

Water Safety (Waterborne diseases & immersion)



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Introduction

This is the first edition of this factsheet. Information contained within this factsheet was previously found in FS120603 Water Safety (Incorporating Life Jackets and Buoyancy Aids), dated Jan/00.

Information regarding Life Jackets and Buoyancy Aids can be found in factsheet FS120603 Water Safety (Incorporating Life Jackets and Buoyancy Aids), dated June/05.

Further editions may be issued in the light of experience from this edition.

General

An awareness of the possible dangers associated with water activities should not be allowed to interfere with the challenge associated with these activities. Proper training in the background to the dangers and self help techniques of survival can help to eliminate or minimise the dangers.

Cold water immersion

Cold water can kill in several ways. These can be explained under two headings - short term and long term immersion.

Short term cold water immersion

The main problems that are associated with this form of immersion involve the circulation of the blood and the breathing system.

When a person drops into cold water, the blood vessels nearest to the skin constrict and the blood pressure in the body core rises rapidly. Together with an increase in heart-rate due to the alarm felt by the person, this can lead to heart failure in

some people. On rare occasions this can happen to apparently healthy young people.

The second type of response is that where immersion is accompanied by big involuntary gasps. During this period a person can be inhaling and exhaling up to five times the normal volume of air. This greatly increases the possibility of inhaling water and drowning. A complication is that, during this process, the level of Carbon Dioxide in the blood is reduced and fainting can occur. An unconscious person is more likely to inhale water and drown. The changes in blood chemistry involved increase the possibility of muscle cramps, and decrease the ability to survive.

In order to minimise these effects, one should attempt to enter the water as gradually as possible, and consciously attempt to control the breathing rate. The more clothing and insulation worn, the greater chance of avoiding these effects and surviving.

Long term cold water immersion

In general those people accidentally immersed in cold water, who have some sort of flotation device (life jacket or buoyancy aid), do not die as a result of the short term problems discussed above. The danger in the long term is the progressive loss of body-heat leading to hypothermia, unconsciousness, inhalation of water, and death (either from drowning or loss of heat).

In the average person it takes from 15 to 20 minutes for the core of the body to begin to cool. When the core temperature has dropped from the normal 37°C to about 34°C, a maximum rate of shivering by the body is reached. The heat

generated by this shivering is, however, only sufficient to match heat loss in cool air and so the cooling continues. Below 35°C, experimental patients tend to lose the ability to maintain a logical sequence of ideas. This could be the

reason for the strange behaviour often noticed in hypothermia victims. The wearing of protective clothing can delay the cooling process and the onset of hypothermia by considerable amounts, depending on the degree of specialisation of the clothing. Figure 1 below shows the rate of decrease in body temperature for an unprotected person in 10°C water.

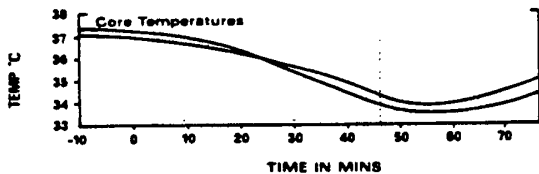
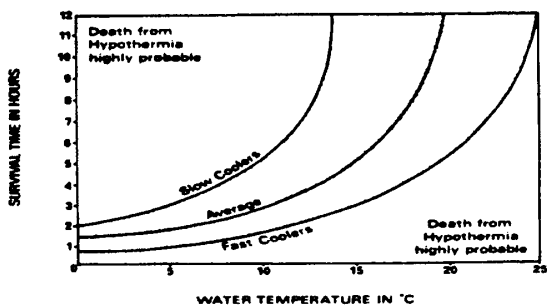


Figure 2 below shows the relation between water temperature and the time of death from hypothermia for a lightly-clothed person. It must be stressed that these figures are for a person making no effort to move in the water



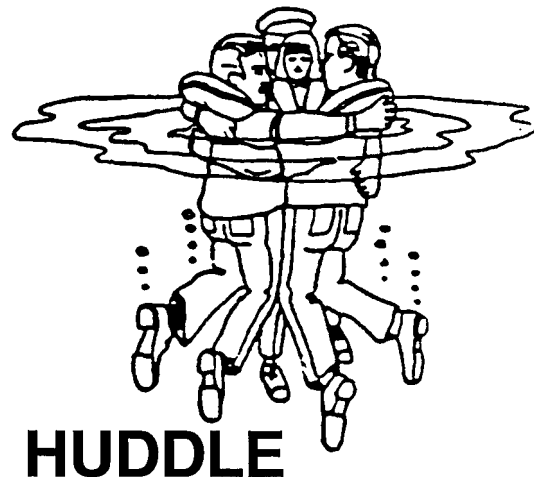
Self help in cold water immersion

If there is any danger that a person will be in a position where cold water immersion is possible, the wearing of a life jacket or buoyancy aid and, if possible, some protective clothing, i. e. wet or dry suit, or thermal type wear, is recommended. If actually immersed, movement should be minimised. If by oneself, the adoption of the Heat

Exposure Lessening Position (**HELP**) will minimise heat loss (see above right). By adopting this crouching position, the areas of greatest heat loss (the head, neck, sides and groin) can be protected.



If a group of people find themselves in cold water together, they can adopt the **HUDDLE** position. In this, the sides of the body and the lower body areas are pressed together. As well as reducing the heat loss there are advantages mentally in being together. Any young person should be placed in the middle of the huddle.



