

Leisure time

➤ **Leisure/sports centres** present a unique challenge to health and safety advisers who have to ensure the safety of both the workforce and the many members of the public who come through the door. **Nick Cook** visited his local sports centre to see how management there deal with this challenge.

Today we need leisure/sports centres more than ever. By making exercise fun, leisure centres help fight the deadly effects of stress-laden sedentary jobs, couch potato hobbies and a diet designed to shove as much fat, salt and sugar into our bulging blood vessels as possible.



Leisure centres can be lifesavers. But at the same time we need to be sure they do not introduce unacceptable risks of their own to those who use them and those who work in them.

And here lies a dilemma. Many leisure centre activities do involve a certain amount of risk, for example diving from a high board, trampolining and contact sports such as rugby and football. This risk is a large part of the appeal. Should it be allowed? The answer, according to Sir Bill Callaghan, chair of the Health and Safety Commission (HSC), is quite definitely yes. He recently admitted to being "sick and tired of hearing that health and safety is stopping people doing worthwhile and enjoyable things..."

RoSPA and the Health and Safety Executive (HSE) back this view. Both see the total elimination of risk in leisure activities as neither possible nor desirable. It is a delicate balancing act, summed up by HSE as the desire to "ensure members of the public can experience fear, excitement or exhilaration ... without exposing themselves unduly to uncontrolled foreseeable hazards and poorly

designed or manufactured equipment." (See: www.hse.gov.uk/risk/principles.htm)

James Hutton is a local authority technical officer specialising in health and safety. He works in the Environmental Health Division of Dacorum Borough Council in Hertfordshire. As part of his job he inspects the borough's leisure/sports centres. His own view of risk parallels that of the HSE.

"A lot of people are tackling each other on leisure centre playing fields, e.g. when playing five-a-side football. This is potentially very risky but people accept this risk as part of the game. We would not think of banning football but we would, for example check that the pitch was in good condition and not contributing to the risk."

Health and safety in leisure/sports centres is enforced by either the Commercial and Consumer Services, Transportation and Utilities Sector (CACTUS) of the HSE or local authority inspectors such as James Hutton. The *Health and Safety (Enforcing Authority) Regulations 1998* maps the territories covered by the two authorities. Leisure/sports centres lie on the border.

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The default is that they are enforced by the local authority (LA). The determining factor is conflict of interest. This could arise where the centre is controlled by the LA, a situation which could put that authority in the unenviable position of having to prosecute itself. To avoid this, LA owned leisure centres are inspected by HSE.

As far as the Dacorum Sports Trust is concerned the conflict does not arise. Dacorum Borough Council no longer runs its five sites. James Hutton is free to inspect.

When he does his initial points of contact will probably be Hayley Bishop and John Challis, respectively the Trust's operations manager and technical manager.

What do they regard as the major hazard at their sports centre? "Slips, trips and falls," says Hayley. In this respect leisure centres do not differ from most other workplaces, only in these centres members of the public can be affected by the hazard too. Also there is probably more opportunity for incidents to occur. For example, left out equipment, mat edges and damaged flooring contribute towards trips. Wet floors, especially around the pool and in the changing rooms, furnish slip opportunities and climbing walls provide a potential environment for falls.

Fortunately, such incidents are very rare at Hemel Hempstead Sports Centre. It has robust systems in place to control these risks. Hayley gives a couple of examples: "We keep a sharp eye to make sure kids do not run round the edge of the pool and we make sure floor surfaces are well maintained and regularly cleaned."

The Trust also scrutinises all incident reports, however minor. When isolated incidents begin to be less isolated the safety committee looks for a trend.

Hayley Bishop: "We had a spate of people slipping on AstroTurf. This prompted us to inspect it very critically. Were there frayed pieces of material which were beginning to pose unacceptable risk?"

James Hutton takes slips, trips and falls equally seriously. "These are the main accidents that happen in leisure/sports centres. Although we cannot investigate all RIDDOR accidents which come to our attention, we do make a point of targeting slips, trips and falls."

Inspections reflect this focus.

