

Ricin FactSheet

HS04-028B (9-06)

What is ricin?

- Ricin is a poison that can be made from the waste left over from processing castor beans.
- It can be in the form of a powder, a mist, or a pellet, or it can be dissolved in water or weak acid.
- It is a stable substance and not affected much by extreme conditions such as very hot or very cold temperatures.

Where is ricin found and how is it used?

- Castor beans are processed throughout the world to make castor oil. Ricin is part of the waste “mash” produced when castor oil is made.
- Ricin has some potential medical uses, such as bone marrow transplants and cancer treatment (to kill cancer cells).

How could you be exposed to ricin?

- It would take a deliberate act to make ricin and use it to poison people. Accidental exposure to ricin is highly unlikely.
- People can breathe in ricin mist or powder and be poisoned.
- Ricin can also get into water or food and then be swallowed.
- Pellets of ricin, or ricin dissolved in a liquid, can be injected into people’s bodies.
- Depending on the route of exposure (such as injection or inhalation), as little as 500 micrograms of ricin could be enough to kill an adult. A 500-microgram dose of ricin would be about the size of the head of a pin. A greater amount would likely be needed if the ricin were swallowed.
- In 1978, Georgi Markov, a Bulgarian writer and journalist who was living in London, died after he was attacked by a man with an umbrella that had been rigged to inject a poison ricin pellet under Markov’s skin.
- Some reports have indicated that ricin may have been used in the Iran-Iraq war during the 1980s and may have been found in Al Qaeda caves in Afghanistan.
- Ricin poisoning is not contagious. It cannot be spread from person to person through casual contact.

How does ricin work?

- Ricin works by getting inside the cells of a person’s body and preventing the cells from making the proteins they need. Without the proteins, cells die. Eventually this is harmful to the whole body, and death may occur.



Castor beans

Photo by Scott Bauer. Courtesy of Agricultural Resource Service, United States Department of Agriculture.

Signs and symptoms of ricin exposure:

- The major symptoms of ricin poisoning depend on the route of exposure and the dose received.
- **Inhalation:** Within a few hours of inhaling significant amounts of ricin, the likely symptoms are respiratory distress (difficulty breathing), fever, cough, nausea, and tightness in the chest. Heavy sweating may follow as well as fluid building up in the lungs (pulmonary edema). This makes breathing even more difficult, and the skin might turn blue. Excess fluid in the lungs can be diagnosed by x-ray or by listening to the chest with a stethoscope. Finally, low blood pressure and respiratory failure may occur, leading to death. In cases of known exposure to ricin, people having respiratory symptoms that started within 12 hours of inhaling ricin should seek medical care.
- **Ingestion:** Following ingestion of ricin, initial symptoms typically occur in less than 6 hours. If someone swallows a significant amount of ricin, he or she would develop vomiting and diarrhea that may become bloody. Severe dehydration may be the result, followed by low blood pressure. Other signs or symptoms may include hallucinations, seizures, and blood in the urine. Within several days, the person’s liver, spleen, and kidneys might stop working, and the person could die.
- **Injection:** The injection of a lethal dose of ricin would initially cause failure of the muscles and lymphatic nodes found closest to the point of injection. Eventually, the liver, the kidneys, and the spleen will cease to function and the person will experience massive hemorrhaging in the stomach and intestines and the person dies of multiple organ failure.
- **Skin and eye exposure:** Ricin in powder or mist form can cause redness and pain of the skin and the eyes.



Castor bean pod

Photo by Brian Prechtel. Courtesy of Agricultural Resource Service, United States Department of Agriculture.

- Death from ricin poisoning could take place within 36 to 72 hours of exposure, depending on the route of exposure (inhalation, ingestion, or injection) and the dose received. If death has not occurred in 3 to 5 days, the victim usually recovers.
- Showing these signs and symptoms does not necessarily mean that a person has been exposed to ricin.

How is ricin poisoning treated?

