

EMERGENCY RESPONDERS AND MEDICAL
PERSONNEL FIRST AID GUIDELINES FOR

**ANHYDROUS HYDROGEN FLUORIDE
(AHF) and HYDROFLUORIC ACID (HF)**

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Health Factors, Industrial Hygiene, and First Aid

Health Factors

This section provides a brief overview of information pertaining to potential acute (short term) health hazards associated with exposure to HF. A comprehensive discussion of health effects information pertaining to HF is beyond the scope of these guidelines. For more information, contact a supplier of HF. Additional information, including first aid information, also may be found in the supplier's Safety Data Sheet (SDS).

There are many excellent resources available for developing a plan to treat HF exposures. For example, ATSDR's Medical Management Guidelines for Hydrogen Fluoride can be a useful guidance tool,¹ and the Australian National Occupational Health and Safety Commission has also published a useful resource tool. The HF manufacturer's Safety Data Sheet (SDS) will also include specific first aid instructions; first aid instructions on an SDS accompanying HF should be followed.

Development of a first aid plan should be done in consultation with appropriately trained medical personnel. To facilitate proper and timely first aid treatment, it can be useful to arrange in advance and have available medical receiving facilities and names of physicians (backup as well as primary) trained in HF emergency treatment.

It is noted that specific first aid procedures may vary based on fact-specific circumstances, recommendations of trained medical personnel, and other factors. Another useful component of a first aid program can be to develop exposure route flowcharts. Several examples are reproduced in Appendix I. Personal decontamination procedures used by some HF manufacturers are included in Appendix J.

For more general information about potential health effects of hydrogen fluoride, consult resources such as the U.S. Center for Disease Control's Fact Sheet about Hydrogen Fluoride²; ATSDR's Toxicity Profile on Fluorides³, European Union HF Risk Assessment⁴, and Australian National Occupational Health and Safety Commission's Guide to Hydrogen Fluoride⁵.

General Health Information

Hydrogen Fluoride or HF is extremely hazardous in both liquid and vapor states. See Appendix I for details on emergency first aid procedures. Contact with HF requires specialized treatment. It can cause severe injury to any tissue with which it comes in contact (chemical burn). Exposure by contact with skin, or by inhalation or ingestion, can lead to severe toxic systemic effects (Acute Fluoride Intoxication) and potentially death. Eye contact from vapor or liquid can result in blindness if not treated immediately. Death can occur from severe electrolytic imbalance (hypocalcemia and hypomagnesemia) that leads to cardiac arrhythmia (fibrillation), which, in turn, can lead to cardio-respiratory arrest.

HF penetrates tissue quickly and can penetrate all levels of the skin within a few minutes. HF rapidly dissociates into hydrogen and fluoride ions. Within the body, the disassociated fluoride ion will preferentially bind to calcium (and to a lesser extent magnesium). Depletion of serum calcium and magnesium may cause serious toxic systemic effects. Washing the exposed tissue with water does not neutralize HF and cannot reverse the skin penetration. While prompt water washing is required for initial decontamination, HF-specific first aid treatments bind the fluoride to calcium, and rapidly starting such treatments is critical to stopping further tissue damage.

The local (harm to the part of the body a substance meets) and systemic (harm that changes the function of other organs) toxic effects that can occur following exposure to HF will vary widely depending on the

concentration of HF, duration, and route of exposure. Effects may range from mild and reversible, such as mild irritation of the skin, eyes, and respiratory tract, to serious and potentially life-threatening.

Hyperkalemia (excessive concentration of potassium in the exposed area) is often cited as the cause of intense pain.

1 ATSDR's Medical Management Guidelines for Hydrogen Fluoride

2 U.S. Center for Disease Control's Fact Sheet about Hydrogen Fluoride

3 ATSDR's Toxicity Profile on Fluorides

4 European Union HF Risk Assessment

5 Safety Commission's Guide to Hydrogen Fluoride

Acute Inhalation Exposure

Inhalation of HF results in upper airway irritation in the nose and throat. More significant exposures may result in coughing and pain under the sternum.

Exposure to low concentrations of HF can result in irritation of nasal passages, dryness, and bleeding from the nose. While continued exposure to low concentrations can result in an ulcerated and perforated nasal septum, due to the irritant effects of HF, employees are unlikely to tolerate this repeated exposure.

