DELAWARE HEALTH AND SOCIAL SERVICES
Division of Public Health

Emergency Medical Services

HYDROGEN SULFIDE

Agent Information:

Used in chemical synthesis, metallurgy and as a chemical warfare agent. H_2S. Synonyms include dihydrogen sulfide, sulfur hydride, sulfurated hydrogen, hydrosulfuric acid, "sewer gas," "swamp gas," hepatic acid, sour gas, and "stink damp." Hydrogen sulfide is a colorless, highly flammable and explosive gas produced naturally by decaying organic matter and by certain industrial processes. Hydrogen sulfide has a characteristic rotten-egg odor; however, olfactory fatigue may occur and may not provide adequate warning of hazardous concentrations. Hydrogen sulfide is slightly heavier than air and may accumulate in enclosed, poorly ventilated and low-lying areas. Hydrogen sulfides are toxicologically, part of a group of compounds known as systemic asphyxiants.

Signs and Symptoms:

Hydrogen sulfide is a mucous membrane and respiratory tract irritant; pulmonary edema, immediate or delayed, can occur after exposure to high concentrations. Breathing high levels of hydrogen sulfide can cause death within a few breaths, by way of respiratory arrest. Lower concentrations can result in eye irritation, sore throat and cough, shortness of breath, and fluid in the lungs. Symptoms of acute exposure include nausea, headaches, delirium, disturbed equilibrium, tremors, convulsions, and skin and eye irritation. Inhalation of high concentrations can produce extremely rapid unconsciousness and death. Exposure to the liquefied gas can cause frostbite injury.

Route of Exposure:

Inhalation is primary. Hydrogen sulfide is well absorbed through the lungs; cutaneous absorption is minimal. Exposure by any route can cause systemic effects.

Protective Measures:

Utilize appropriate Level PPE as identified by the Environmental Protection Agency and Hazmat protocols.

Only those directly exposed to hydrogen sulfide are at risk. Persons exposed to hydrogen sulfide pose no serious risks of secondary contamination to personnel outside the Hot Zone and after decontamination.

Prophylaxis:

N/A

Treatment:

Supportive care. Nitrite therapy (the cyanide antidote kit) has been suggested as a therapy for hydrogen sulfide exposure. Amyl nitrite is given by inhalation (for 30 seconds every minute until an intravenous line is established) followed by intravenous sodium nitrite (300 mg over absolutely no less than 5 minutes). It is not necessary to use the sodium thiosulfate. The antidotal efficacy of nitrite therapy is controversial, but is currently recommended if it can be started shortly after exposure.

Reporting:

Any suspect cases should be reported immediately to the Division of Public Health, Epidemiology Branch: 1-888-295-5156 (24/7 coverage). For additional information, view the CDC website for Emergency Preparedness and Response at www.bt.cdc.gov.