

MECHANISMS AND PHYSIOLOGY OF DROWNING

According to the World Congress on Drowning, drowning is defined as "the process of experiencing respiratory impairment from submersion or immersion in liquid." As a result of the respiratory impairment, unless rescue is immediate and effective, the patient will experience hypoxia and deteriorate into cardiac arrest.

The drowning process includes a series of progressive and destructive stages:

- Struggle
- Aspiration of Water in Stomach & Upper Airway
- Laryngospasm
- Hypoxia
- Unconsciousness
- Aspiration of Water into Lungs
- Respiratory Arrest
- Cardiac Arrest

During the drowning process, the conscious victim may only **struggle** at the surface of the water for 20 - 60 seconds. During this struggle, the drowning victim cannot call out for help and cannot wave for help. During the struggle, the victim's arms are typically thrust out laterally to the side as the victim attempts to keep his/her head out of the water. To the untrained person, the victim appears to be playing in the water; when in reality, the victim is engaged in a life and death struggle. This behavior demonstrated by the drowning victim is referred to as the **Instinctive Drowning Response**. Some victims, however, may not show any signs of a surface struggle if their airway is compromised as a result of the ingestion or inhalation/aspiration of water, or as a result of unconsciousness caused by a medical condition (i.e. heart attack, sudden cardiac arrest, stroke, etc.) or **hyperventilation** (shallow water blackout).

During the victim's frantic struggle to keep his head and mouth above the surface of the water, the victim will **gasp** for air; will **ingest water** into his stomach resulting in a progressive decrease in buoyancy; and will **aspirate water** into his upper airway. In an involuntary reflex response to prevent additional water from entering the airway, the larynx will spasm (**laryngospasm**) which prevents additional water from entering the airway. This reflex spasm, however, also prevents air from entering the lungs. Due to the lack of oxygen to the brain and other vital organs and tissues, the patient becomes **hypoxic** which then causes **unconsciousness**. As the victim further deteriorates as a result of the hypoxia and unconsciousness, the laryngospasm will begin to relax at which time the victim will involuntarily gasp resulting in the **aspiration** of water into his/her lungs.

Since the victim is unconscious at the surface or submerged below the surface of the water with his/her face immersed or submerged in the water, the victim is not breathing (**respiratory arrest**). The heart may continue to beat for up to several minutes. However, as a result of the lack of oxygen to the brain and heart, the victim's condition deteriorates into **cardiac arrest**.

TYPES OF DROWNING

Wet Drowning: Following hypoxia and unconsciousness, the laryngospasm relaxes and water enters and compromises the lungs.

Dry Drowning: Suffocation in the water while the laryngospasm is intact preventing water from entering and compromising the lungs.

Laryngeal Drowning: Vomitus is aspirated into the upper airway resulting in a laryngeal spasm. Often results from swimming after eating.

Torso Reflex: The individual reflexively gasps as a result of cold water contact on the face and/or chest. During this sudden gasp, the individual can aspirate water into his airway resulting in a laryngospasm.

Silent (Passive) Drowning: A drowning incident without any surface struggling because the victim is rendered unconscious, incapacitated or dead due to a physical or medical situation (i.e. **Sudden Cardiac Arrest**, shallow water blackout, head injury, stroke, drug overdose, etc.).

Saltwater vs. Freshwater Drowning: There is no significant difference in the resuscitation protocols for saltwater vs. freshwater drownings. However, the probability of a successful resuscitation is diminished if salt water, polluted water, or a high-concentration of chlorinated water is **aspirated** into lungs, therefore compromising the lining of the lungs as well as the chemical balance of the blood.

Mammalian Diving Reflex: As a result of the sudden exposure or immersion into cold water, the body's **metabolism** is decreased, therefore decreasing the need for oxygen to sustain life. The colder the water, the younger the individual, the greater the chance of surviving a prolonged submersion in the water.

Whether the unconscious victim floats or sinks depends on the victim's original buoyancy as well as the amount of water ingested into the stomach and aspirated into the lungs. **Ingested** and **aspirated** water will cause the unconscious victim to sink. As the body descends, the residual air in the lungs will be squeezed out as a result of the increasing pressure against the body thereby causing the body to descend faster as it goes deeper. Over time, as the body decomposes, carbon dioxide and other gases are created, causing the body to eventually surface. This process is slowed considerably in cold water.