Significant inhalation exposures will almost always result in signs or symptoms of upper airway irritation, so deep lung injury is unlikely in the absence of upper airway irritation. The risk is in failing to recognize the seriousness of an inhalation exposure as laryngeal and pulmonary edema may have delayed onset. Failure to recognize and treat an inhalation exposure may result in discharging a patient who then progresses to laryngeal and/or pulmonary edema.

In addition to the direct local effects on the lung, inhalation exposures pose a significant risk for systemic toxicity. Close observation for respiratory effects and signs of systemic toxicity is warranted.

Skin Exposure

Exposure to anhydrous or aqueous HF solutions above 50% will produce immediate burns. Less concentrated solutions may result in delayed burns which become apparent several hours following exposure. With dilute solutions (5% or less), burns may not be immediately painful or visible, but may be displayed 24 hours or more after exposure.

Eye Exposure

Eye contact with HF results in a feeling of burning, redness, and secretion. Even a splash of a dilute HF solution can quickly result in conjunctivitis, keratitis, or more serious destruction of eye tissue.

Chronic Hazard

Due to the high corrosivity and irritant effects of HF, chronic exposures and associated health effects are unlikely.

The U.S. Occupational Safety and Health Administration (OSHA) has set a permissible exposure limit (PEL) of 3 ppm, 8-hour, time-weighted average for HF. The threshold limit value (TLV[®]) established by the American Conference of Governmental Industrial Hygienists (ACGIH[®]) for HF is 2 ppm (Ceiling), 0.5 ppm 8 hr. TWA. The TLV refers to the airborne concentration and represents the condition under which ACGIH believes that nearly all workers may be repeatedly exposed, day after day, without adverse health effects. The value is a time-weighted average (TWA) concentration for an 8-hour workday and 40-hour work week. It only serves as a guide in the control of health hazards, and not as a fine line to distinguish between safe and dangerous concentrations. It should be noted that where the TLV is lower than the PEL, OSHA has taken the position in the past that it will embrace the more restrictive limit and use it in conjunction with the general duty clause in its enforcement role. TLVs, RELs, and PELs are subject to change by their associated peer review groups. As with other references in these Guidelines, users must check the current reference for up-to-date information.

EPA has issued Acute Exposure Guideline Levels, or AEGLs, for HF. AEGLs describe the risk to humans (general public) resulting from once-in-a-lifetime, or rare, exposure to airborne chemicals. The National Advisory Committee for AEGLs develops these guidelines to help both national and local authorities, as well as private companies, deal with emergencies involving spills, or other catastrophic exposures. Acute exposures are defined as single, non-repetitive exposures (emergency exposure periods) for not more than eight hours.

- AEGL 1 is the airborne concentration (expressed as ppm and mg/m³) of a substance at or above which it is predicted that the general population, including “susceptible” but excluding “hyper susceptible” individuals, could experience notable discomfort. Airborne concentrations below AEGL 1 represent exposure levels that could produce mild odor, taste, or other sensory irritations.
- AEGL 2 is the airborne concentration (expressed as ppm and mg/m³) of a substance at or above which it is predicted that the general population, including “susceptible” but excluding “hyper susceptible” individuals, could experience irreversible or other serious, long-lasting effects or impaired ability to escape.
- AEGL 3 is the airborne concentration (expressed as ppm and mg/m³) of a substance at or above which it is predicted that the general population, including “susceptible” but excluding “hyper susceptible” individuals, could experience life-threatening effects or death.

ACUTE EXPOSURE GUIDELINE LEVELS (AEGIs) for HF

Issued by EPA National Advisory Committee

Classification	10-Minute	30-Minute	60-Minute	4-Hour	8-Hour
AEGL-1 (Nondisabling)	1 ppm (0.8 mg/m ³)	1 ppm (0.8 mg/m ³)	1 ppm (0.8 mg/m ³)	1 ppm (0.8 mg/m ³)	1 ppm (0.8 mg/m ³)
AEGL-2 (Disabling)	95 ppm (78 mg/m ³)	34 ppm (28 mg/m ³)	24 ppm (20 mg/m ³)	12 ppm (9.8 mg/m ³)	12 ppm (9.8 mg/m ³)
AEGL-3 (Lethal)	170 ppm (139 mg/m ³)	62 ppm (51 mg/m ³)	44 ppm (36 mg/m ³)	22 ppm (18 mg/m ³)	22 ppm (18 mg/m ³)

The American Industrial Hygiene Association (AIHA) publishes Emergency Response Planning Guidelines (ERPGs). These guidelines set one-hour exposure limits for effects on the general public for use in emergency response situations. ERPG-1 is the allowable concentration for mild transient effects or objectionable odor (discomfort). ERPG-2 is the concentration for serious health effects or impaired ability to take protective action (disability). ERPG-3 is the allowable concentration for life-threatening effects (death).

