

Fact Sheet

Nerve Agents:

Tabun (GA), Sarin (GB), Soman (GD) and VX



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What are Nerve Agents?



Nerve agents GA (tabun), GB (sarin), GD (soman), and VX are manufactured compounds. The G-type agents are clear, colorless, tasteless liquids capable of being mixed in water and most organic solvents. GB is odorless and is the most volatile nerve agent. GA has a slightly fruity odor, and GD has a slight camphor-like odor. VX is a clear, amber-colored odorless, oily liquid. It is also capable of being mixed with water and dissolves in all solvents. VX is the least volatile nerve agent.

Exposure

For immediate assistance, call the Poison Control Center Hotline: 1-800-222-1222.

Nerve agents GA, GB, GD, and VX could enter the environment from an accidental release. When released to the air, they will be broken down by compounds that are found in the air, but they may persist in the air for a few days before being broken down. If released into the water, they will be broken down quickly but small amounts may

evaporate. When in moist soil, they will be broken down quickly. However, small amounts may evaporate into air or travel below the soil surface and contaminate groundwater.

The general population will not be exposed to these nerve agents unless there is an accidental or intentional release.

Health Effects

Even in very small amounts, nerve agents are highly toxic if you inhale or swallow them, or if they come in contact with the skin or eyes. In general, the manifestation of toxic effects is faster if inhaled or swallowed than if they contact skin. The initial effects also depend on the amount an individual is exposed to. The onset of mild to moderate effects after dermal exposure may be delayed for as long as 18 hours. Regardless of the route of exposure, the manifestation of nerve agent exposure includes:

- Runny nose
- Chest tightness
- Pinpoint pupils
- Shortness of breath
- Excessive salivation
- Sweating
- Nausea or vomiting
- Abdominal cramps
- Involuntary defecation and urination
- Muscle twitching
- Confusion
- Seizures
- Paralysis or coma
- Respiratory Paralysis
- Death

Most of the nerve agents were originally produced in a search for insecticides, but because of their toxicity, they were evaluated for military use. Nerve agents have been used in wars and by terrorists. They are known to be stored by several nations, including the United States. The United States no longer produces nerve agents GA, GB, GD, and VX.

Incapacitating effects occur within 1 to 10 minutes and fatal effects can occur within 1 to 10 minutes for GA, GB, and GD and within 4 to 18 hours for VX. Fatigue, irritability, nervousness, and memory defects may persist for as long as 6 weeks after recovery from an exposure episode.

Diagnosis

There are medical tests available to determine whether an individual has been exposed to nerve agents. There are tests to measure degradation or residual products of nerve agents in urine, but are not generally useful. A different kind of test measures the levels of a substance called cholinesterase in the blood. If these levels are less than half what they should be after exposure to nerve gases, the individual may get symptoms of poisoning. Cholinesterase levels in the blood can stay low for months after exposure to nerve agents. Measurement of cholinesterase levels in blood is not specific for exposure to nerve agents.

Treatment

If exposed to a nerve agent, remove all clothing immediately and wash with copious amounts of soap and water. Seek emergency medical attention! Alert all dispatch personnel to the potential of exposure to nerve gas! Because nerve agents act rapidly, treatment must begin immediately after exposure or death may occur.

Health care professionals use an auto-injector to inject a mixture of atropine and the reactivator into patients exposed to nerve agents. The auto-injector consists of the two active components which are injected into an exposed individual through the use of a very long needle. The auto-injector is usually injected into an individual's thigh or another area where the antidote can reach the heart relatively quickly.

Atropine protects against the excess of acetylcholine formed during nerve agent poisoning. The reactivator's job is to restore acetylcholinesterase to its normal functions. The degree of difficulty in combating the nerve agent depends greatly on the quantity and type of nerve agent.



For more sources of information on this topic visit or contact:

ST. CLAIR COUNTY HEALTH DEPARTMENT www.scchealth.co

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH www.michigan.gov/mdch

CENTERS FOR DISEASE CONTROL AND PREVENTION www.cdc.gov

MICHIGAN DEPARTMENT OF COMMUNITY HEALTH TOXICS AND HEALTH HOTLINE: 1-800-648-6942

MICHIGAN OCCUPATIONAL HEALTH AND SAFETY ADMINISTRATION (MIOSHA): 517-322-1814

AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY: www.atsr.cdc.gov 1-888-422-8737