

Guideline implementation

Recreational water activities can bring health benefits to users, including exercise and relaxation. However, negative health effects may also arise as described in previous chapters. It is necessary to address these issues and implement effective management options in order to minimize the adverse health consequences through implementation of the Guidelines.

Different stakeholders play different roles in the management of the recreational water environment for safety. The typical areas of responsibility may be grouped into four major categories, although there may be overlap between these and stakeholders with responsibilities falling within more than one category:

- design and construction;
- operation and management;
- public education and information; and
- regulatory requirements (including compliance).

This chapter is arranged according to these categories, with the main stakeholders indicated for each category. Successful implementation of the Guidelines will require development of suitable capacities and expertise and the elaboration of a coherent policy and legislative framework.

6.1 Design and construction

People responsible for commissioning pools and similar environments, along with designers and contractors, should be aware of the requirements to ensure safe and enjoyable use of facilities. Many decisions taken at the design and construction stage will have repercussions on the ease with which safe operation can be ensured once the pool is in use.

Table 6.1 summarizes examples of good practice in design, specification or construction of swimming pools and similar environments in relation to the major health issues discussed in previous chapters, while Table 6.2 examines specific risks in various pool types in relation to design and construction issues.

Local and national authorities may set specific requirements that must be met in the design and construction of swimming pools and similar recreational water facilities (see also Section 6.4). Alternatively, less formal guidelines may be established by these authorities or by professional or trade associations. Competent and experienced persons may be members of professional associations or may be subject to licensing schemes in order to practise (see Section 6.4.2). There may be a process of approval for design and during construction – for example, through building regulations.

Table 6.1. Examples of good practice in design and construction: major health-related issues

Objective^a	Typical actions/requirements of good practice
Prevention of entrapment injuries (2)	Specify minimum two suction drains per pump system, with drains sufficiently separated to prevent trapping. Properly installed outlets and drain grates to prevent suction entrapment. Pump shut-off permanently accessible to lifeguards or public (if no permanent lifeguard).
Prevention of diving accidents (2)	Clear indication of depth in locally comprehensible manner at frequent intervals.
Enable adequate lifeguarding (2)	All areas of pool visible from lifeguarding posts. Adequate artificial light. Glare does not impede underwater visibility. Plain pool bottom assists recognition of bodies.
Prevention of slip/trip/fall accidents (2)	Non-slip surround surfaces. Area bordering pool clear of tripping hazards (e.g. pipes and equipment). Temporary fixtures create no hazard when removed (e.g. starting blocks). Pool surround sloped to drain effectively. Edge of pool surround in contrasting colour (unless gentle slope from surface). Steps, treads, etc. marked by contrasting colour. Pool and surround free of sharp edges or projections.
Minimize unintentional immersion and enable self-recovery (especially for non-swimmers) (2)	Avoid unauthorized access, isolation fencing (enclosing the pool only) at least 1.2 m high with self-closing, self-latching gate is recommended for pools where children could obtain unsupervised access. Avoid abrupt changes in depth, especially in shallow (e.g. <1.5 m depth) waters. Changes in depth identified by use of colour-contrasted materials. Side and end walls vertical for a minimum of 1 m. Steps/ladders for easy access in and out of pool.
Minimize and control faecal and non-faecal microbial contamination (3)	Provide easy access to toilets and showers. Design pre-swim showers so bathers have to shower before entrance to the pool area. Strategic placement of footbaths. Provision of adequate treatment capacity. On commissioning or after equipment change or modification to pipes, drains, etc., confirm circulation pattern and absence of 'dead spots' (e.g. by dye tests). For public and semi-public pools (where possible), include small, separate pools for children to facilitate draining in response to accidental faecal releases.
Minimize exposure to volatile chemicals (4)	Ensure air flow across water surface (forced or natural ventilation) and adequate fresh air exchange.
Minimize formation of disinfection by-products by control of precursor input (5)	Design pool treatment system to reduce DBP formation (e.g. water pre-treatment if necessary, disinfection systems that use less chlorine – e.g. UV or ozone plus chlorine). Provide easy-access toilets and showers.