EMERGENCY RESUSCITATION PROTOCOLS

The most important and detrimental consequence of submersion incidents is **hypoxia**. Hypoxia can produce multi-system insult and complications, including **acute respiratory distress syndrome (ARDS)**. The duration of hypoxia is the critical factor in determining the victim's outcome. Therefore, **oxygenation, ventilation, and perfusion** should be restored as rapidly as possible. Immediate resuscitation at the scene is essential for survival and neurological recovery after submersion. Resuscitation efforts should include **positive-pressure-ventilation, oxygen administration, CPR, and defibrillation**. The patency of the airway is maintained via manual **suctioning** of the airway between ventilation efforts.

Assuming the victim's lungs are not compromised, if the victim can be rescued before the onset of cardiac arrest, there is a good chance of successfully resuscitating the victim with **positive-pressure-ventilation** via the use of a resuscitation adjunct device (i.e. PRM: Personal Resuscitation Mask, PRS: Personal Resuscitation Shield, or BVM: **Bag-Valve-Mask Resuscitator**) or by Mouth-to-Mouth rescue breathing. The availability and use of a **manual suction device** and the administration of **high-flow oxygen** during the resuscitation effort will increase the chance of a successful resuscitation effort and the survivability of the victim.

According to the American Heart Association, the highest potential survival rate from cardiac arrest can be achieved only when the following sequence of events occurs as rapidly as possible:

- Recognition of early warning (distress) signs
- Activation of the EMS System
- Basic Life Support CPR
- Defibrillation
- Management of the airway and ventilation
- Intravenous administration of medications

These events are indispensable for any success of the **Emergency Cardiac Care (ECC)** endeavor. And, if any link in the **Chain of Survival** is weak or missing, the chance of survival is lessened, and the EMS system is condemned to poor results. Therefore, the links in the adult Chain of Survival are:

Early **access**
Early **CPR**
Early **defibrillation**
Early **Advanced Cardiac Life Support (ACLS)**

Once the victim's condition deteriorates into cardiac arrest, the chance of successfully resuscitating the victim is decreased considerably. Factors that affect the survivability of the patient include:

- Basic Life Support (**BLS**) CPR administered within the first 2 - 4 minutes of cardiac arrest
- Early defibrillation within the first 2 - 4 minutes of cardiac arrest
- Advanced Life Support (**ALS**) administered within the first 8 minutes of cardiac arrest
- Emergency transport to a designated **Trauma Center** and administration of Advanced Cardiac Life Support measures and protocols

Therefore, immediate basic life support must be administered as soon as the victim is recovered and rescued from the water followed by early **Advanced Cardiac Life Support**. The Standard of Care for the proper and effective administration of **Basic Life Support (BLS)** includes:

A = Airway
B = Breathing
C = Circulation
D = Defibrillation

Early **defibrillation** is critical to survival from cardiac arrest for several reasons:

1. The most frequent initial rhythm in witnessed cardiac arrest is **Ventricular Fibrillation** (VF);
2. The most effective treatment for Ventricular Fibrillation is electrical defibrillation;
3. The probability of successful defibrillation diminishes rapidly over time; and
4. Ventricular Fibrillation tends to convert to **Asystole** within a few minutes.

The speed with which defibrillation is performed is the major determinant of the success of resuscitative attempts for treatment of cardiac arrest. Survival rates after cardiac arrest decrease approximately 7% to 10% with every minute that defibrillation is delayed.

