



# Poison HOTLINE

Partnership between Iowa Health System and  
University of Iowa Hospitals and Clinics

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## *Did you know .....*

The symptoms of carbon monoxide (CO) poisoning, whether early in a CO exposure or from prolonged low-level exposure to CO, are often non-specific and readily confused with other medical conditions. Head ache, flu-like symptoms, fatigue or chest pain are common complaints of patients presenting with CO poisoning. Since CO is colorless and odorless, health care providers need to recognize the clinical effects of CO exposure.

Every house should have at least one CO detector placed near the sleeping areas. Fire departments recommend at least one detector per floor.

## HYDROFLUORIC ACID

Hydrofluoric (HF) acid has been used for centuries to etch glass and to clean brick and metal. This strong inorganic acid is currently found in household products for rust removal and porcelain cleaning. The majority of the adult exposures to HF reported to poison centers is due to occupation exposures; most of these cases involve exposures to the hands, usually on the fingers.

HF acid penetrates deeply into the tissues where it dissociates into a hydrogen ion and a highly electronegative fluoride ion. The reactive fluoride ion binds to calcium and magnesium causing a precipitous drop in both electrolytes. In addition, the free hydrogen ions can cause corrosive burns. Dilute solutions penetrate deeply before dissociating, leading to delayed injury and symptoms, whereas concentrated solutions (greater than 40% HF) cause immediate pain and injury. One characteristic unique to HF acid burns is that the pain and symptoms may be severe compared to a perceived lack of skin damage.

The amount of damage and symptoms are related to the concentration of the HF acid and the body surface area affected. Local effects can include pain, erythema, blisters and necrosis. HF acid can cause profound systemic effects, especially with solutions whose concentration is greater than 50% HF. Hypomagnesaemia, hypocalcemia and hyperkalemia are the systemic abnormalities seen after HF exposures. Tetany, QTc prolongation, and cardiac arrest have occurred after large exposures which were not treated immediately. Respiratory irritation and distress have been seen with inhalation of HF fumes.

Management includes thorough decontamination, removal of all clothes and irrigating affected areas with copious amounts of water. Airway assessment, cardiac monitoring, and electrolyte monitoring are critical. Minor dermal burns can be treated with 2.5% calcium gluconate gel. This should alleviate some of the intense pain seen with this injury and prevent further fluoride toxicity. Subcutaneous or intra-arterial calcium gluconate can be used to treat more serious dermal exposures. Systemic toxicity should be treated with intravenous calcium gluconate and magnesium sulfate, and hyperkalemia requires appropriate potassium-lowering therapy. For questions regarding hydrofluoric acid and how to manage this type of exposure, please call Iowa Statewide Poison Control Center at 1-800-222-1222.

*Pat Gunia RN, BSN, CSPI  
Certified Specialist in Poison Information*

**POISON**  
**Help**  
**1-800-222-1222**

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