Floatation Tank
Department of Health Materials

Compiled by David Wasserman
Oasis Relaxation Systems
P.O. Box 15669
San Diego, CA 92175
info@OasisRelaxation.com
619-265-9391

Addendum to MAIN DOH COMPILATION
Disinfection Discourse
By Eric Herman
January 10, 2013 10:02 AM

As we know, water, for all of its essential nature, is one of the most efficacious ways of spreading disease when left untreated or not properly treated. We also know that for just about a century now, pools as well as public water utilities have relied primarily on chlorine to do the job of killing waterborne pathogens that cause illness. Taken in whole, we can safely say chlorine and in recent decades, bromine, have done a spectacular job, so much so that most of us take safe drinking water and safe water for swimming and bathing as a given.

That said, it should be equally apparent that presumption comes with some big caveats. According to a recent information bulletin from the Centers For Disease Control: "Contrary to popular belief, chlorine does not kill all germs instantly. There are germs today that are very tolerant to chlorine and were not known to cause human disease until recently. Once these germs get in the pool, it can take anywhere from minutes to days for chlorine to kill them. Swallowing just a little water that contains these germs can make you sick."

The bulletin further stated: "Recreational water illnesses (RWIs) are caused by germs spread by swallowing, breathing in mists or aerosols of, or having contact with contaminated water in swimming pools, hot tubs, water parks, water play areas, interactive fountains, lakes, rivers, or oceans. RWIs can also be caused by chemicals in the water or chemicals that evaporate from the water and cause indoor air quality problems."

That bulletin touched a sensitive nerve with Steve Kenny, owner of SRK Pool Services, a service and builder firm located in Wainscott, New York. Steve got in touch recently to share his experience with a YMCA pool in his community that appears to be suffering from the exact issues cited by the CDC.

Apparently, his children had been using the indoor pool at the Y and became ill with asthma-like symptoms and extreme diarrhea, the latter of which became so severe that he and his wife had to take their daughter to the emergency room. In speaking with other parents whose children use the facility, he ran into case after case of families suffering the same problems. The pool was also used by a swim team of once-healthy young athletes who were forced to use inhalers to combat asthma symptoms.

Despite his repeated attempts to prompt the YMCA and local health officials to study the problem, he’s run into resistance based on the fact that there has never been a firm, established link between the pool and the symptoms his and other kids are experiencing. "A huge part of the problem is that it can be difficult to determine exactly where people came in contact with the pathogens," he explains. "And as a result, many of these problems are misdiagnosed."

"There’s a mistaken assumption that many people make that because water is clear, it’s safe," Kenny says. "In fact, I’ve heard many people defend water on the basis that it smells like chlorine and they therefore assume that the water is being properly sanitized. They don’t realize that the chlorine smell is caused by chloramines, not free available chlorine."

In the case of the Y pool Kenny believes is causing these widespread problems, the Y officials have defended the pool while at the same time noting there are measures they could take to improve water and air quality in the facility. In a December 27 edition of The East Hampton Star, facility director Juan Castro allowed, "This pool and facility is heavily used, and at the level we’re experiencing now, we may have to add a secondary system to help with the air quality. It occurs with significant bather-load increases."

Yet the pool’s water quality poses no health hazard, Mr. Castro insisted. The Suffolk County Department of Health has visited twice in the last month, he said, but it does not test the air quality. "They check water-quality procedures. They also responded to the fact that there may be some air-quality issues, but we meet the standards of the Health Department."
According to Kenny, this represents a disconnect between treatment standards and the reality that the 1 to 3 parts per million chlorine residual falls short in situations where bather load is heavy. Among other issues, he points to a CDC report citing that incidents of cryptosporidium outbreaks more than doubled in the U.S. between 2004 and 2008.

"We’ve known for a long time that it takes days for chlorine to kill crypto," Kenny explained. "We also know that chloramines in water can lead to asthma-like symptoms, especially in indoor pools. Those are just a couple of reasons why I believe the pool industry needs to get out in front of this issue and look to secondary sanitizing methods as a way to improve water quality.

"The good news is we already have the tools we need to address these issues."

Again turning the CDC, the agency’s Model Aquatic Health Code recommends the use of ozone and UV sterilization as ways to augment water treatment to prevent disease outbreaks, alongside chlorine or bromine, as well as proper maintenance of water balance.

The CDC also recommends bathers take commonsense measures such as showering and cleaning prior to swimming and avoiding swallowing pool water. "All good recommendations," Kenny allows, "but we know that there are going to be people who don’t practice good hygiene, and, realistically how can anyone completely avoid swallowing water when they’re swimming?

"Bottom line is we need more reliable solutions, and I believe that means secondary sanitizing methods."

---

Eric Herman, former editor of WaterShapes, is senior editor at AQUA magazine.

Blogs: sanitation, health

Permalink | Comments (9)

Related posts

NY Settles $5M Crypto Suit
New York State will pay $5 million to those infected by a 2005 crypto outbreak at a spray park. The ...