For more information, please review the following articles:

Emergency Resuscitation & Protection from Bloodborne Pathogens
http://www.lifesaving.com/issues/articles/07emergency_resuscitation.html

Evolution of Resuscitation
<http://www.lifesaving.com/issues/articles/10evolution.html>

The Heimlich Controversy in Near-Drowning Resuscitation
http://www.lifesaving.com/issues/articles/23heimlich_controversy.html

LIFEGUARD PROTECTIVE SERVICES

When Lifeguard Services are provided, Lifeguard personnel should be appropriately positioned in **elevated stands** and must be **vigilant** while providing **surveillance** to patrons in, on, and around the water. Lifeguards must **anticipate** the need to perform a rescue and must be alert to any signs of an active (struggling) or passive victim, both at the surface, as well as below the surface of the water. Lifeguards must not engage in any activities that **intrude** upon their ability to provide effective surveillance, and they must not engage in any activities that may **distract** their attention away from their surveillance, protection, safety, and rescue responsibilities.

Lifeguard personnel should be appropriately **uniformed** in order to be readily identified by patrons and other Lifeguard personnel. Lifeguard uniforms should not restrict physical movement or emergency response time. Lifeguard uniforms and personal equipment can be categorized as:

1. **Personal Protective Equipment (PPE)**
 - a. U.V. Protection (sunblock)
 - b. Hat
 - c. Shirt
 - d. Goggles or Safety Glasses
 - e. Gloves
2. **Safety Equipment**
 - a. Whistle
 - b. Polarized Sunglasses
3. **Rescue Equipment**
 - a. Rescue Buoy (Rescue Tube or Rescue Can)
4. **Resuscitation Equipment**
 - a. Personal Resuscitation Mask (PRM), or
 - b. Personal Resuscitation Shield (PRS)

Lifeguard personnel should be outfitted with **waistpacks** to carry this equipment, along with other essential equipment. Waistpacks should have quick-release buckles in order to quickly remove the waistpack before entering the water to perform a rescue. Items, such as resuscitation equipment, dressings, and bandages should be sealed in a waterproof/leakproof plastic bag while being stored in the waistpack to protect the contents from moisture should the waistpack be brought into the water by the lifeguard.

When a victim's distress is recognized, Lifeguard personnel must immediately implement the facility's **Emergency Response Plan** (ERP) or **Emergency Operations Plan** (EOP) and immediately initiate the rescue and manage the emergency incident appropriately. In addition to performing the rescue and removing the victim from the water, incident management includes the rapid development and implementation of an **Incident Action Plan** (IAP), patient assessment, the administration of appropriate basic life support protocols, alerting the emergency dispatcher (i.e. 9-1-1), crowd control, etc.

When Lifeguard protective services are provided, it is the responsibility of the facility management to assure that lifeguard personnel are not only **certified** as having successfully completed a Lifeguard training program of instruction, but also **qualified** to work at that particular facility. Lifeguard candidates must have their knowledge and skills assessed through appropriate screening processes, and site-specific **pre-service training** must be provided that includes, but is not limited to, training in the following areas:

- Chain of Command
- Rescue and Safety Equipment
- Standard Operating Procedures (**SOPs**) or Guidelines (**SOGs**)
- Emergency Response or Operations Plans (**ERPs/EOPs**) and Incident Action Plans (**IAPs**)
- Surveillance Procedures
- Telephone and other Communication Systems
- Filtration, Circulation and Chemical Disinfectant Systems & Procedures
- Risk Management Procedures and Requirements

As a part of this training, Lifeguard personnel should be instructed on **surveillance** procedures, protocols, and techniques to be used within their **zone of responsibility**. And, they should be supervised and assessed to assure that these procedures, protocols, and techniques are being adhered to in order to assure the safety of patrons while they are engaged in recreational, instructional, or competitive activities in, on, and around the water.

Once the pre-service training is completed, it is the responsibility of the facility management to provide continuous **in-service training** for the Lifeguard personnel and to continually assess the Lifeguard's ability to **prevent** incidents, to **recognize** incidents or their potential, and to **manage** incidents or their potential.

VISION REQUIREMENTS FOR LIFEGUARD PERSONNEL

Pursuant to the ADA (Americans with Disabilities Act), employers are prohibited from discriminating against a qualified individual with a disability (defined as a physical or mental impairment that substantially limits one or more of the individual's major life activities). However, in several Supreme Court decisions, they held that while someone might be covered under the ADA, the person loses that status if he or she can correct the disabling condition. Besides losing protected status, the person could also lose his or her job if he or she can't meet the job's basic requirements.

