

The Redwoods Group Insurance Program for YMCAs

RISK MANAGEMENT ALERT

TOPIC: Breath Holding and Shallow Water Blackout

Athletes are constantly looking for techniques that will build their endurance and muscle efficiency to give them a winning edge. A method that emerged about 30 years ago and has been historically popular with swimmers, triathletes, and elite military troops like Navy Seals and Army Special Forces is hypoxic training. The theory is that modifying the muscles' response in an anaerobic (without oxygen) environment will lead to enhanced performance.

There are two types of hypoxic training – static breath holding and dynamic breath holding. During static breath holding athletes will hyperventilate, hold their breath, and go under water. While under water they remain stationary, often use a weight to keep their bodies submerged, and attempt to increase their submersion time with each descent. Dynamic breath holding consists of the same pre-hyperventilation followed by an aerobic activity such as swimming or running underwater, again attempting to increase the time or distance with each submersion.

Both methods of breath holding are dangerous and can lead to a condition called shallow water blackout (SWB). During normal breathing, the body monitors the carbon dioxide (CO₂) level in the blood stream. It is the level of CO₂ that triggers the chemical response in the brain to initiate breathing. Hyperventilating causes an athlete's CO₂ to drop, which may prevent the body from receiving a signal to take a breath. If the CO₂ level drops too low the body compensates by causing the athlete to pass out, which retriggers the breathing and allows the CO₂ level to return to

normal. However, if this unconsciousness resumption of breathing takes place under water it can be life threatening – especially since lifeguards often overlook the SWB victim because they know the swimmer is capable, healthy, and intentionally staying underwater as long as possible.

While there are no medically documented benefits of underwater hypoxic training, there are many warnings against it. The YMCA Lifeguarding textbook *On the Guard II* states “Do not allow swimmers to swim underwater or to hold their breath during recreational periods.” Other organizations have also made public statements to educate against hypoxic training. The US Navy, USA Swimming, the American Red Cross, and the American Swimming Coaches Association have all issued public statements against this practice. Pools should post signage that clearly states “No breath holding or underwater lap swimming is permitted”. Education of lifeguards, swim teams, guests, and members should take place through training programs and communication campaigns.

Resources for further information:

- www.safetycenter.navy.mil/articles/shallowwater.htm
- www.aquaticsafetygroup.com/shallowwater.html
- www.usaswimming.org
- www.swimmingcoach.org

**The authorities are in agreement –
YMCA POOLS SHOULD ACTIVELY BAN ALL
PROLONGED, COMPETITIVE, AND REPETITIVE
BREATH HOLDING ACTIVITIES.**

Please call us at 800-463-8546 to discuss this or any other risk management safety tip, or visit our web site at <http://www.redwoodsgroup.com> to learn more about YMCA risk management issues.

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