^a Relevant chapter references are identified in parentheses

Table 6.2. Health risks and design and construction issues associated with various pool types

Pool type or use (refer to Chapter 1)	Special risk factors^a	Principal requirement/action
Natural spa waters (coloured or turbid)	Inability of users to see changes of depth (2) Inability of lifeguards to see bodies under surface (2)	No sudden underwater depth changes or steps
Flow-through seawater swimming pools on cruise ships and ferries	Polluted water in harbour areas Injuries during ship movement in heavy seas	Refer to WHO <i>Guide to Ship Sanitation</i> (in preparation)
Open-air pools	Unauthorized access to children (2) (e.g. when the pool is closed or unsupervised)	Exclusion of unsupervised children through fencing, walls with child-proof gates/doors
	Algal growth (5)	Best controlled by good hydraulic design
	Contamination by mud and grass on users' feet (5)	Provision of pre-swim showers and footbaths
	Contamination by animal faeces, animal urine and wind-blown matter (3 and 5)	Exclusion of animals Edge drainage draining away from the pool Ensuring adequate treatment capacity and good circulation and hydraulic design
Semi-public pools	Lack of adequate water quality management increases the risk of illness (3)	Water quality best controlled by ensuring appropriate treatment capacity, the inclusion of automatic monitoring and chemical dosing systems and good circulation and hydraulic design
Domestic pools (including temporary and portable pools)	Unauthorized access to children (2) (i.e. when the pool is unsupervised)	Provision of isolation fencing with child-proof gates
Hot tubs	Unauthorized access to children (2) (i.e. when the hot tub is unsupervised)	Provision of lockable safety covers on domestic and outdoor hot tubs
	Difficulty in maintaining an appropriate residual disinfectant level (3 and 4)	Provide identifiable seats to prevent overcrowding. Facility designed to enable 'rest periods' to be programmed, to discourage excessive use and allow disinfectant levels to 'recover'
	Temperature too hot	Pre-set maximum temperature <40 °C

^a Relevant chapter references are identified in parentheses

Equipment specified or purchased should meet prevailing standards (see Section 6.4.2). In addition, guidance may be available with regards to the most suitable materials to use for construction to minimize problems with corrosion.

6.2 Operation and management

Facility operators play a key role and are responsible for the good operation and management of the recreational water environment. Good operation is vital to minimize possible negative health impacts. Table 6.3 summarizes examples of good practice in operation and management to deal with the hazards identified in previous chapters.

Table 6.4 examines specific risks in relation to good operation and management by pool type.

6.2.1 Pool safety plan

The facility operator should have a pool safety plan, which consists of a description of the system, its monitoring and maintenance, normal operating procedures, a set of procedures for specified incidents, an emergency evacuation procedure and a generic emergency plan (for things not covered under the specified incidents). Examples of what should be included within the normal operating procedure are outlined in Box 6.1.

BOX 6.1 EXAMPLES OF NORMAL OPERATING PROCEDURES

1. Details of the pool(s); this should include dimensions and depths, features and equipment and a plan of the whole facility. The plan should include positions of pool alarms, fire alarms, emergency exit routes and any other relevant information.
2. Potential risk; a description of the main hazards and user groups particularly at risk is required before safe operating procedures can be identified.
3. Dealing with the public; arrangements for communicating safety messages to customers, ensuring maximum bather numbers are not exceeded, customer care and poolside rules.
4. Lifeguard's duties and responsibilities (see Section 6.2.2), including special supervision requirements for equipment, etc., lifeguard training and numbers of lifeguards for particular activities.
5. Systems of work, including lines of supervision, call-out procedures, work rotation and maximum poolside working times.
6. Controlling access to a pool or pools intended to be out of use, including the safe use of pool covers.
7. Water quality monitoring, including how often, how and where samples are to be taken, details of the operational and critical limits and actions to be taken if water quality is not satisfactory.
8. Response to an accidental faecal release (or this may be covered under an incident plan).
9. Detailed work instructions, including pool cleaning procedures, safe setting up and checking of equipment and setting up the pool for galas.
10. First-aid supplies and training, including equipment required, its location, arrangements for checking it, first aiders, first-aid training and disposal of sharp objects.
11. Details of alarm systems and any emergency equipment, maintenance arrangements; all alarm systems and emergency equipment provided, including operation, location, action to be taken on hearing the alarm, testing arrangements and maintenance.
12. Conditions of hire to, or use by, outside organizations.

