

**Florida Poison Information Center/Jacksonville
At Shands Jacksonville
University of Florida Health Science Center
1-800-222-1222**

RICIN

There has been much concern lately in the law enforcement community regarding the toxin "Ricin." This concern is justifiable, but there are some misconceptions needing clarification, particularly regarding its route of exposure. This memo will hopefully provide some understanding about this toxin and clarify any misconceptions.

Ricin is a plant toxin that is produced from castor beans, which are ubiquitous throughout the world. Castor bean processing for the production of castor oil is a worldwide activity. The toxin is actually concentrated in the shell of the castor bean, and the mash waste from the commercial production of castor oil contains approximately 5% ricin. Additionally, ricin is easy to produce from castor beans in home "labs." The distilled product is a white powder and could easily be mistaken for cocaine or methamphetamine.

Bottomline: Ricin is ubiquitous, easy to access, and hard to recognize.

Ricin is one of the most toxic substances in the world, ranking as one of the top three most toxic substances by weight. It is estimated that approximately 1 milligram (mg) per kilogram (kg) body weight is lethal. This equates to the ingestion of approximately 5 to 8 castor beans by an adult (less by a small child), or in its pure powder form, less than a nickel-sized amount of powder. It causes its toxic effects by disrupting the cells it comes into contact with, leading to cell death and massive sloughing of affected cells. Much smaller quantities are required when exposure is by inhalation or inoculation (less than 0.03 mg / kg).

Bottomline: Ricin is extremely toxic.

Ricin exposure may occur by **ingestion, inhalation, or inoculation**, and its toxic manifestations will differ accordingly. Symptoms would be expected to begin within 3-8 hours after exposure and death within 36-48 hours.

Ingestion: Toxic effects include nausea, vomiting, internal bleeding of the stomach and intestines, circulatory collapse, shock, multi-organ failure and death.

Inhalation: Toxic effects include cough, chest tightness, shortness of breath, nausea and vomiting, profuse sweating and muscle aches; symptoms would then progress to the lungs filling with fluid and sloughed lung tissue leading to respiratory distress, cyanosis (blue discoloration due to lack of oxygen reaching the tissues), circulatory failure and death.

Inoculation: Toxic effects include significant destruction to the tissues directly inoculated followed by spread to the lymph nodes and other organs leading to multi-organ failure, shock and death.

NOTE: Toxic exposure does not occur by skin contact with the toxin unless it is subsequently ingested, inhaled, or exposed to an open wound.

The concern is that in the wrong hands, poisoning might occur by contaminating water or foodstuffs, by “baiting” law enforcement officers with the white powder look-a-like (compared to cocaine or methamphetamine), by inoculation via injection or projectile, or by aerosolization (especially as might occur in biological warfare with the release of the toxin as a toxic cloud).

Protection and Medical Countermeasures:

There is no specific treatment or antidote, although vaccines are under development by the U.S. Army. Therefore, the best treatment is **AVOIDANCE**.

Full Protective Gear should be worn by all personnel coming in contact with the patient. The patient should be decontaminated prior to entering the Health Care Facility.

A **protective mask** offers protection from aerosol exposure and should be worn if field-testing ricin in its white powder form. Aerosolization will not occur by simply being near the powder or opening a bag containing the powder unless it is forcibly aerosolized or thrown into one’s face.

Protective gloves offer protection from casual skin contamination. Again, exposure does not occur by mere skin contact with the toxin, however, if a contaminated hand, glove, or garment is then placed in one’s mouth or nose, toxicity would likely ensue. **DO NOT FIELD TASTE ANY WHITE POWDER.**

Decontamination: Ricin may be inactivated with 0.05% hypochlorite solution (1 tbsp of bleach per gallon of water). Since it is not dermally active and is involatile, decontamination may not be as critical as with certain other biological and chemical agents.

Outbreak control: Ricin does not, in general, pose a risk of secondary aerosolization. Quarantine or isolation of affected individuals would be of no value.

Call the Florida Poison Information Center Network for information and/or to report exposures.



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Centers are located in Jacksonville, Tampa, & Miami