National Swimming Pool Foundation® Awards Research Grants Totaling $180,995
Research Foundation for Health and Environmental Effects, a non-profit founded by the American Chemi...

In The News: September 16, 2010
A Solar Point Of View, Study Suggests Indoor Pool Chemicals Could Be Harmful, Change Your Winerzin...

Comments (9)

1/11/2013 11:04:04 AM #

Excellent article..... my 2 cents..... most of the problems arise from the pool water keeper not being in the water world..... if the keeper is not a daily swimmer, their senses fall far short..... amongst other thing..... again your comment... the right tools and the right person is what its all about..... thanks for the article ...

Patrick...

patrick

5/15/2013 12:51:37 PM #

Commercial facilities, especially indoor ones, MUST know what the maximum bather load the pool can support. They must be educated. Crypto and Gardia are two resistant biologicals. The use of ozone and UV A, B, and C as ways to augment free chlorine are well documented.

The legal responsibilities go beyond the Board of Health requirements. The extra costs in implementing and maintaining such systems, while costly up front, are nothing compared to the costs associated the medical needs of the clients that get sick from a water born illness.

Indoor pools need the air space to be changed on a very regular basis to prevent illnesses that get in it from the water. This also means that the fresh air being brought in also needs temperature controls, be it heat or AC. Indoor facilities also need all surface, not just those in the pool, be cleaned on a regular and periodic basis. That means ceilings, walls, docks, and seating areas.

Residential pools, because of the significantly reduced bather loads and that those loads are usually known regulars, such as family and neighbors, can only be expected to be afflicted on very rare occasions. Prompt action normally follows.
Pool care education, testing, and reaction to the changing conditions is critical. Thank you Eric for this contribution. I have a feeling it won't be the last time this needs to be said.

Scott Bair

1/15/2013 5:14:10 PM

I have some questions; some that need answers and others just to think about.

1. Does anybody know if there is a test kit that will test for Crypto in pool and spa water?
2. Is it true that the Incubation time after infection is 2 – 12 days?
3. Is it possible that many cases (90% according to the CDC when I called) are misdiagnosed as food poisoning or the flu as they all share similar symptoms?
4. At what point will a health department test for this parasite in public pools. Is it after there has been an outbreak of illness confirmed or is there a preventative measure being taken to protect public health?

Steve

1/17/2013 1:39:44 PM

No pool side test exists that I know of. AFAIK, you have to send the water out to a lab.

Gestation after infection is typically 2-10 days after ingestion.

Yes, it's often misdiagnosed.

How often health departments test varies. They may rely on the facility and record keeping.

Scott

Scott Bair

1/19/2013 3:50:46 PM

Thank you Scott. This means that there is no easy way to test for this parasite and nothing in the health code to protect us from Crypto or other pathogens resistant to chlorine. In fact my friends 4 year old just swam at our local YMCA and of course swallowed pool water to find out that evening he was up vomiting. The next day no problem and no fever. A coincidence to food poisoning; maybe, but this seems to be a weekly event for them and they feel helpless because nobody will listen to the fact that it might be the pool water. The Y thinks that because the local Health Department's passed them on inspection that they are not obliged to do anything and dismiss the complaint. I think this is pretty sad for the kid and extremely frustrating for the parents. I guess the only way to prove that something is wrong with the pool water is to get a beach chair, cooler of ice and sit pool side drinking glasses of pool water; the same as the kids.

Thanks again for the feedback.

Steve

Steve

1/22/2013 12:04:06 PM

Take the complaint to the BOH, not the Y's management. Keep the kids out for a week, at least. If they don't get sick, you have established a pattern to the BOH and they will shut the pool and have it tested by their lab. Once confirmed, the pool stays closed until remedial steps are taken to correct the deficiency. That usually catches a manager's attention since a closed commercial pool is not making money.

Most commercial pools are required to by the BOH get lab tests regularly that include testing for parasites like crypto.

Scott Bair

1/24/2013 4:42:20 AM

Great thanks Scott!

Steve

1/24/2013 12:42:48 PM
Thanks again Scott. I tried again with the BOH and they said the kids need to be confirmed sick with Crypto before they will test for it and that if we are concerned about the water being infected then we should ask the YMCA to test for it. As of now they have no biological testing on record for the facility.

steve

You may have to take your own samples for testing. If any come back positive...

Scott Bar

Comments are closed
Is Swimming Pool Chlorine Aggravating Your Asthma?

By Lisa D. Ellis
Reviewed by QualityHealth’s Medical Advisory Board

You know that swimming is good for you, right? While this was certainly considered true in the not so distant past, some researchers now say that you may have to adjust your views once you get all of the facts. In fact, the latest research says that your swimming habits can make a big difference in how your body reacts. This is because people who are around chlorinated pools on a regular basis can be at an increased risk of having an asthma attack.

