Using swimming pools and spas can involve a certain amount of risk, but a day at the pool or an evening in the spa should be safe and fun for everyone. Fortunately, accidents can be prevented if pools and spas are managed effectively. The following guide is intended to highlight important aspects of pool and spa safety and the strategies you can use to help keep your facility safe for everyone.

Managing a swimming facility is complex. This guide is not intended to provide all the answers regarding swimming pool operations or the requirements that apply to swimming pools and spas in different jurisdictions. For specific pool and spa requirements in your area, refer to local codes and consult with the proper regulatory agencies.

**Common Causes of Injuries**
The most common poolside injuries are fractures, cuts, and bruises resulting from falls on pool decks. Alcohol, horseplay and misbehavior and inadequate supervision of children are often contributing factors in these incidents. Sometimes serious or even fatal accidents can result from swimmers diving into shallow water or from drain entrapment.

Swimming pools, spas and hot tubs also provide a medium for the transmission of illnesses. Germs such as Guardia, Cryptosporidium, Shebelle and E. coli from swimmers can contaminate the water and spread to other swimmers when water is accidentally swallowed.

Other causes of injury or illness can include:

- Overexposure, dehydration and shock from jumping into the pool after sitting in the sauna
- Burns from sauna heater or exposed metal
- Defective pool equipment or furniture
- Electrocution from defective electrical equipment
- Pool chemicals

Employees may also be victims of injury in and around the pool compound. They are exposed to the same hazards facing your swimming pool users. In addition, employees may be injured when working with caustic pool chemicals.

**Operations**
A safe pool and spa operation does not just happen. It takes effective management, as well as a number of other factors, including:

- Properly designed facility and equipment
- Well-established and enforced rules
- Effective signage
- Employee training
- Regular safety checks
- Controlled access
- Accurate records
- Facility and equipment maintenance

As a pool operator, you should carry out an assessment of the risks that may affect employees, members of the public and others who may be in or using the facilities. Appropriate actions should be taken to eliminate or reduce these risks as much as possible. As part of the assessment, it is important to also consider people with disabilities.
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Written policies and procedure that cover all pool and spa operations should be established. They should include emergency and first aid procedures, pool and spa rules, employee training, equipment inspection and maintenance, security and chemical safety. All employees should receive training on these policies and procedures, and a copy should be available to staff at all times.

Facility Design and Equipment

Only qualified swimming pool designers and contractors should be used when developing a new facility or altering existing pools and spas. This can help ensure all government and industry standards are followed. They may also be aware of best practices related to non-regulated areas such as proper deck surface materials to reduce falls, etc. Pool safety design standards and best practices have changed over the years, so it is recommended that a qualified pool designer evaluate existing facilities periodically to ensure older pools meet current safety requirements and best practices. This particularly applies to diving boards, slides and drain entrapment hazards.

Diving and Slides

The accidental injuries suffered as a result of diving head first into shallow water can be very serious. Diving from the pool deck should be prohibited unless a specific area of the pool is designed for this purpose and lifeguards are on duty. Under no circumstances should diving be allowed in an unsupervised facility. All facilities should periodically assess the benefits of their diving board or slide in relation to the significant liability they can present.

The complex mix of pool shapes, depth variations and equipment design can make it difficult to determine the safe envelope of water needed to serve a diving board or waterslide. Since design standards have become more conservative over the years, pool operators should periodically ensure their facilities meet current standards and best practices. Operators of older pools should consult with a qualified pool designer and the manufacturer of their diving board or slide to determine if they meet current standards.

Drain Entrapment Hazard

Swimmers, particularly young children, can become entrapped on pool or spa drains due to the suction of the circulating pumps. This entrapment can result in severe injuries and death.

Pools should be equipped with an appropriate number of sump drains, with adequate separation between them. This, in turn, reduces the vacuum pressure possible at any single drain, thus reducing the risk of suction entrapment. All drains must have suitable grilles fitted with holes or gaps meeting industry standards.

Additional anti-entrapment devices and systems are required in some areas. For public pools and spas with a single main drain, other than an unblockable drain, these requirements include features such as:

- Drain flow rate that does not create a suction hazard
- Safety Vacuum Release System (SVRS)
- Suction limiting vent system
- Gravity drainage system
- Automatic pump shutoff system

An SVRS senses an increase in pump suction and responds by removing power to the pump(s) and/or relieving the potentially entrapping suction. All pools and spas should be evaluated to determine if this hazard is properly controlled.

