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Hypothermia: Surviving in Cold Water

HYPOTHERMIA OCCURS WHEN YOUR BODY gets cold enough that its core temperature drops below normal. The condition is a very real possibility for those fishing or boating on the Great Lakes, where water temperatures are frequently 60° F or less.

Sudden immersion in cold water causes a severe shock to your body. The first reaction is often an involuntary gasping for breath, which can result in drowning if your head is underwater at the time.

If you avoid drowning, hypothermia is your next concern.

Cold water can conduct heat away from your body 32 times faster than cold air. Within 10–15 minutes, the temperature in your body's core—the brain, heart, lungs and other vital organs—begins to cool.

Your body responds by trying to keep as much heat as possible in the core. The flow of blood to the arms and legs is dramatically reduced. Your body tries to generate more heat by shivering and other involuntary muscle movements. In a very short time, you lose the ability to move your arms and legs.

Shivering is unlikely to produce enough heat to balance the heat lost to the cold water. Your body has limited readily available energy reserves, and survival depends on making those reserves last as long as possible. If its core continues to cool, your body gives up its attempt to produce heat. Shivering stops. As the brain cools, its functions become impaired. You will probably become very confused; you may even resist efforts by others to assist you. Your muscles will become increasingly rigid. You will be almost completely unable to help yourself.

If your body continues to cool, you will lapse into unconsciousness. You may appear already dead: there may be no signs of a heartbeat or breathing, because these functions slow dramatically. Death actually occurs after your heart cools to about 77° F and stops beating, although there are cases where people with body core temperatures lower than 77° F have survived.

How fast does all of this occur? The answer depends on many factors, such as water temperature, your age

H.E.L.P. (Heat Escape Lessening Posture)

Hold your knees to your chest to protect the trunk of your body from heat loss. Wrap your arms around your legs and clasp your hands together.



HUDDLE

Huddle together with two or more people. This will extend your survival time 50 percent longer than swimming or treading water.



Hypothermia Chart

| Temperature of Water (°F) | Exhaustion or Unconsciousness | Expected Survival Time |
|---------------------------|-------------------------------|------------------------|
| 32.5 | Under 15 minutes | Under 15–45 minutes |
| 32.5–40 | 15–30 minutes | 30–90 minutes |
| 40–50 | 30–60 minutes | 1–3 hours |
| 50–60 | 1–2 hours | 1–6 hours |
| 60–70 | 2–7 hours | 2–40 hours |
| 70–80 | 3–12 hours | 3 hours–Indefinite |
| Over 80 | Indefinite | |

and physical condition, how you behave while in the water, the amount of insulation provided by your clothing and your mental attitude. Under the worst circumstances, you may lapse into unconsciousness in 30 minutes or fewer; you could be dead in less than an hour.

However, you can take certain steps to extend your survival time and increase your chances of being rescued. Many of these steps will help your body to conserve energy and retain heat in the core area.

- Use some means of flotation so you don't have to use energy to keep yourself afloat. Treading water and swimming can increase your body's heat loss by as much as 35 percent. The best means of staying afloat is a personal flotation device (PFD). You should test it in a nonemergency situation to be sure that it fits properly and comfortably.

- Even the very best PFD is ineffective if it doesn't accompany you into the water. The only way to be sure that you will have it when you need it is to wear it at all times while on or near the water.
- Keep as much of your body out of the water as possible. This is especially true of your head and neck. As much as 50 percent of your body's heat loss occurs in these areas. A hat or hood can help protect these critical areas.
- Climbing onto a capsized boat or floating debris is better than remaining in cold water even if the air temperature is colder than the water. Otherwise, huddling together with others in the water helps everyone conserve heat.

HYPOTHERMIA SYMPTOMS AND FIRST AID PROCEDURES*

MILD SYMPTOMS

(Body core temperature 97–93° F)

- Shivering; cold hands and feet.
- Still alert and able to help self.
- Numbness in limbs, loss of dexterity, clumsiness.
- Pain from cold.

