

Don't feel the heat

The dangers of heat illness

Introduction

One of the main attractions of a career at sea is to be able to travel around the world to places not normally visited, including hot and sunny climates. However, the dangers of heat illness need to be known — especially as summer approaches or as the ship is in transit in hot climates.

It is important to be aware of the dangers of heat illness when joining a ship in a very hot climate having travelled from cooler climates such as the UK, especially for the first time.

Heat-induced illness can be prevented by using a little common sense and knowing the symptoms, which could save a life.

A combination of warm air temperature, thermal radiation, humidity and airflow, as well as physical exertion, can bring about heat-induced illness. It is important for those working in potentially hot and humid areas onboard ship to be attentive and know the warning signs of heat illness.

What is heat illness?

Heat-induced illnesses occur when the body cannot cope with, or dispose of excess heat (by sweating) in the normal way in a relatively short space of time. The early phase of the body's inability to cope with heat is:

■ **Heat exhaustion:** where the body's mechanism for regulating body temperature is functioning at a higher rate. The body is hot, flushed and bathed in sweat. Other symptoms

include: headaches, nausea, fatigue, cramps and dizziness.

A more serious condition that can lead to death is:

■ **Heat stroke:** where the body's temperature-regulating mechanism is partially functioning or totally out of action. The body is hot, flushed and dry, as little or no sweat is being produced. Other symptoms include: fast and strong pulse, fast and deep breathing, twitching, unconsciousness, convulsions and/or vomiting.

If a person shows the symptoms of either condition, prompt medical assistance and attention needs to be obtained quickly.

Sweat consists mainly of salt, minerals and water which must be replaced regularly. The body normally copes with hot environments by sweating and increasing the blood flow from the body core to the skin.

The risks

The seafarer is put at risk of suffering heat-induced illness in a number of ways:

■ Being in surroundings with high temperature, high humidity and strong sunlight, ie in the tropics.

■ Physical exertion in enclosed spaces and exposure to high heat, ie the engineroom, galley or laundry.

■ Working on deck and ashore in hot, humid and sunny conditions where there is a risk of sunburn.

■ Wearing personal protective clothing that restricts escape of body heat, such as FFE (firefighter's ensemble).

Seafarers new to an area with higher heat and humidity than they are used to should be given time to acclimatise themselves to the conditions — which might take between one to three weeks. This varies according to the individual.

What can you do to help yourself?

■ **Pace yourself:** get used to the heat and humidity slowly — especially before physical exertion. Change your work pattern to fit the conditions. Distribute the workload evenly over the day and incorporate work-rest cycles.

■ **Drink plenty of fluids:** drink plenty of cool liquids (at least 3 to 5 litres a day in moderate temperatures and up to 7 litres in hot conditions). It is best to take small quantities at frequent intervals. Drink plenty of water before, during and after periods of outdoor work or physical activity. If you have to work strenuously, then drink fruit juice or a sports beverage designed to replenish minerals lost due to excessive sweating.

■ **Avoid alcoholic & sugary drinks:**

Suggested drink concentrations

Standard dehydration:	1 part fruit juice to 4 parts water
Feeling thirsty?	3 parts fruit juice to 2 parts water
Dehydrated:	4 parts fruit juice to 1 part water

avoid very sugary and caffeinated (teas, coffee, cola) beverages. Liquids with high sugar concentration or alcohol cause additional dehydration.

■ **Wear suitable clothing:** when it is necessary to work in strong sunlight, wear lightweight, light-coloured, loose-fitting clothing and a hat, preferably cotton, to cover exposed skin.

■ **Protect your skin:** sunburn should be avoided because of the risk of skin cancer and serious burns. If you have to go outside, make sure you put sunscreen on.

■ **Replace salt and minerals:** make sure that you have adequate salt intake. Heat acclimatised seafarers need much less salt in their diet than those who are not acclimatised to the heat. The standard western diet contains enough salt for supplements not to be necessary. However, drinking large quantities of water tends to dilute the body's fluids, while the body continues to lose salt. If for some reason salt supplement is needed, then add a little salt to food.

■ **Stay cool:** stay in the shade, or if possible, an air-conditioned environment. If the work is in enclosed spaces, they should be well ventilated. If possible, carry out work during cooler parts of the day; only those who are acclimatised to the heat should perform the more strenuous tasks.

■ **Pair up:** work with someone else — use a buddy system to monitor each other for signs of heat illness.

Finally...

Remember to keep cool and drink lots of liquids, regardless of the activity level. Eat regular but light meals, pace yourself when working and get enough sleep. Heat-induced illness is a serious condition that can lead to death. If you feel unwell, report to the person responsible for medical aid onboard.

If a work colleague seems to be suffering from heat illness:

■ Call for medical assistance immediately (the person responsible for medical aid onboard who will then decide what further action is required).

■ Move individual to shade and cool them (shower or sponge with cool water which should not be less than 15 °C).

Working in hot / humid conditions

The risk of heat induced illness and the amount of work that it is safe to carry out can be calculated using the following guidance taken from the Ship Captain's Medical Guide.

The calculation requires the use of an hygrometer, comprised of two thermometers, one wet-bulb and one dry-bulb, usually located in a Stevenson Screen, in the vicinity of the bridge. The readings of the two thermometers can be used to determine a 'composite temperature' which will give an indication of the amount of work that can be undertaken per hour in given circumstances.

The 'composite temperature' is calculated by adding the wet-bulb temperature x 0.7 to the dry-bulb temperature x 0.3 measured in °C. The resulting 'composite temperature' can be used to establish the work/rest ratio as follows:

*Composite temperature °C work/rest ratio

Light Work	Moderate Work	Heavy Work	
30	27	25	Continuous work
30.5	28	26	75% work / 25% rest per hour
31.5	29.5	28	50% work / 50% rest per hour
32	31	30	25% work / 75% rest per hour

*Add 1° to the composite temperature if there is some radiant heat

*Add 2° to the composite temperature if there is intense radiant heat

If the composite temperature is above the values in the table, extreme caution should be exercised in allowing work at all because there will be a risk of heat-stroke. In emergency conditions where the work must be done, short spells of work (say 10 minutes) may be permitted but the person must be allowed to cool off completely before being allowed back into the hot environment.

Note: The temperature measured may not necessarily reflect the ambient temperature outside on deck or in the engine room.

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