
FACT SHEET

What is sarin?

Sarin is a man-made chemical warfare agent classified as a "nerve agent." Nerve agents are among the most deadly and fast-acting of the chemical warfare agents. Sarin was originally developed as an insecticide in 1938 in Germany. It is a clear, colorless, tasteless liquid that has no odor. Liquid sarin can quickly evaporate into a vapor (gas) and spread into the environment. Because it evaporates so quickly, sarin presents an immediate, but short-lived, threat.

Where is sarin found and how it is used?

Sarin is man made. It is not found naturally anywhere in the environment. Sarin and other nerve agents may have been used during the Iran-Iraq War in the 1980s. Sarin was used in two terrorist attacks in Japan in 1994 and 1995.

How might people be exposed to sarin?

If sarin is released into the air, people may be exposed through skin contact or eye contact or by breathing in the contaminated air. Clothing can release sarin for about 30 minutes after it has come in contact with sarin vapor; this gas can harm anyone who breathes it in. Aside from a terrorist attack, an accidental release from military storage or a laboratory could cause exposure.

How does sarin hurt people?

Nerves control bodily functions and movements. Nerve agents can damage the normal functioning of the nervous system, resulting in uncontrolled movements and overstimulation of muscles and glands. If the muscles and glands tire out, this can eventually lead to paralysis or death.

The extent of injury from exposure to sarin depends on the amount a person is exposed to, how long a person is exposed, and how a person comes in contact with it.



What are the signs and symptoms of sarin exposure?

People may not know if they have been exposed to sarin because it has no odor. Symptoms appear within a few seconds after exposure to sarin gas, and within a few minutes after exposure to liquid sarin.

- **People exposed to a low or moderate amount of sarin may experience some or all of the following:**
- Eye symptoms
 - Watery eyes
 - Small, pinpoint pupils
 - Eye pain
 - Blurred vision
- Respiratory (breathing-related) symptoms
 - Runny nose
 - Cough
 - Chest tightness
 - Rapid breathing
- Gastrointestinal (stomach-related) symptoms
 - Diarrhea
 - Increased urination
 - Nausea, vomiting, and/or abdominal pain
- Nervous system symptoms
 - Drooling and excessive sweating
 - Confusion
 - Drowsiness
 - Weakness
 - Headache
- Circulatory (heart-related) symptoms
 - Slow or fast heart rate
 - Abnormally low or high blood pressure

Exposure to a large amount of sarin by any route may result in these additional health effects:

- Loss of consciousness;
- Convulsions (uncontrolled muscle spasms/seizures);
- Paralysis;
- Respiratory failure possibly leading to death.

Showing the signs and symptoms listed above does not necessarily mean that a person has been exposed to sarin; these symptoms can also be caused by other conditions.

What are the long-term health effects of sarin exposure?

Mild or moderately exposed people usually recover completely. Fatigue, irritability, nervousness, and memory defects may last for as long as 6 weeks after recovery from exposure. It is not known whether exposure to nerve agents causes cancer or reproductive effects in humans.

What should I do if I'm exposed to sarin?

Reduce your exposure as soon as possible.

1. *Get fresh air as fast as you can.* Immediately leave the area where the sarin is released. If the sarin is released in an open space, it will spread out rapidly. If sarin is released indoors, get out of the building. People should keep in mind that sarin is heavier than air, so vapors will collect in lower areas.
2. *Quickly remove any clothing that has liquid sarin on it.* If possible, any clothing that has to be pulled over the head should be cut off the body.
3. *Rinse the eyes.* If eyes are burning or vision is blurred, rinse the eyes with clean water for 10-15 minutes.
4. *Wash the skin as soon as possible.* If sarin gets on to the skin, wash with large amounts of soap and water. Do not rub the skin forcefully to avoid pressing sarin into the skin.
5. *If swallowed, do NOT induce vomiting or drink any fluids.*
6. *Dial 911.* Explain what has happened and seek medical attention right away.

How is sarin poisoning treated?

First and most importantly, victims should be removed from the exposure, decontaminated (clothing removed, eyes rinsed, and the body washed), and given medical treatment as soon as possible. Sarin poisoning is treated with antidotes and with supportive medical care. Antidotes are most useful if given as soon as possible after exposure.

Is there a medical test to show whether I've been exposed to sarin?

Yes. There are medical tests that can determine whether you have been exposed to sarin. One such test measures the levels of a substance in the blood known as cholinesterase, which is needed for the proper functioning of the nervous system. Exposure to nerve agents may lower cholinesterase levels. Levels can stay low for months following an exposure. However, cholinesterase levels in the blood can be low for reasons other than sarin exposure.

Are there any special risks to children?

Children exposed to nerve agents are likely to experience the same harmful effects experienced by exposed adults. Children are generally more vulnerable than adults to the effects of any harmful chemical. It is not known whether exposure to sarin can cause developmental effects.

What are the effects of exposure on pets?

Pets exposed to sarin are likely to experience similar toxic effects as those experienced by humans. If possible, remove the sarin 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).

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. Were a biological release to 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 Helpline at 211.

Additional information can be found at:

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