Practicing drown-proofing in cold water exposes the head to the cold water, increases the rate of body cooling, and hastens hypothermia. Treading water uses up body energy which means that heat is being lost more rapidly than if simply floating in your lifejacket or buoyancy aid. Any person regularly undertaking water activities in water which has a temperature of less than 15°C,

should practice H.E.L.P. and Huddle techniques regularly, so that if there is an emergency they come automatically to mind.

Hypothermia

Hypothermia is an insidious condition that creeps up slowly on the victim. If a casualty has been immersed in cold water for more than a few minutes it is wise to consider the possibility of hypothermia. It is also possible for people involved in water activities to succumb to hypothermia just by being exposed to cold, damp conditions in an open boat, canoe or sailboard.

Symptoms and treatment

The victim may not complain of anything more than being cold and shivering. Occasionally there may also be attacks of cramp.

Leaders are often in a better position to assess the physical state of others in the party, although their judgment may be impaired if the conditions are such that the whole party is being affected. The Leader should watch for the development of quietness and apathy, slow thinking, unexpected outbursts both vocal and physical, loss of faculties (slurred speech, blurred vision, etc.) and violent fits of shivering. All indicate that a problem is possible and evacuation from the water is advisable.

Undoubtedly, the best treatment is to minimise the possibility by ensuring that the clothing worn is suitable for the conditions. Early diagnosis of the conditions that may lead to hypothermia and curtailing the activity are better than having to treat a hypothermic patient. If hypothermia is diagnosed the first stages of treatment must be evacuation to a warm dry place. If in any doubt medical assistance should be sought. Initial treatment should include insulating the victim from further cold and supplying warm drinks with energy giving food.

Weil's Disease

Weil's Disease is a bacterial infection carried in rats' urine which contaminates water and wet river banks. The bacteria does not survive for long in

dry conditions. It can be a serious illness requiring hospital treatment, and can lead to kidney or liver failure. **Weil's Disease is a notifiable illness.** The bacteria are absorbed through the skin or mucous membranes of the mouth and eyes. It gets into the blood stream very easily if you have a minor cut on your skin or feet, if you become immersed. If you feel ill after training - particularly in stagnant water or pools - or have any of the following symptoms, call your doctor promptly. The most common early symptoms are high temperature, an influenza-type illness and muscle pains. **Tell your doctor that you have been undertaking water activities and where and ask if you can have a blood test for Weil's Disease.**

There is a specialist reference laboratory for *Leptospirosis* in the UK, which can be consulted by doctors.

Prevention

Prevention measures are largely common sense

- Cover all cuts and abrasions with waterproof plasters.
- Always wear footwear to avoid cutting the feet.
- Avoid capsize drill or rolling practice in suspected waters.
- Where possible shower soon after the activity
- If in doubt contact your doctor as soon as possible.

Blue-green algae

Certain species of the blue-green algae can produce toxins which, upon contact, may cause a number of conditions such as dermatitis, asthma, eye irritation, rashes, blistering of the skin around the mouth and nose, nausea, gastroenteritis, muscle cramps, headaches and pneumonia in some people. They have also caused fatalities in fish, livestock and pets

These organisms can undergo a very rapid population increase in favorable conditions (i.e. prolonged, warm, still weather and high levels of

nutrients in the water such as nitrogen runoff from fertilisers used on adjacent land) and therefore, produce very high levels of toxin quite suddenly. This is sometimes, but not always, associated with the production of a scum at the surface of the water.

Situations where recreational water users are at most risk from toxins are:

- Ingestion of scum on water including drinking raw water or inadequately treated water.
- Skin contact with scum or water or raw water.

Those most at risk from blue green algae are, in order of risk:

- 1 Children playing at the water's edge.
- 2 Swimmers.
- 3 Board Sailors.
- 4 Paddling (Canoeists & Kayaks).
- 5 Dinghy sailors.
- 6 People engaged in non-capsizing type sailing or motor cruising.

Many areas of water, particularly those used by sailing clubs, will now display information about blue green algae and where high levels of blue-green algae are found, a flag will be flown to warn the public. The flag will be half blue and green with the word **toxic** across it. For other water areas contact your local river authorities or water company to find out whether blue-green algae is present.

Other potential hazard

- Cryptosporidium

This is a parasite infection which is widespread in the United Kingdom. Enhanced personal hygiene should be encouraged at all times. The symptoms are an acute diarrhea illness, commonly of two to three weeks duration from which the patient recovers fully unless there are underlying conditions.

- Hepatitis A (Infectious Hepatitis)

Hepatitis A is a virus infection of the liver which can vary from a mild or in-apparent illness to, rarely, a severe disabling disease lasting several months. Infection has been caused by swallowing water during water sports.

The incubation period varies from two to six months after swallowing the virus. The onset of the illness is abrupt, with loss of appetite, fever, nausea, and abdominal discomfort, following within a few days by jaundice. If you become ill at any time with these symptoms, call your doctor and tell him you participate in water sports.

- Gastro-intestinal disturbance

The commonest illness associated with water sports is mild gastro intestinal disturbance (tummy upset) which can occasionally lead to diarrhea and vomiting. When this happens you are advised to consult a doctor. Flu like symptoms and mild respiratory symptoms may also occur, as may eye and ear symptoms. Those generally resolve rapidly without treatment.