An Aquatic Facility Manager or Operator seeking to hire lifeguard personnel can, in the interest of safety, require all lifeguard candidates to have 20/20 vision, even though visually impaired applicants could wear corrective lenses to mitigate their impairment. Because proper risk management procedures are so vital to public safety, the vision rule could be considered a ***Bona Fide Occupational Qualification*** (BFQQ). A ***BFQQ*** would allow an employer to exclude a candidate if the vision rule were designed to guarantee that lifeguard personnel can perform their job properly without increasing the harm of injury to themselves or others. As an example, a lifeguard involved in a water rescue incident whose contact lenses are flushed from his or her eyes might not be able to see the victim, rescue equipment, or shore, putting both the lifeguard, the victim, and possibly other patrons and other lifeguard personnel in serious or additional danger.

The risk of injury to oneself or another person is a major defense in any ADA case. A court will therefore allow an employer to exclude an applicant or to terminate an employee with a disability if that person poses a threat to himself, or to others, by working at the job. However, the courts will also consider whether there exists alternate means to allow a person to perform his or her job. Therefore, the employer must determine whether reasonable accommodations might be made to permit the person to remain on the job. As an example, the employer might provide the lifeguard with goggles and require the lifeguard to wear the goggles when entering the water to perform a rescue in order to prevent the lifeguard's contact lenses from flushing out. Most courts would consider such actions as not overly burdensome on an employer, and would find them to constitute reasonable accommodations.

For more information, please review the following articles:

Safety in Indoor Aquatics: Summary of the Athens 2004 Olympics

<http://www.lifesaving.com/issues/articles/12-04/12-07-04.html>

Lifeguard Shortage May be Putting Swimmers at Risk

http://www.lifesaving.com/issues/articles/08lifeguard_shortage.html

Lifeguard Bill No. 3993

http://www.lifesaving.com/issues/articles/24lifeguard_bill_3993.html

Fatal Vision

http://www.lifesaving.com/issues/articles/26fatal_vision.html

The Standard of Care in Lifeguarding

http://www.lifesaving.com/issues/articles/standard_of_care.html

Lifeguard Competitions: An Effective Motivational Tool

http://www.lifesaving.com/issues/articles/31lifeguard_competitions.html

MANAGEMENT AND OPERATIONAL RESPONSIBILITIES

The primary responsibilities of aquatic facility management and lifeguard personnel are:

- 1) To **Prevent** incidents;
- 2) To **Recognize** incidents or their potential;
- 3) To **Manage** incidents or their potential.

PREVENTION FACTORS & RISK MANAGEMENT

In order to prevent the occurrence of incidents, the aquatic facility management and staff should develop **prevention strategies** to include the **development** of **rules and regulations**, the **posting** of these rules and regulations, and the **enforcement** of the rules and regulations by lifeguard and management personnel. A comprehensive **Risk Management Program** should be developed and implemented that involves input by all lifeguard, management, and support personnel to (A) identify physical **hazards**, remove or correct those hazards, and/or warn patrons of them; (B) to identify activities that place patrons at increased **risk** and either prohibit those activities, or safeguard the patron while they are engaged in those activities. The Risk Management program should include a **public education component**, a **hazard** and **risk assessment**, prevention strategies, implementation guidelines, etc.

Hazard + Risk = Danger

The combination of hazards and risks constitutes a **danger**. The goal of the Risk Management program should be to eliminate or reduce the danger to patrons, lifeguard personnel, and anyone else having access to the facility.

If lifeguard services are not provided, patrons must be adequately advised of the following conditions:

- No Lifeguard On Duty
- Swim At Your Own Risk
- Children Must Be Carefully Supervised At All Times
- No Swimming Without Another Adult In Attendance
- No Diving (in less than 9' of water)
- Children Under The Age of 15 May Not Use The Pool Unattended Without An Adult Providing Supervision

It is the responsibility of the aquatic facility management to develop **Standard Operating Procedures** (SOPs) or **Standard Operating Guidelines** (SOGs) that guide or govern the lifeguard personnel and other staff (i.e. Swimming Pool or Facility Operators, maintenance personnel, managerial personnel, etc.) in their actions. These SOPs or SOGs would include operational expectations, policies, procedures, etc.

