

This fact sheet answers the most frequently asked health questions (FAQs) about the blister agents, Lewisite and Mustard-Lewisite. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It is important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

**HIGHLIGHTS:** It is unlikely that the general population will be exposed to blister agents Lewisite or Mustard-Lewisite. People who breathe in vapors of Lewisite or Mustard-Lewisite may experience damage to the respiratory system. Contact with the skin or eye can result in serious burns. Lewisite or Mustard-Lewisite also can cause damage to bone marrow and blood vessels. Exposure to high levels may be fatal. Blister agents Lewisite and Mustard-Lewisite have not been found in any of the 1,585 National Priorities List sites identified by the Environmental Protection Agency (EPA).

### What are Lewisite and Mustard-Lewisite?

Lewisite is an oily, colorless liquid with an odor like geraniums. Mustard-Lewisite Mixture is a liquid with a garlic-like odor. Mustard-Lewisite is a mixture of Lewisite and a sulfur mustard known as HD.

Lewisite might have been used as a chemical weapon by Japan against Chinese forces in the 1930s, but such reports have not been confirmed. Any stored Lewisite in the United States must be destroyed before April 2007, as mandated by the Chemical Weapons Convention.

### What happens to Lewisite and Mustard-Lewisite when they enter the environment?

- Blister agents Lewisite and Mustard-Lewisite could enter the environment from an accidental release.
- In air, blister agents Lewisite and Mustard-Lewisite will be broken down by compounds that are found in the air, but they may persist in air for a few days before being broken down.
- Lewisite and Mustard-Lewisite will be broken down in water quickly, but small amounts may evaporate.

- Lewisite and Mustard-Lewisite will be broken down in moist soil quickly, but small amounts may evaporate.

- Lewisite and Mustard-Lewisite do not accumulate in the food chain.

### How might I be exposed to Lewisite and Mustard-Lewisite?

- The general population will not be exposed to blister agents Lewisite or Mustard-Lewisite.
- Lewisite and Mustard-Lewisite are no longer produced in the United States.
- People that are potentially exposed to Lewisite or Mustard-Lewisite are soldiers who might be exposed to chemical weapons or people who work at military sites where these compounds are stored.

### How can Lewisite and Mustard-Lewisite affect my health?

If you breathe Lewisite or Mustard-Lewisite vapors, your airways will immediately become irritated. You could experience burning pain in the nose and sinuses, laryngitis,

**BLISTER AGENTS:  
LEWISITE (L) CAS #541-25-3  
MUSTARD-LEWISITE MIXTURE (HL) CAS # NOT AVAILABLE****ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>**

cough, shortness of breath, nausea, and vomiting. You could also experience airway tissue damage and accumulation of fluid in your lungs, which could result in death.

Contact of the skin with Lewisite or Mustard-Lewisite vapors or liquid will result in local pain, swelling, and rash, followed by blistering that might be delayed for hours. If Lewisite or Mustard-Lewisite vapors or liquid contact your eyes, you will suffer immediate pain and rapid swelling, as well as serious damage to the cornea and other parts of the eye.

Ingestion of Lewisite or Mustard-Lewisite will burn your mouth and throat, will cause severe stomach pain, nausea, vomiting, and bloody stools.

If some of the Lewisite and Mustard-Lewisite that you breathe, touch, or ingest, pass to your blood stream, it can cause bone marrow damage and fluid loss from your blood vessels, which could result in low blood pressure and damage to the rest of your body.

We do not know if exposure to Lewisite or Mustard-Lewisite causes reproductive effects in humans.

**How likely are Lewisite and Mustard-Lewisite to cause cancer?**

The Department of Health and Human Services (DHHS), the International Agency for Research on Cancer (IARC), and the EPA have not classified Lewisite as to its carcinogenicity. Both the DHHS and IARC have classified the blister agent H/HD (the sulfur mustard used in the Mustard-Lewisite mixture) as a human carcinogen. We do not know whether the Mustard-Lewisite mixture might also be a human carcinogen.

**How can Lewisite and Mustard-Lewisite affect children?**

There is no information on children exposed to Lewisite or Mustard-Lewisite, but children would probably be affected in the same ways as adults. We do not know whether children differ from adults in their susceptibility to these blister agents.

We do not know whether Lewisite or Mustard-Lewisite can cause developmental effects in humans.

**How can families reduce the risk of exposure to Lewisite and Mustard-Lewisite?**

It is unlikely that families will be exposed to Lewisite or Mustard-Lewisite.

**Is there a medical test to show whether I've been exposed to Lewisite and Mustard-Lewisite?**

There are no specific tests to indicate whether you have been exposed to Lewisite or Mustard-Lewisite. The presence of arsenic in the urine could indicate if you have been exposed to one of these blister agents.

**Has the federal government made recommendations to protect human health?**

An Airborne Exposure Limit (as recommended by the Surgeon General's Working Group, U.S. Department of Health and Human Services) of 0.003 milligrams of Lewisite and Mustard-Lewisite per cubic meter of air (0.003 mg/m<sup>3</sup>) has been established as a time-weighted average (TWA) for the workplace.

**Where can I get more information?** For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone: 1-888-422-8737, FAX: 770-488-4178. ToxFAQs™ Internet address is <http://www.atsdr.cdc.gov/toxfaq.html>. ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