"Where the centre has a swimming pool, I measure the surface micro-roughness of the floor. The risk of slipping is strongly related to the micro-roughness, or lack of it. We can measure micro-roughness with a meter. We then feed the results, along with



"Microbial contamination is a major issue in swimming pools and people are the main source."

other factors, into an HSE software package, the *Slips Assessment Tool* (SAT). This tool, available on the HSE website, calculates the degree of risk."

High risks trigger action. "It may simply be a matter of cleaning the floor. In a pool, for example, swimmers continually deposit flakes of skin and body fats on the floor surfaces around the edges of the pool and in the changing rooms. These reduce the surface roughness of the floor and make it more slippery."

Mopping up spilt water can introduce hazards of its own. "It is common practice to use the mop to spread the water more thinly over the surface so that it evaporates more quickly. Unfortunately, this also increases the area of slippery floor. Recent research has shown that increasing the amount or depth of water on a floor has surprisingly little effect on its slipperiness. It is the micro-layer of water spread thinly across the surface that is the problem. In the light of this research we recommend dry mopping to completely remove the water."

Of course it may be the floor itself that is at fault. For example, in one case the Health

and Safety Laboratory investigated a string of slips on a leisure centre floor. They found that anti-slip particles were missing from the resin regions of the floor. These coincided with the regions where most slips occurred. The manufacturers were called in to resurface and the problem was solved.

Leisure centre owners/managers have a legal duty to protect not only their workforce but also members of the public. *Section 3 of the Health and Safety at Work etc Act 1974* requires employers to conduct their undertaking in such a way as to ensure, so far as is reasonably practicable, that the public is not exposed to risks to health and safety. This general duty is supplemented by the requirement under *Regulation 3 of the Management of Health and Safety at Work Regulations 1999* that employers make a suitable and sufficient assessment of the risks to members of the public to help decide what measures need to be implemented.

Specific guidance for swimming pool operators can be also found in the HSE publication, *Managing health and safety in swimming pools* (HSG179)¹.



Prevention in Practice



“Although we cannot investigate all RIDDOR accidents which come to our attention, we do make a point of targeting slips, trips and falls.”

Properly managed by competent qualified people, leisure/sports centres are very safe. It is only when failures occur that accidents happen. And even then it often takes a combination of failures. For example, in 2001 an eight year-old boy drowned in a swimming pool in Rotherham's Herringthorpe Leisure Centre. Two failures led to this tragedy. First there was a failure of design. Blind spots hid sections of pool. Secondly, management failed to increase lifeguard cover to compensate for the blind spots. The £5,000 fine plus costs must have been small consolation to the boy's parents.

While drowning may be the most obvious risk presented by swimming pools, it is certainly not the only one. Poor management of swimming/spa pools can result in outbreaks of disease. Microbial contamination is a

major issue in swimming pools and people are the main source. As we swim we pollute. For example, we can introduce faecal matter contaminated with cryptosporidium into the pool.

Cryptosporidium is a unicellular organism. It is well known for causing gastro-intestinal illness when present as a contaminant in drinking water. It is now also associated with swimming pools.

LA inspector James Sutton explains: “The problem is that the organism has a thick outer shell and is resistant to the chlorine used to disinfect swimming pool water. The organism is extremely infectious and particularly hazardous to anyone who has an immune system which has been compromised, e.g. by HIV or chemotherapy.”

Because chlorination is ineffective,

national water safety forum

Search the Forum:

Welcome to the National Water Safety Forum

The National Water Safety Forum has replaced the National Water Safety Committee (NWSC).

The re-organisation of the existing committee was prompted by the Government's [review](#) into inland water safety, lead by the Department for Transport. The review, known as 'Roles and Responsibilities' recognised that responsibility for inland water safety was spread across a number of Government departments and recommended the establishment of an interdepartmental group with links to the NWSC.

Following the Government review, the structure of the NWSC was considered. The Government was keen to see a wider, enhanced, membership of the committee to encourage full involvement by all relevant and interested organisations. It was recognised that to enable the Committee to grow its membership, it would be necessary to reorganise, as currently with so many organisations represented, time for relevant issues to be discussed was at a premium. It was also essential to ensure that links with Government were strengthened. RoSPA provides the secretariat for the Forum with funding from the Department for Transport and the Department of the Environment and Rural Affairs.