The Chlorine Connection
Researchers have been increasingly interested in understanding asthma causes, including the connection to swimming pool chlorine, which is a man-made chemical that is frequently used to purify pool water. According to the results of several recent studies, exposure to chlorinated pool water can increase or even cause asthma attacks. The reason is not actually the chlorine itself but a reaction that occurs when people sweat in the pool or even urinate in chlorinated water, creating a lung irritant. The result is that swimmers (or even those sitting around the pool) can find themselves experiencing wheezing and other asthma effects. In addition, in indoor pools, the risks of asthma symptoms seem to be worse than in outdoor settings.

Further, researchers from University College Cork (Ireland) looked at boys between the ages of 6 and 12 years old and found that the more number of years a participant had been swimming in an indoor pool, the worse his asthma was. Other studies also found similar effects when it comes to asthma causes, and further, reveal that the younger the swimmer is, the more he or she seems to be at risk for asthma symptoms caused by swimming pool chlorine.

While these points raise some disturbing connections for parents to consider, it is even more startling when you learn that the young male swimmers followed by researchers in Ireland had lung damage that was consistent with that of a regular smoker.

The Silver Lining
While the role chlorine plays in causing asthma may raise many concerns, it is also important to point out that there is one silver lining in the news: if you experience lung damage from breathing in a chlorine induced lung irritant in indoor spaces, when you stop the exposure to this substance, in many cases the damage will ultimately be reversed.

Understanding the Findings
Olympian swimmers seem to be particularly prone to asthma, but until the results of the latest studies were released, the cause and effect of the situation was not clear. Now, though, that there is more data that is helping to make sense of the connection, experts say that it is important for people who manage indoor pools to ensure the best ventilation systems are in place, to stress the importance of good hygiene among guests and to consider safer alternatives to chlorine for the future that will still ensure pool water stays clean with fewer risks.

Sources:
This research appeared in the Irish Medical Journal. To access a summary of the findings, you can refer to a news article at http://www.irishtimes.com/news/health/ireland/2008/04/17/2242249023999.html.

This comes from the results of a study conducted by Dr. Simone Carbonnelle of the industrial toxicology and...
Study links swimming pool chlorine to asthma

Dr MUIRIS HOUSTON
Fri, Apr 17, 2009

BOYS WHO swim frequently in swimming pools may be at increased risk of developing asthma, new research has found.

A study of 6- to 12-year-old boys carried out by Dr Tony Ryan and colleagues in the Department of Paediatrics at University College Cork found a significant association between the number of years a boy had been swimming and the likelihood of the child being wheezy in the past year. The greater the number of years a boy had been attending an indoor chlorinated pool, the greater the likelihood of him having asthma, the researchers found.

Parents of some 231 boys attending a national school in Cork city were questioned about how often the boys went swimming in chlorinated indoor pools. The results showed most boys swam once a week. They had been swimming for an average of five years at the time of the study.

No link was found between prevalence of asthma and parental smoking, but a significant link existed between the number of years spent swimming and a diagnosis of asthma, as well as whether a boy had experienced wheezing in the previous 12 months.


The authors of the Irish study say a range of chlorine products are used in swimming pools, including chlorine gas. "When organic matter is introduced into chlorinated water (e.g. urine and sweat), a harmful mixture of by-products is created," they say, adding that the most concentrated by-product found is nitrogen trichloride. This is a known respiratory irritant, and the authors suggest that chronic exposure to indoor, chlorinated environments may be a risk factor in the development of asthma in boys.

While acknowledging their study is relatively small and relies on subjective responses by parents, the Cork paediatricians conclude: "Until the relationship between respiratory health and chlorination of swimming pools is investigated further and accurate information is available, every effort should be made to improve pool ventilation and enforce better swimmer hygiene."

© 2009 The Irish Times
Have problems "SEEING YOURSELF AS A SWIMMER" in your pursuits? Is it your Limeter? It was mine. But I choose to see myself differently now. The more I look at myself as a swimmer, the more I become one and thanks to the help of friends at our own unofficial Master's Swim at the YMCA Tues/Thursday... Scott, Lyne, Nikki and others!

I took this picture with some friend's and we did a 'photoshoot' with the kids and us swimming outside... really fun idea, all you need is to go get an underwater $10 camera from Target... brought it to Walgreens to develop the pics, put it on a CD, and edited it in any photosoftware you might have, just to "see myself" as a swimmer and LIKE-IT!
Otherwise, I avoided it.

I've had a few Swimming Set backs... One of them being recently I was diagnosed with Chlorine Induced Asthma... or i.e. I am allergic to the pool. So, I take Advair and in the spring/summer it's back to lake swimming.

Here are some articles out there to help anyone that may be happening to or if you suspect it:

http://www.aquasanastore.com/water-facts_b07.html


http://oem.bmj.com/content/60/6/385.abstract
Chlorine Cancer And Heart Disease

"We are quite convinced, based on this study, that there is an association between cancer and chlorinated water."

