BASF Chemical Emergency Medical Guidelines

Phenol (C_6H_5OH) A 1

Information and recommendations for first responders

- **Patients whose clothing or skin is contaminated with phenol can secondarily contaminate rescue and medical personnel, by direct contact or through evaporation of phenol.**
- **Phenol is a highly corrosive chemical which is very well and rapidly absorbed by all exposure routes. Thus, phenol can cause severe burns at the contact site, as well as systemic poisoning resulting in central nervous system disturbances, cardiovascular and renal failure.**
- **Extensive local damage may be caused before pain is felt.**
- **Rapid decontamination by immediate extensive irrigation with polyethylene glycol and water is the most critical measure after dermal exposure.**
- **There is no systemic antidote to be administered to counteract the effects of phenol. Treatment consists of supportive measures.**

1. Substance information

Phenol (C_6H_5OH), CAS 108-95-2
Synonyms include carbolic acid, hydroxybenzene, phen(yl)ic acid, phenyl(ic) alcohol
At room temperature, phenol has a low vapor pressure and is a clear or light-pink crystalline mass, white powder, or thick liquid. Phenol is well soluble in alcohol and slightly soluble in water. It has a sweet, sharp odor.
Phenol is obtained by organic synthesis or fractional distillation of coal tar. It is used in the manufacture of a variety of products including artificial resins, plastics, photographic developers, rubber, and dyes. Phenol is a general disinfectant and also, in dilute solutions, is used as a preservative, an antipruritic or a local anesthetic in some medical preparations.

2. Routes of exposure

Inhalation

Inhaled phenol is rapidly and significantly absorbed from the lungs, leading to systemic toxicity. However, because of its low volatility, inhalation hazard at room temperature is limited. Phenol's odor usually provides an adequate warning of hazardous concentrations.

Skin/eye contact

Skin contact is the major route of toxic phenol exposures. Phenol vapor and liquid are absorbed very well and rapidly through the skin and eyes and cause systemic toxicity. If more than 100 cm^2 (15 square inches) of skin are affected, there is risk of imminent death. Even dilute solutions (<2%) may cause severe eye or skin burns if contact is prolonged.

Ingestion

Accidental ingestion of phenol may occur and rapidly lead to severe systemic toxicity. Deaths in adults have been described after ingestion of 1 g or more.

3. Acute health effects

At all sites of oral, esophageal, dermal, or ocular contact phenol can cause severe burns with irreversible tissue destruction. Serious inhalation exposure may result in upper respiratory tract irritation, swelling, ulceration and accumulation of fluid in the lungs.

Systemic poisoning by any route may result in CNS stimulation with nausea, headache, dizziness, and seizures, followed rapidly by CNS depression with loss of consciousness, respiratory depression, and coma. Cardiovascular and renal failure may also occur. Vomiting and diarrhea commonly occur after significant phenol exposure by any route.

4. Actions

Rescuer self-protection	**If the zone which has to be entered by the rescuer is suspected of containing phenol in response situations that involve exposure to phenol vapor or contact with liquid phenol, pressure-demand, self-contained breathing apparatus and chemical-protective clothing shall be worn; do not use equipment that is contaminated itself.** Patients whose clothing or skin is contaminated with phenol may secondarily contaminate rescue and medical personnel, by direct contact or through evaporation of phenol. Exposure to high concentrations of phenol vapor may cause absorption of phenol onto clothing; caution should be exercised in decontamination.
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 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	All patients exposed to phenol require immediate decontamination. Patients who are able and cooperative may assist with their own decontamination. If the exposure involved liquid phenol and if clothing is contaminated, remove and double-bag the clothing. **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. **In any case of phenol contamination flush exposed skin and hair immediately with copious amounts of plain water until polyethylene glycol 300 or 400 is available. Protect eyes during flushing of skin and hair. Sponge the contaminated area repeatedly for at least 20 minutes with a number of sponges soaked in polyethylene glycol. After decontamination with polyethylene glycol flush the contaminated area again with copious amounts of plain water for at least 10 minutes.** Continue other basic care during decontamination. In case of phenol ingestion, **do not induce emesis. The vomitus may contain phenol and result in secondary contamination. Patients who are conscious and able to swallow should be given a slurry of 30 g activated charcoal with 240 ml water.**
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 phenol. 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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