Adapted from Sport England & Health and Safety Commission, 2003

Table 6.3. Good practice in operation and management: major health-related issues

Objective^a	Typical actions/requirements of good practice
Prevention of drowning incidents (2)	<p>Provision of properly trained and equipped lifeguards.</p> <p>Declared procedure for dealing with emergencies, all staff trained and familiar.</p> <p>Water turbidity monitored and action plan in place to deal with trends or deviations from acceptable range.</p> <p>Natural spas and hot tubs operated at temperatures below 40 °C.</p> <p>Ensuring unauthorized access is prevented.</p> <p>Installation and maintenance of appropriate water safety signage.^b</p> <p>Forbidding consumption or sale of alcohol at recreational facility.</p>
Prevention of diving injuries (2)	<p>Signage^b against diving into shallower water, active lifeguard supervision and intervention supported by management.</p> <p>Starting blocks and diving boards inaccessible to untrained persons.</p> <p>High boards with non-slip surfaces and side rails.</p> <p>Where possible (larger pools), designated areas for non-swimmers and children, increased supervision.</p>
Prevention of entrapment injuries (2)	<p>Checking that drain covers are in place and undamaged.</p> <p>Emergency shut-off is clearly marked.</p>
Prevention of slip/trip/fall accidents (2)	<p>Regular cleaning programme for all surfaces subject to algal or bacterial growth.</p> <p>Minimize presence of moveable objects (i.e. objects that could be transported near to pool edge and constitute a trip hazard).</p>
Accident response capability (2)	<p>Written emergency evacuation procedure and generic emergency plan.</p> <p>Rescue and resuscitation equipment available to lifeguards.</p> <p>First-aid equipment readily available.</p> <p>Communication links to local emergency and first-aid facilities readily available.</p>
Control after accidental faecal releases (3 and 5)	<p>Declared procedure for dealing with accidental faecal releases, all staff trained and familiar. For example:</p> <ul style="list-style-type: none"> • Evacuation of pool immediately after accidental faecal releases. • Pool maintained out of use for a specified period, six full turnovers of filtration cycle during which disinfectant concentrations to be elevated and maintained at maximum normal operating concentration. • Total drain-down and cleaning of children's pools.
Maintenance of water quality and clean ancillary facilities (3 and 5)	<p>Encouraging users to shower before using the facilities (e.g. through the use of posters and educational material – see also Section 6.3).</p> <p>Stated water quality and facilities monitoring programme implemented and recorded by trained staff.</p> <p>Respect bathing load limits.</p> <p>Declared process for dealing with adverse trends and unacceptable values.</p> <p>Previous identification of source of expertise/reference in case of problems.</p> <p>Availability of critical parameter water-testing equipment.</p> <p>Filtration performance periodically monitored and action taken if outside operational requirements.</p> <p>Maintenance of toilets, showers and changing rooms in clean, socially acceptable state.</p>
Maintenance of air quality (5)	<p>Manage DBP formation by encouraging users to shower before using the facilities.</p> <p>Monitoring.</p> <p>Ensuring adequate ventilation, especially across the pool surface, and suitable exchange with fresh air.</p>

^a Chapter references are given in parentheses

^b Signage is also an education issue and is covered in more detail in Section 6.3.1

The normal operating procedures cover day-to-day management and aim to prevent problems such as poor air and water quality or overcrowding from arising, through monitoring and appropriate management actions. In terms of water quality monitoring, for a number of parameters there will be both operational and critical limits (see Section 5.10). When operational limits are exceeded, action should be taken to bring levels back in line with guidelines or standards. When a critical limit is exceeded, more urgent action is required, which may include closing the facility.

In addition to normal operating procedures, it is also necessary to have a series of incident plans that cover less routine matters, such as an accident to a water slide user (see Box 6.2) or how to manage an accidental faecal release (if this is not covered under the normal operating procedure – see Section 5.8).

Situations that are not covered by either the normal operating procedure or the incident plans are likely to be unanticipated emergency situations such as structural failure and should be dealt with according to an emergency evacuation procedure. The pool safety plan should be fully documented and the results of monitoring and any incidents recorded.

6.2.2 Lifeguards

The primary responsibilities of the lifeguard include the following (Sport England & Health and Safety Commission, 2003):

- supervising the pool area, keeping a close watch over the pool and its users;
- preventing injuries by minimizing or eliminating hazardous situations, intervening to prevent unsafe behaviours, exercising appropriate control and enforcing all facility rules and regulations;
- anticipating problems and preventing accidents, including warning bathers of the risks of their specific behaviours;
- identifying emergencies quickly and responding effectively, including effecting a rescue from the water, administering first aid or CPR, and informing other lifeguards and facility staff when more help or equipment is needed; and
- communicating with the pool users and colleagues.

