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## Information and recommendations for first responders

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- Before approaching the patient the first responder must make sure that he does not risk exposing himself to phosgene.
  - Patients exposed only to phosgene gas should not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with liquid phosgene or solvents containing phosgene can secondarily contaminate rescue and medical personnel by direct contact or through off-gassing phosgene.
  - Phosgene irritates lungs severely. Because of its slow hydrolysis in the alveoli, serious lung effects and, therefore, symptoms of toxicity may be delayed up to 24 hours. Signs of accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) do not usually appear for hours after even severely toxic exposures.
  - There is no antidote to be administered to counteract the effects of phosgene. Treatment consists of supportive measures.
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### 1. Substance information

Phosgene (COCl<sub>2</sub>), CAS 75-44-5  
Synonyms: carbonic acid dichloride, carbonic dichloride, carbon oxychloride, carbonyl chloride, chloroformyl chloride  
Phosgene is a colorless, fuming liquid below 8°C (47°F) and a colorless, nonflammable gas above 8°C. Often it is used as a solution in organic solvents. At low concentrations, its odor is similar to that of green corn or newly mowed hay; at high concentrations, its odor can be sharp and suffocating. Phosgene is hydrolyzed slowly by moisture to form hydrochloric acid.  
Phosgene is used as an intermediate in the manufacture of many chemicals including isocyanates, polyurethane, polycarbonates, dyes, crop protection products, and pharmaceuticals.

### 2. Routes of exposure

#### *Inhalation*

**Inhalation is the major route of phosgene exposure.** Phosgene's odor may provide insufficient warning of hazardous exposure which can occur even at low concentrations. Its irritating quality can be mild and delayed, which may allow persons to be exposed for prolonged intervals. Phosgene is heavier than air and may cause asphyxiation in poorly ventilated, low-lying, or enclosed spaces.

#### *Skin/eye contact*

When phosgene gas contacts moist or wet skin or eyes, it may also add to exposure.

#### *Ingestion*

Ingestion of phosgene is unlikely because it is a gas at room temperature.

### 3. Acute health effects

Phosgene exposure usually causes eye, nose, throat, and lung irritation. **Irritating effects immediately after exposure might be mild, but severe delayed lung damage can occur as late as 24 hours after exposure.** Phosgene poisoning may cause respiratory and cardiovascular failure.  
If the skin is wet or moist, contact with phosgene gas can cause irritation and redness of the skin. Contact with liquid phosgene under pressure can result in frostbite.  
High gas concentrations cause tearing and redness of the eye.

Eye contact with liquid phosgene may result in clouding of the eye surface and delayed perforation.

#### 4. Actions

##### *Rescuer self-protection*

**If the zone which has to be entered by the rescuer is suspected of containing phosgene, pressure-demand, self-contained breathing apparatus and chemical-protective clothing shall be worn; do not use equipment that is contaminated itself.**

Patients exposed only to phosgene gas should not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with liquid phosgene or solvents containing phosgene can secondarily contaminate other people by direct contact or through off-gassing phosgene.

##### *Patient recovery*

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 ventilations 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)

##### *Decontamination*

Patients exposed only to phosgene gas 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 phosgene or solvents containing phosgene 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 15 minutes.** Remove contact lenses if present and easily removable without additional trauma to the eye. Continue other basic care during flushing.

##### *Further actions*

**Each potentially exposed person 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 phosgene. 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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