

Soman (GD)

What is soman (GD)?

Soman is a highly toxic substance belonging to a class of chemicals known as nerve agents. Soman, also referred to as GD, is clear and has a faint fruity or camphor-like odor. It is not naturally-occurring. When heated, liquid soman readily turns into a gas.

Soman and other nerve agents are structurally similar to a family of common insecticides called organophosphates, but they are much more potent. As the name implies, nerve agents work by attacking the nervous system.

Can soman be used as an attack agent?

Nerve agents, including soman, are classified as weapons of mass destruction. They can be dispersed from missiles, artillery shells, land mines, spray tanks, and by other methods. Because soman vaporizes when heated, breathing in air containing soman is particularly dangerous.

How are people exposed to soman?

There are several ways that people can be exposed to soman. The most likely way is for people to breathe air containing soman gas or droplets. People also can be exposed when liquid soman or droplets come into contact with the skin or eyes. Because soman mixes easily with water, it has the potential to be used as a poison for food and water supplies. Clothing from a contaminated person can release vapors for about 30 minutes after exposure, thus endangering people who were not in an original area of release.

Effects from inhaling soman gas are usually immediate, while effects from exposure to liquid soman may be immediate or delayed.

What should you do if you are exposed to soman?

If you are in an area where soman has been released, leave quickly and go to an area with fresh air. If the release is outdoors, move to higher ground. Because soman gas is heavier than air, it will sink to low-lying areas.

Remove your outer clothing, taking care not to touch the outside of your clothing to your skin. Carefully put contaminated clothing in plastic bags, and set them aside for proper disposal by authorities. Clothing contaminated with soman should never be washed or worn again.

Decontaminate yourself by washing your body thoroughly with soap and water, preferably outdoors to avoid contaminating indoor facilities. The sun also will help degrade the soman. Rinse your eyes with water for 10 to 15 minutes. Then quickly seek medical attention.

How does soman affect the body?

Soman and other nerve agents work by interfering with an enzyme critical to the normal control of nerve impulses to muscles, glands and other nerve cells in the brain, resulting in numerous reactions.

Signs and symptoms of low to moderate exposure include:

- Nausea and vomiting
- Abdominal cramps and diarrhea
- Small, pinpoint pupils
- Runny eyes and nose
- Blurred vision and aching eyes
- Excessive drooling and sweating
- Uncontrolled urination
- Tightness in the chest
- Slow breathing followed by rapid breathing that may become slow again*
- Slow heart rate followed by fast heart rate that may become slow again*
- Low blood pressure followed by high blood pressure that may become low again*
- Drowsiness
- Confusion

Large doses may cause the following symptoms:

- Uncontrolled muscle tremors and contractions
- Convulsions
- Loss of consciousness
- Paralysis
- Respiratory failure
- Death

People who experience mild or moderate exposure may recover completely. Severe exposure is often fatal.

How is soman exposure treated?

Exposure to soman can be treated with specific antidotes – atropine and pralidoxime chloride (2-PAM) – along with supportive medical care in a hospital. These nerve agent antidotes are most effective when given within minutes after exposure.

**Respiratory rate, heart rate and blood pressure follow a similar cycle. Reaction to the toxin causes an initial decrease. Then, to compensate for low levels of oxygen in the blood and brain, rates increase. The cycle may end with rates becoming slow again.*