Secondary responsibilities should not interfere with the primary responsibilities of lifeguard personnel. These secondary responsibilities include informing patrons about rules and regulations, helping patrons locate a missing person, completing required records and reports on schedule and submitting them to the proper person or office, and undertaking maintenance or other tasks as assigned.

A detailed example of the duties and requirements of a lifeguard and determination of lifeguard staffing levels are outlined in Appendix 1.

6.3 Public education and information

Facility operators, local authorities, public health bodies, pool-based clubs (such as swimming clubs, aqua-aerobics classes, scuba clubs and so on) and sports bodies can play an important role in ensuring pool safety through public education and providing appropriate and targeted information to pool users. Table 6.5 outlines education requirements and responses to identified risks by pool type.

Table 6.4. Health risks and operation and management actions associated with various pool types

Pool type or use (refer to Chapter 1)	Special risk factors^a	Principal requirement/action
Natural spa and thermal waters	High water temperatures (2) Microbial water quality if water is untreatable (problems may be encountered with filtration and/or disinfection) (3)	Limit temperatures to below 40 °C. Drain-down obligatory after accidental faecal release. Monitoring for faecal indicators required. Special water quality management regime typically requires, for example, physical cleaning of surfaces above and below water. Regular drain-down and a high rate of dilution to waste.
Flumes, wave machines, etc.	Increased accident hazards, inhibition of visibility (2)	More intensive supervision. Avoid overcrowding Pre-warning of change in water conditions.
Flow-through seawater swimming pools on cruise ships and ferries	Risk of contamination from sewage discharge in source water Injuries during ship movement in high seas	Refer to WHO <i>Guide to Ship Sanitation</i> (in preparation)
Open-air pools	Unauthorized access to children (2) (e.g. when the pool is closed or unsupervised) Exposure to UV radiation degrades residual disinfectant (5) Algal growth (5) Contamination by mud and grass on users' feet (5) Contamination by animal faeces, animal urine and wind-blown matter (3 and 5)	Maintenance of fencing, walls with child-proof gates/doors. Close monitoring of residual disinfectant or use of stabilizer (e.g. chlorinated isocyanurates) to lessen degradation. Ensuring effective disinfection and good hydraulic design. If problems persist, then proprietary algicides for swimming pool application may be used. Encouragement of the use of pre-swim showers and footbaths. Cleaning and maintenance around the pool area. Banning of pets. Removal of litter to discourage presence of animals. Cleaning. Ensuring effective disinfection and filtration as well as good water circulation.
Public and semi-public pools with access to alcohol	Increased inappropriate behaviour, reduced ability to cope, impaired judgement (2)	Recommendations that facilities are not used while under the influence of alcohol. Supervision required. Physical exclusion of access at unsupervised times.

Table 6.4. (continued)

Pool type or use (refer to Chapter 1)	Special risk factors ^a	Principal requirement/action
Domestic pools (including temporary and portable pools)	Unauthorized access to children (2) (e.g. when the pool is unsuper- vised)	Maintenance of isolation fencing with child-proof gates. Monitor water quality.
	Deterioration in water quality (3)	Drain pool (if small), wash and refill after an accidental faecal release.
Hot tubs	Unauthorized access to children (2) (e.g. when the hot tub is unsuper- vised)	Securing of safety covers on domestic and outdoor tubs.
	Aerosolization (3)	Limit temperature to below 40 °C. <i>Legionella</i> -specific management (see Section 3.4.1).
	Difficulties in maintaining disinfec- tant residual (5)	Increased disinfectant monitoring. Implementation of 'rest periods' dur- ing use to allow disinfectant levels to 'recover'.

