

Research has suggested that there is a link between exposure to chloramines in indoor swimming pools and a rise in childhood asthma. An ultraviolet chloramine-destruction system may help lower this risk.

levels of chloramine-laden air from pool surroundings. Methods suggested include better ventilation, improved hygiene practices by bathers themselves such as showering before swimming and the regular renewal of pool water. They also suggested that operators should seriously consider alternatives to chlorine-based disinfection.

While chlorine is used to ensure that the water is disinfected, other treatment methods should be considered. For instance, ultraviolet (UV) water treatment can provide an effective way of reducing those chloramines from pool water. UV systems can destroy these compounds, resulting in improved air around the pool.

UV dechlorination inactivates microorganisms, particularly chlorine-resistant ones, present in pool water. This means that the amount of chlorine necessary for general disinfection also can be significantly reduced.

The primary action of UV is to kill bacteria, viruses, molds and their spores, thus reducing the risk of transmission of stomach, skin and respiratory tract infections to bathers. UV has an important secondary action: it initiates photochemical and photo-oxidation reactions which destroy chloramines, a range of compounds responsible for unpleasant smells in pools. This is particularly important for indoor pools where features such as water slides and waves give a greater surface area for the release of chloramines into the air.

The overall result is a cleaner, healthier environment with none of the unpleasant side effects commonly associated with chlorination. A reduction in chlorine usage also can mean significant financial savings for pool operators.

While further research into the effects of chloramines is needed, pool managers with any doubts about the long-term health effects of their current disinfection regime can be offered ultraviolet as an alternative to current chlorination practices. **WQP**

References

- 1 Bernard, A., et.al. "Lung Hyperpermeability and Asthma Prevalence in Schoolchildren: Unexpected Associations With the Attendance at Indoor Chlorinated Swimming Pools," *Occupational & Environmental Medicine*, 60, pp. 385-394, 2003.

Ultraviolet Can Reduce Chloramine Effects

Study Links Chloramines and Asthma, Technology Could Reduce Levels in Indoor Swimming Pools

Researchers from the Catholic University of Louvain in Belgium set out to study whether exposure to nitrogen trichloride in indoor chlorinated pools may affect the respiratory epithelium of children and increase the risk of some lung diseases such as asthma. Health problems of swimmers in indoor pools at such facilities as health clubs and competition pools have traditionally been attributed to the chlorine in the water.

Dealers seeking to apply ultraviolet treatment systems for customers can find indoor pool applications almost anywhere including health clubs, resorts and spas, hydrotherapy pools, theme park water rides, water parks, public pools, retirement housing and university pools.

The researchers found an increased incidence of asthma in children who swam regularly in chlorinated pools. In some cases the damage was equivalent to that found in heavy smokers. Even people working at the sides of pools such as lifeguards and instructors were found to be at risk. The recent scientific study links chlorine byproducts in indoor swimming pools to a rise in childhood asthma.¹

The study claims that regular attendance at chlorinated pools by young children is associated with an exposure-dependent increase in lung epithelium permeability and an increase in the risk of asthma development, particularly when associated with other risk factors. Researchers concluded that "the increasing exposure of children to chlorination products in indoor pools might be an important cause of the rising incidence of childhood asthma and allergic diseases. Although there are various types of chemicals, nitrogen trichloride is the most common and the type that

researchers believe may be the cause of the asthma development.

The researchers believe that symptoms are caused by chloramines, particularly trichloramines, which are formed when chlorine reacts with sweat or urine in the pool water. Trichloramines evaporate easily into the air and, like mono and dichloramines, are powerful irritants that are responsible for the unpleasant smells and eye irritation often felt by visitors and staff at indoor pools.

The study reports that the amount of chloramines present in the air depends on factors such as swimmers' personal hygiene and how often the water is changed.

The study's authors recommended that pool operators should try to reduce the

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