

Why swim, and why in cold water?

Most of us swim in the bay because we enjoy open water swimming and the health benefits that regular swimming imparts.

The fact that the water gets cold over the winter is a pain, but that's how it is. But that needn't stop us from enjoying our swimming activities. It is entirely possible to swim safely through the winter, and to benefit greatly from the experience. But it requires knowledge, common sense, mindfulness and the utmost respect for our fellow swimmers and for the conditions in which we swim. Our safety depends on recognising and avoiding life-endangering situations. Prevention is always better than cure.

What are the health benefits associated with cold water swimming?

Cold water swimming is reputed to have quite a number of health benefits, largely resulting from physiological changes that occur in the body during **cold adaptation**. Cold adaptation is a gradual process that requires repeated and persistent cold exposure (*e.g.* once or twice per week over the whole winter period). The list of benefits experienced by cold-adapted swimmers, and for which there is considerable evidence, includes:

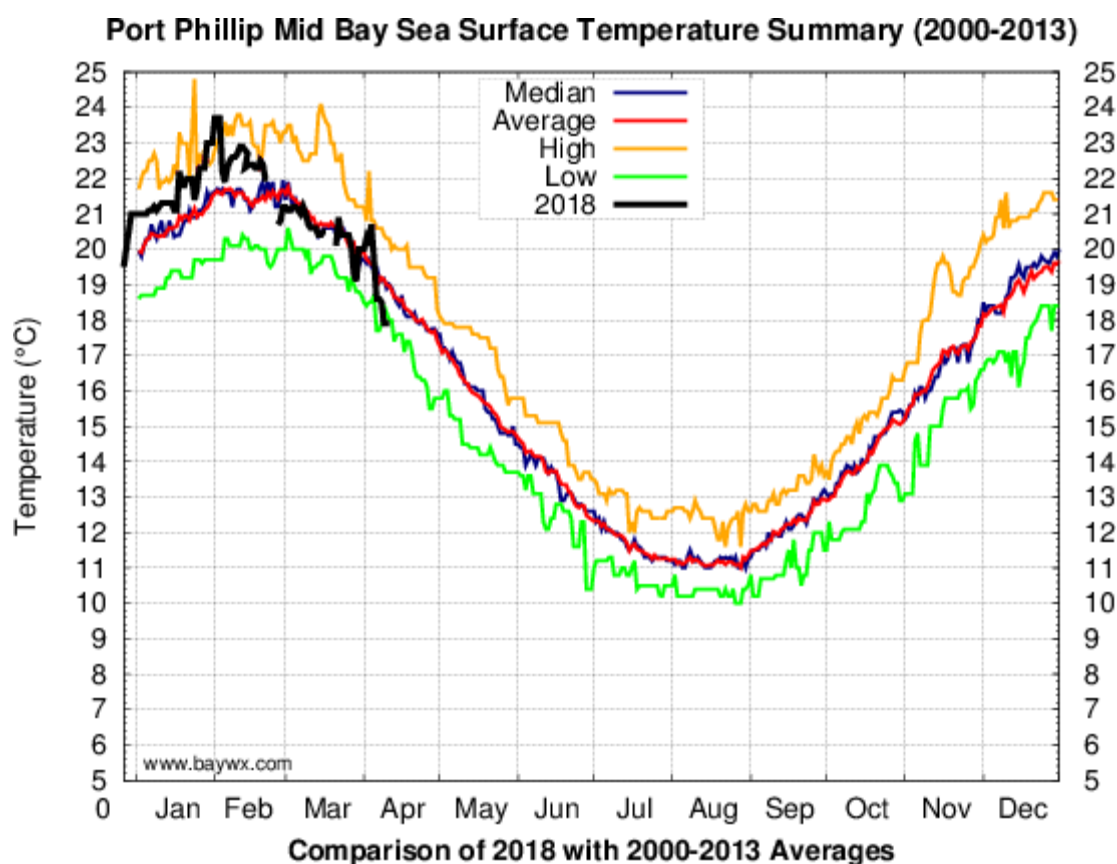
- A feeling of general well-being with less stress and fatigue.
- Better mood and memory function.
- Relief of pain from lower-back instability, rheumatism and fibromyalgia.
- Activation of the immune system; for example, cold adapted swimmers report fewer upper respiratory tract infections.
- Further increases in cardiovascular fitness (over that achieved by warm temperature swimming), with improved heart function and blood flow. Better circulation is particularly noticeable in the hands and feet.
- Further improvements in lung function and reduction in asthma.
- Better anti-oxidant protection that may be anti-ageing (we can only hope).
- Improved metabolic profile that may have ramifications for non-insulin dependent diabetes.