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➤ The National Water Safety Forum was set up in 1999 to represent all organisations with interests in water safety and to provide close links with the government. The website – www.nationalwatersafety.org.uk – provides safety advice and facts and figures about beaches, inland water sites, swimming pools, water sports and water safety in the home. It also gives details about the forum's role.

RoSPA provides the secretariat for the forum with funding from the Department for Transport and Defra.



cryptosporidium has to be tackled by other means. These include coagulation and filtration. The Pool Water Treatment Advisory Group² has published specific advice on fighting cryptosporidium in swimming pools³.

Legionella

"We pay special attention to legionella," says James Hutton. "We check the management systems and all the records. We look for 'dog legs' in the pipework where legionella multiply. Water temperature plays an important role. We check that the showers are hot enough to kill legionella without scalding the user."

Dacorum Sports Trust (which operates under the name Sportspace) follows a strict policy on legionella. "We clean the shower-heads," says the Trust's technical manager John Challis, "but we contract out the rest of the risk control process. A private company does the risk assessment, tank cleaning and temperature checks etc and produces the log books and all the necessary certification."

Importantly, John also gets the company to provide training for sports centre staff. "We felt it particularly important that our duty managers are aware of the risk and what is necessary to control it," says John. "After all, they own the issue and should know what it is all about."

Spa pools need special attention. "They have been associated with legionella in the past because they atomise the water which people then inhale," says James Hutton.

The PTWAG gives quite specific advice on controlling legionella in spa pools. Water turnover in a commercial spa should be every six minutes, 30 litres of fresh water per day is a good guideline. The pool should be emptied once a day.

It is also very important to make sure the water is disinfected even when the spa is not in use and is for display only. In the past people have become ill and some have died through exposure to the mist from a non-disinfected pool which had been used for display only. In one example, the pool was located in a garden centre, in another at a flower show in Amsterdam.

Legionella and cryptosporidium are not the only microbiological hazards potentially lurking in the waters of your local pool. *Escherichia coli* (E-coli), although not itself a



serious health hazard is used as a specific indicator of faecal contamination, either from the skin of bathers or poor hygiene, i.e. allowing contamination from shoes to enter the water.

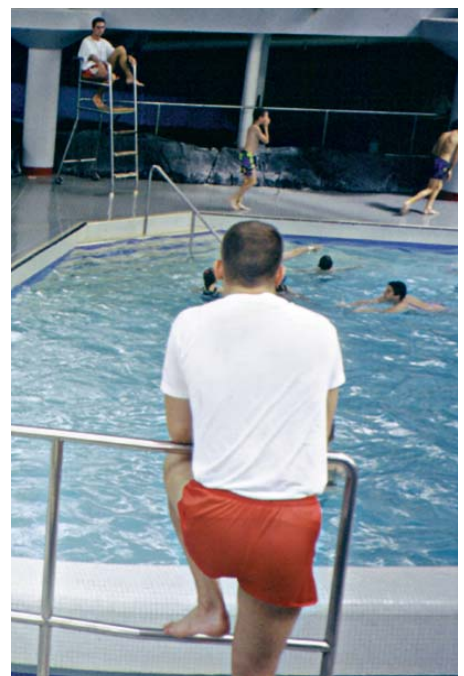
Pseudomonas aeruginosa can be more serious. It has been linked with outbreaks of skin infections among swimming pool users and can also cause ear and eye infections. Testing for this microorganism has recently become a standard indicator of swimming pool biological contamination.

Disinfecting swimming pool water is a major requirement. The main method used at Sportspace sites is sodium hypochlorite. Correct handling of water treatment chemicals is vital to protect staff and the public. Staff responsible for maintaining water quality should be well trained and competent, working to established, approved procedures under the direction and guidance of knowledgeable, responsible management. Poor training in chemical safety can result in exposure. Sodium hypochlorite is irritating to the skin and eyes, causing burns, inflammation and blisters. More substantial exposure may cause breathing difficulties and swelling of the airways.