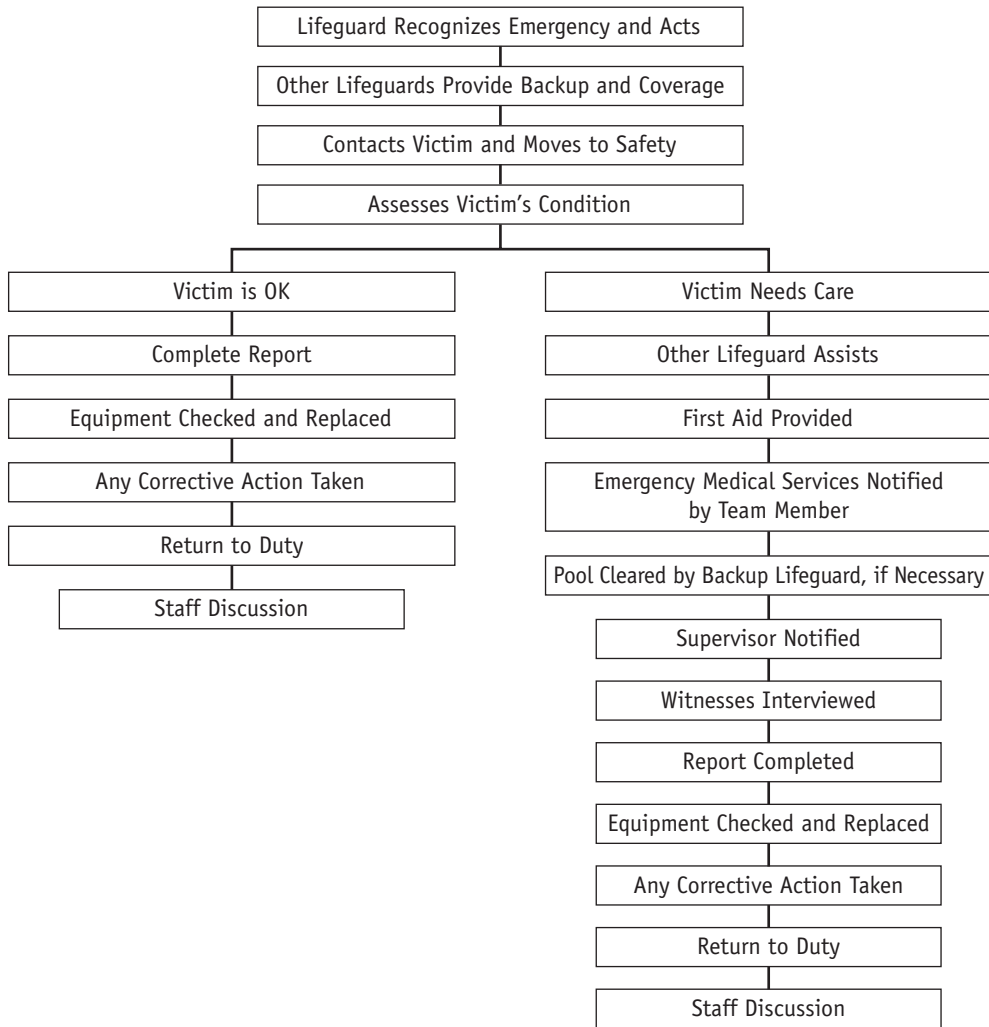
^a Relevant chapter references are identified in parentheses

BOX 6.2 EXAMPLE INCIDENT PLAN FOR LIFEGUARDS MONITORING A WAVE POOL OR WATER SLIDE

When you spot a user who needs help, follow this procedure:

- By immediately blowing one long, loud whistle blast, you notify your safety team that there is an incident. Once you have given the signal, members of the safety team can react to the situation.
- Stop the waves or slide dispatch. At a wave pool, hit the emergency stop button to be sure the waves are turned off. If you are on duty at the top of an attraction, do not dispatch any more riders. Communication between the top and bottom positions is vital.
- Determine which method of rescue is needed. If it is necessary to enter the water to make a rescue, use the entry most appropriate for the location you are lifeguarding. For example, you might use a compact jump from a head wall. If it isn't necessary to enter the water, use the appropriate equipment to help the victim.
- If you are not the lifeguard making the rescue, make sure the rescuing lifeguard's observation zone is covered.
- Once the situation is under control, the lifeguard who made the rescue completes and files an incident report as soon as time permits. This report form should have a diagram of the pool or activity on the back so that the location of the incident can be marked for future study.
- All equipment used in the rescue must be checked to ensure it remains in good condition and is returned to the appropriate location. Lifeguards return to duty, if able, and users are allowed to participate in the activity again if there are enough guards to cover it.

