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## Information and recommendations for first responders

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- Exposed or intoxicated patients do not pose a significant risk of secondary contamination.
  - Ingestion of 30 ml ethylene glycol or more can cause severe systemic toxic effects, in particular central nervous system depression. Dosage of approximately 100 ml ethylene glycol may result in death.
  - Ethylene glycol is slightly irritating when it comes in contact with the eyes, skin, and upper respiratory tract causing redness and tearing of the eyes, coughing, defatting and inflammation of the skin.
  - Inhalation of the aerosol or ingestion of the liquid may result in significant systemic toxicity. Skin absorption is poor.
  - Ethylene glycol intoxication can be treated by the administration of ethanol. If conscious after ingestion of ethylene glycol, an adult patient should immediately drink alcoholic beverages, e.g. 150 ml of whiskey/brandy.
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### 1. Substance information

Ethylene glycol (HOCH<sub>2</sub>CH<sub>2</sub>OH), CAS 107-21-1  
Synonyms: 1,2-dihydroxyethane, 1,2-ethane diol, 2-hydroxyethanol  
Ethylene glycol is, at room temperature, a colorless, odorless, viscous, hygroscopic liquid (boiling point 198°C, 387°F, respectively). Ethylene glycol is soluble in water, ethanol, and acetone, little soluble in ether, and insoluble in oil, fat, and hydrocarbon halogens.  
Ethylene glycol is widely used as a solvent, an antifreeze and hydraulic fluid, as a softener, dehydrating agent and as an intermediate in chemical production.

### 2. Routes of exposure

#### *Inhalation*

Ethylene glycol is well absorbed by the respiratory tract, but there is little risk due to its low volatility. Inhalation may occur as aerosol, when the liquid is heated, agitated, or sprayed.

#### *Skin/eye contact*

Ethylene glycol can cause slight irritation to the skin and the eyes. It is poorly absorbed through the intact skin.

#### *Ingestion*

**Ingestion of ethylene glycol results in severe systemic intoxication.** It is readily absorbed from the gut.

### 3. Acute health effects

Ingestion of ethylene glycol may result in severe metabolic acidosis with CNS depression, cardio-pulmonary failure and acute renal failure. The lethal dose can be as little as 100 ml. The stage with severe signs or symptoms of intoxication may be preceded by an asymptomatic latent period of 1 to 4 hours. Drowsiness, elevated blood pressure, tachycardia, hyperventilation and coma are typical clinical features of poisoning.

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## 4. Actions

### *First aid*

Patients exposed to ethylene glycol do not pose a significant risk of secondary contamination. Patients should be removed from the contaminated zone immediately. Patients who are unable to walk may be removed on backboards or stretchers; if these are not available, carefully remove/transport patients with appropriate action to a safe zone, taking into account your self-protection.

Immediate priorities must follow the "A, B, C's" of resuscitation:

- A) Airway** (make sure the airway is not blocked by the tongue or by a foreign body)
- B) Breathing** (check to see if the patient is breathing, provide ventilation with use of appropriate barrier devices, e.g. with a pocket face mask, if breathing is absent)
- C) Circulation** (start CPR in any unresponsive person with absent or abnormal breathing)

### *After ingestion*

**Do not induce emesis. Each potentially exposed person should seek immediate medical advice and treatment. If conscious, the adult patient should immediately drink alcoholic beverages containing about 0.7 g ethanol/kg body weight, e.g. 150 ml of whiskey/brandy.**

### *After inhalation or skin/eye contact*

Patients exposed only to ethylene glycol vapor who have no evidence of skin or eye irritation do not need decontamination. All others require decontamination.

Patients who are able and cooperative may assist with their own decontamination. If the exposure involved liquid ethylene glycol and if clothing is contaminated, remove and double-bag the clothing.

**Flush exposed skin and hair with plain water for at least 15 minutes.** Protect eyes during flushing of skin and hair. Continue other basic care during flushing.

**Irrigate exposed or irritated eyes with plain water or saline for at least 20 minutes.** Remove contact lenses if present and easily removable without additional trauma to the eye. Continue other basic care during flushing.

**Each person potentially exposed to a ethylene glycol by inhalation of aerosol or ingestion of the liquid should seek immediate medical advice and treatment.**

In this document BASF has made a diligent effort to ensure the accuracy and currency of the information presented but makes no claim that the document comprehensively addresses all possible situations related to this topic. This document is intended as an additional resource for first responders in assessing the condition and managing the treatment of patients exposed to ethylene glycol. It is not, however, a substitute for the judgement of a first responder and must be interpreted in the light of specific information regarding the patient available to such a first responder and in conjunction with other sources of authority.

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