*By Medical College Of Wisconsin research team*

The addition of chlorine to our drinking water began in the late 1800s and became the standard in water treatment by 1904. For the most part, it remains the standard today. We do not use chlorine because it is the safest or even the most effective means of disinfection, we use it because it is the cheapest. In spite of all our technological advances, we essentially still pour bleach in our water before we drink it. The long-term effects of chlorinated drinking water are just now being recognized.

According to the U.S. Council Of Environmental Quality, "Cancer risk among people drinking chlorinated water is 93% higher than among those whose water does not contain chlorine."

Dr. Joseph Price wrote a highly controversial book in the late sixties titled Coronaries/Cholesterol/Chlorine and concluded, "Nothing can negate the incontrovertible fact, the basic cause of atherosclerosis and resulting entities such as heart attacks and stroke, is chlorine." Dr. Price later headed up a study using chickens as test subjects, in which two groups of several hundred birds were observed throughout their span to maturity. One group was given water with chlorine and the other water without chlorine. The group raised with chlorine, when autopsied, showed some level of heart or circulatory disease in every specimen; the group without had no incidence of disease. The group with chlorine, under winter conditions, showed outward signs of poor circulation: shivering dropped feathers and a reduced level of activity. The group without chlorine grew faster and larger and displayed vigorous health. This study was well received in the poultry industry and is still used as a reference today. As a result, most large poultry producers now use dechlorinated water. "It would be a common sense conclusion that if regular chlorinated tap water is not good enough for the chickens, then it probably is not good enough for us humans!"

A good amount of well-founded concern about chlorine currently exists. When chlorine is added to our water, it combines with other natural compounds to form Trihalomethanes (chlorination byproducts), or THMs. These chlorine byproducts trigger the production of free radicals in the body, causing cell damage, and are highly carcinogenic. According to the Environmental Defense Fund, "Although concentrations of these carcinogens (THMs) are low, it is precisely these low levels that cancer scientists believe are responsible for the majority of human cancers in the United States."

Simply stated chlorine is a pesticide, as defined by the U.S. EPA, whose sole purpose is to kill living organisms.

When we consume water containing chlorine, it kills some part of us, destroying cells and tissue inside our body. Dr. Robert Carlson, a highly respected University of Minnesota researcher whose work is sponsored by the Federal Environmental Protection Agency, sums the dilemma by claiming, "the chlorine problem is similar to that of air pollution." He later adds, "Chlorine is the greatest crippler and killer of modern times!"

Breast cancer, which now affects one in every eight women in North America, has recently been linked to the accumulation of chlorine compounds in the breast tissue. A study carried out in Hartford Connecticut, the first of its kind in
North America, found, "Women with breast cancer have 50% to 60% higher levels of organochlorines (chlorination byproducts) in their breast tissue than women without breast cancer."

One of the most shocking components to all of these studies is that up to 2/3 of our harmful exposure to chlorine is due to inhalation of steam and skin absorption while showering.

A warm shower opens up the pores of the skin and allows for accelerated absorption of chlorine and other chemicals in water. The steam we inhale while showering can contain up to 50 times the level of chemicals that tap water contains, due to the fact that chlorine and most other contaminants vaporize much faster and at a lower temperature than water. Inhalation is a much more harmful means of exposure, as the chlorine gas (chloroform) we inhale travels directly into our blood stream. When we drink contaminated water, the toxins are partially filtered out by our kidneys and digestive system. Chlorine vapors are known to be a strong irritant to the sensitive tissue and bronchial passages inside our lungs; they were used as a chemical weapon in World War II. The inhalation of chlorine is a suspected cause of asthma and bronchitis, especially in children; such cases have increased 300% in the last two decades.
Chlorine, Cancer, and Heart Disease

Published on June 26, 2011, Last Updated on April 25, 2013

“We are quite convinced, based on this study, that there is an association between cancer and chlorinated water.”

-Medical College Of Wisconsin research team

Adding chlorine to drinking water is a practice that began in the late 1800s and by 1904 as the standard in water treatment, and for the most part remains so today. Unfortunately, chlorine isn’t used because it’s the safest or most effective means of disinfection, it’s just the cheapest. In spite of all our technological advances, we essentially still pour bleach in our water before we drink it. The long-term effects of chlorinated drinking water have just recently being recognized. According to the U.S. Council Of Environmental Quality, “Cancer risk among people drinking chlorinated water is 93% higher than among those whose water does not contain chlorine.”

History of Chlorine Danger

Dr. Joseph Price wrote a highly controversial book in the late sixties titled Coronaries/Cholesterol/Chlorine and concluded that the basic cause of atherosclerosis and resulting entities such as heart attacks and stroke, is chlorine. Dr. Price later headed up a study using chickens as test subjects, where two groups of several hundred birds were observed throughout their span to maturity. One group was given water with chlorine and the other without. The group raised with chlorine, when autopsied, showed some level of heart or circulatory disease in every specimen, the group without had no incidence of disease. The group with chlorine under winter conditions, showed outward signs of poor circulation, shivering, drooped feathers and a reduced level of activity. The group without chlorine, grew faster, larger, and displayed vigorous health. This study was well received in the poultry industry and is still used as a reference today. As a result, most large poultry producers use dechlorinated water. It would be a common sense conclusion that if regular chlorinated tap water is not good enough for the chickens, then it probably is not good enough for us humans!