Rules and Regulations

Greater employee and public awareness is helpful in reducing accidents. Increase awareness of inherent dangers by posting rules and regulations and by teaching employees how to effectively intervene when necessary. Hazard awareness training for employees is an important way to reduce injuries.

Develop rules for staff, facility users and special groups, and make the facility manager responsible for updating and enforcing them. Staff members should have the full support of the property’s management to enforce these rules. Place signs in visible and appropriate locations around the pool facility to communicate important information to swimming pool and spa users regarding rules, hazards and ways to avoid injury. Use pictorial instructions and warnings whenever possible. If the property is in an area where foreign swimming pool users are frequent, print rules in various languages on cards and give them to your facility users. Post signs conveying general rules at the entrance to the swimming pool and spa and conspicuous areas throughout.

Specific rules for diving boards, slides and spas should be posted near this equipment. Mark the pool depths in meters and feet. The markings must appear both on the vertical pool wall just above the water line and horizontally on the pool deck or coping, close to the water’s edge.

Rules of conduct and procedures within the locker room should be posted in the locker room or bathhouse. Consider prohibiting cell phone use due to privacy concerns related to camera phones.

Pool operators should consider limiting the number of young children allowed in the pool without close adult supervision during unprogrammed sessions. Limits should take into account the physical attributes of the pool environment,
staffing levels, etc., and should be part of your pool operating procedure.

**Emergency Equipment**

The following types of emergency equipment should be readily accessible in the pool area and in good condition:

- Rope and float line separating the shallow end from the deep end
- Rescue tube
- Ring buoy with throw line
- Shepherd’s crook
- Resuscitation equipment
- Floating back board
- Spine or back board
- Appropriate first aid equipment and supplies

Requirements for specific emergency equipment may depend on your location. Contact your local public health and/or safety officials for information about specific emergency and first aid equipment requirements.

Consider having at least one telephone in the pool area for emergency use, for increased safety. Post the emergency services contact number, as well as facility emergency numbers, in a conspicuous place and next to phones.

Prior to pool use, daily checks should be performed to ensure all equipment is present, free from defects and in the correct locations.

**Lifeguards**

Providing a safe swimming pool environment is enhanced greatly by the use of lifeguards to supervise the pool. However, considerable management is needed to ensure they are qualified, provided in adequate numbers and supervised so they are effective. The management of the swimming pool environment requires more than a strong swimmer; lifeguards must be well trained and rotated so that they are alert at all times. Specifics regarding lifeguard training, duties and responsibilities are beyond the scope of this document.

**Employee Training**

The success of your pool operation depends on the ability and performance of your staff, so they should be qualified to maintain and manage the operation of the pool. Operation and maintenance staff may include a pool engineer, locker room or bath house attendants, lifeguards, groundkeepers and other support personnel. Take the time to supervise, counsel and train them. Certify at least one staff member as a pool operator or hire an outside contractor.

Job orientation, hazard communication training and regular in-service training, such as first aid or CPR and the use of automatic external defibrillators (AEDs), is important. Remember to include drills for handling emergencies. Provide written job descriptions for all employees and distribute copies of the pool operations manual. Use regular performance reviews to discuss issues related to your employees’ work and training.

Site-specific training includes hazard recognition, rules and regulations, policies and procedures enforcement, surveillance procedures, emergency operations, use of safety and rescue equipment, standard operating procedures and safety and emergency communications. Lifeguards should have first aid, CPR and lifeguard training with copies of their certificates on file. Train staff to handle emergency situations. Post emergency procedures for handling accidents in conspicuous locations. If an accident happens, take care of injured swimming pool user(s) promptly and courteously.

**Chemical Safety**

Inform your employees of the hazards associated with chemicals, and teach them to handle them safely. Make sure instructions and precautions are visible on all cleaning material containers and that chemicals are marked and labeled for hazards and precautions. When chemicals are delivered, ensure there is sufficient space for maneuvering, parking and unloading.

