



*Mandurah  
Masters Swimming Inc.*

## Hypothermia

The following information has been prepared specifically for Mandurah Masters members swimming at Doddi's Beach and may not be appropriate in other situations.

### What is Hypothermia

Hypothermia is a potentially dangerous drop in body temperature, usually caused by prolonged exposure to cold temperatures. The risk of cold exposure increases when swimming in autumn, winter and spring.

Normal body temperature averages 37°C. Hypothermia is when the body's temperature drops below 35°C. In severe hypothermia, body temperature can drop to 28°C or lower. As the body's temperature falls, systems and organs progressively fail until death occurs, usually from cardiac arrest. Hypothermia can be a gradual and insidious process.

### What causes Hypothermia?

#### Cold Exposure

When the balance between the body's heat production and heat loss tips toward heat loss for a prolonged period, hypothermia can occur. Hypothermia usually happens after cold temperature exposure without enough warm, dry clothing for protection.

However, much milder conditions can also lead to hypothermia depending on a person's age, body mass, body fat, overall health, and length of time exposed to cold temperatures. Infants and elderly people are at a greater risk, but no one is immune to hypothermia.

#### Other causes

Certain medical conditions such as diabetes and thyroid conditions, some medications, severe trauma, using drugs or alcohol all increase the risk of hypothermia.

### How does cold exposure cause Hypothermia?

During exposure to cold temperatures, most heat loss (up to 90%) escapes through your skin; the rest, you exhale from your lungs. Heat loss through the skin happens primarily through radiation and speeds up when skin is exposed to wind or moisture. When swimming, heat loss can occur 25 times faster than it would if exposed to the same air temperature.

When exposed to cold temperatures the body triggers processes to heat the body. Shivering is a protective response to produce heat through muscle activity. Another heat-preserving response is called vasoconstriction, where blood vessels temporarily narrow. When blood vessels narrow, the flow of blood is restricted or decreased, thus retaining body heat and reducing radiation of heat.

"After drop" occurs upon cessation of vasoconstriction after swimmers leave the water. Vasodilation causes cold blood in the extremities to return to central circulation, lowering the core temperature further.

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Normally, the activity of the heart and liver produce most of your body heat. As core body temperature cools, these organs produce less heat, in essence causing a protective “shut down” to preserve heat and protect the brain. Low body temperature can slow brain activity, breathing and heart rate.

Confusion and fatigue can set in, hampering a person’s ability to understand what’s happening and make intelligent choices.

### What are the Symptoms of Hypothermia

Recognising the symptoms is the first step in diagnosing hypothermia. It is unlikely that a hypothermic person will recognise their symptoms; it is up to others to be vigilant for the symptoms of hypothermia.

#### Mild Hypothermia

- Shivering, which may stop as hypothermia progresses (shivering is a sign that a person’s heat regulation system is still active).
- Pale, cool skin.
- Slow, shallow breathing.
- Responsive but with apathy or confusion
- Slurred or mumbled speech.
- Impaired coordination, fumbling hands, stumbling steps.
- Drowsiness or exhaustion.
- Slow, weak pulse.

#### Moderate to Severe Hypothermia

- Shivering may decrease or stop.
- Muscular rigidity increases.
- Markedly uncoordinated.
- Increased confusion, abnormal behaviour; i.e. loss of reasoning and recall.
- Denies problem, may resist help.
- Semiconscious or unconscious.
- No obvious signs of breathing or a pulse.

### What is the Treatment for Hypothermia

Hypothermia is a potentially life-threatening condition that may need emergency medical attention. The goals of care for a hypothermic person are to stop the fall in core temperature, establish a steady, safe rewarming rate, and support cardiorespiratory function. Beware that active prehospital rewarming may lead to increased complications such as “after drop”.

#### First Aid

- Remove wet batters and dry the person, but do not remove wet batters if there is no dry blankets or other suitable cover.
- Protect the person against wind, drafts, water and further heat loss with warm dry clothes and blankets.
- Move gently to a warm, dry sheltered area as soon as possible.
- Begin **passive** rewarming using extra clothing and warm blankets. Use your own body heat if nothing else is available. Do not rub or apply heat to the limbs.

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- If conscious, offer warm liquids, but not alcohol and caffeine, which speed up heat loss. Do not try to give fluids to an unconscious person.
- Be prepared to start CPR.

If the person displays symptoms of severe hypothermia, is unconscious, or has no pulse or signs of breathing call for emergency help right away.

If a pulse cannot be felt and there is no sign of breathing, commence CPR immediately. Continue CPR in the absence of signs of breathing or pulse until paramedics arrive or the person is taken to hospital.

### How to reduce the risk of Hypothermia

Strategies to reduce the risk of hypothermia include:

- If you are not an experienced and confident cold water swimmer, wear a wetsuit (Neoprene caps, booties and gloves may also help).
- Ensure you have adequate energy levels; i.e. have eaten recently, are not tired from prior exercise or suffering ill health.
- Prior to swimming, drink a warm beverage (not coffee or alcohol).
- Minimise the duration of exposure to the cold:
  - Prior to swimming, leave warm dry clothes where they can be easily retrieved after the swim; i.e. not locked in your car;
  - During the swim, do not wait in the water for other swimmers;
  - Minimise the duration of your swim;
  - Upon completing your swim, exit the water as soon as possible;
  - Minimise the time between exiting the water, removing your wet bathers and dressing in warm dry clothes (don't jog or run as this might accelerate "after drop" and don't stop for a chat); and
  - Do not stop for a cold shower before dressing.
- After swimming:
  - Dress, as much as possible, out of the wind and in the sun (Swimmers robes are useful for changing under);
  - Minimise your time in the cold change rooms;
  - Bring a hot water bottle;
  - Drink a warm beverage (not coffee or alcohol); and
  - Sit in your car with the engine running and heater on.

### References and further reading

What is Hypothermia? WebMD <http://www.webmd.com/a-to-z-guides/what-is-hypothermia#1>

Hypothermia. Professor Ian Rodgers <http://rotnestchannelswim.com.au/hypothermia/>

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First Aid Science Advisory Board. Part 10: First Aid. Circulation, 2005.112:115-125 [http://circ.ahajournals.org/content/112/22\\_suppl/III-115](http://circ.ahajournals.org/content/112/22_suppl/III-115)