Abrin (Bioterrorism)

WHAT IS ABRIN?

- Abrin is a natural poison that is found in the seeds of a plant called the rosary pea or jequirity pea. These seeds are red with a black spot covering one end.
- Abrin is similar to ricin, a toxin that is also found in the seeds of a plant (the castor bean plant). However, abrin is much more poisonous than ricin.
- Abrin can be made in the form of a powder, a mist, a pellet, or it can be dissolved in water.
- Powdered abrin is yellowish-white in color.
- Abrin is a stable substance, meaning that it can last for a long time in the environment despite extreme conditions such as very hot or very cold temperatures.

WHERE ABRIN IS FOUND AND HOW IT IS USED

- Abrin is not known to have been used in any wars or terrorist attacks.
- The rosary pea, which is the source of abrin, is common to many tropical areas throughout the world and is sometimes used as an herbal remedy.
- The seeds of the rosary pea have been used to make beaded jewelry, which can lead to abrin poisoning if the seeds are swallowed.
- Abrin has some potential medical uses, such as in treatment to kill cancer cells.

HOW YOU COULD BE EXPOSED TO ABRIN

- It would take a deliberate act to obtain abrin from rosary pea seeds and use it to poison people. Accidental exposure to abrin is not likely.
- You could *inhale* (breathe in) abrin if it is in the form of a mist or a powder.
- You could be exposed if you touch surfaces on which abrin particles or droplets have landed, or if particles or droplets of abrin land on your skin or in your eyes.
- You could *ingest* (swallow) abrin if it is in food or water.
- Pellets of abrin, or abrin dissolved in a liquid, could be injected into a person's body.
- Abrin poisoning is not contagious. It cannot be spread from person to person through casual contact.

HOW ABRIN WORKS

- Abrin 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.
- Effects of abrin poisoning depend on whether abrin was inhaled, ingested, or injected.

SIGNS AND SYMPTOMS OF ABRIN EXPOSURE

- The major *symptoms* (problems) of abrin poisoning depend on the route of exposure and the dose received, though many organs may be affected in severe cases.
- Initial symptoms of abrin poisoning by inhalation may occur within 8 hours of exposure. Following ingestion of abrin, initial symptoms may occur in less than 6 hours but usually are delayed for 1 to 3 days.
- Inhalation: Within a few hours of inhaling significant amounts of abrin, the likely symptoms would be *respiratory distress* (difficulty breathing), fever, cough, *nausea* (feeling sick to your stomach), and tightness in the chest. Heavy sweating may follow as well as fluid building up in the lungs (*pulmonary edema*). This would make breathing even more difficult, and the skin might turn blue. Excess fluid in the lungs would 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.
- Ingestion: If someone swallows a significant amount of abrin, 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.

- Skin and eye exposure: Abrin in the powder or mist form can cause redness and pain of the skin and the eyes.
- Death from abrin 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 abrin.

HOW ABRIN POISONING IS TREATED

Because no antidote exists for abrin, the most important factor is avoiding abrin exposure in the first place. If exposure cannot be avoided, the most important factor is then getting the abrin off or out of the body as quickly as possible. Abrin poisoning is treated by giving victims supportive medical care to minimize the effects of the poisoning. The types of supportive medical care would depend on several factors, such as 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 abrin 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 ABRIN

- If there is a suspicion that people have inhaled abrin, 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 tell for sure that a person has been exposed to abrin.

HOW YOU CAN PROTECT YOURSELF, AND WHAT TO DO IF YOU ARE EXPOSED TO ABRIN

- First, get fresh air by leaving the area where the abrin was released. Moving to an area with fresh air is a good way to reduce the possibility of death from exposure to abrin.
  - If the abrin release was outside, move away from the area where the abrin was released.
  - If the abrin release was indoors, get out of the building.
- If you are near a release of abrin, 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 abrin, 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 abrin 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 abrin from your skin with large amounts of soap and water. Washing with soap and water will help protect people from any chemicals on their bodies.
  - 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. You can put your eyeglasses back on after you wash them.
- 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 cannot avoid touching contaminated areas, or you are not sure where the contaminated areas are, wear rubber gloves 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 wear 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.
- If someone has ingested abrin, do not induce vomiting or give fluids to drink.
- Seek medical care right away. Call your local emergency department (911 in the U.S.).

Most of this information is courtesy of US Government CDC. In times of an emergency, much of this material may not apply when it comes to specialized care and testing. These are guidelines to help you when that care is not available. Some of this information is very technical and difficult to understand, but hopefully someone will be available for help in treatment and understanding.

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