Chlorine Dangers Today
There is a lot of well-founded concern about chlorine. When chlorine is added to our water, it combines with other natural compounds to form Trihalomethanes (chlorination byproducts), or THMs. These chlorine byproducts trigger the production of free radicals in the body, causing cell damage, and are highly carcinogenic. The Environmental Defense Fund warns that, “Although concentrations of these carcinogens (THMs) are low, it is precisely these low levels that cancer scientists believe are responsible for the majority of human cancers in the United States.”

Chlorine is a pesticide and its sole purpose is to kill living organisms. When we consume water containing chlorine, it destroys cells and tissue inside our body. Dr. Robert Carlson, a highly respected University of Minnesota researcher whose work is sponsored by the Federal Environmental Protection Agency, sums it up, “the chlorine problem is similar to that of air pollution” and adds that “chlorine is the greatest crippler and killer of modern times!”

**Chlorine and Breast Cancer**

Breast cancer, which now affects one in every eight women in North America, has recently been linked to the accumulation of chlorine compounds in the breast tissue. A study carried out in Hartford Connecticut, the first of its kind in North America, found that; “women with breast cancer have 50% to 60% higher levels of organochlorines (chlorination byproducts) in their breast tissue than women without breast cancer.”

**Chlorine Inhalation**

One of the most shocking components to all of these studies is that up to 2/3s of our harmful exposure to chlorine is due to inhalation of steam and skin absorption while showering. A warm shower opens up the pores of the skin and allows for accelerated absorption of chlorine and other chemicals in water. The steam we inhale while showering can contain up to 50 times the level of chemicals than tap water due to the fact that chlorine and most other contaminants vaporize much faster and at a lower temperature than water. Inhalation is much more harmful means of exposure since the chlorine gas (chloroform) we inhale goes directly into our blood stream. When we drink contaminated water the toxins are partially filtered out by our kidneys and digestive system. Chlorine vapors are known to be a strong irritant to the sensitive tissue and bronchial passages inside our lungs; it was used as a chemical weapon in World War II. The inhalation of chlorine is a suspected cause of asthma and bronchitis, especially in children, which has increased 300% in the last two decades. “Showering is suspected as the primary cause of elevated levels of chloroform in nearly every home because of chlorine in the water.” Dr Lance Wallace, U.S. Environmental Protection Agency.

Chlorine in shower water also has a very negative cosmetic effect, robbing our skin and hair of moisture and elasticity, resulting in a less vibrant and youthful appearance. Anyone who has ever swam in a chlorinated pool can relate to the harsh effects that chlorine has on the skin and hair. What’s surprising is that we commonly find higher levels of chlorine in our tap water than is recommended safe for swimming pools.

**Chlorine Tastes Bad**

Aside from all the health risks related to chlorine in our water, it is the primary cause of bad taste and odor in drinking water. The objectionable taste causes many people to turn to other less healthful beverages like soft drinks, tea or other sweetened drinks. A decreased intake of water, for any reason, can only result in a lower degree of health.

**Removing Chlorine From Water**

The good news is that chlorine is one of the easiest substances to remove from our water. For that reason it logically should serve it’s purpose of keeping our water free from harmful bacteria and water borne diseases right up to the time of consumption, where it should then be removed by quality home water filtration.

No one will argue that chlorine serves an important purpose, and that the hazards of doing away with chlorine are greater than or equal to the related health risks. The simple truth is that chlorine is likely here to stay. The idea that we could do away with chlorine any time in the near future is just not realistic. It is also clear that chlorine represents a very real and serious threat to our health and should be removed in our homes, at the point of use, both from the water we drink and the water we shower in.

— Dr. Edward F. Group III, DC, ND, DACBN, DCBCN, DABFM
Pool chemicals cause nearly 5,000 emergency room visits per year

Friday, May 16, 2014 by J.J. Angell, Staff Writer
Tags: pool chemicals, chlorine, bromine

Most Viewed Articles

Today | Week | Month | Year
The science is conclusive: Mobile phones cause cancer
Four surprising uses for hydrogen peroxide
Three supplements that can help eliminate carbohydrate cravings
Every major bank in the US is heading for default - What do they know that we do not know?
Former US Treasury official warns about Russian economic crisis causing global financial collapse
Pine bark extract improves blood vessel health, heart function and homestudies
Pharmaceutical employees arrested after causing 54 deaths with drug laced with fungal meningitis
Mainstream media panics over Dr. Oz teaching disease prevention and nutritional wellness
Want to cultivate a vegetable garden? Here are some tips to get started!
Harvard Business School professor goes ballistic with legal threats over $4 worth of Chinese takeout food
Why everyone should be eating more heme proteins
A surprising Ebstorf treatment option: melatonin
When the grocery store shelves are empty, this amazing food rising invention will keep you well fed and nourished
BREAKING: CDC whistleblower confesses to MMRF vaccine research fraud in historic public statement
What parents need to know about Monsanto: “By 2050 one in two children will be autistic”
The lemon detox diet - a recipe that really works
Scientists inject human brain cells into mice, making them "significantly smarter"
War metaphors don’t help cancer prevention and treatment