The National Institute for Occupational Safety and Health (NIOSH) has set an IDLH (immediately dangerous to life or health) level for HF at 30 ppm.

The current NIOSH definition for an immediately dangerous to life or health condition is a situation “that poses a threat of exposure to airborne contaminants when that exposure is likely to cause death or immediate or delayed permanent adverse health effects or prevent escape from such an environment.” NIOSH’s intention in setting an IDLH is to “ensure that the worker can escape from a given contaminated environment in the event of failure of the respiratory protection equipment.” NIOSH’s respirator decision logic uses IDLH criteria to aid in the selection of respirators for emergency and certain other situations.

EMERGENCY RESPONSE PLANNING GUIDELINES (ERPGs) for HF

Issued by the American Industrial Hygiene Association

ERPG 1 (60 min)	2 ppm	ERPG 1 (10 min)	2 ppm
ERPG 2 (60 min)	20 ppm	ERPG 2 (10 min)	50 ppm
ERPG 3 (60 min)	50 ppm	ERPG 3 (10 min)	170 ppm

APPENDIX A

References to Regulations and Other Guidance

American Conference of Governmental Industrial Hygienists:

- TLVs[®] and BEIs[®] Based on the Documentation of the Threshold Limit Value for Chemical Substances and Physical Agents & Biological Exposure Indices

Agency for Toxic Substances and Disease Registry (ATSDR):

- “Managing Hazardous Materials Incidents” series (<https://www.atsdr.cdc.gov/MHMI/index.asp>) contains recommendations for on-scene (pre-hospital), and hospital medical management of patients exposed during a hazardous materials incident.
- Toxicological Profile for Fluorides (<https://www.atsdr.cdc.gov/mhmi/mmg11.pdf>)

American Industrial Hygiene Association (AIHA):

- AIHA2016: Environmental Response Planning Guidelines (<https://www.aiha.org/get-involved/AIHAGuidelineFoundation/EmergencyResponse-PlanningGuidelines/Pages/default.aspx>)

CHEMTREC:

- “Users Guide for Emergency Responders,” published by ACC (www.chemtrec.org)

Environmental Protection Agency (EPA):

- “Chemical Profile for Hydrogen Fluoride,” published by Office of Solid Waste and Emergency Response (<https://www.epa.gov/sites/production/files/2016-10/documents/hydrogen-fluoride.pdf>)

European Union:

- Substance Information- Hydrogen Fluoride (<https://echa.europa.eu/substance-information/-/substanceinfo/100.028.759>)

National Institute of Occupational Safety and Health

- NIOSH Pocket Guide to Chemical Hazards (<https://www.cdc.gov/niosh/npg/npgd0334.html>)

Occupational Safety and Health Administration:

- Permissible Exposure Limit (https://www.osha.gov/dts/chemicalsampling/data/CH_246500.html)

APPENDIX B

Typical Exposure Management Flowcharts (Decontamination, Evaluation, First Aid and Medical Treatment)

General Procedure to be followed:

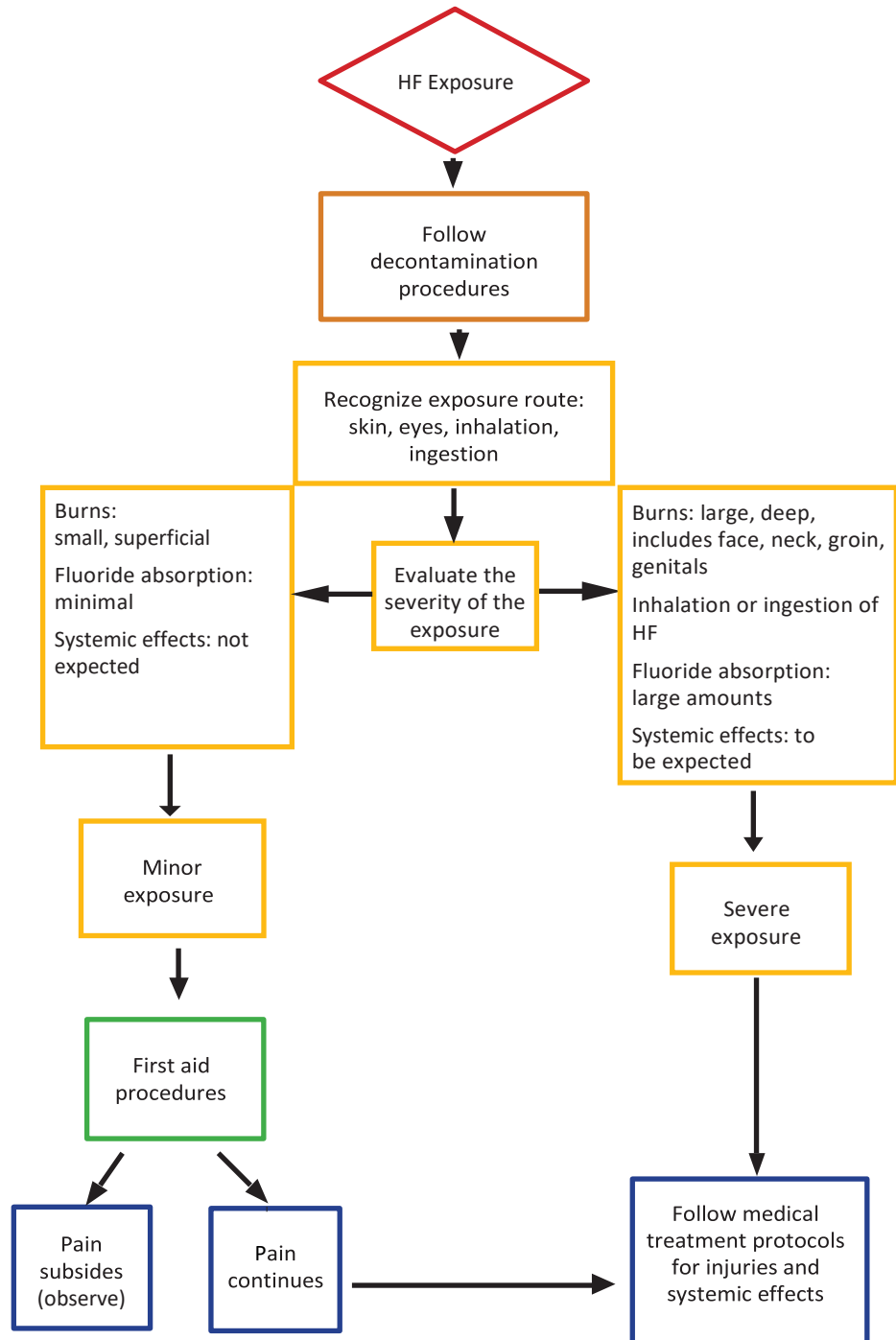
Exposure

Decontamination

Signs, symptoms, and severity evaluation

First aid

Medical treatment



Exposure

Skin Exposure

Decontamination

Decontamination procedure for AHF and HF aqueous solutions:

- Go to the nearest source of water or safety shower
- Turn on water
- While washing, remove ALL clothing, shoes, and jewelry
- Finally, while closing your eyes and facing the water - flow, remove your goggles or respirator face mask
- Wash for 5 minutes maximum if first aid treatments are immediately available. Otherwise continue to wash until first aid treatments are available

Decontamination procedure for HF containing tars and oils: After protecting your hands with PVC, nitrile, or neoprene gloves, proceed to

- Mechanically remove the tar or oil using gauze, tongue depressor, paper towels, etc.
- Consider all discarded materials hazardous waste and handle them appropriately
- Use baby oil to remove leftover tar and oil
- Remove baby oil residue thoroughly by washing with soap and water
- Wash with copious amount of water for 5 minutes maximum or until first aid treatments are available

Signs, symptoms, and severity evaluation

- Exposure to solution concentrations of HF <30%
- Exposed body surface to AHF less than 16 square inches
- Injury or pain appears several hours after exposure
- Superficial injuries
- Redness, blanching, swelling, pain
- Patient is conscious, stable, cooperative
- No apparent systemic toxic effects

- Exposure to high concentrations of HF >30% or AHF
- Exposed body surface is greater than 16 square inches
- Injury or pain appears immediately after exposure, with severe pain, redness, blanching, blistering, and tissue necrosis
- Exposure of the face, groin, genitals, or neck
- Patient is unconscious and unstable
- Cardiac arrhythmia (irregular heartbeats)

Minor exposure

Severe exposure

First aid

First aid procedures:
Using acid resistant gloves
-Immersion or compress with iced zephiran solution (0.13% benzalkonium chloride)
OR
-Continuously rub calcium gluconate 2.5% gel on the exposed area
-Note the time of initiation
-If pain significantly decreases or disappears within 20 to 30 minutes, stop, and observe

