

Emergency treatment of hydrofluoric acid (HF) burns and injury prior to transfer to hospital

Primary response

AVOIDING DANGER: For the safety of the rescuers it is essential to prevent inhalation of HF and contact with HF during any rescue operation. **First aiders involved in rescue or decontamination must use appropriate personal protective equipment (PPE).**

RESPONSE: Assess for a response and breathing. If the casualty is unresponsive or breathing abnormally commence Advanced Life Support. Call for an ambulance immediately as high concentration HF exposures can be rapidly fatal.

ABC: Follow Basic Life Support and Advanced Life Support guidance. Administer 100% oxygen if patient is breathing.

Decontamination

Decontamination is the **immediate** priority if the patient is responsive. This takes precedence over transfer to medical facilities, though an ambulance should be requested while decontamination is being undertaken.

Skin exposure

- **DO NOT DELAY decontamination if the patient is responsive.**
- **Immediately decontaminate** with high flow water for a maximum of one minute.
- Ask others to ensure ample supplies of calcium gluconate gel are obtained.
Note: If calcium gluconate gel is not available continue to flush with water until it is.
- **Rapidly remove contaminated clothing**, shoes and jewellery.
- **Apply calcium gluconate gel** and massage into the burnt area wearing gloves appropriate to the level of decontamination. *Continue to massage while repeatedly applying gel until 15 minutes after the pain in the burnt area is relieved, if necessary during the ambulance transfer to hospital.*
- If skin contamination is extensive and clothing affected, be aware of the possibility of inhalation injury.
- All potentially contaminated equipment and clothing should be disposed of in line with the COSHH risk assessment.

Eye exposure

- **DO NOT DELAY decontamination if the patient is responsive.**
- Flush the eyes with copious amounts of water or eye wash solution (sterile isotonic saline solution) until the ambulance arrives. Do not attempt to remove contact lenses. Irrigation should be continued while en route to hospital.
- Remove any exposed clothes, jewellery and shoes.
- **Do not apply calcium gluconate eye drops** as effectiveness has not been proven and the drops may increase ocular damage.

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- There is some evidence from a single experimental study that if Hexafluorine® is applied to the eye within 25 seconds of exposure, and continued for 15 minutes, ocular damage is lessened. (Spöler et al. *Analysis of HF penetration and decontamination of the eye by means of time-resolved optical coherence tomography*. Burns 2008; 34: 549-555). However, at the time of publication of this guidance this is by no means conclusive evidence.

Inhalation

- **Remove casualty to fresh air** and remove any exposed clothes, jewellery and shoes.
- If inhalation is suspected administer 100% oxygen.
- **Immediately arrange transfer to hospital.**
- Keep casualty at rest in a comfortable position and administer oxygen until transfer to hospital.

Ingestion

- **DO NOT DELAY decontamination: remove clothes and shoes.**
- **Seek urgent hospital transfer as ingestion can be rapidly fatal.**
- **Do not induce vomiting.** Mouth and lips may be rinsed with water, only if casualty is conscious.

Transfer to hospital

Arrange for transfer to hospital for further assessment and treatment by an appropriately qualified and experienced medical practitioner ensuring that the nature of the incident has been explained and, where possible, all of the chemicals involved in the contamination have been identified. Ideally send the Manufacturer's Safety Data Sheet (MSDS) with the patient.

Decontamination with high flow water and removal of clothes and shoes should be done prior to loading inside the confines of an ambulance. The administration of calcium gluconate gel can be done en-route to hospital.

It is good practice to provide a treatment pack to accompany the patient to hospital. The pack should contain several tubes of calcium gluconate gel, as well as a copy of these medical treatment guidelines, to alert the receiving doctor or nurse to the potential severity and recommended treatment of an HF burn.

Hospital medical staff should consult TOXBASE (www.Toxbase.org) and telephone NPIS for specific advice (0844 892 0111)

Occupational Health and Safety

These guidelines should form part of a site specific approach to the prevention and treatment of HF burns.

- All persons using HF should have appropriate PPE.
- There should be immediate access to high flow water for decontamination and easy access to calcium gluconate gel in areas where HF exposures may occur.
- All persons working on a HF plant should receive education on the spectrum of HF burns from life threatening to delayed burns. Workers should be provided with calcium gluconate gel to take home in the event of delayed symptoms from low concentration burns. They should present to hospital if they are concerned or have used the gel at home.

Chemical Industries Association
Health and Safety Executive
National Poisons Information Service

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