

AMMONIA

Background:

Ammonia exposures occur from contact with liquefied gas, gas or aqueous solution. Anhydrous ammonia is transported and stored under pressure as liquefied gas but is a gas at room temperature and pressure. Aqueous ammonia solutions range in concentration from 5 percent (household use) to 25 percent or greater (commercial use). When ammonia comes in contact with water, it forms ammonium hydroxide, a potent, alkaline-corrosive solution. Ammonia gas or concentrated solution can cause severe corrosive burns on contact. The extent of injury will be dependent upon the duration of exposure and the ammonia concentration of the gas or liquid.

Signs/Symptoms:


- 1) Airway: Burning sensation of the mouth, nose and pharynx can occur. Serious exposures (gas or ingestion) can result in swelling of the upper airway and larynx with stridor, muffled voice or aphonia as signs of impending occlusion.
- 2) Pulmonary: Bronchospasm, wheezing, cough
- 3) Cardiovascular: No direct cardiovascular effects; may have secondary effects from hypoxia
- 4) CNS: No direct CNS effects; may have secondary effects from hypoxia
- 5) Dermal: Burning and irritation from concentrated solutions and gases. In addition, frostbite injury from contact from liquefied anhydrous ammonia is possible.
- 6) GI: Severe mucosal, esophageal and intestinal injury possible from ingestion of alkaline-corrosive solution
- 7) Ocular: Burning, irritation and swelling from gas or liquid exposure

Treatment:

Decontamination:

- 1) Skin: Gas exposures usually do not need decontamination. Patients exposed to liquefied gas or large amounts of aqueous solution should have clothing removed and be decontaminated with water for at least five minutes.
- 2) Eyes: For symptomatic exposures, irrigate eyes for 30 minutes with water or saline. Check pH of conjunctiva post irrigation; it should be 7.
- 3) Ingestion:
 - a) Gastric lavage generally not considered
 - b) Activated charcoal usually not considered for alkaline corrosive ingestions
 - c) Consider dilution, initially with a small amount of milk or water

Supportive care:

- 1) Support airway as clinically indicated
- 2) Treat bronchospasm with bronchodilators
-  3) Consider racemic epinephrine for pediatric patients with stridor from gas exposures
- 4) GI consult for significant ammonia ingestions
- 5) Ophthalmology consult for symptomatic eye exposures
- 6) Treat burns as clinically indicated

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Disposition:

Consider admission for patients with evidence of respiratory abnormalities or distress, significant GI symptoms, or significant dermal burns, as well as those who have ingested concentrated ammonia solution.