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## Information and recommendations for patients

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- Patients whose clothing or skin is contaminated with hydrofluoric acid can secondarily contaminate rescue and medical personnel, by direct contact or through evaporation of hydrofluoric acid.
  - Hydrofluoric acid is a highly corrosive chemical causing extremely painful burns.
  - Fluoride ions are very well and rapidly absorbed by all exposure routes. Thus, hydrofluoric acid can also cause systemic poisoning resulting in central nervous system disturbances, cardiovascular, renal, and respiratory failure.
  - Rapid decontamination by immediate extensive irrigation - even before removing clothing - with copious amount of water is the most critical measure after dermal exposure.
  - The early administration of calcium and/or magnesium can counteract the systemic effects of hydrofluoric acid.
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### Substance information

Hydrogen fluoride (HF), liquid or gas (CAS 7664-39-3), is clear and colorless with a strong and irritating odor.

The boiling point of hydrogen fluoride is 19-20°C, 292-293 K. Hydrogen fluoride is miscible in water and forms a clear and colorless aqueous solution, hydrofluoric acid (boiling point of the azeotrope 112°C, 385 K). When exposed to air, hydrogen fluoride and its solutions may produce pungent dangerous fumes. Significant vapor concentrations may occur when concentrations of hydrofluoric acid of >40% in water are heated.

The substance is a strong acid and reacts violently with many compounds causing fire and explosion hazard. It attacks metals, glass and stone and dissolves silica, and must be kept in plastic, lead, wax, or paraffin paper bottles. Hydrofluoric acid is used in solutions of various concentrations (concentrated - >50%, e.g. in industrial processes; intermediate - 20-50%, e.g. in the electronics industry; dilute - less than 20%, e.g. in industrial and consumer cleaning compounds). Typical uses are frosting, etching and polishing of glass, removing sand from metal castings, enameling and galvanizing iron, and etching silicon wafers, especially in the semiconductor industry.

### What immediate health effects can result from exposure to hydrofluoric acid?

Hydrofluoric acid causes severe painful burns when it contacts skin or eyes, or when it is inhaled or swallowed. After skin exposure redness, swelling, blistering as well as white discoloration of the skin can occur. Inhalation usually causes sore throat and coughing. Rapid development of respiratory distress with chest pain, shortness of breath, swelling of the throat and accumulation of fluid in the lungs may occur. Fluoride ions can rapidly be absorbed through skin, lungs, and stomach. Heart rhythm, kidney and lung function might be disturbed after severe exposure.

### Are any future health effects likely to occur?

A single small exposure from which a person recovers quickly is not likely to cause delayed or long-term effects. Symptoms might still appear up to 24 hours after exposure if not treated appropriately. Skin, deep tissue and eye damage caused by chemical burns may be irreversible; large scars, necroses and destruction can occur.

## Follow-up instructions

Keep this page and take it with you to your next appointment. Follow only the instructions checked below.

- ( ) Call your doctor or the Emergency Department if you develop any unusual signs or symptoms within the next 24 hours, especially:
- headache, dizziness, confusion, fainting
  - pain in the area of effected skin
  - nausea, vomiting
  - chest pain, fast and/or irregular heartbeats, trouble with breathing
- ( ) No follow-up appointment is necessary unless you develop any of the symptoms listed above.
- ( ) Call for an appointment with Dr. \_\_\_\_\_ in the practice of \_\_\_\_\_  
When you call for your appointment, please say that you were treated in the Emergency Department at \_\_\_\_\_ Hospital by \_\_\_\_\_ and were advised to be seen again in \_\_\_ days.
- ( ) Return to the Emergency Department/\_\_\_\_\_ Clinic on (date) \_\_\_\_\_ at \_\_\_\_\_ am/pm for a follow-up examination.
- ( ) Do not perform vigorous physical activities for 1 to 2 days.
- ( ) You may resume everyday activities including driving and operating machinery.
- ( ) Do not return to work for \_\_\_ days.
- ( ) You may return to work on a limited basis. See instructions below.
- ( ) Avoid exposure to cigarette smoke for 72 hours; smoke may worsen the condition of your lungs.
- ( ) Avoid drinking alcoholic beverages; alcohol may worsen your clinical conditions.
- ( ) Avoid taking the following medications: \_\_\_\_\_  
\_\_\_\_\_
- ( ) You may continue taking the following medication(s) that your doctor(s) prescribed for you: \_\_\_\_\_  
\_\_\_\_\_
- ( ) Other instructions: \_\_\_\_\_  
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Signature of patient \_\_\_\_\_ Date \_\_\_\_\_  
Signature of physician \_\_\_\_\_ Date \_\_\_\_\_

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