Plus it's a great way to start the day!

When is the water cold?

It is generally agreed that by the time the water temperature gets down to about 15°C it is cold (see next page for a less arbitrary definition). On that basis, the water at Mount Martha is 'cold' for more than six months of the year, from late April until early November, or approximately from ANZAC Day until after Melbourne Cup Day if that's easier to remember. The minimum occurs around mid-August, and is often below 10°C, and maybe as low as 8°C.

Bay temperatures may be monitored online at baywx.com.au. The data are updated on a daily basis and show the surface temperature in the middle of the bay. The graph below shows how this years' water temperature is tracking in comparison with previous years.



Shallow water responds more markedly and more rapidly to environmental change than does deep water. As a consequence, in winter, the shallow water of the bay becomes colder than the open ocean, as can be seen clearly from other graphs available on this website. What is more, at the edge of the bay where we actually swim it is about 1-2°C colder than the mid-bay temperatures shown in this graph. The same logic explains the fact that the bay as a whole becomes warmer in summer than the much deeper open ocean.

Local temperature variations

- The water in the shallows, where we get in, is the coldest. It's usually warmer at the poles, especially if there are sandbars in between.
- The combination of very still water and cold air temperature overnight leads to the formation of an extra cold surface layer in the morning. Choppy water has a much more even temperature distribution.
- Fresh water from the estuary is noticeably colder than the salty water of the bay and creates cold patches when the creek's flowing out. Furthermore, if the bay water is still, the fresh estuarine water forms layer on top that is colder than the water below.

It may be of interest to put our local conditions into the broader context of cold swimming. International swimming bodies like FINA, Outdoor Swimming Society, World Open Water Swimming Association and the Ice Swimming Association use water temperature to loosely define various categories of cold swimming, especially as applied to distance swimming.

- Cold water swimming – between 18°C and 12°C
- Extreme cold water swimming – between 11°C and 6°C
- Ice swimming – below 5°C

Obviously, each category comes with its' own set of challenges, though this publication concentrates on what is most relevant locally. That includes at least 2 or 3 months of extreme cold water swimming.

What are the risks associated with cold water swimming?

Swimming in cold water puts us at risk of three potentially life threatening conditions:

COLD SHOCK, SWIM FAILURE & HYPOTHERMIA

REMAINING SAFE requires KNOWLEDGE and AWARENESS

Swimming regularly in winter in Mount Martha, we are most **unlikely** to suffer true HYPOTHERMIA as long as we swim for less than about 30 minutes. COLD SHOCK is dangerous to the uninitiated but can generally be managed by acclimatising. However **SWIM FAILURE is a real danger and a very real possibility.**

Cold shock

Sudden immersion in very cold water triggers an immediate, involuntary 'gasp' reflex, followed quickly by hyperventilation. The result is a massive ingestion of air; or water – sufficient water to cause drowning if you happen to be underwater at the time. So don't dive or jump in. Another element of cold shock is a rapid increase in heart rate and blood pressure which may, in rare cases, lead to a heart attack.

Swim failure

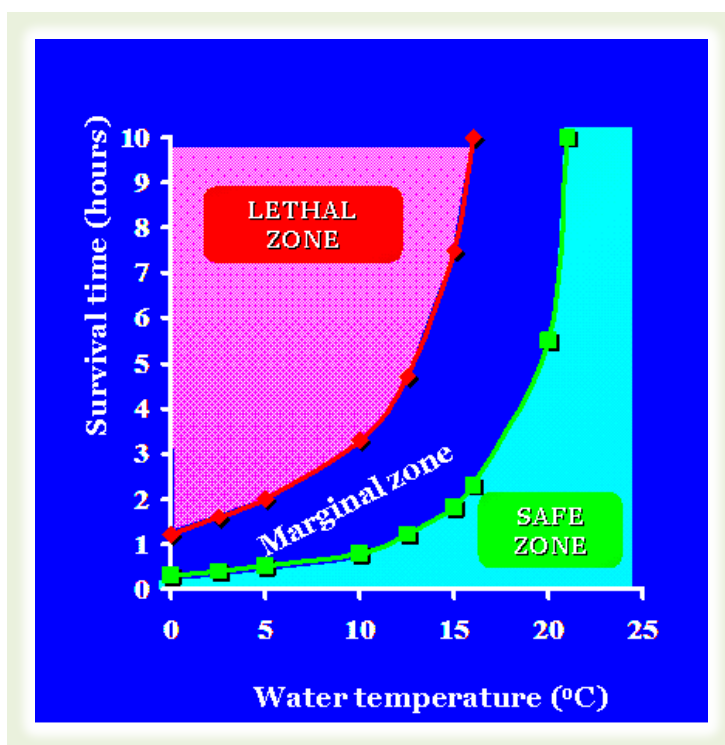
Swim failure (or cold water incapacitation) occurs when the muscles of the arms and legs are cooled to the point where they become weak and stop working properly. Swimming becomes increasingly difficult to the point of being impossible, and there is a real danger of drowning. This often happens too quickly to be the result of true hypothermia and is not dependant on a significant drop in core temperature. Clearly this is very dangerous, and probably provides the best reason for never swimming alone in cold water. Children and skinny adults are more vulnerable to swim failure. **But all swimmers should be aware – it can happen to you!**

