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**Chlorine**

The use of Chlorine in swimming pools has saved literally hundreds of thousands of lives throughout history.  Even though Chlorine has its dangers, they are far outweighed by the good it does by killing bacteria that are harmful to people using pools.  Recently there has been a lot of publicity about the hazards of chlorine. Unfortunately, Chlorine gets the blame for the harm Chloramines cause.

As an example, cars do not injure people, carless drivers injure people. Chlorine properly regulated in a pool, does not put people at risk. Uninformed or careless pool operators put people at risk. The 3 “main” factors for pool water to be safe to swim in and breath the air above are:

1. The Chlorine level is kept between 1.5 and 2.5 with a pH between 7.3 and 7.5
2. No Chloramines can be present in the pool water
3. The air circulation and dehumidification system must be functional and properly sized

If the air smells like chlorine – something is wrong. That acrid smell we sometimes associate with chlorine is usually an ammonia type compound. In the swimming pool industry, the “cause of this odor” is called “chloramines”. Chloramines (combined chlorine) occurs when free chlorine combines with ammonia and other nitrogen compounds. This “combining process” can be accelerated by perspiration, urine, saliva, body oils, lotions and some shampoos/soaps, fertilizers, and many industrial or household cleaners.

The odor is created when water is not properly balanced. The odor intensifies when swimmers agitate the water – as in kicking or general warm-up swimming. The odor is worse at water level but can be extremely irritating at deck level or in the viewing area. Many times, not only an odor is noticeable, but eye irritation and difficulty breathing is also experienced. Sometimes the water may be hazy – but not always. Many times, the water will appear perfectly clear and the water test for free chlorine and pH reads normal.

This has become such a widespread problem in indoor pools that literally hundreds of people are hospitalized each year. People with Asthma can findthemselves in Intensive Care if exposed to this type of pool condition for even a short period of time. Most of the problems occur in indoor pools. Outdoor pools have plenty of fresh air and sunshine (ultraviolet light) so they are not as susceptible to the chloramines problem.

Chloramine formation can be accelerated by:

1. Swimmers not properly showering before entering pool.
2. People using the pool rather than getting out and going to the restroom.
3. People doing a high level of aerobic activity and sweating in the water. *(everyone sweats in the water – the same as if they were doing exercise on land)*
4. Residues from ammonia-based cleaning products that are used on decks or in shower rooms/lavatories.
5. Residues from fertilizers used on landscaping (nitrogen based) that get tracked into building on everyone’s shoes.
6. Poor air circulation and lack of fresh air introduction into the pool building.
7. Overuse of “shocking” the pool for maintenance purposes.
8. Improper use of certain brands of chemicals not suitable for conditions specific to a geographic area.
9. The city adding Chloramines to the drinking water which is becoming common practice throughout this country.

What do we do if this occurs?

If Chloramines are detected the most prevalent solution is to “shock” the water. This means super-chlorination (break-point chlorination) or raising the level of chlorine in the pool to 10 parts per million. Normally a dry chlorine powder or a liquid chlorine is used to achieve super-chlorination. Recent studies show that many times this is not as effective as Hyper-chlorination which is raising the level of chlorine to 20 parts per million.

These methods may temporarily “burn out” chloramines but will also necessitate the pool being closed for a few days. More than the normal amount of fresh air will also have to be introduced during this process.

Antidotal evidence from people who have tried this solution seems to prove that shocking the pool does not really help and can create a whole new set of problems.

Some success has been realized with a non-chlorine shock additive. Adding an Oxidizer (Potassium Peroxy, Monosulphate = brand names Oxykleer or Oxybrite) to the water to convert the available chlorine to free chlorine. If this process is done in the evening, swimmers can usually be in the pool the next morning. Fresh air introduction is still important. This is NOT a permanent solution.

PREVENTION:

Usually more than one thing needs to be changed to alleviate the problem.

The most common methods are:

1. Change the air circulation system to include more fresh air introduction and better turnover or more efficient closed system circulation and dehumidification.
2. Evaluate the type and brands of chemicals being used to treat the pool water for both chlorine and pH control
3. Evaluate the pool filtration system to see if a filter that filters down to a more effective micron rating (like DE at 4 microns) would help.
4. Check the labels on all cleaning products to make sure they do not contain ammonia or are not nitrogen enriched.
5. Have your staff attempt to get the users of the pool to take 30 second “rinse type” showers before entering – this is usually required by state health codes.

Plan to install a medium pressure Ultraviolet (UV) water treatment system that cuts down on the amount of chlorine you have to use and also “breaks down” mono and di and tri chloramines. UV kills bacteria which also gives an extra layer of protection for swimmers.

Consider installing an activated carbon filter on the fill pipe from the city for water that fills the pool. This will help remove Chloramines from the source water.

We need to stop blaming Chlorine for everything and start putting solutions into place. Bacteria in the water is extremely dangerous. Chlorine has been the solution for generations. Until a completely new method of water treatment is developed and field tested, it is still the best and safest method.