First Aid

- Primary task is to prevent further heat loss and enable the body to rewarm itself. Give warm, sweet drinks—no alcohol! Apply gentle heat source to stabilize body temperature.
- Exercise victim to generate heat. Keep victim warm for several hours, keep head and neck covered.

MODERATE SYMPTOMS

(Body core temperature 93–90° F)

- Shivering may decrease or stop.

First Aid

- Same as above, except limit exercise.
- Offer sips of warm, sweet liquids only if victim is fully conscious, has begun to rewarm, and is able to swallow. No alcohol!
- Do not massage the extremities.
- Use hot, wet towels to warm the victim. Do not warm the extremities.
- Have victim checked by a doctor.

SEVERE SYMPTOMS

(Body core temperature 90–82° F)

- Shivering has decreased or stopped.
- Confusion, abnormal behavior, loss of reasoning and recall.
- Victim appears drunk; very clumsy, slurs speech, denies problem and may resist help.
- Victim semiconscious to unconscious. Noticeable muscular rigidity.

First Aid

- Victim is in serious trouble—keep continuous watch over him/her.

- Obtain medical assistance or advice as soon as possible.
- Treat as for shock—lay victim down, elevate feet slightly and keep immobile.
- Apply external mild heat to head, neck, chest and groin; keep temperature from dropping, but avoid too rapid a temperature rise.
- Avoid jarring victim—rough handling may cause cardiac arrest or ventricular fibrillation of heart.
- No food or drink—no alcohol!
- Ignore pleas of, “Leave me alone, I’m OK.”
- Transport soon, but gently, to hospital.

CRITICAL SYMPTOMS

(Body core temperature below 82° F)

- Victim is unconscious and may appear dead.
- Little or no apparent breathing.
- Pulse slow and weak or no pulse found. Skin cold, may be bluish-gray in color.
- Eyes may be dilated. Body is very rigid.

First Aid

- Don’t give up! Always assume patient is revivable.
- Handle with extreme care.
- Tilt the head back, which opens the airway—look, listen and feel for breathing and pulse for one to two full minutes.
- If there is any breathing or pulse, no matter how faint or slow, do not give CPR, but keep close watch on vital sign changes.
- Stabilize temperature with external heat sources; try skin-to-skin, chest-to-back warming (leave legs alone) and/or exhale in victim’s face and in unison with his/her breathing.
- If no breathing or no pulse is detected for one to two minutes, begin CPR immediately.
- Medical attention is imperative—hospitalization is needed.

* Adapted from the University of Rhode Island Sea Grant Program and the United States Yacht Racing Union.



JASON EDWARD SCOTT BAIN

- Some PFDs provide better insulation from cold water than others. Generally, a vest provides more insulation than a collar-type device. Full PFD jackets, especially those equipped with a hood, can extend your survival time by protecting most of the core area of your body. Fully insulated flotation suits or coveralls offer the best protection.
- Your clothing can also help float and insulate you. Clothing traps air. If you find yourself in the water without a PFD, the air trapped in your clothing may be sufficient to float you for a while. Don't make the mistake of struggling to get out of your clothing: this drives out the air, increases your body's heat loss and wastes precious energy. Good clothing for water-related activities includes inner layers of wool, or fleece and outer layers of windproof, watertight materials. Avoid cotton.
- You are not a survivor until you are rescued. Equip your PFD with items that will help you attract attention. Reflective tape and a flashing light, both secured high on your PFD, will make you more visible. A plastic whistle can be effective in drawing the attention of passing boaters or rescue personnel. You might also carry small aerial flares and orange smoke canisters, which are available at marine, sporting and recreational equipment suppliers. These items should be secured to your PFD with a cord long enough so that you can use them. Remember that in cold water you will quickly lose the use of your hands and fingers, so get these items out and prepared for use soon after you enter the water.
- If you have taken these precautions, assume that you can—and indeed must—survive. Maintaining a positive attitude often makes the difference between life and death in such situations.

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