Emergency Action Plans (EAPs) are guidelines and procedures that a facility creates for handling any number of emergencies in order to **prevent the escalation** of the incident. These emergencies may result from equipment failures, utility failures, storm warnings, etc. According to the APSP, "The emergency action plan should be designed to assist the staff in preventing accidents when possible as well as provide guidelines on how to react should a situation occur." The EAP should include guidelines for evacuation of the facility, if necessary, and communication with other emergency services should the situation require. The plan should also describe the **chain of command** for making decisions during the emergency as well as who will be the spokesperson to talk to the media.

Emergency Response Plans (ERPs) or **Emergency Operations Plans (EOPs)** should be developed and implemented, and all lifeguard, management, and other personnel affiliated with the facility need to participate in regular, but un-announced, **Emergency Response Drills** prior to the season and throughout the season to assure their ability to respond to emergency crises situations when or should they occur. The development of the ERPs/EOPs should include every conceivable contingency, both in the water, as well as on land. Also, as a result of participating in Emergency Response Drills, lifeguard and other personnel develop a greater appreciation for the need to prevent the incident from occurring in the first place, and are better prepared to respond to an emergency incident when or should one occur.

Management must develop, post and implement appropriate **Rules and Regulations** for each particular facility, and lifeguard, management, and other personnel are expected to strictly **enforce** these rules and regulations. They must be cognizant of the rationale as to why these rules and regulations were established and acceptable methods to enforce them.

EEC Factors

Aquatic facility managers and operators must **establish** rules and regulations to guide patrons in acceptable practices when using their facilities. Lifeguard, supervisory and management personnel must **enforce** these rules and regulations. For those individuals who don't adhere to the rules and regulations, there must be **consequences** that are imposed on them for not following the facility's rules and regulations.

Facility Use Guidelines

Regardless of whether or not lifeguard protective services are provided, aquatic recreation facilities must develop facility-specific guidelines for outside groups who use these facilities. These guidelines should outline the supervisory responsibilities of the group for supervising those persons affiliated with that group, as well as facility rules and regulations, emergency procedures, etc. Having lifeguards present at a facility should not excuse the group from supervising their people, nor should it reduce their supervisory responsibility. The first line of defense should be the supervision and accountability maintained by the group leadership. Lifeguard personnel should supplement, not replace, that level of supervision and accountability. When no lifeguard protective service is provided, it is even more critical to develop, implement, and enforce these guidelines for outside groups.

Proper Bathing Attire

Aquatic facilities have the right to define the bathing attire required to be worn by patrons using their facilities. The rules and regulations stating the bathing attire expectations must be clearly **posted** and strictly **enforced** by lifeguard and management personnel. These rules and regulations are commonly used and accepted as the **standard of care** throughout the U.S. to assure the **health** and **safety** of patrons using aquatic recreation facilities, regardless of whether these facilities are swimming pools, lakes/beaches, or waterparks. These **rules and regulations** are established in order to reduce the influx of contaminants brought in on street clothes, and to prevent **entrapment** and **strangulation** incidents caused by the entanglement of loose fitting garments into swimming pool circulation/filtration equipment, or debris on lake or ocean bottoms, or from other attractions and equipment including docks, floats, ladders, diving boards, slides, etc.

In addition to recognizing distress victims and performing rescues, lifeguard and management personnel are responsible for preventing incidents and recognizing the potential for incidents. Anyone engaged in aquatic recreation activities in, on and around the water is at some degree of risk. **Rules and regulations** are established and enforced to reduce that risk. Persons engaged in aquatic recreation activities who wear loose fitting clothing are at greater risk of drowning or serious injury as a result of entrapment and entanglement. That person is also at greater risk from a child or panic-stricken adult struggling in the water who might reach out and grab or become entangled in the loose fitting clothing. When this clothing is fitted around the neck, this person is then at even greater risk of strangulation as a result of entrapment and entanglement. Clothing worn around the neck puts the patron at even greater risk from a compromised airway that can cause panic, ingestion and aspiration of water, **hypoxia**, and **laryngospasm**, resulting in a **submersion** incident.

