



FACT SHEET

What are blistering agents/vesicants?

Blistering agents, also known as vesicants, are man-made chemical warfare agents. Exposure to these chemicals can cause skin blisters and burns, as well as irritation to the eyes and lungs. Examples of blistering agents are mustard agents, such as sulfur mustard (mustard gas) and nitrogen mustard.

Where are blistering agents found and how are they used?

Blistering agents are not found in nature; they are man-made chemicals. They were the most commonly used chemical warfare agents during World War I. Today, more than a dozen countries have blistering agents. A mandate by the Chemical Weapons Convention requires all stockpiles of chemical agents, including blistering agents, to be destroyed worldwide before April 2007.

How might I be exposed to a blistering agent?

Blistering agents could be used by terrorists. They can be released in areas as a liquid or vapor. You are exposed to a blistering agent only when you come into contact with it. The most likely routes of exposure are by breathing it in or by skin or eye contact. Blistering agents can easily pass through clothing and get onto the skin. Accidental releases from military storage or laboratories could also cause exposure.

Blistering agents can last from 1-2 days in the environment under average weather conditions, and from weeks to months under very cold conditions. The vapor can also be carried long distances by wind.

How can blistering agents affect my health?

Contact with a blistering agent can cause bodily injury. The extent of injury depends on the amount you are exposed to, how long you are exposed, and how you come in contact.

- Exposure to a blistering agent gas is usually not deadly. When sulfur mustard was used during World War I, it killed fewer than 5% of the people who were exposed and got medical care.
- Exposure to a liquid blistering agent can cause second- and third-degree skin burns. It can be particularly harmful to sweaty body parts, such as the underarm area. Exposure may also cause skin blisters within a few days. Extensive skin burning can be fatal.



BLISTERING AGENTS (VESICANTS)

- Exposure to blistering agents can make the eyes burn and eyelids swell, or make a person blink a lot. Extensive eye exposure can cause permanent blindness.
- Breathing in blistering agents can cause coughing, bronchitis, and other breathing symptoms. Exposure to very high levels can cause long-term respiratory disease or death.
- Blistering agents may cause cancer in the airways, lungs, skin, and maybe other areas of the body years after exposure. It is not known whether blistering agents can affect people's ability to reproduce.

What are signs and symptoms of exposure to a blistering agent?

People may not know right away that they have been exposed to a blistering agent. Depending on the agent and the amount of the exposure, signs and symptoms may take 2-24 hours to appear (as with mustards) or may occur immediately (as with phosgene oxime or lewisite). Some people may have symptoms sooner.

Specific effects of exposure include:

- **Skin:** Redness and itching may occur 2-8 hours after exposure; yellow blistering of affected skin may appear later.
- **Eyes:** Irritation, pain, swelling, and tearing may occur within 3-12 hours. A more severe exposure may cause symptoms within 1-2 hours and may also include light sensitivity, severe pain, or blindness (lasting up to 10 days).
- **Respiratory tract:** Runny nose, sneezing, hoarseness, bloody nose, sinus pain, shortness of breath, and cough may occur within 12-24 hours of a mild exposure and within 2-4 hours of a severe exposure.
- **Digestive tract:** Abdominal pain, diarrhea, fever, nausea, and vomiting may occur.

Showing these signs and symptoms does not necessarily mean that you have been exposed to a blistering agent. These symptoms can also be caused by other conditions.

What should I do if I'm exposed to a blistering agent?

Reduce your exposure as soon as possible.

1. *Leave the affected area.* Immediately leave the area where the blistering agent was released. If it is released in an open space, it will spread out rapidly; if it is released within an enclosed space, get fresh air as fast as you can. People should keep in mind that blistering agents are heavier than air, so vapors will collect in lower areas.



BLISTERING AGENTS (VESICANTS)

2. *Get the blistering agent off your body.* If you have direct contact with the chemical, get the blistering agent off your body to prevent or reduce injury.
3. *Quickly remove any clothing* that has liquid sulfur mustard on it.
4. *Immediately wash exposed skin and eyes with plain, clean water.* Eyes need to be flushed with water for 5-10 minutes. Since affected eyes can become sensitive to light, sunglasses may be worn to protect the eyes.
5. *If swallowed, do NOT induce vomiting.* Drink milk.
6. *Dial 911.* Explain what has happened and seek medical attention right away.

What is the medical treatment for people exposed to a blistering agent?

Supportive medical care is given to victims to minimize the effects of blistering agent exposure. The most important factors are to remove the blistering agent from the body and flush the eyes with water.

Is there a medical test to determine whether I have been exposed to a blistering agent?

There is no effective medical test to determine whether you have been exposed to a blistering agent.

Are there any special risks for children?

Children are more vulnerable than adults to the effects of blistering agents. Burns may be more severe and blisters may appear sooner in children. Coughing and vomiting have been reported as early symptoms of exposure to a blistering agent in children. We do not know if exposure causes birth defects or other developmental effects in humans.

What are the effects of blistering agent exposure on pets?

Pets exposed to a blistering agent are likely to experience similar toxic effects as those experienced by humans. If possible, remove the chemical from your pet(s) with soap and water. Be sure to protect yourself from getting exposed by wearing gloves and protective clothing. Contact either a veterinarian or the ASPCA Animal Poison Control Center (1-888-426-4435).



BLISTERING AGENTS (VESICANTS)

Is there anything specific that Houstonians can do to prepare for a possible chemical terrorism event?

Emergency management officials recommend an "all-hazards" approach to emergency preparedness, which means that one plan can be used for several kinds of emergencies. Creating a household disaster plan, assembling an emergency supply kit, and putting together a bag of supplies you can grab on the go (a "go-bag") will provide you with the tools you need for almost any emergency, including a chemical release. For more information on developing family disaster plans or assembling emergency supply kits, visit **READYAmerica** (<http://www.ready.gov/america/index.html>).

The City of Houston Department of Health and Human Services, along with other government agencies and health institutions, will do everything possible to protect the health of all persons who live, work, or are visiting in Houston. During any public health emergency, health officials will provide instructions through TV and radio on how best to protect yourself and your loved ones. If a chemical release does occur in Houston, stay tuned to the news media. Do NOT immediately rush to hospital emergency rooms. You may not be in immediate danger, and hospitals have to treat those who need immediate care. Furthermore, many treatments will be provided in non-hospital settings (emergency clinics) that would be established in multiple locations throughout the city.

What if fears about terrorism are having a serious impact on my family and work life?

After the events of September 11th, 2001, it is reasonable for individuals to feel anxious about their personal safety. However, if anxiety stops you from doing things that you would normally do, it might be helpful to speak with a professional counselor. Your healthcare provider can make a referral, or you can get help by calling Crisis Hotline at 713-HOTLINE (English) or 713-526-8088 (Spanish), or United Way Help Line at 211.

Additional information can be found at:

- **U.S. Centers for Disease Control and Prevention**
<http://www.bt.cdc.gov/chemical/>
- **Agency for Toxic Substances and Disease Registry**
<http://www.atsdr.cdc.gov/>