(NaturalNews) While chlorine and bromine are depend on today to kill pathogens in pools, spas and hot tubs, these chemicals also create their own array of health hazards. The US Consumer Product Safety Commission’s National Electronic Injury Surveillance System has documented and analyzed thousands of emergency room visits between 2003 and 2012 that are all related to pool chemical injuries.

Thousands of children sent to emergency room yearly over pool chemicals

The Centers for Disease Control reported on the data, which tallies up nearly 5,000 emergency room visits in the year 2012 alone due to pool chemical injuries. **This statistic is screaming out to the public that commercial chlorine and bromine pool additives are easily mishandled, caustic to the human body and capable of turning basic swimming water into a toxic chemical bath.**

In the study, almost half of the documented pool chemical injuries were found in children under 18 years old, and over a third of the injuries were home based. While no deaths were recorded, the 4,900 chemical injuries in the year 2012 pose questions.

**How can pool chemicals be more properly handled? Are they being overused?**

The report stated very explicitly that “pool chemical-associated health events are preventable,” citing one case in Minnesota that involved seven hospitalized children who were poisoned due to poor monitoring of pool chemistry. The report also details simple steps for avoiding pool chemical injuries, which includes keeping children away from containers, wearing goggles and gloves when handling chemicals and in a well ventilated area, properly measuring chemical amounts and following all directions on product labels.

**But are these chemicals any safer diluted into pools or are they just as dangerous absorbed over time?**

Chlorine and bromine pool chemicals compete with iodine in the endocrine system

The burns and the allergic skin reactions may only be the beginning of health issues and
hospital visits. In fact, the findings did not provide complete information on pool chemical injuries not pertaining to immediate emergency room visits.

So what is really happening as chlorine and bromine pool chemicals sink into the skin? What other damages are being done as these halogens enter the body? What is the body trying to say when the skin breaks out in reaction to pool chemicals?

As part of the halide family on the periodic table, chlorine and bromine mimic iodine. While iodine is needed in the thyroid gland of the endocrine system, chlorine and bromine are not needed and actually compete with iodine at the receptor sites. Chlorine and bromine chemicals may enter the body easily during a simple swim, since the skin is the biggest organ on the body and absorbs what it comes into contact with. In the CDC report, improper handling of the pool chemicals caused acute poisoning in many of the hospital patients, showing how easily they are absorbed. By not using protective equipment such as goggles and gloves, some patients were poisoned directly through the hands or face.

Many people are iodine-deficient in modern day culture because bromines and chlorines are found lurking in so many places. Not only are they contained in commercial pools, but they persist in most municipal water sources.

In fact, a hot shower can actually produce chlorine gas that is breathed into the lungs. In the CDC report, the most frequent diagnosis of pool chemical injuries was actually inhalation poisoning from fumes! Are hot showers a similar poisoning experience over time?

Bromine also persists in modern day life. Brominated vegetable oils are a common additive to processed foods and sports drinks.

Methyl bromide pesticides taint commercially grown crops like strawberries.

Potassium bromate may exist as a dough conditioner in processed bread products.

With breast, thyroid, prostate and ovarian cancers on the rise, it's apparent why, since iodine is so easily displaced by the surplus chlorine and bromine lurking everywhere.

Silver and copper ionization method can also be used to treat pools

What are safer alternatives to keeping pools pathogen-free without creating a toxic cesspool of chemicals?

A more natural alternative to chlorine and bromine chemical-treated pools is a method of ionization that uses copper and silver to kill bacteria, viruses and algae. This method reduces the amount of total chlorine used, limiting toxic exposure. This sanitation method must also be monitored carefully and copper levels measured appropriately.

Sources for this article include

http://www.medicalnewstoday.com

http://www.ccohs.ca

http://curezone.org

http://science.naturalnews.com
Study: Chlorinated water found to increase risk of bladder cancer

Friday, January 26, 2007 by: M.T. Whitney
Tags: chlorinated water, chlorine, swimming pools

Most Viewed Articles

Today | Week | Month | Year
The science is conclusive: Mobile phones cause cancer
Four surprising uses for hydrogen peroxide
Three supplements that can help eliminate carbohydrate cravings
Every major bank to receive survival kit - What do they know that we do not know?
Former US Treasury official warns about Russian economic crisis causing global financial collapse
Pine bark extract improves blood vessels' health, heals psoriasis and hemorrhoids
Pharmaceutical employees arrested after causing 54 deaths with drug tainted with fungal meningitis
Mainstream media panics over Dr. Oz teaching disease prevention and nutritional self-care
Want to cultivate a vegetable garden? Here are some tips to get started!
Harvard Business School professor goes ballistic with legal threats over $4 worth of Chinese takeout food
Why everyone should be eating more homesteaded food