Hypothermia

Hypothermia is a medical emergency! It is also inevitable if you remain exposed to cold water long enough. So what is hypothermia and how much exposure to the cold is too much?

Hypothermia is defined by a core temperature of less than or equal to 35°C (compared to a normal temperature of 37°C (98.6°F)). The electrical activity of the heart and brain in particular is very cold-sensitive and ultimately, if the core continues to cool, these organs may fail causing death.

The core temperature starts to fall when the body loses heat faster than it can be generated by the metabolism. The human body cools about 25 times faster in cold water than it does in cold air. The relationship between water temperature and survival time is shown below. Clearly this relationship is not precise and there is considerable variation between individuals, resulting in a quite broad marginal zone.



For normal individuals at

- 15°C – survival times vary between 90 mins and 6-7 hrs. Unconsciousness will occur much earlier.
- 10°C – death in 1 – 3 hours, unconsciousness in about 30 – 60 mins.
- 0°C – death in 20-60 mins, unconsciousness in 15–30 mins

<https://sportsscientists.com/2008/01/exercise-in-the-cold-part-ii/>

Hypothermia develops gradually and can be quite advanced before it is recognised. Detecting the onset of hypothermia whilst in the water is largely a matter of self-awareness. Thinking and reasoning are usually affected first, making recognition somewhat problematic. Other warning signs are numerous

and varied, but include shivering which then stops, clumsiness, drowsiness, slurred speech, a lack of concern about your own condition, combativeness, disorientation, a weak pulse, slow shallow breathing, the onset of swim failure. Reluctance to acknowledge that you're showing some of these signs is what makes hypothermia so dangerous in the water.

Risk management through conditioning

Most of these risks can be modified through processes of physical adaptation and mental conditioning. However, the risks cannot be eliminated.

What helps?

1. Getting fit – improves your ability to generate body heat, control breathing and swim more efficiently
2. Getting cold – repeated exposure to cold water gradually leads to acclimatisation
3. Getting focussed – mental conditioning is vital, and is often the hardest part
4. Getting fat – an extra layer of subcutaneous insulation can work wonders
5. Learning and acknowledging your limits – not pushing them!

Acclimatisation takes time, patience and effort but is quite straight forward if you start at the right time. And the right time is summer! If you keep swimming regularly as the weather (and the water) gradually gets colder your body will adapt. Over time you will develop more control of your breathing and also will condition your body to cope better with cold shock through progressive desensitisation.. Your shivering threshold will reduce and your non-shivering thermogenesis (metabolic heat production) will improve, along with improvements in blood flow. The ultimate outcome is greater cold tolerance and more efficient swimming which will reduce, but not eliminate, the chances of swim failure or hypothermia. You will also feel more comfortable in the water

Maintaining cold adaptation requires repeated exposure to cold water. The odd swim in warm water such as a pool won't be a problem, though you might find the warmth a little more uncomfortable than usual.

Deciding whether or not cold water swimming is for you

Despite the benefits, cold water swimming is a potentially dangerous sport, especially swimming without a wetsuit.

However, there's no need to fear cold water swimming as long as you respect the water and prepare yourself physically and mentally for the challenge. Also, you don't have to make your decision all at once; many people find it easier to just to keep on swimming one day at a time, thus avoiding making any real decision.

