



FOR YOUTH DEVELOPMENT  
FOR HEALTHY LIVING  
FOR SOCIAL RESPONSIBILITY

## AQUATICS SAFETY & RISK EDUCATION

DATE: MARCH 11, 2011

TOPIC: **UNSAFE BREATH HOLDING PRACTICES**

FOR: AQUATICS SAFETY STAKEHOLDERS

Learning to hold one's breath is an essential skill when learning to swim and is an important part of the YMCA Swim Lessons program. This skill allows the swimmer to achieve confidence and comfort in the aquatic environment. But, when does breath holding become dangerous? What techniques put a swimmer's life at risk? What should lifeguards know about breath holding techniques in order to prevent injury? Understanding and clarifying what these techniques and practices are will help to answer these questions. The following is a description of breath holding techniques or activities.

- **Hyperventilation** – is an excessive rate and depth of respiration leading to the abnormal loss of carbon dioxide (CO<sub>2</sub>) from the blood. The amount and presence of CO<sub>2</sub> in the blood is what triggers the need to breathe. Some swimmers may purposely induce this condition in an effort to stay under water longer. By inhaling deeply and forcefully exhaling, the amount of CO<sub>2</sub> in the blood is reduced and the swimmer will not feel a need to breathe. However, oxygen is still being depleted from the blood and coupled with the reduced level of CO<sub>2</sub>; the swimmer is at risk of losing consciousness. Once unconscious, swimmers will reflexively breathe allowing water into their lungs and will die if not rescued and resuscitated.
- **Static apnea** – is a practice where enthusiasts hold their breath and attempt to increase their time underwater in a 'static' or motionless position.
- **Hypoxic Training** – is low oxygen training, achieved by reducing or eliminating the number of breaths taken while performing swimming strokes (restricted breathing frequency) at the surface of the water. Breathing every five, seven or nine strokes is a typical hypoxic training method. Limited underwater swimming can also be used in hypoxic training. Porpoising or dolphin-kicking is an example of limited underwater swimming.

Hyperventilation and prolonged breath-holding are dangerous. Lifeguards should not allow swimmers to engage in these techniques or practices. Watch for persons who talk about wanting to swim the length of a pool or swimming area underwater or who are forcefully exhaling at the side prior to going underwater. These activities should be stopped immediately.

Static apnea is a particular problem because the lack of swimmer movement provides no feedback to the lifeguard as to whether or not the swimmer is ok. Lifeguards must react to any person who remains motionless for 20 seconds, so this activity at best could require lifeguards to make regular

or unnecessary rescues, or worse ignore their training and put everyone in the facility at risk. Static apnea should never be permitted at any time, with or without supervision.

Hypoxic training can be an acceptable training method to teach competitive swimmers and other aquatic athletes how to handle the rigors of less oxygen in competition. Such training should be used for more experienced swimmers in good physical condition and always under very specific supervision. Hypoxic training with hyperventilation or prolonged underwater swimming must never be combined. Lifeguards should educate well-meaning but overzealous coaches or instructors about the dangers of hyperventilation and prolonged breath holding.

The YMCA of the USA recommends that local YMCAs include the following rule: "Breath Holding Activities are Prohibited" on their posted rules and regulations signage. In addition, lifeguards should be reminded that even the most skilled swimmers need their attention when scanning. Skilled swimmers are the most likely to practice or train with unsafe breath holding techniques. Lifeguards should assess these swimmers for such unsafe practices, prevent them and educate swimmers engaged in these activities about the dangers.

Lastly, lifeguards should receive in-service training regarding specific programs you may have at your facility and what to expect and look for particularly in programs such as synchronized swimming, underwater hockey, skin and scuba diving. These participants spend more time underwater than recreational swimmers and lifeguards must be familiar with the movements for these activities.

Being confident and comfortable underwater is an essential aquatic skill. Knowing what breath holding techniques are unsafe is important in exercising good judgment for safe skill practice and supervision of underwater aquatic activities.

**References:**

YMCA of the USA Medical Advisory Committee Recommendations: A Resource Guide for YMCAs, August 2009. Available at: [www.ymcaexchange.org](http://www.ymcaexchange.org)

Sperling, Judith. *Risk Management: Coming Up for Air*. February 2008. Available at: [www.aquaticsintl.com/2008/feb/0802\\_rm.html](http://www.aquaticsintl.com/2008/feb/0802_rm.html)

YMCA of the USA. *On the Guard II: The YMCA Lifeguard Manual*. Fourth Edition, Champaign, Illinois: Human Kinetics, 2001.