A surprising Ebola treatment option, melatonin
When the grocery store shelves are empty, this amazing Food Rising invention will keep you well fed and nourished
BREAKING: CDC whistleblower confesses to MMR vaccine research fraud in historic public statement

What parents need to know about Monsanto: “By 2025 one in two children will be autistic”
The lemon detox diet - a recipe that really works
Scientists inject human brain cells into mice, making them “significantly smarter”
War metaphors don’t help cancer prevention and treatment

Popular on Facebook

CDC issues flu vaccine apology: this year’s vaccine doesn’t work!

(NaturalNews) Drinking, or even immersing yourself in, chlorinated water may increase your risk of bladder cancer, says a new study.

The new study is the first to suggest that chlorine is harmful to humans when ingested or absorbed through the skin, according to study leader Cristina M. Villanueva of the Municipal Institute of Medical Research in Barcelona and her colleagues.

Chlorine itself is not harmful, but its byproducts increase the risk of cancer. Trihalomethanes are the most prevalent byproduct, and they can be absorbed into the body through the skin or by inhalation. When THM is absorbed through the skin or into the lungs, they hold stronger carcinogenic properties because they aren’t detoxified through the liver, Villanueva and her team found in their research.

Villanueva and her team surveyed 1,219 individuals with bladder cancer and 1,271 control individuals without the disease, polling them about their exposure to chlorinated water, including their bathing, swimming and tap water drinking habits.

The researchers also looked at the THM levels in the water systems of 123 municipalities.

People who live in households with more than 49 micrograms per liter of THM were at double the risk of bladder cancer versus households that have below 8 micrograms per liter of THM.

In industrialized countries, the common level is 50 micrograms per liter, the researchers note.

The researchers also found that use of swimming pools increased the risk by 57 percent and that people who drank chlorinated water held a 35 percent greater risk. Taking long showers and bathing also increases the risk in households that has water with higher levels of THM.

In the United States, an estimated 67,160 new cases of bladder cancer are expected to occur in 2007, and 13,750 deaths, according to statistics from the American Cancer Society.

“If confirmed elsewhere, this observation has significant public health implications in relation to preventing exposure to these water contaminants,” the researchers said in their report.
The study was published in the January issue of the American Journal of Epidemiology.

###

5) **Foods Hurt The Liver**


Watch Video That Shows How Foods Ruin Your Liver & Weight.

---

Enter your email address here...

Join our 4 million monthly readers. Your privacy is protected. Unsubscribe at any time.

More news on **chlorinated water**

Is this one daily habit increasing your risk of cancer?

Chlorinated tap water linked to upsurge in food allergies worldwide: study

Pool chemicals cause nearly 5,000 emergency room visits per year

America's 'chlorine chicken' hampers trade talks with European Union

Stop using Splenda

The major toxins in your water

Five ways to ensure you are drinking safe, clean water even in a crisis

---

**Articles and Offers of Interest**

**Mainstream media panics over Dr. Oz teaching disease prevention and nutritional self-care**

**Homeschooled children have higher graduation rates, more social prowess**

**Pine bark extract improves blood vessel health, heals poronias and hemorrhoids**

**Russians engage in mass shopping spree ahead of hyperinflation and possible economic collapse**

---

9 Celebs Who Raised Their Faces To The Point Of No Return...

How 4 of the richest Americans are preparing for the next financial crisis

Incoln's New Rival is so Big that it Could Surpass the Dollar, Euro and Swiss Franc by Christmas.

Here are 25 of the most gorgeous cheerleaders on NFL sidelines

---

Cornell Scientist Discovers a New Vitamin That Could Make People Live Forever?

Warren Buffett Reveals How Anyone With $40 Could Become A Millionaire

Top 10 Richest Women In The World

Rare Ingredients Help Reduce Neuropathy Nerve Pain

---

**GOT A NEWS TIP FOR NATURALNEWS?**

Send us your news tip, and we’ll investigate!

[Click here to submit a news tip to NaturalNews](http://naturalnews.com/news-tips.html)
Water Filters - Chlorine and Cancer - The Shocking Facts

By Ismyn Ramus | Submitted On March 07, 2010

Chlorine contaminated water is now linked to rising incidences of cancer. Researchers have shown that there is a correlation between chlorinated water and cancers involving the bladder and rectum. These types of cancer were once relatively rare but they have now been shown to be on the rise. If you and your family do not have a water filter installed in your kitchen and bath you may be subjecting yourselves to a nasty little bonus in the water that you are using.

Once it was possible to drink and bathe in water that was pure and clean when it rushed from the faucet, but times have changed and not in a positive way. Chlorine is commonly used during the reclamation and cleaning processes for waste water but this chemical is capable of unleashing some deadly attacks once it is inside the body.