John Challis explains the system at Hemel Hempstead Sports Centre: "Sodium hypochlorite solution is fed into the water from

the "day tanks". This will make the water slightly alkaline. Hydrochloric acid is injected to balance the water. The whole process is automated.

"It is very important to store the acid and hypochlorite in quite separate areas. If they mixed they would react and produce chlorine gas which is very toxic. To be safe, we store these chemicals in separate rooms. The storage is bunded to protect against accidental leaks." Of course these chemicals do mix in the pool but this is on such a dilute scale that the risk from chlorine gas is insignificant. ➤



"Lifeguards and other pool staff are 2.6 times more likely to contract asthma compared to the general population."



Prevention in Practice



► John Challis and Hayley Bishop from Dacorum Sports Trust

The key to control is measurement. Scheduled measurements of microorganisms and the physical and chemical parameters of the water itself (e.g. free chlorine, total chlorine, temperature, pH) are essential to maintaining the pool water in a safe condition. The reference bible for managing pool water is the *Swimming Pool Treatment and Quality Standards*⁴ produced by PTWAG. This is due to be updated in November.

Airbourne exposure

Not only do pool operators have to consider the quality of the water. Contaminants can also get into the air. In addition to legionella (carried on droplets of mist), the pool disinfectants can themselves result in airborne contamination.

Chloramines are a particular cause for concern. These arise through reaction of chlorine disinfectant with sweat, urine or dander from swimmers. Once in the air they can cause irritation and stinging eyes and have been linked in several studies to asthma. One Belgian study links them with the development of asthma in children, while a Dutch study⁵ concludes that lifeguards and other pool staff are 2.6 times more likely to contract asthma compared to the general population.

These reports prompted a survey of UK⁶ pools by PTWAG which found higher than expected levels. While there is still some debate about the link, PWTAG nevertheless advocates the need for good water management and good ventilation. Chloramines can be reduced by careful regulation of the

chlorine level within the pool and encouraging swimmers to shower before entering the water.

Asthma concerns have prompted a search for alternative disinfectants. Novel treatments include the use of copper and silver compounds. Unfortunately, so far, none of these alternatives have proved as effective.

And chloramines have not only been associated with asthma. In 1985 the stainless steel rods supporting the concrete roof of a swimming pool in Uster, Switzerland failed. The concrete roof collapsed killing 12 people. In 2001 a similar collapse happened in Holland. Other failures of metal supports in swimming pools have been reported.

They all had one common cause – stress corrosion cracking (SCC). This happens when chlorine-containing substances condense onto the steel and cause it to corrode. Eventually the point arrives when the steel suddenly gives way.

Today the risk is reduced by a number of steps. These include the use of more resistant grades of stainless steel, careful maintenance of the chemical balance of the pool, and regular inspection of safety critical structural components.

Given the sheer range of activities, the sheer range of people exposed to risk and the variety of risks, leisure/sports centre safety requires a particularly robust system of health and safety management.

John and Hayley make use of a consultancy specialising in leisure centre health and safety, and the sports centre's quality management system is audited quarterly. The results are used to trigger improvement. They are also used to benchmark the Trust against other leisure/sports centres.

“Leisure centre safety requires a particularly robust system of health and safety management.”

References

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2. *Pool Water Treatment Advisory Group* provides advice and help for pool managers, operators and local authorities www.pwtag.org
3. *Advice on cryptosporidium updated*. Pool Water Treatment Advisory Group, 2001
4. *Swimming Pool Water Treatment & Quality Standards*. Greenhouse Publishing, tel: 01379 89072. ISBN 0 9517007 66
5. *European Respiratory Journal Online* 2007; 29: 690-8 <http://erj.ersjournals.com>
6. *Atmospheric Determination of Chloramines in Six Swimming Pool Halls located within the M25 Catchment Area*. PTWAG 2004 www.pwtag.org/report_swimmingpoolatmospheres.html

Useful websites

- www.rosa.com/waterandleisuresafety/index.htm
- www.isrm.co.uk/news/policy_statements.php
- www.hse.gov.uk/entertainment/information.htm