

Bug Zappers

Recreational water illnesses are on the rise. Here's a look at new weapons to help turn the tide. | by Terry Arko

Recreational water illnesses are a major concern for facility operators, with outbreaks up significantly last year. In the fight against these stealthy germs, industry professionals use several approaches based on research, health department regulations and recommendations from the Centers for Disease Control and Prevention.

Here's a look at some of the traditional methods for fighting these pathogens — and some newer methods that show promise.

One of the most effective tools to prevent the threat of swimmer sickness is still good, old-fashioned chlorine sanitizer. But when chlorine is used against contaminants

in pool water, it's very important to understand that there are varying contact time values to which you need to pay attention. These values depend on the type of pathogenic (disease-causing) microorganism.

For example, *giardia* has a CT value of 45 minutes at 1 ppm of chlorine. This means that a *giardia* protozoa is inactivated in 45 minutes of contact with pool water carrying a 1 ppm residual of chlorine.

The problem child of pathogenic microorganisms is *cryptosporidium* (*crypto*), which has a CT value of 9,600 minutes or 6.7 days. Consequently, it remains active for at least a week in

normally chlorinated pools. Recent studies conducted by the EPA have shown that the average adult swallows up to an ounce of water when swimming. Children usually swallow twice as much as adults. With the possibility of billions of chlorine-resistant *crypto* cysts present in pool water, it's easy to see how swimmers can become infected. This is especially true in pools with a high bather load.

Because *crypto* is so chlorine-resistant and has a size of 4-6 microns, it is very difficult to deal with. The majority of public facilities still use sand filters that only filter down to 25 microns. DE filters can pick up under 4 microns.

This may appear to be a solution. However, studies have shown that *crypto* cysts actually have the ability to elongate and press through filtration media in a viable state.

Existing preventive measures for *crypto* hardly seem effective, currently ranging from ensuring that swimmers shower, to keeping sick swimmers out of the water.

Hyperchlorination (aka superchlorination) methods are recommended by health departments to deal with the suspicion of possible *crypto* in pools. The hyperchlorination method is typically 20 to 30 ppm of chlorine for eight to 12 hours. This method may vary depending on local health regulations. The CDC reported



TAKE THAT! This photo illustration dramatically shows how UV systems “zap” pathogens — if you could see them with the naked eye.

in 2004 that there was no conclusive evidence to prove complete eradication of *crypto* even using this recommended method.

Fortunately, there are some alternative methods for dealing with *crypto* as well as other RWIs.

Ozone is becoming popular as a possible backup means for eradicating *crypto*. Ozone kills bacteria and *crypto* cysts 3,125 times faster than chlorine.

Ultraviolet light is another system quickly gaining in popularity. However, note that high turbidity can be a problem that could cause UV systems to become less effective in the fight against *crypto*. For this reason, health departments also regulate turbidity levels in public pools.

The biggest problem with many public facilities is that they rely on chlorine alone and use sand filtration. Thus, to effectively

deal with *crypto*, expensive upgrades such as ozonators and UV units need to be installed. Many private and publicly funded aquatics facilities simply don't have the budgets to make such vast improvements.

Regular dilution of water is another means of reducing the risk of illness. This is already practiced on public pools in Europe, where there are requirements of an entire pool being diluted with fresh water over a month's time.



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