



Drowning Prevention

Drowning is a leading cause of unintentional injury death for persons of all ages and is the second leading cause of death from injury among persons aged 1-14 years. Many of these injuries occur in recreational water settings, including pools, spas/hot tubs, and natural water settings (e.g., lakes, rivers and oceans). Water recreation provides hours of enjoyment and exercise for children, yet water and children can be a deadly mix when an unsafe environment and inadequate supervision is present. Drowning is a silent death. There is no splash or cry for help. People drown in more quiet, less attention-getting ways. For each drowning death, it is estimated that at least 1 to 4 children suffer a serious nonfatal submersion event, many of which leave children with permanent disabilities. Near-drowning, the initial survival after submersion, is sometimes fatal, the majority of children who survive without neurological consequences are discovered within two minutes of submersion.

Five Stages to a Drowning – *Jeff Ellis and Associates*

SURPRISE – In this stage, the victim recognizes danger and becomes afraid. The victim assumes a near-vertical position in the water, with little or no leg movement. The arms will be at or near the water's surface, making random grasping or flipping motions. The head will be tilted back with the face turned up. Victims rarely make any sounds; they are struggling just to breathe.

INVOLUNTARY BREATH HOLDING – The victim has now dropped below the static water line and the body, in an attempt to protect itself initiates involuntary breath holding. This occurs because water has entered the mouth and causes the epiglottis to close over the airway. Though a victim may continue to struggle, he/she will not usually make any sounds as he/she cannot breathe. Without oxygen, the victim will lose consciousness.

UNCONSCIOUSNESS – Because the victim has been without oxygen, the body shuts itself down as unconsciousness results. In this stage, the victim will be motionless. Because breathing has stopped, he/she is in respiratory arrest. There is no chest movement or breathing sounds. At this point, the victim sinks to the bottom of the water, either slowly or rapidly, depending on factors such as the amount of air trapped in the lungs, body weight, and muscle mass. The victim will remain unconscious unless breathing is reestablished.

HYPOXIC CONVULSION – Due to the lack of oxygen in the brain, the victim may look as if he/she is having a convulsion, which is why this stage is called the hypoxic convulsion stage. The victim's skin turns blue, especially in the lips and fingernail beds, and the body may appear rigid. There may be violent jerking of the body and frothing (foaming saliva).

CLINICAL DEATH – The final stage in the drowning process is death. Clinical death occurs when both breathing and circulation stop. The victim is in cardiac arrest. The heart stops pumping blood. The organs are no longer receiving oxygen rich blood. The lack of oxygen causes the skin to turn blue.

Drowning Prevention Facts

According to the U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, Injury Center, for every child 14 years and younger who dies from drowning, five receive emergency department care for nonfatal submersion injuries. More than half of these children require hospitalization. Nonfatal drowning can cause brain damage that result in long-term disabilities ranging from memory problems and learning disabilities to the permanent loss of basic functioning (i.e., permanent vegetative state).

To reduce the number of drowning, environmental protections (e.g., pool fences and lifeguards) should be adopted. Alcohol use should be avoided while swimming or while supervising children; and all participants, caregivers, and supervisors should be knowledgeable regarding water-safety skills and trained in cardiopulmonary resuscitation (CPR). To prevent drowning in recreational water settings, The Journal of the American Medical Association suggest the following strategies:

- Learn to swim.
- Never swim alone or in unsupervised places and always swim with a buddy. Select swimming sites that have lifeguards.
- Make sure an adult is constantly watching children swimming or playing in or around the water. Do not read, play cards, talk on the phone, socialize, or engage in any other distracting activity while supervising children.

The State of Maryland Department of Health and Mental Hygiene, Laws and Regulations Concerning Youth Camps, 10.16.06.47Aquatic Programs require that-

During an aquatic activity:

- A safety plan must be developed and implemented;
- One lifeguard, with lifeguard certification appropriate for the swimming site, must be on duty for each group of 50 campers or fraction of 50 campers in the water. *The lifeguard must be properly positioned. Before swimming at a pool, check with your local health department; the physical layout of the pool may require more than 1 lifeguard on duty, even when there are less than 50 swimmers; and*
- At least 2 individuals certified in first aid and CPR must be on duty at the activity.

In addition to the lifeguard(s):

- A director must be present at the activity site;
- One designated watcher must be on duty at pool side observing the campers for each group of 25 campers or fraction of 25 campers;
- One adult, counselor, or assistant counselor must be on duty and supervising each group of 10 campers or fraction of 10 campers; and
- When swimming instruction is given, an instructor must be present and supervising the activity.
- *An additional instructor, lifeguard, counselor, or assistant counselor must be on duty if any condition exists that compromises the ability of the staff member to perform their job.*

The presence of lifeguards, watchers, and trained CPR/First Aid staff increases the likelihood of a favorable outcome. Having lifeguard and camp staff supervision, knowing safety procedures, knowing camper swimming abilities, and restricting swimming areas can eliminate a drowning. Every second counts!

U.S. Department of Health and Human Services, Centers for Disease Control and Prevention-Injury Center (2005). *Water-Related Injuries: Fact Sheet, 1-3*. Retrieved, April 11, 2007 from <http://www.cdc.gov/ncipc/factsheets/drown.htm>

The Journal of the American Medical Association *Nonfatal and Fatal Drowning in Recreational Water Settings – United States*, (2001-2002), 1-5. **JAMA**. 2004; 292: 164-166. **MMWR**. 2004; 53:447-452.