First aid procedures:
Using acid resistant gloves
-Immersion or compress with iced zephiran solution (0.13% benzalkonium chloride)
OR
-Continuously rub calcium gluconate 2.5% gel on the exposed area until you reach medical assistance
-Follow medical procedures

Medical treatment

During transportation to a medical facility or while waiting for a physician to see the victim, it is extremely important to continue the zephiran soaks or compresses or continue massaging calcium gluconate gel

Medical treatment procedures:

Medical management of the chemical injuries after decontamination and first aid:

- If burn is responding to standard first aid treatment (i.e., zephiran soaks or calcium gluconate gel), continue under pain subsides
- If pain does not subside, inject into, around, and under all injuries a solution of 2.5-5% calcium gluconate solution in normal saline
- Never use local anesthetics which may hide pain perception, which is important to determine the amount of calcium gluconate to be injected
- Treat the injury after the injections as you would any open wound
- Do not over-inject digits, nose flaps or ear lobes to avoid ischemic necrosis

Medical treatment of the toxic systemic effects:

- Start IV drop of 1000cc normal saline + 20cc of 10% calcium gluconate solution
- The amount of solution and rate of administration will depend on the patient's serum calcium (electrolyte titration technique)
- Monitor EKG (prolonged QT interval), electrolytes (with special interest in calcium, magnesium, sodium, and potassium), chest X-rays, pH, blood chemistry, fluorides in urine and blood, liver, and kidney functions
- Consider hemodialysis for the removal of serum fluorides and excess potassium

* There are other available and proven techniques—refer to Appendix 1

Exposure



Decontamination

Decontamination procedure:
 - Go to the nearest eye wash or source of clean water
 - Turn water on
 - Put your eyes in the water flow
 - Open your eyes for 5 minutes maximum. If you cannot open them, use your finger to maintain your eyelids open or ask for

Signs, symptoms, and severity evaluation

Severity: All exposures are considered severe because of the danger of vision loss. Consider the following information:

Exposure effects on	Mild exposure	Severe exposure
Skin	Minor irritation, reddening or swelling	Severe irritation, evidence of chemical burns of the eyelids and peri-ocular skin
Conjunctiva	Minimal irritation and injection (reddening)	Severe irritation, injection (reddening) and swelling, possible ulcerations
Cornea	No evidence of injury or minor irritation	Corneal opacification, pitting or ulceration with vision loss and intense pain
Vision	No evidence of vision loss	Vision loss that can be temporary if it is only due to corneal opacification, or permanent vision loss is retinal death occurs due to increased intraocular pressure

First aid

First aid procedures:
 -Irrigate each eye with 1000cc of a 1% calcium gluconate solution (no higher than 1%) for a minimum period of 15 minutes or if necessary, until medical aid is available.
 -Use standard IV tubing fixed to the forehead if one eye is exposed. For both eyes use a nasal cannula (designed for oxygen delivery) mounted on the nose or a "morgan lens" system for eye irrigation.
 -The use of a local anesthetic such as two drops of Pontocaine® (tetracaine) will facilitate the irrigation of the eyes and allow the insertion of the "morgan lens." This should always be inserted and removed while a continual flow of the irrigation solution is present.
 -Always obtain specialized medical evaluation & treatment.
 During transportation to a medical facility or while waiting for a physician to see the victim, it is extremely important to continue the calcium gluconate

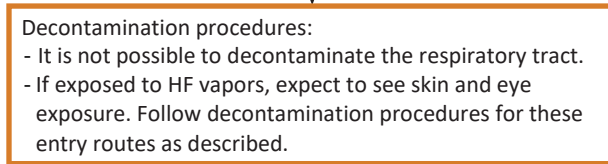
Medical treatment

Medical treatment procedures:
 Evaluation: you should always obtain a specialized medical evaluation which includes a detailed study of the exposed eyes using a slit lamp, determination of ocular pressure and fundoscopy.
 Treatment:
 -If necessary, continue treatment with 1% calcium gluconate eye drops.
 -Antibiotics and steroids can be used as indicated by an eye specialist.
 -Monitor ocular pressure.
 -Evaluate corneal opacification and conjunctival injury frequently.
 -If skin, inhalation, or ingestion exposure occurred do not forget to follow decontamination, first aid and medical treatment for those entry routes, including systemic toxicity
 Treatment protocols.
 -Psychological support may be necessary.
 * Other accepted treatment are listed in appendix 2.

