Bromine (Biochemical Terrorism)

WHAT IS BROMINE?

- Bromine is a naturally occurring element that is a liquid at room temperature.
- It has a brownish-red color with a bleach-like odor, and it dissolves in water.

WHERE BROMINE IS FOUND AND HOW IT IS USED

- Bromine is found naturally in the earth's crust and in seawater in various chemical forms. Bromine can also be used as an alternative to chlorine in swimming pools.
- Products containing bromine are used in agriculture and sanitation and as *fire retardants* (chemicals that help prevent things from catching fire).
- Some bromine-containing compounds were historically used as sedatives (drugs that can make people calm or sleepy).

HOW YOU COULD BE EXPOSED TO BROMINE?

- Following the release of bromine into water, you could be exposed by drinking the contaminated water.
- If food becomes contaminated with bromine, you could be exposed by eating the contaminated food.
- Following release of bromine gas into the air, you could be exposed by breathing the fumes.
- Skin exposure to bromine could occur through direct contact with bromine liquid or gas.
- Bromine gas is heavier than air, so it would settle in low-lying areas.

HOW BROMINE WORKS

Bromine works by directly irritating the skin, mucous membranes, and tissues. The seriousness of poisoning caused by bromine depends on the amount, route (drink, eat, breathe, or through skin), and length of time of exposure, as well as the age and pre-existing medical condition of the person exposed.

IMMEDIATE SIGNS AND SYMPTOMS OF EXPOSURE TO BROMINE

- Breathing bromine gas could cause you to cough, have trouble breathing, get a headache, have irritation of your mucous membranes (inside your mouth, nose, etc.), be dizzy, or have watery eyes.
- Getting bromine liquid or gas on your skin could cause skin irritation and burns. Liquid bromine that touches your skin may first cause a cooling sensation that is closely followed by a burning feeling.
- Swallowing bromine-containing *compounds* (combinations of bromine with other chemicals) would cause different effects depending on the compound. Swallowing a large amount of bromine in a short period of time would be likely to cause symptoms such as nausea and vomiting (gastrointestinal symptoms).
- Showing these signs and symptoms does not necessarily mean that a person has been exposed to bromine.

LONG-TERM HEALTH EFFECTS OF EXPOSURE TO BROMINE

- Survivors of serious poisoning caused by *inhaling* (breathing in) bromine may have long-term lung problems.
- People who survive serious bromine poisoning may also have long-term effects from damage done by what is called systemic poisoning; for example, kidney or brain damage from low blood pressure.

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

- Get fresh air by leaving the area where the bromine was released. Moving to an area with fresh air is a good way to reduce the possibility of bad health effects from exposure to bromine.
- If the bromine release was outdoors, move away from the area where the bromine was released. Go to the highest ground possible, because bromine is heavier than air and will sink to low-lying areas.
- If the bromine release was indoors, get out of the building.
- If you are near a release of bromine, emergency coordinators may tell you to either *evacuate* (leave) the area or to “shelter in place” (stay where you are) inside a building to avoid being exposed to the chemical. For more information on evacuation during a chemical emergency, see “Facts About Evacuation” at

www.bt.cdc.gov/planning/evacuationfacts.asp. For more information on sheltering in place during a chemical emergency, see "Facts About Sheltering in Place" at http://www.bt.cdc.gov/planning/Shelteringfacts.asp.

- If you think you may have been exposed to bromine, you should remove your clothing, rapidly wash your entire body with soap and water, and get medical care as quickly as possible.
  - **Removing your clothes:** Quickly take off clothing that may have bromine on it. Any clothing that has to be pulled over your head should be cut off your body instead of pulled over your 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 bromine from your skin with large amounts of soap and water. Washing with soap and water will help you and other people remove any chemicals on your body. 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. For more information about cleaning your body and disposing of your clothes after a chemical release, see "Chemical Agents: Facts About Personal Cleaning and Disposal of Contaminated Clothing" at www.bt.cdc.gov/planning/personalcleaningfacts.asp.

TREATMENT

- Seek medical attention right away. Dial 911 and explain what has happened.
- If someone has swallowed bromine, do not try to make them vomit or give them fluids to drink.
- Bromine poisoning is treated with supportive medical care (for example, oxygen, fluids given through a needle into your vein) in a hospital setting. No specific *antidote* exists for bromine poisoning. (An antidote is a medicine that reverses the effects of a poison.)
- The most important thing is for people to remove themselves from the exposure site and seek medical treatment as soon as possible.

FOR MORE INFORMATION ABOUT BROMINE, YOU CAN 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
Español (888) 246-2857
TTY (866) 874-2646
Emergency Preparedness and Response Web site (http://www.bt.cdc.gov)
E-mail inquiries:cdcresponse@ashastd.org

Agency for Toxic Substances and Disease Registry (ATSDR)
1-888-422-8737
E-mail inquiries:atsdric@cdc.gov

Centers for Disease Control and Prevention (CDC), National Institute for Occupational Safety and Health (NIOSH), Pocket Guide to Chemical Hazards (www.cdc.gov/niosh/npg/npgd0064.html).

This fact sheet is based on CDC's best current information. It may be updated as new information becomes available. For more information, visit www.bt.cdc.gov or call the CDC public response hotline at (888) 246-2675 (English), (888) 246-2857 (Espanola), or (866) 874-2646 (TTY).

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.

Document Released: 08/29/2005 Document Re-Released: 03/16/2010
ExitCare® Patient Information ©2011 ExitCare, LLC.