healthcare workers should exercise standard precautions. Decontaminate surfaces with 0.5% sodium hypochlorite (1 part household bleach added to 9 parts water) with 10-15 minutes contact time, and/or soap and water.

**Report:** Immediately report any suspect cases to your local health department or the Oregon Health Division at (503) 731-4024 during working hours (8:00 am to 5:00 pm Monday through Friday) or (503) 631-4030 nights, weekends and holidays.