First Aid Treatment for Hydrofluoric Acid Burns

- Honeywell documentation -

In Case of Contact or Suspected Contact with HF:

SKIN CONTACT

1. Move victim immediately under safety shower or other water source and flush affected area thoroughly with large amounts of running water. Speed and thoroughness in washing off the acid is of primary importance.

2. Begin flushing even before removing clothing. Remove all contaminated clothing while continuing to flush with water.

3. Rinse with large amounts of running water. If 0.25% calcium gluconate gel is available, the rinsing may be limited to 5 minutes, with the soaks or gel applied as soon as the rinsing is stopped. Otherwise rinsing must continue until medical treatment is rendered.

4. While the victim is being rinsed with water, someone should alert first aid or medical personnel and arrange for subsequent treatment.

5. Immediately after thorough washing, use one of the measures below:
   a. Begin soaking the affected areas in iced 0.13% benzalkonium chloride (Zephiran) solution. Use ice cubes, not shaved ice, in order to prevent frostbite. If immersion is not practical, towels should be soaked with iced 0.13% benzalkonium chloride (Zephiran) solution and used as compresses for the burned area. Compresses should be changed every two to four minutes. Do not use benzalkonium chloride (Zephiran) solution for burns of the eyes. Exercise caution when using benzalkonium chloride (Zephiran) solution near the eyes as it is an eye irritant. Benzalkonium chloride (Zephiran) soaks or compresses should be continued until pain is relieved or until more definitive medical treatment is provided.
   b. Start massaging 2.5% calcium gluconate gel into the burn site. Apply gel frequently and massage continuously until pain and/or redness disappear or until more definitive medical care is given. The individual applying the calcium gluconate gel should wear surgical gloves to prevent a possible secondary HF burn.

6. After treatment of burned areas is begun, the victim should be examined to ensure there are no other burn sites which have been overlooked.

7. Arrange to have the victim seen by a physician. (If burns are small and/or caused by weak acid, and treatment has been provided by an experienced individual, evaluation by a physician may not be necessary.) During transportation to a medical facility or while waiting for a physician to see the victim, it is extremely important to continue the benzalkonium chloride (Zephiran) soaks or compresses or continue massaging calcium gluconate gel. In many situations, particularly for minor burns covering a small skin area or for burns caused by dilute HF, continued treatment with soaks or gel may be effective as the sole type of medical care. All persons with extensive burns or burns with significant blister formation or with the appearance of whitish or dead skin need to be seen by a physician. All persons with HF burns which do not respond to either calcium gluconate gel or benzalkonium chloride (Zephiran) soaks or compresses within 30 minutes should be evaluated by a physician.

8. The physician may advise continuation of benzalkonium chloride (Zephiran) soaks or calcium gluconate gel.
   a. If the physician advises continued treatment with benzalkonium chloride (Zephiran) soaks or compresses, the soaks or compresses are usually required for 2 to 4 hours. Significant relief of pain should be noted within the first 30 minutes. If this does not occur, the victim must be seen by a physician and more definitive care instituted. If the pain is substantially relieved within the first 30 minutes, continue the treatment for a total of 2 hours. After that time, discontinue treatment and observe for the recurrence of pain. If pain recurs, continue soaks or compresses until relief of pain occurs. Soaking for 6 hours is sometimes needed. (Note: Because prolonged immersion in the ice bath may result in discomfort, relief may be obtained by removing the part from the bath
every 10 minutes for a minute or so and then reimmersing it. After the initial 30-60 minutes of treatment, less ice can be used so the bath is cool rather than cold.)

b. Calcium gluconate gel may be used for several hours or even repeated over a period of a few days. However, if significant relief of pain does not occur within 30 to 40 minutes, more definitive treatment such as Calcium Gluconate injections or iced benzalkonium chloride (Zephiran) will be required. For small burns, or burns of the face, ears, and near mucous membranes, calcium gluconate gel may be very useful. The gel is applied frequently and massaged into the burned area. This is continued until relief is obtained or further medical care is available.

9. For serious burns, medical attention must be provided as quickly as possible. For minor burns, if first aid treatment does not alleviate symptoms or if symptoms persist or recur, medical attention must be sought.

EYE CONTACT

1. Immediately flush the eyes for at least 15 minutes with large amounts of gently flowing water. Hold the eyelids open and away from the eye during irrigation to allow thorough flushing of the eyes. Do not use the benzalkonium chloride (Zephiran) solutions described for skin treatment. If the person is wearing contact lenses, the lenses should be removed, if possible. However, flushing with water should not be interrupted, and the lenses should be removed by a person who is qualified to do so. If sterile 1% calcium gluconate solution is available, water washing may be limited to 5 minutes, after which the 1% calcium gluconate solution should be used to irrigate the eye using a syringe or a continuous irrigation device.

2. Take the victim to a doctor, preferably an eye specialist, as soon as possible. Ice water compresses may be applied to the eyes while transporting the victim to the doctor.

3. If a physician is not immediately available, apply one or two drops of 0.5% tetracaine hydrochloride, 0.5% proparacaine, or other aqueous, topical ophthalmic anesthetic and continue irrigation. Use no other medications unless instructed to do so by a physician. Rubbing of the eyes is to be avoided.

INHALATION

1. Immediately move victim to fresh air and get medical attention.
2. Keep victim warm, quiet and comfortable.
3. If breathing has stopped, start artificial respiration at once.
4. 100% Oxygen should be administered as soon as possible by a trained individual. Continue oxygen while awaiting medical attention unless instructed otherwise by a physician.
5. A nebulized solution of 2.5% calcium gluconate may be administered with oxygen by inhalation.
6. Do not give stimulants unless instructed to do so by a physician.
7. The victim should be examined by a physician and held under observation for at least a 24 hour period.
8. Vapor exposures can cause skin and mucous membrane burns as well as damage to pulmonary tissue. Vapor burns to the skin are treated the same as liquid HF burns.

INGESTION

1. Have the victim drink several large glasses of water or milk to dilute the acid. Do not induce vomiting. Do not give emetics or baking soda. Never give anything by mouth to an unconscious person.
2. Give several glasses of milk or several ounces of milk of magnesia, Mylanta®, Maalox®, etc or grind up and administer up to 30 Tums®, Caltrate®, or other antacid tablets with water. The calcium or magnesium in these compounds may act as an antidote, however this has not been supported in the literature (39).
3. Get immediate medical attention. Ingestion of HF is a life-threatening emergency.