



Ricin

Information for Healthcare Facilities

Adapted with permission from the Kansas Poison Control.

Last revised: August 2026

Causative Agent

Ricin is a potent toxin extracted from the beans of the castor plant (*Ricinus communis*).

Hospital Precautions

Standard precautions

Transmission

Ricin can be in the form of a powder, mist (dissolved in water or weak acid), or a pellet. Food contaminated with ricin may be ingested. No person-to-person contact has been reported.

Decontamination

Standard precautions are recommended as ricin is non-volatile and secondary aerosols are not expected to be a hazard. Remove all clothing from patient and place in a plastic bag and decontaminate patient with soap and water after. Ricin is stable in the environment and foods. It is inactivated by heat and a hypochlorite solution (0.1% hypochlorite).

Mechanism

Ricin is a type II ribosome inactivating protein consisting of two toxins, an A chain and B chain, which are joined by a disulfide bond. The B chain binds to cell-surface receptors, allowing the toxin complex to enter the cell by endocytosis. The A chain inhibits DNA replication and protein synthesis, causing cell death.

Routes

Inhalation, ingestion, or injection

Symptoms/ Onset

- Inhalational: Within 4-8 hours. Fever, chest tightness, cough, dyspnea, nausea, arthralgias. Airway necrosis and pulmonary capillary leak resulting in pulmonary edema may occur within 18-24 hours, followed by severe respiratory distress and death from hypoxemia in 36-72 hours.
- Injection or Ingestion: Within 8-24 hours. Nausea, diarrhea, vomiting, fever, abdominal pain, renal failure, hepatic failure, cardiovascular collapse, seizures, cerebral edema, multi-organ failure.
- Ricin has a hard seed coating, so toxicity depends on how thoroughly they are chewed in addition to number of beans ingested.

Treatment

Treatment is aggressive supportive care. Pulmonary intoxication is managed with appropriate respiratory support and treatment of pulmonary edema. Vigorous gastric lavage, activated charcoal, and cathartics may be indicated if the patient presents within an hour after ingestion.

The M-40 protective mask is effective in preventing aerosol exposure. There is not a vaccine currently available for commercial use.

REFERENCES

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