Provide employees with personal protective equipment (respirator, chemical resistant gloves, face shield, etc.) and make sure it is in good condition. Train staff in the proper fitting and use of the equipment. Provide emergency eyewash stations and showers in the chemical handling area.

Storage areas should be clearly marked, warning of the possible danger, and be secure locations accessible only to authorized personnel. Ensure all chemicals are stored appropriately and any incompatible chemicals are a suitable distance apart (e.g. combustibles and oxidizing materials).

**Physical Safety**

Daily inspections of the pool facility before and during pool operations are important. If an unsafe condition is found, correct it before the pool opens. If the problem is serious, close the pool until it is corrected. Use signs and barricades to communicate minor hazards or restrict access to problem areas.

Inspect these main areas when conducting safety checks:

- Deck
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- Pool, spa, sauna etc.
- Emergency equipment
- Recreational equipment
- Chemical storage areas
- Showers, locker rooms and restrooms

Opening Safety Checklist
Do the first safety check before the pool opens in the morning. Check the deck, pool, spa, locker rooms and restrooms for hazardous conditions. Note the condition of the water. Ensure all safety equipment is in place and in working order. Check that the first-aid station is well stocked and that telephones and two-way radios are working properly.

Deck
Watch for hazards on the deck, including loose or broken flooring material, standing water or slippery areas. Remove equipment, personal belongings and any other objects that may cause swimming pool users to fall or be injured. Keep chairs, tables and umbrellas in good condition and out of the travel path.

Pool, Spa & Sauna
The pool, spa and sauna can present several hazards, so it is important to follow these guidelines:

- Ensure anti-vortex drain covers are present in the bottom, are in good condition, have a proper strain hole size and are securely in place. Check the suction forces by placing a cloth over the drain; you should be able to remove it easily.
- Ensure depth markers are visible and that a buoyed lifeline marks the separation between shallow and deep areas of the pool.
- Ensure ladders and steps are secure and free from defects.
- You must be able to see the bottom, especially at the deep end, from anywhere on the pool deck. If water is cloudy or an unusual color, the chemical balance may be off or the filtration system might not be working properly.
- Check the water temperature in the pool and the spa. Typically, pool water should range between 82 and 86 degrees Fahrenheit (28 – 30 degrees Celsius) and spa water should not exceed 104 degrees Fahrenheit (40 degrees Celsius). Check with your local regulatory agency for specific requirements.
- Ensure that fences around the pool are are in good condition.
- Ensure that self-closing/self-latching gates controlling access to the pool work properly and latch securely.
- Ensure pool rules are posted in several strategic locations and that they are legible. Make “No Diving” signs visible from the pool deck and from the water.
- Ensure all electrical outlets near the pool and in the filter room have ground fault circuit interrupter (GFCI) or earth leakage circuit breaker (ELCB) protection in working order. Keep rooms and boxes containing electrical equipment locked.
- Check the filtration and chlorination systems and areas that are used to store chemicals and maintenance equipment.

Sauna
Ensure the guard for the sauna heater is in place. The door latch from inside the sauna must be operational. Check the sauna at frequent and regular intervals. Monitor maximum operating temperatures to ensure they are in accordance with local requirements.

Recreational Equipment
Regularly inspect recreational equipment, such as diving boards and water slides. The joints on the water slide should not have gaps, cracks or sharp edges, and the surface of the slide should always be wet to avoid rub burns. Instructions on the safe use of recreational equipment should be posted on or near recreational equipment.

Showers, Locker Rooms and Restrooms
Keep floors clean and slip resistant. Inspect lockers and furniture for sharp edges, stability and splinters. Lights need protective globes.

Midday Safety Check
Your midday safety check may involve some of the same items you checked before you opened the pool.

Weather
If the pool is outside, monitor weather conditions. If a storm is threatening, you may need to close the pool to protect the safety of your swimming pool users.

Closing Safety Checklist
Inspect the pool facility before closing. Be sure all pool toys are put away. Children may find them irresistible and figure out a way to get into the pool after hours to play. After the closing inspection, write an entry in the daily log that the water area is clear; you have made the safety check and taken any necessary steps to eliminate problems. Ensure pool areas are lit after hours or equipped with motion-sensitive lights to indicate if someone is in the pool area.
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Security
Control access to the pool area using fences, gates, doors and walls. Make sure they are in good condition and that locks are present and in working order.