That said, winter swimming in the bay is not for everyone. Before proceeding, you need to consider your individual circumstances. Factors suggesting that winter swimming may not be a great idea include:

- Older age (unless you're physically fit)
- Childhood (not recommended for the under 16s)
- Medical conditions – such as underactive thyroid (hypothyroidism), poor nutrition, anorexia, severe arthritis, history of stroke, Parkinson Disease, obesity, high blood pressure, cardiac arrhythmia, heart/respiratory disease, disorders that affect sensation in the extremities, e.g. diabetes, dehydration
- Mental problems
- Medication - such as antidepressants, antipsychotics, narcotic pain killers, sedatives, medication affecting temperature regulation
- Alcohol/drug use
- Jet lag – wait until it's gone

If you are in any doubt about your medical capacity to undertake this sport safely, consult your doctor before you start.

Note: If you use swimming to keep fit, you may need to supplement your winter bay swims with some pool sessions, because you're unlikely to swim far enough in the cold water to achieve or maintain a high level of swimming fitness. See the lifesaving club website for details of winter pool sessions.

What you really need to ask yourself is:

Q:. Are you a thalassophile who's prepared to practise psychrolusia – in public?

A: If so, welcome aboard! Translation: see bottom of p10

Recommendations for safe winter swimming

Swim planning:

- Plan to swim regularly throughout the season, starting before the water temperature has dropped into the cold zone – start in summer.
- Meet fellow swimmers on the beach at a pre-arranged time.
- Observe the prevailing conditions carefully. For example, the air temperature can have considerable effect on how quickly your body cools. Inhaling very cold air, and having your head, arms and back exposed can be a very different experience from swimming in similarly cold water when the air temperature is warmer. Also important to take into account are things such as: the state of the tide, any obvious currents, the size and condition of any waves, the wind direction and strength, position of sand bars, whether or not Balcombe Creek is open*.
- Based on these factors decide where, and for how long, you intend to swim. Plot a course that's within your capability, and that brings you closer to shore and nearer to the clubhouse in the later part of your swim (you don't want to be caught out wide or way up the beach when you're most likely to be getting really cold). Don't let anyone talk you into swimming for a time or distance that you feel might be beyond your limits. Swimming 'laps' between Poles 1 & 2 can be a good option, particularly when the conditions are adverse. It will keep you fairly close to home and within view.
- See the map at the end of this booklet for approximate swim distances.
- Find yourself a buddy or buddies to swim with.

PLEASE DON'T SWIM ALONE

**when the Balcombe Creek opens to the bay, the water quality may well provide a health risk for a few days, especially if it's been closed for some time. The risk of ear/throat infections and/or gastroenteritis may be greatly increased. Consider swimming somewhere else.*

What to wear:

- If not wearing a wetsuit, it is important to wear at least a neoprene hood or 2 or 3 silicon caps. Neoprene booties may provide extra comfort.
- Ear plugs are advisable for comfort and to lessen the risk of developing surfers' ear**. They can also help prevent dizziness, vertigo and nausea in rough water
- Consider towing a hi-vis float, especially in rough water

Getting wet:

- Diving in is not recommended, due to the danger of cold shock (see p4). This is particularly important if you are not cold-adapted. The recommendation is to dip yourself into the water and make sure you establish a controlled breathing pattern before you start to swim.
- Generally speaking, getting wet is the hardest part of the swim.

Swimming:

- Look up often to check you are on course.
- Be mindful of the water conditions. They can change very quickly in the bay, especially when the wind changes.
- Keep an eye out for your swim buddies at regular intervals.
- Listen to your body. Swim failure and/or hypothermia will creep up on you if you are not vigilant. Initial symptoms vary widely between individuals. However, most people who swim regularly will learn to read their own warning signs. These may include, for instance, numbness or lack of control over your hands or feet, splaying or flexing of the fingers. Among the other early effects are impaired thinking and reasoning which you may not be quick to acknowledge. Don't ignore or deny these signs – get out of the water as soon as possible. If you cannot immediately exit the water, swallow your pride and call for help before swimming becomes too difficult and you stop completely (swim failure - see p4).

***continued exposure to cold water/wind can lead to ear infections, ear blockage, discomfort, hearing loss and ultimately to abnormal bone growth within the ear canal.*

Rewarming:

Rewarming safely largely involves warming from the inside out, not the outside in.

