



# Aquatic Consulting Services

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## Pool Tip #1: Drowning Recognition

It is extremely important that an aquatic professional be able to recognize an emergency situation in progress. Patrons may be in distress or drowning, suffering a medical emergency, or may be injured and in need of assistance, rescue, first aid or emergency medical treatment.

### Causes of Drowning

Inability to swim  
Exhaustion, exertion  
Panic  
Dangerous marine life  
Cramps  
Trauma, head or spinal injury  
Sudden cardiac emergency  
Electrocution  
Shallow water blackout  
Diabetic coma and loss of consciousness  
Seizure  
Electrical shock  
Hypothermia  
Entanglement  
Entrapment  
Decompression sickness, air embolism  
Laryngospasm and suffocation (dry drowning)  
Alcohol or drug intoxication  
Reaction to contaminated water  
Suicide  
Homicide or intentional/unintentional injury

When an emergency occurs, the aquatic professional should assess the situation to determine the degree of injury to the patron, whether the situation is life threatening or not, what type of assistance they can safely provide, and whether emergency personnel need to be called.

It is essential that an aquatic professional recognize a water emergency while it is occurring, and provide immediate aid. Not recognizing a swimmer in distress, an unconscious person floating on the surface of the water or submerged underwater, or a person who is drowning can lead to permanent disabling injuries or death of the patron. If the water emergency has already progressed to the stage where the person is unconscious and no longer breathing, time is critical. The longer the delay in beginning rescue efforts, the less likely you are to successfully resuscitate without the victim being severely affected. If an open airway is not established for a clinically dead victim, and breathing and circulation are not restored within approximately 4 minutes, biological death and irreversible brain damage will begin to occur. Basic life support procedures must begin within 4 minutes of breathing cessation.

Who is most likely to get into trouble in the water, and need rescue assistance? Statistics gathered over recent years have shown that patrons who are:

- Unfamiliar with the facility -- first time users, new members or guests
- Poor swimmers often recognized by cautious behaviors such as grabbing on to the gutter, holding on to another person, or depending on the use of a flotation device for support
- Non swimmers -- individuals who have not had an opportunity to learn to swim because of economic circumstances, fear of water, or lack of convenient or nearby facilities in which to learn to swim
- Swimmers whose balance, judgment or cognitive ability is impaired due to intoxication or certain medical conditions
- Very young children as well as elderly persons
- Males in their teens and early 20's who are influenced by peers to engage in dangerous acts or aquatic skills beyond their capabilities
- Swimmers whose ability to move freely through the water is impaired -- including some disabled individuals, parents trying to support their children as well as themselves in the water, and swimmers who have sustained a traumatic injury upon entry into the water

Distressed swimmers are not drowning but are consciously aware that they are in a dangerous situation and in need of assistance in the water. Behaviors you should look for include a swimmer who is on or just below the water surface in a slightly diagonal position, making often splashy, ineffectual swimming movements with their arms and legs. They may or may not be able to call out for help. If the distressed patron is not able to get themselves out of immediate danger by reaching shallow water, the pool wall, life line or some other means of support, or if rescue assistance is not immediately and readily available, a distress situation may progress to drowning.

Drowning can occur on or below the surface of the water, and in some cases outside the pool itself. Drowning victims may be conscious or unconscious depending on the circumstances which led to the emergency situation, as well as the stage of the drowning progression. The physiology of drowning varies depending on whether the person drowned in fresh, chlorinated, brackish, polluted or salt water.

Most drownings are "wet" drownings, meaning aspiration of water or other fluids occurred. The victim breathes water into his lungs.

A small percentage of drownings are "dry" drownings. In a dry drowning, the victim involuntarily holds his breath and suffocates, or there is a muscular contraction or spasm of the larynx (muscle and cartilage at the top of the trachea which contains the vocal cords) caused by water droplets hitting the epiglottis (the valve like cartilage behind the tongue) with force, and preventing air from getting into the trachea (air way or windpipe). Dry drowning often occurs when a person enters a pool with force from a height such as from a diving board, or with high velocity such as occurs when sliding down a flume. The dry drowning spasm usually occurs 6 to 10 minutes after water hits the epiglottis, and is accompanied by choking and gagging. The victim may be in the pool when the spasm occurs, or may have left the water.

An unconscious person, will usually be face down in the water, initially at the surface but slowly sinking toward the bottom and deepest point in the pool. There will be no noticeable body movements for 10 or more seconds. The body may be either limp or very rigid, and will eventually go in to hypoxic convulsions due to lack of oxygen to the brain. Frothing and violent jerking movements may accompany this convulsive stage.

A conscious, actively drowning victim, can ordinarily be recognized by being in a vertical or slightly diagonal body position in the water, with his head back and face looking up, with an "O" shaped mouth, either gasping for air or involuntary holding his breath. He is typically not able to call for help. There's usually very little or no leg movement, but the arms are out toward side of the body, flailing and pushing down on water in an attempt to remain near the surface. The victim is disoriented, and has a surprised look on his face. Eyes are either wide open or squeezed tightly shut. The victim is usually in a neutral or slightly negative position in the water. This surface struggle typically lasts no more than 10 to 20 seconds, before the victim progresses to other stages of drowning. The length of each drowning stage is dependent on the victim's age, fitness level, exertion level, and swimming ability, as well as water temperature and whether other complications, such as seizures, shallow water blackout, medical or traumatic injuries are involved.

<b>Drowning Stages (Active Victim)</b>	
• Surface struggle	(10 - 20 seconds)
• Involuntary breath holding	(30 - 90 seconds)
• Unconsciousness	(60 seconds)
• Hypoxic convulsions	(5 - 10 seconds)
• Aspiration	
• Clinical death	(3 - 4 minutes)

- Biological death (4 - 6 minutes)