Topic: FLUORINATED HYDROCARBONS

0.0 OVERVIEW

0.1 LIFE SUPPORT

This overview assumes that basic life support measures have been instituted.

0.2 CLINICAL EFFECTS

0.2.1 SUMMARY OF EXPOSURE

A. LOW CONCENTRATION: Inhalations such as those caused by leaking air conditioners or refrigerators usually result in transient eye, nose, and throat irritation. Palpitations and light headedness are also seen.

B. HIGH CONCENTRATION: Inhalation associated with deliberate abuse, or spills or industrial use occurring in poorly ventilated areas has been associated with ventricular arrhythmias, pulmonary edema and sudden death.

C. Heating freon may produce phosgene, chloride, or fluoride gases. (See Poisindex Managements)

0.2.3 HEENT

A. EYES: Eye irritation occurs with ambient exposure. Ocular installation results in corneal burns in rabbits.

B. NOSE: Nasal irritation occurs with ambient exposure.

C. THROAT: Frostbite of the lips, tongue, buccal mucosa and hard palate developed in a man after deliberate inhalation of a propellant containing propane and dichlorodifluoromethane (Elliot, 1991).

0.2.4 CARDIOVASCULAR

A. Inhalation of high concentrations is associated with the development of refractory ventricular arrhythmias and sudden death, believed to be secondary to myocardial sensitization to endogenous catecholamines. Some individuals may be susceptible to arrhythmogenic effects at lower concentrations.

0.2.5 RESPIRATORY

A. Pulmonary irritation, bronchial constriction, cough, dyspnea, and chest tightness may develop after inhalation. Pulmonary edema is an autopsy finding in fatal cases.

0.2.6 NEUROLOGIC

A. Headache, dizziness, and disorientation are common. Cerebral edema may be found on autopsy. A syndrome of impaired psychomotor speed, impaired memory and learning, and emotional lability has been described in workers with chronic occupational exposure to fluorinated hydrocarbons.

0.2.7 GASTROINTESTINAL

A. Nausea may develop. Ingestion of a small amount of trichlorofluoromethane resulted in necrosis and perforation of the stomach in one patient.

0.2.8 HEPATIC
A. Jaundice and mild elevations in transaminases rarely develop after inhalational exposure or ingestion.
0.2.15 DERMATOLOGIC
A. Dermal contact may result in defatting, irritation or contact dermatitis. Severe frostbite was reported as a rare effect of severe freon exposure. Injection causes transient pain, erythema and edema.
0.2.16 MUSCULOSKELETAL
A. Rhabdomyolysis developed in a worker susceptible to malignant hyperthermic after exposure to fluorinated hydrocarbons.
0.3 LABORATORY
A. Fluorinated hydrocarbons plasma levels are not clinically useful.
B. No specific lab work (CBC, electrolyte, urinalysis) is needed unless otherwise indicated.
C. Obtain baseline pulse oximetry or arterial blood gas analysis.
0.4 TREATMENT OVERVIEW
0.4.2 ORAL/PARENTERAL EXPOSURE
A. Few oral exposures to liquid fluorinated hydrocarbons have been described including a single ingestion resulting in gastric perforation. The manufacturer of one product does not recommend inducing emesis following exposure due to a low potential for toxicity. Following a large oral ingestion, however, careful lavage and activated charcoal may be considered in alert patients.
B. ACTIVATED CHARCOAL/CATHARTIC: Administer charcoal slurry, aqueous or mixed with saline cathartic or sorbitol. The FDA suggests 240 mL of diluent/30 g of charcoal. Usual charcoal dose is 30 to 100 grams in adults and 15 to 30 grams in children (1 to 2 g/kg in infants).
1. Administer one dose of a cathartic, mixed with charcoal or given separately. See "Treatment: Prevention of Absorption" in the main document.
C. GASTRIC LAVAGE: May be indicated if performed soon after ingestion, or in patients who are comatose or at risk of convulsing. Protect airway by placement in Trendelenburg and left lateral decubitus position or by cuffed endotracheal intubation.
1. After control of any seizures present, perform gastric lavage. Volume of lavage return should approximate fluid given.
0.4.3 INHALATION EXPOSURE
A. MONITOR EKG and VITAL SIGNS carefully. Cardiopulmonary resuscitation may be necessary.

B. PROVIDE A QUIET CALM ATMOSPHERE to prevent adrenalin surge if the patient is seen before the onset of cardiac arrhythmias. Minimize physical exertion.
C. MONITOR pulse oximetry or arterial blood gases.
D. Provide symptomatic and supportive care.

0.4.4 EYE EXPOSURE

A. DECONTAMINATION: Exposed eyes should be irrigated with copious amounts of tepid water for at least 15 minutes. If irritation, pain, swelling, lacrimation, or photophobia persist, the patient should be seen in a health care facility.

0.5 RANGE OF TOXICITY

A. Freons are very toxic when inhaled in high concentrations and/or for extended periods. At lower concentrations or brief exposure, freons may cause transient eye, nose, and throat irritation. There is significant interpatient variation and it is difficult to predict which patient will exhibit symptoms following exposure.

1.0 SUBSTANCES INCLUDED/SYNONYMS