

Safety Tip of the Month – February 2007
VSI Safety Committee
“Shallow Water Blackout – A Fatal Situation!”

Underwater swimming results in less turbulence, better visibility, and a greater feeling of tranquility than may be achieved with surface swimming. Younger children often challenge their peers to determine who can swim the furthest underwater or who can remain on the bottom of the deep end the longest. The more experienced swimmers hyperventilate vigorously before engaging in the underwater trial.

Shallow Water Blackout (SWB) occurs when a swimmer becomes unconscious while swimming underwater due to low levels of blood oxygen. Prior hyperventilation reduces the level of carbon dioxide in the blood. Since carbon dioxide is the major stimulus for breathing, the need to take a breath while underwater is suppressed, and the swimmer feels that he/she can go farther and farther underwater, until the actual blood oxygen to the brain gets so low that the swimmer passes out. Continued submersion leads to a rapid drop in brain and heart oxygen levels and acidosis, causing the heart to revert to ventricular fibrillation and stop.

There have been a number of deaths of very successful, outgoing athletic males over the last 10 years due to SWB. Each of these cases was related directly to prolonged breath holding while swimming, exercising, or playing underwater. Accomplished swimmers can easily suppress the urge to breathe while underwater, by forceful pre-submersion hyperventilation. The swimmer is then minimally inhibited by the feeling of “air hunger,” and he/she can continue to swim underwater until cerebral (brain) oxygen levels fall so low that the swimmer faints. At this point, death will quickly ensue (we are talking 4 to 6 minutes) unless a life guard or other person quickly pulls the swimmer out of the water. Even if the underwater swimmer is lucky enough to be scooped out of the pool after he/she faints, the swimmer may require CPR, defibrillation (shocking of the heart), and a long term hospitalization to treat possible water aspiration and/or brain injury.

Forced, prolonged underwater swimming should be discouraged. Furthermore, aggressive hyperventilation should not be attempted before any long underwater swim, since this will greatly elevate the risk of SWB and possible death. During practice and competitive swim meets, swimmers should not be permitted to swim underwater past the 15 meter mark. Such maximum underwater distance guidelines were incorporated into the USA Swimming Rules to minimize the incidence of SWB. Even if the lane lines are not marked at the 15 meter threshold, coaches should strongly discourage longer continuous underwater distances by any swimmer.

Think smart! Leave the long underwater swims to the scuba divers. Do NOT let your swimmers take a chance with zealous underwater swimming contests. The price for Shallow Water Blackout is just too great!

References:

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