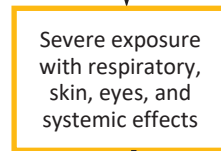
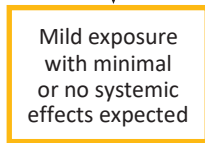
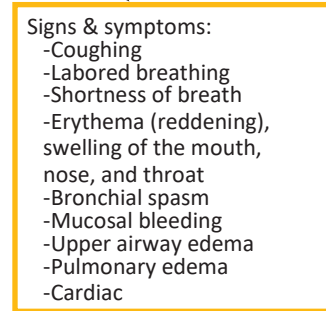
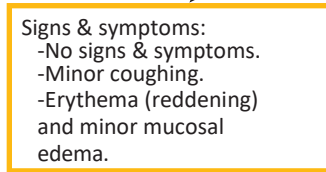
Exposure



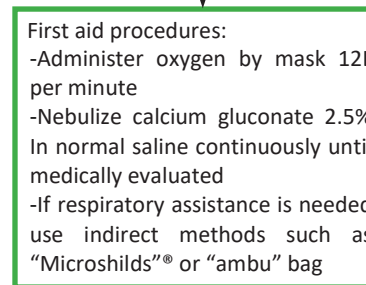
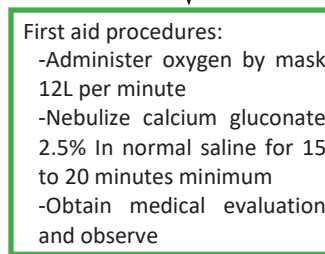
Decontamination



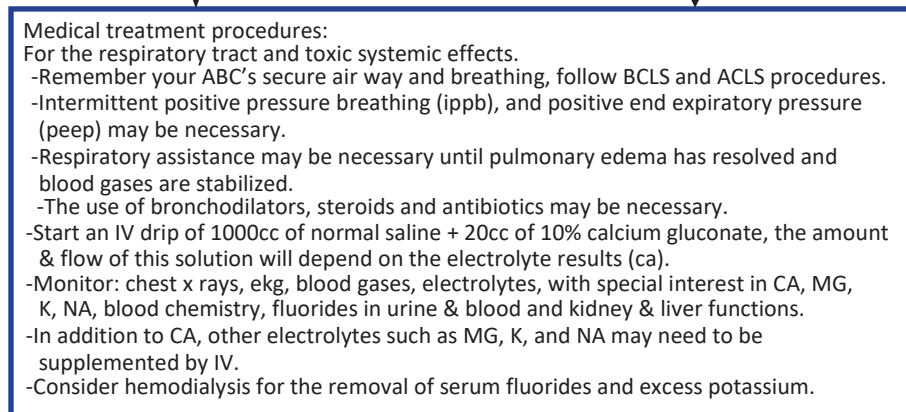
Signs, symptoms, and severity evaluation



First aid



Medical treatment



Decontamination

Decontamination procedures:

- It is not possible to decontaminate the G.I. Tract.
- If skin or eyes have been exposed, decontamination & treatment procedures should be followed.

Signs, symptoms, and severity evaluation

Severity: All exposures are considered severe because of the high probability of systemic toxic effects and G.I. Complications.

First aid

Signs & symptoms:

- Erythema (reddening) of the oral mucosa (mouth).
- Oral injury - ulcerations.
- Dysphagia (difficulty in swallowing).
- Bleeding of the oral cavity (mouth).
- Systemic toxicity should be expected.
- Possible bronchial or pulmonary injury due to aspiration if vomiting occurs.
- Cardiac arrhythmia (irregular heartbeat).
- Death may occur.

First aid procedures:

- **DO NOT INDUCE VOMITING!**
- If patient can swallow, give oral calcium solutions or calcium-based antacids, milk, or water.
- If patient is unconscious obtain medical attention immediately.

Medical treatment

Medical treatment procedures:

Injury management:

- HF destroys fiber optics—consider before attempting endoscopic techniques.
- If possible, install naso-gastric tube.
- Gastric lavage with calcium solutions or antacids.