Therefore, we encourage facilities to conduct a **threat analysis** of their facilities and the activities patrons engage in within that facility, and to develop appropriate rules and regulations that regulate the type of clothing/bathing attire required within that facility. An example of these rules and regulations might include the following:

Bathing suits MUST be worn by any person who enters the water. No cut off shorts. No gym shorts. No body suits. No t-shirts. There will be no exceptions to this rule. No one may enter the water in any other attire.

RECOGNITION FACTORS & SURVEILLANCE PROTOCOLS

Lifeguard personnel must be instructed in effective surveillance procedures, protocols, and techniques that are specific to the facility they are protecting. A number of objective protocols are recognized and implemented at aquatic facilities throughout the United States including the **30-Second Rule**, the **10/20 Rule**, and the **10 x 10 Reaction Rule**. Whatever protocols are developed and implemented for the specific facility, these protocols should be adhered to by all personnel and it is the responsibility of the facility management to guarantee the lifeguards' ability to use and adhere to these protocols.

30 Second Rule

The 30-Second Rule implies that lifeguard personnel must be able to provide effective surveillance of their entire **zone of responsibility** and must be able to effectively survey their zone and everyone within that zone from one extreme periphery to the other extreme periphery and back within a total of **30** seconds. If this cannot be accomplished due to the size of the zone, the number of patrons within the assigned area, or the activities the patrons are engaged in within the zone, then the zone must be confined, or additional lifeguard personnel must be deployed, assigned to the zone, and appropriately positioned to survey this zone.

10/20 Rule

The 10/20 Rule implies that lifeguard personnel, while providing continuous and effective surveillance within their zone of responsibility, must be able to assess the potential victim's distress and must be able to determine whether or not intervention is required within a period of **10**-seconds from initial observation. And, if intervention is required, lifeguard personnel must be able to perform the rescue within **20** seconds. In order for this to be accomplished, lifeguard personnel must be appropriately positioned to be able to provide effective surveillance, and to be able to respond to contact and rescue the victim anywhere within their zone of responsibility within a 20-second time period.

10 x 10 Reaction Rule

The lifeguard's goal is to scan his/her assigned zone of responsibility in **10** seconds and to strive to be able to respond and rescue a swimmer in distress in **10** seconds or less.

Lifeguard personnel must be vigilant in their duties while positioned at their assigned stations and must provide continuous and effective surveillance. They must **anticipate** the rescue and must remain alert to recognize distress victims in, on, and around the water including victims at the surface as well as those submerged below the surface of the water.

Whether the aquatic facility is operated with or without Lifeguard personnel, it is the responsibility of the parent to carefully monitor and supervise the actions of their own children in, on, and around the water. When organized groups are using the facility, it is the responsibility of the group leadership to provide additional supervision for their participants in, on and around the water in order to supplement the lifeguards' surveillance capabilities. If **No Lifeguard Service** is available, it is the responsibility of the facility management/operator to advise the group there are **No Lifeguards On Duty**, and to provide stringent supervisory and safety guidelines that must be adhered to while their facility is in use by that group.

RID Factors

When an incident occurs at a "guarded" facility that is not immediately recognized by lifeguard personnel, it is typically due to one of three factors. These factors are referred to as the **RID Factors**:

R = Recognition

Lifeguard personnel failed to **recognize** the victim's distress, the incident, or the potential for the incident because they were not positioned properly, were not vigilant in their supervisory responsibilities, or were not appropriately trained and knowledgeable to recognize the signs of a victim's distress or incident.

I = Intrusion

Lifeguard personnel failed to identify and recognize the incident or its potential because they were engaged in activities that **intruded** upon their ability to provide effective surveillance. Lifeguard personnel should never be assigned duties that infringe upon their surveillance responsibilities.

D = Distractions

Lifeguard personnel failed to recognize the incident or its potential because they were engaged in activities that **distracted** them from their level of attention and vigilance. Lifeguards should not be allowed to engage in social conversation with patrons or other lifeguards and should not engage in activities such as reading or talking on the phone while on duty.

