ALAMEDA COUNTY HEALTH CARE SERVICES AGENCY
PUBLIC HEALTH DEPARTMENT

Chemical Emergencies: Nerve Agents

Nerve agents are usually liquids or gasses that can poison people, animals and plants. These agents damage the nervous system of victims and can cause injuries or death. How serious the injuries are depends on the type of agent, the amount, and the length of exposure. Nerve agents are the most toxic chemical warfare agents known to man. These agents include VX, Tabun, Sarin, and Soman.

In the same family of chemical warfare agents are industrial chemicals called organophosphates. These include chemicals such as Malathion or Parathion and other insecticides. All nerve agent exposures have similar effects on humans.

SARIN

Facts

- Sarin has no color, odor or taste. It is in a form of gas or liquid and is very deadly.
- Sarin enters the body through the skin or by breathing it in. It causes severe respiratory damage.
- Small amounts of Sarin can kill people.
- Sarin is a gas when it stays near the ground.
- Sarin remains deadly in warm, dry temperatures.

Sarin as a Weapon

- Sarin can be released into the air and expose people through breathing it in or contact with the skin or eyes.
- Sarin can be released into water and expose people who touch or drink contaminated water.
- Sarin can be used to contaminate food.
- Sarin is most dangerous in closed space.

Sarin Symptoms

- Exposure to small amounts can cause blurred vision, eye pain or tearing, runny nose and shortness of breath.
- Exposure to moderate amounts can cause muscle weakness, nausea, vomiting and diarrhea.
- Exposure to large amounts can cause difficulty of breathing, shortness of breath, tightness in chest, loss of consciousness, convulsions, seizures, and death.

Sarin Diagnosis and Treatment

- When exposed to large amounts, death can occur within seconds.
- Medicines atropine or pralidoxime must be used quickly to be effective.

What You Should Do If Exposed

- Call 9-1-1 immediately.
- Move away from the site of exposure immediately and move to higher ground for fresh air.
- Remove clothing, place in a plastic bag, and close it tightly.

- Take a cool shower. Use lots of soap. Flush irritated eyes with water for 10 minutes.
- Listen to radio for evacuation and shelter-in-place procedures.

VX

Facts

- VX has no color, odor or taste. It is in a form of gas or liquid and is highly toxic.
- In average weather, VX can stay on objects for days.
- In extremely cold weather, VX can stay harmful for months.
- VX can be a long-term hazard on surfaces.

VX as a Weapon

- VX is a human-made chemical warfare agent.
- VX can be released into water and expose people who touch or drink contaminated water.
- VX can be used to contaminate food.

VX Symptoms

- People are exposed to VX by ingesting it, breathing in a VX mist, or by coming into contact with it through skin or eyes.
- Within seconds or hours of the exposure to VX, symptoms include:
  Runny nose, watery eyes, eye pain or irritation, blurred vision, excessive sweating, drooling, chest tightness, difficulty in breathing, increased urination, confusion, drowsiness, headache, weakness, nausea, vomiting, slow or fast heart rate, low or high blood pressure.
- Exposure to large amounts of VX can cause loss of consciousness, convulsions, paralysis, and death.

VX Diagnosis and Treatment

- Medicines atropine or pralidoxime must be given quickly to be effective.
- Prolonged exposure can result in long-term damage to the body.

What You Should Do If Exposed

- Call 9-1-1 immediately.
- Move away from the site of exposure immediately and move to higher ground for fresh air.
- Remove clothing, place in a plastic bag, and close it tightly.
- Take a cool shower. Use lots of soap. Flush irritated eyes with water for 10 minutes.
- Listen to radio for evacuation and shelter-in-place procedures.

Radiation Emergencies

Facts

- Radiation is energy released from light, heat, sound and charged particles that can cause direct or indirect damage to the body.
- Different types of radiation exist; some have more energy than others.

How Can Exposure Occur?

- People are exposed to small amounts of radiation every day, both from naturally occurring sources and man-made sources. Man-made sources include some electronic equipment (such as microwave ovens), medical sources (such as x-rays), and from nuclear weapons.
- The amount of radiation from natural or man-made sources to which people are exposed is usually small.
- Large amounts of radiation can occur in events such as a nuclear power plant accident or a terrorist attack.

What Happens When People Are Exposed to Radiation?

- Radiation can affect the body in a number of ways. The adverse health effects of exposure may not present for many years.
- The health effects include: nausea, vomiting, headache, diarrhea, loss of hair and teeth, and anemia. Long-lasting health effects include infertility, cancer and death later in life.

Radiation as Weapon

- Radiation can be released into food or water supplies, crops, animals and the environment.
- Radioactive materials can be use as explosives to destroy a nuclear facility.
- An explosion of a nuclear facility can cause a large amount of radioactive material to be released. People at the facility could be contaminated with radioactive material and may be injured. People who live in surrounding areas could be exposed or contaminated. Death and injury could occur. Developing cancer could happen over time to those who are exposed.

What You Should Do If Exposed

- Move away from the source of radiation immediately.
- Remove clothes and shoes; put exposed clothing in a plastic bag; seal the bag and place it out of the way; take a thorough shower.
- If you are outside, go inside. Close and seal your windows and doors. Turn off any ventilation.
- If the event is indoors, get out of the building or follow instructions for shelter-in-place.
- Seek medical help as soon as you can.
- Listen to radio for evacuation and shelter-in-place procedures.

Shelter-in-Place

When a chemical agent attack occurs, authorities will instruct people to either seek shelter where they are and seal the area (shelter-in-place), or leave (evacuate) immediately.

If the order is to remain in your home, office or school, you will need to follow these instructions for "shelter-in-place".

- Stay inside.
- Close and lock all windows and doors.
- Turn off ventilation systems (heat and air-conditioners, fans, air filters, etc.).
- Close fireplace dampers.
- Take your emergency/disaster kit(s).
- Bring pets inside.
- Go into a room with the fewest doors and windows and seal the room.
- Stay in the room until told by the authorities that it is safe to come out.
- Turn your radio on for emergency response and local news updates.

How to Seal An Area (Shelter-in-Place)

- Wet towels and place over the crack under the floor.
- Cut plastic sheeting to fit over the windows and vents. Secure the plastic with duct tape.
- Tape around the door.
- Turn on the radio for update.
- Don't ventilate (air out) or leave your sealed shelter until you are told to do so.

Evacuation

If you are asked to evacuate, follow the instructions that your local officials or authorities provide. Leave the area as quickly and orderly as you can.

Be sure to take a flashlight, portable radio, batteries, first-aid kit, supply of food and water, essential medicines, cash and credit cards.

Sources: Terrorism and Other Public Health Emergencies, A Reference Guide for Media, U.S. Department of Health and Human Services; Chemical Agents Fact Sheet, Washington State Department of Health; Radiation Emergencies FAQs, Center for Disease Control and Prevention, Department of Health and Human Services.