Systemic toxic effects management:

- Establish IV drip 1000cc normal saline + 20cc of 10% calcium gluconate.
- The amount & flow rate of the calcium IV solution will depend on the serum calcium levels.
- Monitor ekg, electrolytes with special interest in CA, MG, K, and NA, chest x rays, blood gases, blood chemistry fluorides in urine & blood, kidney & liver functions.
- In addition to CA, other electrolytes such as MG, K, and NA may need to be supplemented by IV.
- Follow BCLS & ACLS procedures if necessary.
- Consider hemodialysis for the removal of fluorides or excess potassium in blood.

APPENDIX C

Personnel Decontamination Procedures

CAUTION: Personnel responding to an HF exposure must wear appropriate Personal Protective Equipment to prevent secondary exposure. Wear surgical gloves, as a minimum, to protect against a secondary HF burn. Nitrile, PVC, or neoprene gloves provide a higher degree of protection than latex gloves and should be used if available.

Eliminating HF contact quickly will minimize fluoride absorption.

Skin:

- Proceed to the nearest water source and begin flushing affected area with copious quantities of water.
- Under the water flow remove all clothing, jewelry, and shoes.
- When using chemical goggles or a full-face respirator, face the water flow, close eyes, remove the equipment and let the water flow away from the eyes.
- Flush with water for one to five minutes under the safety shower depending on shower flow rate, and the speed with which contaminated clothing, personal protective equipment, and other items can be removed.
- Immediately administer first aid and promptly seek medical attention.

Eyes:

- Proceed to the nearest water source.
- Under low pressure, clean water flow, open and close eyes continuously.
- Flush with water from one to five minutes under the eyewash, but it must be assured that there is adequate irrigation under the lids and in the corners of the eyes.
- Immediately administer first aid and promptly seek medical attention.

Respiratory Tract or Gastrointestinal Tract cannot be decontaminated. Immediately administer first aid and promptly seek medical attention.

First Aid Procedures

CAUTION: Significant Exposures to the skin, via inhalation or ingestion will lead to systemic toxic effects such as hypocalcemia and/or Acute Fluoride intoxication due to fluoride ion absorption. Please refer to the next section's Medical Treatment decision tree procedures for various exposure routes.

NOTE: Personnel who respond to an HF exposure incident must wear appropriate Personal Protective Equipment to prevent secondary exposure.

After thorough water decontamination and for inhalation or ingestion, where skin and possibly eyes need to be decontaminated, follow the First Aid procedures listed below. Ensure that the person to be treated is in a clean and safe environment.

Skin Decontamination

After an HF liquid or vapor exposure to the skin, begin decontamination with water under a safety shower as soon as possible. Clothing, personal protective equipment, and jewelry/watches should be assumed to be contaminated and removed while under the safety shower. HF is very water soluble, so water decontamination is highly effective. If more definitive treatment for HF exposures is available, decontamination time should be kept to a minimum. This may be as short as 1 to 5 minutes under the

safety shower depending on shower flow rate, and the speed with which contaminated clothing, personal protective equipment, and other items can be removed.

If more definitive treatment for HF exposure is not available, water decontamination should be continued until either:

- More definitive treatment is available
- Transport services are available to take the individual to a medical care facility
- The need to treat other injuries or exposures (such as HF inhalation) takes precedence over further skin decontamination

The advice above applies to exposures of HF alone or in combination with another agent that is very water soluble. HF exposures combined with hydro- carbons or other agents that are not water soluble may require longer water decontamination or use of other decontamination methods.

HF Exposures to the Eye

Initial decontamination is with water from an eye- wash or similar high flow device. Because of the discomfort associated with irrigating under the eyelids and in the corners of the eyes, use of a topical anesthetic is recommended after an initial brief decontamination. HF is very water soluble, so water decontamination is highly effective. If more definitive treatment for HF exposures is available, decontamination time should be kept to a minimum. This may be as short as 1 to 5 minutes under the eyewash, but it must be assured that there is adequate irrigation under the lids and in the corners of the eyes.

Once decontamination has been completed, continued irrigation with a low flow solution of 1% calcium gluconate is recommended. If 1% calcium gluconate for eye irrigation is not available, low flow irrigation with 0.9% saline should be continued while the individual is transported for medical evaluation by an eye specialist.

HF Ingestion

All individuals who have ingested HF or compounds that may generate HF on exposure to water should be transported to a medical facility for evaluation and treatment of both the local effects on the mouth and esophagus, and for systemic effects of HF. Given the limited efficacy of first aid treatments for HF ingestion, do not delay transport to give first aid treatment.

If trained personnel and supplies are available to initiate intravenous medications, strongly consider the infusion of calcium gluconate intravenously as presumptive treatment for impending systemic effects of HF (hypocalcemia being the most immediate).