Incident plan flowchart



Adapted from American Red Cross, 1995

6.3.1 Signage

Information can be conveyed by means of prominently and appropriately located signs. These should provide concise information and a single message (as distinct from notices and posters, which are covered under Section 6.3.2). Signs can be used to inform people of hazards and safe behaviours and also reinforce previous educational messages. Warning signs, in particular, should be simple to understand and display a clear message. Many national organizations have adopted descriptive standards for warning and information signs, and the International Organization for

Table 6.5. Education to reduce health risks from special risk factors

Pool type or use (refer to Chapter 1)	Special risk factors^a	Management action
Natural spa waters	Microbial water quality if water is untreatable (3)	Education for high-risk users on infection risk
Open-air pools	Unauthorized access to children (2) (e.g. when pool is unsupervised or closed)	Education of children and parents/care-givers on the drowning hazard posed by pools
	Water and air quality (5)	Education on the importance of pre-swim hygiene
Public and semi-public pools with access to alcohol	Increased inappropriate behaviour, reduced ability to cope, impaired judgement (2)	Information regarding peer supervision and safe behaviours, impact of alcohol
Domestic pools (including temporary and portable pools)	Unauthorized access to children (2)	Education of children and parents/care-givers on the drowning hazard posed by pools and hot tubs
Hot tubs	Aerosolization (3)	Education for high-risk users (such as young, elderly, pregnant women and immunocompromised) on infection risk and importance of avoiding excessive use
	Difficulties in maintaining residual disinfectant (5)	
	Overheating (2)	Alcohol warnings

^a Relevant chapter references are identified in parentheses

Standardization (ISO) has adopted a standard for safety signs (not specifically swimming pool related) to try to avoid a proliferation of symbols that could cause confusion rather than send a clear message (ISO, 2003).

Signage can convey the need for awareness (e.g. danger), the hazard (e.g. shallow water), the health risk (e.g. paralysis may occur) or the prohibition (e.g. no diving, no running, no glass, no alcohol). Signage also includes pool labels and markings, such as pool depth markings. Extra attention may be required when designing signs applicable to tourist groups with different languages and cultures, as, unsurprisingly, some signs have been ineffective when such explanatory and precautionary information was in a language not understood by the pool users.

Signs alone may have a limited impact on behaviour (Hill, 1984; Goldhaber & de Turck, 1988). However, studies have shown that the public accept and recognize warning placards, pictographs and labelling. Therefore, signs are best deployed to reinforce previous awareness raising and education.

6.3.2 Education

Education can encourage pool, hot tub and natural spa users to adopt safer behaviours that benefit both themselves and other users and should encompass issues such as pre-swim hygiene, when not to use a pool or similar environment and how to identify possible hazards. Schools, public health bodies (including health care providers), facility operators

and user groups can all provide information. Castor & Beach (2004), for example, suggest that health care providers can help to disseminate healthy swimming messages to their patients, especially those patients with diarrhoea and parents of children who are not toilet trained, or patients who are particularly susceptible to certain diseases or conditions. This would include messages on not swimming when you are suffering from diarrhoea, on showering before swimming or that immunocompromised patients should take extra precautions or not swim in areas with a higher probability of being contaminated.

Bather safety may be improved if possible hazards are clearly identified at the facility (see Section 6.3.1) and users educated before they enter the pool environment. An attempt at education may also be made by handing safety leaflets to users at the pool entrance or to those in charge of organized group activities and displaying posters in reception and changing room areas (Sport England & Health and Safety Commission, 2003). Lifeguards can also act as information providers, although this role should not interfere with their supervisory role.

Box 6.3 provides a code for pool users, which could be displayed in public areas or, where membership to a facility is required, form part of a membership pack. Educational information can also be added to agreements or contracts with groups that use pools for special purposes (e.g. scuba lessons, water aerobics, etc.).

BOX 6.3 EXAMPLE CODE FOR POOL USERS

Spot the dangers. Take care, swimming pools can be hazardous. Water presents a risk of drowning, and injuries can occur from hitting the hard surrounds or from misuse of the equipment. Every pool is different, so always make sure you know how deep the water is and check for other hazards, such as diving boards, wave machines, water slides, steep slopes into deeper water, etc.

Always swim within your ability. Never swim under the influence of alcohol. Avoid holding your breath and swimming long distances under water. Be especially careful if you have a medical condition such as epilepsy, asthma, diabetes or a heart problem. Follow advice provided for the safety of yourself and others. Avoid unruly behaviour that can be dangerous, for instance, running on the side of the pool, ducking, acrobatics in the water, or shouting or screaming (which could distract attention from an emergency). Always do as the lifeguards say, and remember that a moment of foolish behaviour could cost a life.

