Chemical Emergency Medical Guideline

Information and recommendations for first responders and patients

Ammonia

CAS No: 7664-41-7

GHS symbols:

GHS05
Corrosive

GHS06
Acute toxicity

Signal word: Danger

Hazard statements:

H314	Causes severe skin burns and serious eye damage.
H331	Toxic if inhaled.

Overview

- Before the first aider approaches a patient, who has been or is exposed to ammonia, they must ensure that there is no danger to themselves from ammonia.
- There is no danger from contact with patients who have only been exposed to ammonia gas. A patient who is wet with ammonia-containing liquid, or whose clothing is contaminated with it, may endanger other people through direct contact or through ammonia gas emissions.
- Ammonia is highly irritating as a gas and in solution and can cause severe burns to the eyes and skin.
- Irritation of the respiratory tract can result in swelling of the nasal and throat mucosa, the larynx, coughing and shortness of breath. Signs of fluid accumulation in the lungs (shortness of breath, blue-red discoloration of the skin and mucous membranes, sputum, coughing) may occur.
- There is no known specific antidote. Treatment depends on the extent of exposure and the symptoms.

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1. Information about the substance

Ammonia (NH_3), CAS 7664-41-7
Ammonia dissolves easily in water to form a caustic alkaline ammonium hydroxide solution. At room temperature, it is a colorless gas with a characteristic pungent odor. Ammonia is lighter than air. When pressurized liquid ammonia is released and rapidly cooled, it forms a dense cloud that settles on the ground.
Ammonia is widely used as a catalyst and reagent in the manufacture of fertilizers, plastics, explosives, pesticides and other chemicals, as well as a refrigerant. It is a component of many household products and industrial cleaning agents.

2. Exposition

2.1. Inhalation

Inhalation is a major route of exposure to ammonia. The smell and irritating effect of ammonia serve as a clear warning. However, the sense of smell can become dull, making it difficult to detect low concentrations during prolonged exposure.

2.2. Skin/eye contact

Even low concentrations of ammonia cause immediate irritation to the eyes and moist skin. Direct contact of the eyes or moist skin with liquid ammonia or concentrated gas causes severe chemical burns.

2.3. Ingestion

Accidental ingestion of ammonia is unlikely. If swallowed, ammonia solutions can cause severe damage through chemical burns in the mouth, throat and stomach.

3. Acute health effects

Ammonia gas generally causes irritation to the eyes, nose and throat. Breathing difficulties, including shortness of breath with coughing, constriction of the upper respiratory tract and bronchi, and accumulation of fluid in the lungs may occur.

If the skin is wet or damp, contact with ammonia gas can cause burning pain, inflammation, blisters and ulcers. Contact with pressurized liquid ammonia may result in frostbite.
Low gas concentrations can cause eye irritation with burning, redness, tearing and involuntary eyelid closure. Higher concentrations or contact with liquid ammonia can cause chemical burns to the cornea, leading to blindness.

In most cases, the danger posed by ammonia arises from inhalation of the gas. Even small amounts of ammonia gas are usually noticeable due to their pungent odor and cause irritation of the eyes, nose and throat. Tearing of the eyes, coughing and feelings of suffocation may occur. Higher concentrations can lead to death due to swelling in the larynx area or chemically induced lung damage. Exposure of the eye to concentrated gas or liquid ammonia can cause severe corneal damage, resulting in blindness. Skin contact with liquids containing ammonia can cause chemical burns.

A single, short-term exposure to low concentrations of ammonia gas, from which the affected person recovers quickly, does not normally cause delayed or lasting damage to health. Some people who have inhaled large amounts of ammonia have developed persistent respiratory problems and have subsequently been more susceptible to infectious lung diseases.

4. Measures

4.1. Self-protection of first aiders

If there is a suspicion that the area the helper must enter contains ammonia in a concentration of 500ppm or more, a self-contained breathing apparatus and a chemical protection suit must be worn. Contaminated equipment should not be used.

Only for acute rescue measures can exposure to ammonia in concentrations below 500ppm be accepted for a short time for helpers without protective equipment.
There is no danger from contact with patients who have only been exposed to ammonia gas. A patient who is wet with ammonia-containing liquid, or whose clothing is wet with it, may endanger other people through direct contact or through ammonia gas emissions.

4.2. Rescue

Patients should be removed from the danger zone immediately. If they are unable to walk unaided, they should be removed from the danger zone quickly using appropriate means, taking care to protect themselves. The "A, B, C procedure" has absolute priority.

A) Clear the airways (check for blockages caused by the tongue or foreign objects)
B) Ventilation (check the patient's breathing; if necessary, begin ventilation with adequate self-protection, e.g. breathing mask)
C) Circulation (begin resuscitation for any person who does not respond to verbal commands and is not breathing normally)

4.3. Cleaning

Patients who have only been exposed to ammonia gas and show no signs of skin or eye irritation do not require any special cleaning measures, unlike all others.
If possible, patients should assist with their own cleaning. If liquid ammonia has contaminated clothing, it must be removed and securely wrapped.
If the eyes have been exposed to ammonia or if there is eye irritation, rinse with water or neutral saline solution for 15 minutes. Remove any contact lenses, if possible, without causing additional danger to the eye. Continue other important first aid measures during this time.
Rinse affected skin and hair with water for at least 15 minutes. Protect eyes while rinsing. Continue other important first aid measures during this time.

4.4. Further measures

Anyone who may have been exposed to ammonia should seek medical attention immediately.

4.5. Instructions for further rules of conduct

Consult your family doctor or the emergency department of the nearest hospital if any abnormalities or symptoms occur within the next 24 hours, in particular:

- Coughing, wheezing or whistling breath
- Difficulty breathing or shortness of breath
- Increased pain or abnormalities in the affected skin areas or eyes
- Pain or tightness in the chest
- Stomach ache or nausea

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Administrative Information

Document Type	Chemical Emergency Medical Guideline
Number of Version	EN.1.0.0
Initial Publication	01.01.2026
Next Revision	2029
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