Lifeguard personnel are taught general **surveillance** principles and procedures within their Lifeguard training course. However, it is the responsibility of the aquatic facility's management to instruct the lifeguard personnel on the procedures, protocols, and techniques that must be used and adhered to within their specific facility in order to supervise patrons while they are in, on, and around the water. The procedures, protocols, and techniques for each facility are based on the design of the facility, the number of patrons, the number of lifeguards, the activities patrons are engaged in, environmental factors, etc.

Lifeguard personnel must understand the principles that impact the **Standard of Care** as it relates to their ability to **prevent, recognize, and manage** incidents, as well as their potential. While lifeguard personnel are off the stand, they are never "off duty" and always must be actively engaged in either providing surveillance to patrons in, on, and around the water, or in monitoring the actions, activities, and needs of other lifeguard personnel. Should an incident occur, non-assigned or off-stand lifeguard personnel must be prepared to immediately respond to assist in the rescue and respond to the emergency incident.

Facility management must continuously assess the activities and numbers of patrons in, on, and around the water in order to determine the number of lifeguards or other supervisory personnel that are required to assure the safety of the patrons. Any duties or responsibilities assigned to lifeguard personnel must never be allowed to intrude upon their ability to provide effective surveillance, and lifeguard personnel should never be allowed to socially talk to other lifeguard personnel or patrons while providing surveillance in order to prevent the lifeguards from getting distracted. Official **communication** between lifeguards is encouraged, however, as long as it contributes to job performance and as long as their effectiveness is not compromised. Whistle signals hand signals, and/or radio signals should be developed to assist lifeguard personnel in lifeguard-to-lifeguard communications to increase their job performance.

MANAGEMENT FACTORS

Management of the incident or its potential refers not only to the activation and implementation of an **Emergency Response Plan (ERP)** or **Emergency Operations Plan (EOP)** in the **rescue** of patrons, but also in the enforcement of **rules and regulations** to prevent incidents, and in the active and continuous **assessment** of physical **hazards** or activities that place patrons at **risk**. When the potential for an incident is recognized due to the presence of physical hazards or those activities that place patrons at increased risk, lifeguard, supervisory or management personnel must remove or correct the hazards or warn patrons of the presence of those hazards. Lifeguard and management personnel must enforce rules and regulations in order to **prohibit** activities that place patrons at further risk. If patrons are allowed to participate in specific activities that place them at greater risk, then appropriate supervisory and operational **safeguards** must be implemented to assure their safety while they are engaged in those activities. Lifeguard personnel must recognize the incident at its inception and perform a rescue in order to prevent the progression of the incident and the deterioration of the victim's condition.

LEGAL CONSIDERATIONS

Public Safety and Rescue personnel (i.e. Fire, Rescue, EMS, and Law Enforcement) have a **duty to act**. For the most part, this duty primarily includes the responsibility to respond to emergency incidents after they've been notified of the incident by the emergency dispatcher. Lifeguards, on the other hand, have a duty to **prevent** the incident; a duty to **recognize**, not only the incident, but the potential for the incident; and, a duty to **manage** the incident, or its potential, by responding appropriately and effectively.

The following is a brief description of various legal factors that must be considered when operating any type of aquatic facility.

Duty to Act

Lifeguards have a Duty to Act, which includes the prevention, recognition, and management of drowning and aquatic injuries, as well as their potential. While off duty, they may have a moral and ethical duty to act.

Good Samaritan Laws

These laws vary from state-to-state, but typically are designed to prevent an individual who voluntarily helps an injured or suddenly ill person from being legally liable for any error or omission in rendering good faith emergency care.

Certification

Certification as having completed a course of instruction (i.e. lifeguard training, CPR, etc.), does not imply retention of knowledge or skill for any time period. Certification only implies that by the conclusion of the training, all educational objectives (knowledge, practical, and behavioral) were met. This is why it is critical to conduct appropriate pre-service and continuous in-service training of all personnel.

Standard of Care

The standard of care is evaluated on how an individual with similar training and experience would act under similar circumstances to (A) prevent the incident; (B) recognize the incident or its potential; and (C) manage the incident or its potential.