- After leaving the water, minimize any further heat loss by getting out of the wind, wearing thongs on your feet, and entering a warm environment.
- Option 1 – Shower (this can be tricky). Get into a relatively cold shower and slowly warm it up over several minutes. Getting into a hot shower simply warms the skin and draws blood away from the core where it's needed most. If you start to feel dizzy or have tingling in any extremities, make your shower colder. If the feeling persists, sit down or lie down until you feel better. This feeling is most often due to a sudden drop in blood pressure and is a forerunner to collapsing. Don't leave the shower while you still feel cold. This can take quite a while; often 10 minutes or more.
- Option 2 – Steam room (preferable). Rewarming in the steam room is more gradual and the heat distribution is much more even. The ingestion of steam warms the core more directly than most methods, while the external temperature is not sufficiently high to draw the blood to the surface or cause blood pressure problems. It's also a very therapeutic communal past-time.
- Coffee (or other warm drinks) top off the rewarming process nicely. Rehydration is also important in re-establishing a good body balance, so drink plenty of water whilst at coffee. The therapy continues.

In the depths of winter, many people will show some of the early signs of hypothermia as they leave the water. Commonly these may include a slight slurring of speech, being a little clumsy or wobbly, disorientation *etc.* If you observe any of these signs in your fellow swimmers, keep a very close eye on them during their rewarming process.

Thalassophile – lover of the sea/ocean (Gr, *thalassa* – sea + *philos* – dear, beloved)

Psychrolusia – bathing in cold water (Gr, *psychros* – cold + *louo* - bathe)

When trouble strikes

Self-awareness is your greatest asset. If, despite your best preventative measures, you feel the onset of symptoms of either swim failure or hypothermia, raise the alarm (preferably before you're in real trouble).

- Call loudly to any nearby swimmer or board paddler, or raise your arm while you still can
- Try to stand up if the water is shallow
- Don't panic and try to maintain rhythmic breathing
- Try to use your legs – they don't cool as quickly as your arms

If you observe another swimmer in difficulty or starting to lose their swimming efficiency:

- Summon help quickly (a board or rescue tube if possible)
- Re-assure the swimmer and keep them calm
- Stand up if possible, or keep swimmer afloat, preferably on their back.
- Remember your own time is also limited – try not to put yourself in danger

Treating hypothermia

If you suspect hypothermia seek medical attention immediately by calling 000. In the meantime:

- Get the person out of the water and the wind into a warm environment
- Dry them off very gently without rubbing the skin
- Lay them down in the steam room (if it's on), get them a warm drink and apply skin-to-skin contact with warmer individuals if possible
- If the steam room is unavailable, dry the person gently, lay them down on a dry surface in a warm place and warm them passively using blankets and warm drinks. Do not apply any direct heat. Attempting to rewarm them in a shower is very problematic and would be the option of last choice.
- Monitor breathing and pulse and administer CPR if necessary.

Who swims at Mount Martha in winter, and who are the Icebergers?

A wide variety of people choose to swim (or paddle boards/skis) in winter. To use the facilities (and equipment) of the Mount Martha Lifesaving Club, including the hot showers and steam rooms, you must become an active member of the Lifesaving Club and have a current Working with Children clearance. Membership of the club comes with an obligation to contribute to the club as a whole, but, there is absolutely no obligation to become (or even to want to become) an Iceberger. Please see the Lifesaving Club website for membership details: <http://www.mmlsc.com.au>

Iceberger: Is someone who has swum **regularly** throughout at least one winter season without the benefit of a wetsuit. Icebergers earn the right to wear the Iceberger rugby top and are awarded a certificate to attest to their achievement. Bayside groups also swim at Brighton, Mentone and Black Rock.

Iceberger Rookie: Is someone who has hinted at their intention to swim **regularly** through their first winter season without the benefit of a wetsuit. This first season is very much a learning phase, and there is an almost unlimited supply of encouragement and support for these people to achieve their goal. However, it's no big deal if they don't make it, whatever the reason. There's always another winter.

Iceberger Tenderfoot: Is a potential Iceberger who still wears a wetsuit. It may take one, two or even five winters to shed this rubber skin, but that's OK.

Rubber Duck: Is someone who chooses to swim wearing a wetsuit, with no intention to do otherwise. This is also perfectly acceptable, even on an ongoing basis. Just don't expect to be first in the showers!

Water Safety Personnel: Board paddlers and ski paddlers who are comfortable in/on cold water and prepared to act as water safety are gold, especially at the weekends when the group size tends to be larger.

All of the above groups are most welcome at any of the social events the Icebergers put on from time to time. Please let us know if you'd like to be included on our email list, WhatsApp group or Facebook page.

Contact: email to icebergers@mmlsc.com.au