

PHOSGENE (COCl₂)

Agent information: Phosgene is an industrial chemical with the potential to cause mass casualties. At room temperature, phosgene is a colorless and nonflammable gas with a suffocating odor like newly mown hay. Its odor provides insufficient warning of hazardous concentrations.

Below 47 degrees F, phosgene is a colorless and fuming liquid; contact causes frostbite. In the presence of water (sweat, saliva, or tears), the liquid or gas slowly hydrolyzes to hydrochloric acid, which irritates and damages cells.

Transmission: Inhalation is the major route of exposure. Phosgene is absorbed to some extent by the lungs, but not by intact skin. It is corrosive to the lungs and intact skin. Systemic damage is usually a secondary result of anoxia caused by loss of lung function. Ingestion is unlikely.

Signs and symptoms: Signs and symptoms vary, depending on the route of exposure and level of the exposure. Signs include pulmonary edema with some mucosal irritation (higher water solubility of the agent would lead to greater mucosal irritation), leading to Acute Respiratory Distress Syndrome or non-cardiogenic pulmonary edema, pulmonary infiltrate. Symptoms include shortness of breath, chest tightness, wheezing, laryngeal spasm, mucosal, and dermal irritation, and redness. Onset is one to 24 hours up to 72 hours, but delayed onset is not common. The patient may be asymptomatic for hours.

Protective measures: Persons exposed only to phosgene gas do not pose substantial risks of secondary contamination. Persons whose clothing or skin is contaminated with liquid phosgene (ambient temperature below 47 degrees F) can secondarily contaminate response personnel through direct contact or off-gassing vapor. Medical Personal Protective Equipment (PPE) would include hooded Powered Air purifying Apparatus, chemical-resistant suit, gloves, and boots.

Emergency Medical Services and Preparedness Section
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Contact Number: 302-223-2999

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Evaluation: No tests available.

Prophylaxis: Appropriate PPE to avoid secondary contamination.

Treatment: There is no antidote for phosgene, just supportive care: administering humidified oxygen, bronchodilators, and airway management; and treating skin and eyes with copious irrigation.

Keep victims warm and quiet; any activity following exposure may increase the likelihood of death. Monitor those minimally exposed for six hours with a follow-up chest radiograph. Monitor patients with moderate to high exposure for 24 hours. In a mass casualty incident, victims becoming severely ill before six hours have lapsed may be triaged to comfort care only, as mortality is nearly 100%.

Reporting: Report suspect cases immediately to the Division of Public Health, 1-888-295-5156 (24/7 coverage).

Additional information: Visit the Centers for Disease Control and Prevention website: <https://www.atsdr.cdc.gov/>.

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