



Hyperventilation or 'Over-Breathing' and Breath-holding

Breathing whilst swimming is a natural and essential part of every stroke. Standard breathing techniques, every stroke or every other stroke for example, hardly interfere with the bodies' natural breathing pattern. Rarely in swimming are prolonged periods of breath-holding required. Even the extended underwater racing starts and turns do not extend beyond 7-8 seconds of breath-holding or trickle exhalation.

Perhaps the only discipline that requires extended breath holding is synchronised swimming (and the fringe sports of octopush and free diving). Hypoxic training, breathing every 5,7 or 9 strokes, or repeated short spells of breath-holding without sufficient recovery, can safely be used to stress the bodies physiological systems to get it used to coping with relatively low levels of oxygen which are commonly experienced during races.

Hyperventilation or 'over-breathing' before periods of underwater breath-holding has long been recognised as a dangerous situation. This can occur when trying to swim prolonged distances under water. Unfortunately, we continue to see cases of drowning or near-drowning when this is attempted.

It is not difficult for a good swimmer to hold their breath and swim underwater for a minute or so. This is because there is sufficient oxygen available in the lungs and in the blood stream. The oxygen level steadily falls with time and effort. When the blood oxygen level drops to about half the normal level, the swimmer may lose consciousness without any warning. Their survival will then depend on rescue by others. Fortunately, however, nature has given us a safety mechanism, which normally prevents this happening. As oxygen is used up by the body, carbon dioxide is produced. The carbon dioxide builds up relatively quickly and this produces an inescapable and unavoidable urge to breathe. This normally happens before the oxygen level drops to a dangerous situation. The swimmer surfaces and breathes restoring the oxygen levels to normal.

The danger of hyperventilation or 'over-breathing' and breath-holding

This safety mechanism can be delayed or even by-passed by prolonged, rapid deep breathing (hyperventilating or 'over-breathing') before breath-holding. This hyperventilation washes out any carbon dioxide from the body which delays the build-up of carbon dioxide. Without this, the safety mechanism of the irresistible urge to breathe is not triggered and the length of time that a swimmer can hold their breath underwater is extended - but only by the swimmer becoming more hypoxic. Swimmers may then simply slow down and lose consciousness. In the ensuing automatic breaths, water, rather than oxygen, enters the lungs and the swimmer drowns.

Not uncommonly, this happens to capable, experienced swimmers. This can be linked to competitions or bets to see how far they can swim underwater. Usually this is in swimming pools and the depth of water is irrelevant. In Australia, hypoxic blackouts account for 20% of all snorkelling deaths and most of the deaths occurring in young, fit men.

All swimmers, teachers and coaches should be aware of the dangers of hyperventilation before breath-holding for swimming or diving. This practice should be discouraged for the protection and safety of swimmers.

