First Aid for Anhydrous Ammonia Exposure

When anhydrous ammonia gas or liquid comes in contact with the human body, three types of injuries may result:

1. **Dehydration.** Because of ammonia's great attraction for water, NH3 will extract water from body tissue.
2. **Caustic burning.** When ammonia comes into contact with body tissue, it combines with the water in the tissue to form strong ammonium hydroxide that can chemically burn tissue.
3. **Freezing.** When NH3 liquid vaporizes, it pulls heat away from body tissue causing instant frostbite. In addition, released liquid anhydrous ammonia has a temperature of -28°F.

There is no antidote for ammonia poisoning. First aid consists of decontamination, maintaining open airway, and respiration support followed by rapid transport to an advanced medical care facility. After decontamination, no special protective clothing is required for those caring for the injured.

Be aware that children are much more vulnerable to ammonia injury because of their larger surface area to body weight ratio. Also, a child's respiratory system will suffer the effects of ammonia exposure more so than an adult because children have a greater lung surface area relative to their body weight.

Rescuers need to be trained on scene safety and attired in proper personal protective clothing which should include self-contained breathing apparatus (SCBA) to prevent themselves from becoming casualties. Ample quantities of fresh water must be available. If the ammonia release hasn't been controlled, remove patient from the "hot zone" and rapidly decontaminate with water.

Eye Contact: The extent of eye injury is dependent upon the duration of the exposure and concentration of the gas or liquid. Even low air ammonia concentrations can be very irritating to the eyes. Permanent eye damage is not unlikely. Contact lenses should never be worn when working with ammonia.

- **First Aid for Eye Contact:** Immediately flush eyes for at least 15 minutes keeping the eyelids open. Remove contact lenses if it can be done safely. Contact emergency management services (EMS).

Skin Contact: Ammonia gas may cause skin irritation especially where skin is moist (perspiration). Patients exposed to only ammonia gas and have no skin or eye irritation, do not need decontamination. Ammonia liquid will cause extensive skin damage resulting from dehydration, freezing and the corrosive action of ammonium hydroxide.

- **First Aid for Skin Contact:** Flush exposed areas thoroughly with water. If clothing is frozen to skin, thaw out area first with water before removing clothing. Clothing then is contaminated with ammonium hydroxide and can cause secondary exposure to responders. Applying water on a patient may cause hypothermia, so use blankets and quickly shelter them in a warm and dry environment. Contact EMS.

Inhalation: Even at low concentrations, ammonia vapor is very irritating to the nose, mouth, throat and lungs. The airway may swell and constrict making respirations difficult for those exposed. Because of a child's narrow airway, they are especially susceptible to breathing difficulties if exposed.

- **First Aid for Inhalation:** Move the person to fresh air. If breathing has stopped, perform artificial respiration and administer oxygen if available. Contact EMS.

Emergency Water Supplied by Ammonia Dealer:
Permanent ammonia storage locations are required to have an open container filled with water for emergency use. Each ammonia nurse tank has a water supply designed to provide ready access for flushing any part of the body contacted by ammonia.