Look out for yourself and other swimmers. It is safer to swim with a companion. Keep an eye open for others, particularly younger children and non-swimmers. Learn how to help. If you see somebody in difficulty, call for help immediately. In an emergency, keep calm and do exactly as you are told.

Do not swim if you have a gastrointestinal (stomach) upset or skin or respiratory infection. You are likely to pass on the germs that are making you ill.

Shower before you swim. This will reduce the amount of germs, sweat and chemicals (such as cosmetics) that you transfer to the water. This means that the water quality of the pool will be better.

Adapted from Sport England & Health and Safety Commission, 2003

6.4 Regulatory requirements

National legislation may include different sets of regulations that will apply to swimming pools and similar recreational environments. Regulation may control, for example, the design and construction of pools (see Section 6.1), their operation and management (see

Section 6.2) and substances hazardous to health (e.g. chemicals). These may be quite detailed and specific in their requirements, covering water treatment processes, sampling and testing regimes, and they may be applied differently according to the type of pool (i.e. public versus semi-public versus domestic). Within regulations it is likely that there will be a requirement for the use of certified material, equipment and, possibly, staff registered to certain bodies (e.g. lifeguards, design and construction engineers).

Another aspect of pool management that may necessitate regulatory involvement is occupational health and safety legislation, designed to ensure protection of pool employees (occupational health is not covered by these Guidelines; see Chapter 1), as well as the general public.

Local regulatory oversight can support the work of pool management and provide greater public health protection and public confidence. Inspections by the regulatory officials to verify compliance with the regulations are an important component of this oversight.

6.4.1 Regulations and compliance

The extent to which swimming pools and similar environments are regulated varies greatly. In some countries, a permit or licence to operate is required by the local municipal authority. In others, a level of regulatory oversight is provided, based on specific regulations and/or advisory codes of practice.

Local authorities may, for example, require that the initial plans for the construction of a new pool be submitted by a licensed engineer. The design and construction plans are then reviewed and approved by a competent person. These plans generally include complete details and layout of the facility, including amenities, and information regarding the individual circulation system components (pumps, filters, chemical dosing system, etc.). Once approved, the construction of the facility may commence. However, prior to issuance of the final permit for operation, a physical inspection of the final facility and a review of the pool safety plan or daily operations management are usually required. Periodic audits may be required to ensure continued compliance. Regulations should provide for authority to close the facility if serious hazards and breaches to regulations or a significant risk to public health is identified, with reopening prohibited until the problem has been rectified and measures are in place to prevent recurrence.

Most regulations apply to public pools, but limited evidence suggests that the greatest burden of disease and physical injury arises from domestic and semi-public pools. These may be subject to periodic or informal supervision, and their operation and maintenance may be less adequate than those at public pools *per se*.

In terms of the operation and management of pools and similar environments, the typical requirements, in terms of a normal operating procedure, incident plans and an emergency plan, have already been outlined (Section 6.2). The preparation and use of such procedures ensure that the hazards specific to that facility have been evaluated and management actions determined.

It may be a regulatory requirement that the results of hygiene and safety monitoring be made available to the public; this may be useful in terms of public education material and, if the regulator also provides comparable information from other venues, as a means of comparing the health and safety records of different facilities.

In all cases, regulatory involvement should be welcomed and not seen as a burden on pool management. The purpose of regulatory involvement is to ensure that pools and similar environments are operated as safely as possible in order that the largest

possible population gets the maximum possible benefit, not to close facilities or hinder their proper operation.

6.4.2 Registration and certification schemes

Certain staff members (e.g. lifeguards) and personnel involved in the design and construction (for example) may be required to be registered with certain approved bodies. In addition, all equipment components installed in the facility should meet minimum performance, design, sanitation and safety requirements. Certification that the equipment or the entire pool is in compliance with the guidelines or regulatory requirements is helpful for all involved parties. There are four basic methods of certification in use; these are outlined in Box 6.4.

Equipment that may be certified for performance, sanitation and/or safety considerations includes the following: piping system; filters; pumps; surface skimmers; suction fittings and drain covers; valves (multiport, three-way, butterfly, etc.); chemical feeding devices (mechanical, flow-through); process equipment (chlorine/bromine generators, ozone generators, UV disinfection systems and copper/silver ion generators); heaters; automated chemical monitor/controllers; chemical disinfectants; and electrical equipment (safety).