It is a good practice to police the pool area periodically, assuming someone will try to use the pool, even when it is closed. Leave the underwater lights on in the pool so you have a better chance of noticing if someone is in the water after hours. If appropriate, use an alarm system, such as water sensors, pool deck sensors, motion detectors or motion-sensitive lights to detect after-hours use.

Where permitted, consider using a closed circuit camera system to monitor activities in the pool area. Local requirements may restrict where and how camera systems can be used. Check with your local authorities to learn about specific requirements.

Recordkeeping
Recordkeeping is an important part of managing a pool facility. Accurate records can play a vital role in the event of a lawsuit. Retain the following records:

- Daily attendance
- Inventories – equipment, supplies and chemicals
- Personnel – duty log, certification or other qualifications, training and evaluation records
- Daily maintenance – chlorine residual and pH
- Program – record of daily events and special activities
- Accident and near-miss reports
- Water and air temperatures
- Weather conditions
- Pool’s condition and daily inspection reports
- Annual report – include recommendations for improvements

Pool and Spa
Close the pool when it is undergoing maintenance, and inform users that it is closed by using signs. If you drain the pool for repair, take measures to ensure that swimming pool users do not get injured by falling, diving or jumping into the empty pool.

Perform the following daily maintenance tasks:

- Clear the drains on the deck and in the equipment room
- Brush the pool walls and vacuum the bottom
- Maintain anti-vortex drain covers in the pool and spa in good condition. They should be difficult to remove and have the proper strain hole size
- Check the filtration system and backwash if the pressure indicates a problem
- Have a certified electrician check electrical service annually

Water Quality and Testing
Frequent water quality testing is important to help ensure that the filtration and chemical treatments are effective. If the water is cloudy or has an unusual color, the chemical balance may be off or the filtration system might not be working properly. Even though water clarity is not always related to its sanitary condition, it is a factor in providing a safe swimming environment.

The following controls can help prevent sanitation-related hazards:

- Sanitize locker rooms, restrooms and seating.
- Provide appropriate containers for waste material, making sure that waste receptacles are emptied regularly and that any spillages are promptly cleaned up.
- Skim the pool water continuously as it enters the overflow.
- Maintain proper pH levels. Proper pH levels provide better chlorine efficiency.
- Maintain proper sanitation residuals. These requirements may depend on your location. Contact your local public health and/or safety officials for more information.
- Maintain water clarity such that a black disc six inches (150 mm) in diameter is readily visible when placed on a white field at the deepest point in the pool.
- Take daily water samples for chemical analysis (chlorine residual and pH) in accordance with local requirements.
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- Conduct bacteria sampling periodically and document the results. Send samples to a qualified laboratory for analysis.
- Implement a preventive maintenance system for water filtration and sanitation systems.

Sauna
Ensure temperature controls and timers are in good condition and working correctly. The thermostat and controls should be inspected annually by a qualified electrician. The guard for the sauna heater should be in place.

Locker Room
Clean and disinfect locker rooms and restrooms, including flooring and seating, frequently during pool operating hours. Keep floor drains clear and floors as dry as possible. Inspect lockers and furniture for sharp edges, stability and splinters. Regulate shower and faucet water temperatures to prevent scalding. Protect all circuits with residual current device (RCD) or ground fault circuit interruptor GFCIs. Locate electric hair dryers in a dry area of the room.

General maintenance
Maintain chairs, tables, umbrellas and handrails in good condition. Provide a non-skid surface on the pool deck, ladders, steps and diving boards. Inspect floor tile, pool decking and edging for chipped or broken masonry and repair as necessary. Maintain adequate drainage on the pool deck and keep it clean and uncluttered. Constantly be on the lookout for oil deposits from suntan lotions. All electrical outlets near the pool and in the filter room should have RCD's or GFCI protection and be inspected semi-annually by an electrician. When making repairs, do not allow the use of extension cords for any reason when the pool is open. Use only qualified electricians to perform electrical work.

Additional Resources
The Association of Pool and Spa Professionals, http://apsp.org/
Health and Safety Executive www.hse.gov.uk/entertainment/leisure/swimming-pool.htm