



North Dakota Department of Health Health Alert Network

HEALTH ADVISORY

January 9, 2003

RICIN TOXIN: SIGNS AND SYMPTOMS

Categories of Health Alert messages:

- Health Alert: conveys the highest level of importance; warrants immediate action or attention.
- Health Advisory: provides important information for a specific incident or situation; may not require immediate action.
- Health Update: provides updated information regarding an incident or situation; no immediate action necessary.

We are providing this information to you because of the heightened concern about the use of ricin as a potential terrorist weapon.

On Jan. 7, 2003, police in London, England, arrested six men under the Prevention of Terrorism Act. London police said material seized from the suspects' apartment had tested positive for traces of ricin, one of the world's deadliest poisons. The men are suspected of possessing equipment and materials capable of producing ricin.

Although there is no known imminent threat in the United States at this time, ricin has been used as a biological weapon.. It is toxic by numerous routes; however, its use by bioterrorists might involve poisoning of water or foods, inoculation via ricin-laced objects, or aerosol release.

Ricin is a deadly protein toxin made from the bean of the castor plant (*Ricinus communis*). The castor plant can be found in most parts of the world. Ricin is fairly easy to make in large quantities, thus making it a significant biological warfare agent. The effects of ricin are through inhibition of protein synthesis. A small dose can be fatal if swallowed, injected or inhaled. There is no known antidote, specific treatment or vaccine.

Clinical signs and symptoms and pathological manifestations of ricin toxicity vary with dose and route of exposure:

- **Inhalation – Ricin inhalation is characterized by sudden onset of nose and throat congestion, itchiness of the eyes, urticaria and chest tightness.** Respiratory distress may be seen as early as eight hours after exposure. Weakness, fever, cough and pulmonary edema occur within 18 to 24 hours after exposure. Death from hypoxia occurs within 36 to 72 hours.
- **Injection – Injection of ricin often presents as a flu-like illness with severe fatigue and sometimes nausea and vomiting.** Severe local necrosis of

muscle and regional lymph nodes occur at the injection site. Weakness may occur within five hours, with severe abdominal cramping, diarrhea, nausea, vomiting and elevation of temperature within 15 to 24 hours. Between 36 and 48 hours, hypotension and tachycardia may set in with an elevated white blood count. Cardiac dysrhythmias and gastric bleeding with vomiting may occur within 48 to 72 hours, leading to death.

- **Ingestion – Symptoms of ricin ingestion include rapid onset of nausea, vomiting followed by abdominal pain, diarrhea, fever, thirst, sore throat and headache.** Ingestion causes severe abdominal cramping and diarrhea which may lead to gastrointestinal hemorrhage with hepatic, splenic and renal necrosis.

Management of patients is primarily supportive. Cough suppressants and acetaminophen for fever may make the patient more comfortable. Hydration is important. For those with pulmonary intoxication, respiratory support may be necessary. Pulmonary edema may need to be treated with positive end expiratory pressure ventilation and diuretics. Standard management techniques for ingestion should be used with intravenous fluid and electrolyte replacement as necessary.

Standard precautions should be used by health care workers. Ricin is not volatile, so secondary aerosols are generally not a danger to health care providers. Weak hypochlorite solutions and/or soap and water should be used to decontaminate exposed skin surfaces.

Any suspected cases should be reported immediately to the North Dakota Department of Health at 800.472.2180.

If you would like more information, please contact Larry Shireley, state epidemiologist, at 701.328.2378 or visit the following websites:

<http://www.emedicine.com/emerg/topic889.htm>

<http://www.ansci.cornell.edu/plants/toxicagents/ricin/ricin.html>

<http://www.nbc-med.org/SiteContent/HomePage/WhatsNew/MedAspects/contents.html>