Individuals who are conscious and have a burning sensation in the mouth may have some pain relief from rinsing with water or a calcium gluconate solution (the 1% solution for eyes or 2.5% solution used for nebulization would be suitable).

APPENDIX D

Potential Exposure Triage Evaluation

EXPOSURE TRIAGE SHEET

NAME _____ DOB _____ Date _____ Time _____ am/pm

How exposed: _____

Type Exposure: Skin _____ Eyes _____ Inhalation/Ingestion _____

Decontamination: Started _____ am/pm Decontamination: Completed _____ am/pm

SYMPTOMS

SKIN: None _____ Burning _____ Pain _____
 Tingling _____ Discoloration _____
 Blistering _____ Other _____

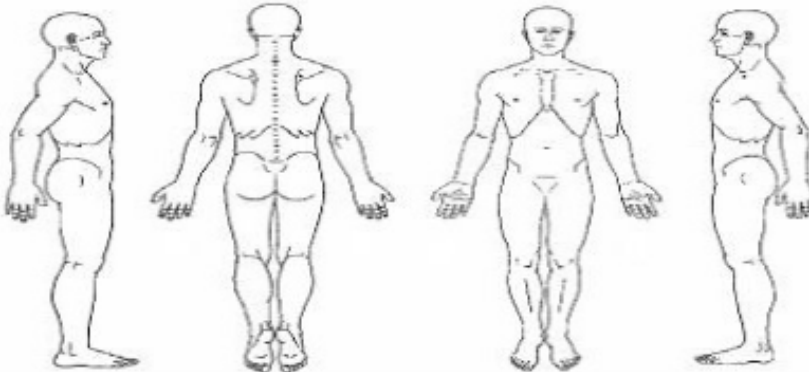
EYES/NOSE: None _____ Burning _____ Watery _____ Redness _____
 Irritation _____ Nasal drip _____ Other _____

INHALATION/
 INGESTION: None _____ Chest tight _____ Burning in throat / windpipe _____
 Short of breath _____ Congestion _____ Wheezing _____
 Cough _____ non-productive _____
 productive _____
 blood _____
 Abd pain _____ Other _____

PHYSICAL ASSESSMENT

BP _____ / _____ P _____ R _____ Pulse Ox _____ Other _____

SKIN: (mark areas below) None _____



Document abnormalities:

GENERAL : _____	SHEENT: _____
LUNGS : _____	HEART : _____
ABD : _____	VASC : _____
NEURO : _____	OTHER : _____

TREATMENT

Ca gluc gel time _____ am/pm Ca gluc nebulizer time _____ am/pm
 Ca gluc irrigation time _____ am/pm Oxygen therapy time _____ am/pm
 Other _____

NOTES

EMS Contacted _____ am/pm Arrived _____ am/pm Transfer Completed _____ am/pm
 Life Flight Contacted _____ am/pm Arrived _____ am/pm Transfer Completed _____ am/pm

Attending ERT Site Personnel Signature / Date _____

Witness or Commander Signature / Date _____

APPENDIX E

Definitions and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists

AIHA: American Industrial Hygiene Association

AHF: Anhydrous Hydrogen Fluoride

ACC: American Chemistry Council

ATSDR: Agency for Toxic Substances and Disease Registry

Chemical Company: Legal entity that manufactures, transports, or uses HF products, including AHF and HF acid by rail, water or truck in the United States, Canada, or Mexico

CHEMTREC® (Chemical Transportation Emergency Center): 24-hour, 365-days per year chemical transportation emergency center operated by the American Chemistry Council

EPA: U.S. Environmental Protection Agency

ERP: Emergency Response Plan

ERPG: Emergency Response Planning Guideline

ISO: International Standards Organization

LEPC: Local Emergency Planning Committee

Member's Responder: Any duly designated response personnel employed by, or any for-hire company, contractor, or independent contractor retained by a Member, who functions as an HFDI Responder

OSHA: Occupational Safety and Health Administration

PEL: Permissible Exposure Limit

Promptly: In response context, means responding to or being at the scene of a HFDI as soon as reasonably possible, considering the incident seriousness, the potential public exposure, potential environmental harm, the Responder proximity and the geographic, weather, travel, and other relevant conditions

Responder: An individual, qualified as set forth in this Framework, and designated by a Member

SDS: Safety Data Sheet

Transporter: Entity responsible for the physical conveyance of the HF, AHF, or HFA from one location to another. The Transporter may, or may not, be a Member