

**Virginia Department of Health**  
**Ricin: Overview for Healthcare Providers**

<b>Agent/ Characteristics</b>	Ricin is a naturally occurring protein toxin made from the bean of the castor plant ( <i>Ricinus communis</i> ), which is found worldwide. Beans contain 1%-5% ricin by weight, and ricin is easily isolated from the bean. Once extracted, ricin can be processed into a powder, mist or pellet, or dissolved in liquid. Ricin acts by disrupting ribosome function, leading to inhibition of protein synthesis. Medical uses for ricin have been investigated.
<b>Reporting to Public Health</b>	All chemical exposures should be reported to the regional poison center at 800-222-1222. Outbreaks and unusual occurrences of disease require immediate reporting to the <a href="#">local health department</a> .
<b>Potential Sources</b>	Ricin is generated as a by-product formed when castor oil is extracted from castor beans. Ricin intoxications have occurred from consuming castor beans.
<b>Route of Exposure</b>	Multiple routes of exposure are possible. Injection, inhalation and ingestion are highly toxic. Ricin is unlikely to be absorbed through intact skin.
<b>Ricin as a Terrorism Agent</b>	Ricin is a Category B bioterrorism agent and a Schedule number 1 chemical warfare agent. It could be acquired or manufactured for use as a biological/chemical weapon.
<b>Contamination/ Decontamination</b>	Contamination: Ricin is not volatile and does not off-gas and form vapor. Patients suspected of being contaminated should be decontaminated before arrival in the medical facility, if possible. Those performing decontamination should wear a full chemical resistant suit with gloves, surgical mask and eye/face protection (e.g., face shield and goggles). Decontamination: People with only skin exposure to liquids or powders should remove clothing, wash skin and hair with soap and water, and rinse with plenty of water. People with only ingestion exposure do not require skin decontamination. For ocular contamination, flush the eyes with large amounts of tepid water for at least 15 minutes. After decontamination, standard precautions are adequate.
<b>Risk Indicators</b>	If absorbed systemically, ricin is highly toxic to all people. The extent of injury depends on the concentration, duration and route of exposure. Children, older people, and those with underlying medical conditions might be more susceptible to ricin poisoning.
<b>Cause of Death</b>	Injection and Ingestion: multiple organ system failure, vascular collapse, hypovolemic shock Inhalation: pulmonary edema leading to hypoxemia.
<b>Latency</b>	Based on limited human cases and animal studies, symptom onset can occur as early as 4-8 hours after exposure and as late as 24 hours after exposure. Death can occur within 3-5 days of exposure.
<b>Clinical Manifestations</b>	Exposure causes a chemically induced radiation-like syndrome. Specific signs and symptoms vary with dose and route of exposure. Injection: Pain at injection site and local lymph nodes, sepsis/influenza-like illness (fever, fatigue, weakness, myalgia, nausea, vomiting) progressing to multiple organ system failure (liver necrosis, nephritis, splenitis, GI bleeding), vascular collapse, hypovolemic shock. Inhalation: Cough/congestion, chest tightness progressing to fibrinopurulent pneumonia; pulmonary edema, necrosis and hemorrhage; respiratory failure. Ingestion: Sore throat, headache, nausea, vomiting, abdominal pain, diarrhea, GI bleeding, multiple organ system failure (liver necrosis, nephritis, splenitis), anuria, vascular collapse, hypovolemic shock.
<b>Laboratory Testing</b>	Confirmatory diagnostic testing: None available. Monitor clinical effects and complications: CBC, renal function, liver function as indicated. Public health officials might request urine specimens for testing. For consultation, call Virginia's Division of Consolidated Laboratory Services (DCLS), available 24/7, at 804-335-4617.
<b>Radiography</b>	Obtain x-rays as indicated by clinical presentation.
<b>Treatment</b>	See Decontamination (above). An antidote is not available; supportive care (e.g., mechanical ventilation, fluid and electrolytes, anti-inflammatory agents, analgesics) is the mainstay of therapy. CDC guidance is available at <a href="https://emergency.cdc.gov/agent/ricin/clinicians/treatment.asp">https://emergency.cdc.gov/agent/ricin/clinicians/treatment.asp</a>
<b>Precautions/ Disposition</b>	Pitfall: Not considering a chemical exposure as a cause of a radiation-like or sepsis-like illness. Disposition: Asymptomatic patients might need to be observed if they were exposed to large doses.