BOX 6.4 BASIC METHODS OF CERTIFICATION

- *First party* – Self-certification of the product’s compliance against a standard by the manufacturer. Concerns are often raised with manufacturers’ self-certification because of the potential bias of the manufacturer and the lack of ongoing monitoring to ensure that the product continues to comply.
- *Second party* – Certification by a trade association or private party. In many instances, trade associations or private companies provide testing and certification services for products against industry standards or regulations. Since a trade association represents and is often controlled by manufacturers, second-party certifications are not considered to be completely independent. Typically, no follow-up services to monitor continued compliance are provided. As a result, it is often difficult to determine whether a product selected for use is identical to the unit that was originally evaluated for certification. Private entities also offer testing and certification services that monitor the continued compliance of the product. These follow-up services often include audits of the production location, ongoing testing and complaint investigation.
- *Third party* – Certification by an independent organization without direct ties to the manufacturing sector. Third-party certifications provide for an independent evaluation of the product coupled with follow-up services that help ensure that products continue to comply with all requirements. These follow-up services typically include audits of the production location, ongoing testing of representative products and complaint investigation. The follow-up service aspect of third-party certification is an advantage, in that the purchaser has the assurance that the product installed is identical to the product evaluated for the certification. Third-party certifiers also maintain close working relationships with the regulatory and user communities. This provides for a more balanced assessment of the product and helps ensure that the product will be accepted by local, regional and national regulatory agencies.
- *Fourth party* – Certification by governmental agencies. In some instances, local, regional or national governmental agencies will require that products be evaluated by the agency or a designated representative organization for compliance with regulations for installation, use and operation. Typically, no follow-up monitoring services are provided by the agency. As a result, continued compliance is often left up to the manufacturer.

6.5 Conclusions

In order to ensure an effective overall system that will result in the safe and healthy use of swimming pools and similar recreational environments, it is necessary that these Guidelines inform and be adapted to suit national systems. Figure 6.1 outlines how the Guidelines and the four categories of responsibility outlined within this chapter fit together.

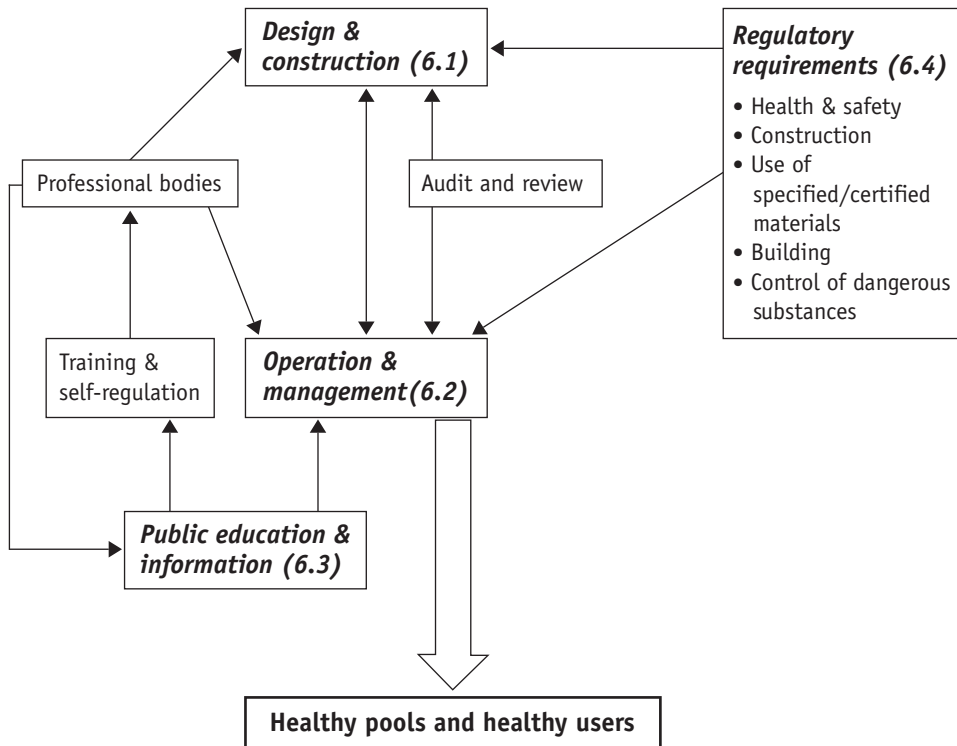


Figure 6.1. Linkages between categories of responsibility

6.6 References

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