

POLICY STATEMENT

Bladder cancer and exposure to water disinfection by-products through ingestion, bathing, showering, and swimming in pools

Members may have seen an article in the Daily Mail on Saturday 27 January 2007 warning of the possibility of acquiring bladder cancer from trihalomethanes in drinking, showering and swimming pool water. The article arose from a recently published study in Spain. The potential for harm from trihalomethanes is nothing new to the swimming pool manager who has taken the ISRM qualifications in the form of the Sport and Recreation Management Certificate (City and Guilds HPD) or the National Pool Plant Operator qualification. The advice from these, based upon research carried out by the Pool Water Treatment Advisory Group, has been consistent for some time and is one of the reasons today for the levels of disinfectant recommended in swimming pool water.

Trihalomethanes may be found in the pool water and in the air above the water. They are a threat to health and we should, wherever possible, limit their formation in swimming pools. This is best achieved by lowering the interface between chlorine levels and pollution. Shock dosing a pool with chlorine for example, or alternatively overloading a pool with bathers will both increase the production of trihalomethanes. Limiting trihalomethanes means operating pools in the lower range of free chlorine levels 0.5 mg/l to 1.5mg/l, at a pH level of 7.2 to 7.4 where chlorine is more effective. Then, at the same time, limiting the amount of pollution brought into the pool through good pre-swim hygiene practices such as ensuring that all customers have a thorough shower before entering the pool and that young children especially are encouraged to use the toilet before swimming.

No matter how good the quality of water, or what action is taken to improve water quality, trihalomethanes will still be formed in the best of pools operating to these guidelines but at levels where there is little or no risk to health. Trihalomethanes are volatile and rapidly given up from the surface of the water. Consequently, an effective pool ventilation system which removes polluted air from the surface of the pool can also play a significant role in removing this threat. Humic acid, present in some surface waters, is also a cause of trihalomethanes, however these compounds can be reduced through coagulation.

The World Health Authority in their book Guidelines for Safe Recreational Water Environments point out the relatively low risk arising from trihalomethanes in pools:

“The guideline values in the WHO Guidelines for Drinking Water Quality can be used to screen for potential risks arising from disinfection by-products from swimming pools and similar environments, while making appropriate allowance for the much lower quantities of water ingested, shorter exposure periods and non-ingestion exposure.

“Although there are data to indicate that the concentrations of chlorination by-products in swimming pools and similar environments may exceed the WHO guideline values for drinking water (WHO, 2004), available evidence indicates that for reasonably well managed pools, concentrations less than the drinking-water guideline values can be consistently achieved.

“Since the drinking water guidelines are intended to reflect tolerable risks over a lifetime, this provides an additional level of reassurance. Drinking water guidelines assume an intake of 2 litres per day, but ingestion of swimming pool water is considerably less than this; recent measured data indicate an extreme of about 100 ml (Evans et al., 2001). Uptake via skin absorption and inhalation (in the case of THMs) is proportionally greater than from drinking-water and is significant, but the low oral intake allows a margin that can, to an extent, account for this. Under such circumstances, the risks from exposure to chlorination by-products in reasonably well managed swimming pools would be considered to be small and must be set against the benefits of aerobic exercise and the risks of infectious disease in the absence of disinfection.”

This latter point is worth bearing in mind, we use chlorine as a disinfectant in pools and in drinking water to make it safe from disease. People shouldn't be worried every time they step into the bath, shower or swimming pool. Any potential cancer risks must be weighed against the risk of the many infectious diseases caused by improperly disinfected water.