Because no antidote exists for ricin, it is important to avoid ricin exposure in the first place. If exposure cannot be avoided, the most important factor is then getting the ricin off or out of the body as quickly as possible. Ricin poisoning is treated by giving victims supportive medical care to minimize the effects of the poisoning. The types of supportive medical care depend on the route by which victims were poisoned (that is, whether poisoning was by inhalation, ingestion, or skin or eye exposure). Care could include such measures as helping victims breathe, giving them intravenous fluids (fluids given through a needle inserted into a vein), giving them medications to treat conditions such as seizure and low blood pressure, flushing their stomachs with activated charcoal (if the ricin has been very recently ingested), or washing out their eyes with water if their eyes are irritated.

How you can know whether you have been exposed to ricin

- If we suspect that people have inhaled ricin, a potential clue would be that a large number of people who had been close to each other suddenly developed fever, cough, and excess fluid in their lungs. These symptoms could be followed by severe breathing problems and possibly death.
- No widely available, reliable test exists to confirm that a person has been exposed to ricin.

How you can protect yourself, and what to do if you are exposed to ricin

- First, get fresh air by leaving the area where the ricin was released. Moving to an area with fresh air is a good way to reduce the possibility of death from exposure to ricin.
 - If the ricin release was outside, move away from the area where the ricin was released.
 - If the ricin release was indoors, get out of the building.
- If you are near a release of ricin, emergency coordinators may tell you to either evacuate the area or to “shelter in place” inside a building to avoid being exposed to the chemical.
- If you think you may have been exposed to ricin, you should remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.

Removing your clothing:

- Quickly take off clothing that may have ricin on it. Any clothing that has to be pulled over the head should be cut off the body instead of pulled over the head.
- If you are helping other people remove their clothing, try to avoid touching any contaminated areas, and remove the clothing as quickly as possible.

Washing yourself:

- As quickly as possible, wash any ricin from your skin with large amounts of soap and water.
- If your eyes are burning or your vision is blurred, rinse your eyes with plain water for 10 to 15 minutes. If you wear contacts, remove them and put them with the contaminated clothing. Do not put the contacts back in your eyes (even if they are not disposable contacts). If you wear eyeglasses, wash them with soap and water and then you can put them back on.

Disposing of your clothes:

- After you have washed yourself, place your clothing inside a plastic bag. Avoid touching contaminated areas of the clothing. If you can't avoid touching contaminated areas, or you aren't sure where the contaminated areas are, wear rubber gloves, turn the bag inside out and use it to pick up the clothing, or put the clothing in the bag using tongs, tool handles, sticks, or similar objects. Anything that touches the contaminated clothing should also be placed in the bag. If you had taken out your contacts, put them in the plastic bag, too.

- Seal the bag, and then seal that bag inside another plastic bag. Disposing of your clothing in this way will help protect you and other people from any chemicals that might be on your clothes.
- When the local or state health department or emergency personnel arrive, tell them what you did with your clothes. The health department or emergency personnel will arrange for further disposal. Do not handle the plastic bags yourself.

For more information about ricin contact one of the following:

- Regional poison control center (1-800-222-1222)
- Centers for Disease Control and Prevention, Public Response Hotline (CDC)
 English (888) 246-2675
 Espanol (888) 246-2857
 TTY (866) 874-2646

Emergency Preparedness and Response website at www.bt.cdc.gov

E-mail inquiries: cdcresponse@ashastd.org

Mail inquiries:

Public Inquiry c/o BPRP
 Bioterrorism Preparedness and Response Planning
 Centers for Disease Control and Prevention
 Mailstop C-18
 1600 Clifton Road
 Atlanta, GA 30333

- Agency for Toxic Substances and Disease Registry (ATSDR) (1-888-422-8737)

E-mail inquiries: atsdric@cdc.gov

Mail inquiries:

Agency for Toxic Substances and Disease Registry
 Division of Toxicology
 1600 Clifton Road NE,
 Mailstop E-29
 Atlanta, GA 30333

This fact sheet is based on CDC’s best current information. It may be updated as new information becomes available.

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The Texas Department of Insurance,
 Division of Workers’ Compensation (TDI/DWC)
 E-mail resourcecenter@tdi.state.tx.us
 or call 1-800-687-7080 for more information.

Safety Violations Hotline
1-800-452-9595
safetyhotline@tdi.state.tx.us