Negligence

When an incident occurs at a facility that (A) could have been prevented; (B) was not recognized in a timely manner; or (C) was not appropriately and effectively managed, the injured party can claim that the facility owner and operator, as well as individual lifeguard personnel were negligent. The following formula represents the factors that need to be considered:

1. The defendant had a duty to the plaintiff;
2. The defendant breached that duty;
3. The plaintiff actually suffered some injury or loss; and
4. The defendant's breach of duty was the actual cause of the plaintiff's injury or loss.

Abandonment

Once patient care or a duty to an individual has been assumed, it must be continued until someone of equal or higher level of training and skills assumes responsibility for that patient or individual. Failure to continue care or duty constitutes abandonment.

Consent

Prior to performing any emergency care for a patient, that patient must authorize the rescuer to provide care. This is referred to as ***expressed or actual consent***. However, if emergency care is rendered to prevent death or permanent injury and the patient/victim is unable to provide expressed or actual consent, the legal assumption is that the patient/victim would have authorized this care.

Records and Reports

The old adage, "the job's not done until the paperwork is complete" is indeed appropriate when dealing with the management and operation of any type of aquatic facility. All patient care, staff training, rescue operations, personnel issues, etc. must be carefully documented. In the eyes of the legal community, if it wasn't documented...it wasn't done!

Early CPR

Provides *life-sustaining* blood flow

- Cerebral
- Coronary

Maintains patient in gray area between *Clinical & Biological Death*

Cricoid Pressure

Early Defibrillation

The earlier the patient is defibrillated, the greater the chance of survival!

Probabilities of Successful Conversion

- 1 minute = 90%
- 2 minutes = 80%
- 3 minutes = 70%
- 4 minutes = 60%
- 5 minutes = 50%

Early Advanced Life Support

Administration of drugs & other therapy further improves the patient's chances for survival

- Monitoring
- I.V. insertion
- Pain control
- Antiarrhythmic therapy
- Thrombolytic therapy

Emergency Resuscitation Equipment

Positive Pressure Ventilation Equipment

- Personal Resuscitation *Masks*
- Personal Resuscitation *Shields*
- Bag-Valve-Mask (*BVM*) Resuscitators

Airway Management

- Manual *Suction* Device
- Oropharyngeal Airway

Oxygen Administration

- Oxygen Tank
- Oxygen Regulator

Automatic External Defibrillator (*AED*)

Hypoxia

Dangerous condition in which the body's tissues & cells *do not have enough oxygen to support life*

- Respiratory Distress/Arrest
- Cardiac Distress/Arrest
- Blood Loss
- Spinal Injuries
- Shock

Hypoxia: Time is Critical

- | | |
|----------------|---------------------------|
| 0 - 1 minutes | Cardiac irritability |
| 0 - 4 minutes | Brain damage not likely |
| 4 - 6 minutes | Brain damage possible |
| 6 - 10 minutes | Brain damage very likely |
| > 10 minutes | Irreversible brain damage |

Oxygen Administration Equipment

- ✓ Oxygen Regulator
- ✓ Oxygen Tank
- ✓ Personal Resuscitation Mask w/ O2 Inlet
- ✓ Bag-Valve-Mask (*BVM*) Resuscitators
- ✓ Non-Rebreathing Mask

Practical Evolutions

Positive-Pressure-Ventilation

- ✓ Mouth-to-Mask or Mouth-to-Shield Resuscitation

- ✓ Bag-Valve-Mask Resuscitation

Airway Management

- ✓ Suctioning Procedures
- ✓ Oropharyngeal Airway Insertion

Oxygen Administration

- ✓ Set-up & break-down oxygen equipment
- ✓ Oxygen administration via *BVM*

CPR

AED

American Heart Association's Position on Early Defibrillation

All emergency personnel should be trained and permitted to operate an appropriately maintained defibrillator if their professional activities require that they respond to persons experiencing cardiac arrest!

Automated External Defibrillators (*AEDs*)

- 1) Analyze the patient's cardiac rhythm
- 2) Charges the defibrillator
- 3) Instructs rescuer to shock the patient