

---

## Information and recommendations for first responders

---

- Before approaching the patient, the first responder must make sure that he does not risk exposing himself to formaldehyde.
  - Patients exposed only to formaldehyde gas or vapor do not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with an aqueous solution of formaldehyde can secondarily contaminate rescue and medical personnel by direct contact or through evaporation of formaldehyde.
  - Formaldehyde vapor is irritating when it comes in contact with the eyes, skin, and upper respiratory tract causing eye irritation, coughing, chest pain and dyspnea. Swelling of the throat and signs of accumulation of fluid in the lungs (shortness of breath, cyanosis, expectoration, cough) may occur. Formaldehyde is a potent skin sensitizer.
  - There is no antidote to be administered to counteract the effects of formaldehyde. Treatment consists of supportive measures.
- 

### 1. Substance information

Formaldehyde (HCHO), CAS 50-00-0  
Synonyms: formalin, formic aldehyde, methanal, methylene oxide.  
Formaldehyde is, at room temperature, a nearly colorless gas with a sharp or pungent odor. Its vapor is flammable and explosive. Because the pure gas tends to polymerize, it is usually used as an aqueous solution of 30–50 % formaldehyde, containing up to 15 % methanol as a stabilizer.  
Formaldehyde is widely used in the manufacture of plastics, resins, and urea-formaldehyde foam insulation. Formaldehyde-containing resins are found in construction materials (plywood, particle board, and fiberboard) and are used in the processing of paper and the production of carpets, paints, and furniture.

### 2. Routes of exposure

#### *Inhalation*

**Most exposures occur by inhalation or by skin/eye contact.**  
Formaldehyde's odor and irritant properties generally provide adequate warning of hazardous concentrations. Olfactory fatigue and tolerance may occur. However, persons who are sensitized to formaldehyde may react to concentrations below the odor threshold. Formaldehyde is slightly heavier than air and may cause asphyxiation in poorly ventilated, low-lying, or enclosed spaces.

#### *Skin/eye contact*

Formaldehyde vapor or aqueous solutions can cause irritation and burns to the skin and the eyes.

#### *Ingestion*

Ingestion of aqueous solutions can result in severe corrosive injury to the esophagus and stomach. Nausea, vomiting, diarrhea, and abdominal pain may occur.

### 3. Acute health effects

**Formaldehyde exposure usually causes eye irritation, sore throat, and coughing.** Rapid respiratory distress with chest pain, shortness of breath, swelling of the throat and accumulation of fluid in the lungs may occur with inhalation of high concentrations of formaldehyde gas or vapor. Lung injury may progress over several hours. Formaldehyde poisoning may cause respiratory and cardiovascular failure.  
If the skin is wet or moist, contact with formaldehyde vapor or aqueous solutions can cause burning pain, inflammation, and blisters.

Low vapor concentrations cause burning discomfort, spasmodic blinking or involuntary closing of the eyelids, redness, and tearing. Corneal burns occur at high concentrations or contact with aqueous solutions.

#### 4. Actions

##### *Rescuer self-protection*

**If the zone which has to be entered by the rescuer is suspected of containing formaldehyde, 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 formaldehyde gas or vapor do not pose a significant risk of secondary contamination. Patients whose clothing or skin is contaminated with liquid formaldehyde may secondarily contaminate rescue and medical personnel by direct contact or through evaporation of formaldehyde.

##### *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 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)

##### *Decontamination*

Patients exposed only to formaldehyde gas or 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 formaldehyde 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*

In case of ingestion of formaldehyde, **do not induce emesis. 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 formaldehyde. 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.

**BASF SE**  
Corporate Health Management  
Carl-Bosch-Straße 38  
67056 Ludwigshafen  
Germany

**BASF Corporation**  
Medical Department  
100 Campus Drive, M/S F 221  
Florham Park, NJ 07932  
USA