Think about how your eyes and nose sting and burn when you splash in a pool that has been chlorinated. That same stinging, blistering feeling is what happens on the inside of your body when you drink water that contains chlorine chemicals and has not been cleaned by running it through a simple water filter.

It is rather mind-boggling when you think about it, isn’t it? There are over 60,000 chemicals used in the United States today. It is honestly hard for anyone to say just how many of them end up in your drinking water but chlorine is almost always in the mix.

In addition to the link between chlorine and cancer this chemical can cause breathing problems when the vapors are inhaled. You might be wondering how and when you could be exposed to chlorine vapors at home. This is easy to answer, just think about those long, hot, steamy baths and showers. Without a water filter being installed on your bathtub faucet or showerhead the hot water creates a steamy mist that you are inhaling each time you bathe or shower. In fact these vapors can be carried to the other rooms of your home and then your children and other family members are breathing fumes that contain this caustic chemical residue.

Chlorine is a powerful agent that can be used to fight bacteria in water but that does not mean that it is a safe substance to have in the water you are drinking. In addition to the link between chlorine and cancer there have been numerous cases where chlorine related skin rashes, allergies and respiratory problems have been reported. This just reaffirms how necessary it is that people consider using an inexpensive water filter in their home. Everyone should at least filter the water they are using for drinking and cooking, if nothing else.

There are procedures that are in place that are supposed to help protect consumers from these toxic contaminants. Unfortunately there are more than 50,000 unsafe substances that have been identified in different bodies of water in the US and the Safe Drinking Water Act only regulates 91 of them. This means that more than 49,000 toxic substances might exist in water that is being supplied to homes and offices every day. Are you ready for more bad news about your drinking water? The government has not added any toxicants, contaminants or chemicals to the regulated list for more than a decade. Of course there are groups that are trying to help get our drinking water cleaned up but a water filter a good idea right now?

Ismyn Ramus invites you to find out more about water filters and water filtration systems. She continuously researches the benefits of chemical free water. With so many people health conscious today you can find out more by clicking here [http://www.absolute-clean-water.com]

Article Source: http://EzineArticles.com/?expert=Ismyn_Ramus
Water Filters - Chlorine and Cancer - The Shocking Facts

By Ismay Ramus  | Submitted On March 07, 2010

Chlorine contaminated water is now linked to rising incidences of cancer. Researchers have shown that there is a correlation between chlorinated water and cancers involving the bladder and rectum. These types of cancer were once relatively rare but they have now been shown to be on the rise. If you and your family do not have a water filter installed in your kitchen and bath you may be subjecting yourselves to a nasty little bonus in the water that you are using.

Once it was possible to drink and bathe in water that was pure and clean when it rushed from the faucet, but times have changed and not in a positive way. Chlorine is commonly used during the reclamantion and cleaning processes for waste water but this chemical is capable of unleashing some deadly attacks once it is inside the body.

Think about how your eyes and nose sting and burn when you splash in a pool that has been chlorinated. That same stinging, blistering feeling is what happens on the inside of your body when you drink water that contains chlorine chemicals and has not been cleaned by running it through a simple water filter.

It is rather mind boggling when you think about it, isn’t it? There are over 60,000 chemicals used in the United States today. It is honestly hard for anyone to say just how many of them end up in your drinking water but chlorine is almost always in the mix.

In addition to the link between chlorine and cancer this chemical can cause breathing problems when the vapors are inhaled. You might be wondering how and when you could be exposed to chlorine vapors at home. This is easy to answer, just think about those long, hot, steamy baths and showers. Without a water filter being installed on your bathtub faucet or showerhead the hot water creates a steamy mist that you are inhaling each time you bathe or shower. In fact these vapors can be carried to the other rooms of your home and then your children and other family members are breathing fumes that contain this caustic chemical residue.

Chlorine is a powerful agent that can be used to fight bacteria in water but that does not mean that it is a safe substance to have in the water you are drinking. In addition to the link between chlorine and cancer there have been numerous cases where chlorine related skin rashes, allergies and respiratory problems have been reported. This just reaffirms how necessary it is that people consider using an inexpensive water filter in their home. Everyone should at least filter the water they are using for drinking and cooking, if nothing else.

There are procedures that are in place that are supposed to help protect consumers from these toxic contaminants. Unfortunately there are more than 50,000 unsafe substances that have been identified in different bodies of water in the US and the Safe Drinking Water Act only regulates 91 of them. This means that more than 49,000 toxic substances might exist in water that is being supplied to homes and offices every day. Are you ready for more bad news about your drinking water? The government has not added any toxins, contaminants or chemicals to the regulated list for more than a decade. Of course there are groups that are trying to help get our drinking water cleaned up but a water filter a good idea right now?

Ismay Ramus invites you to find out more about water filters and water filtration systems. She continuously researches the benefits of chemical free water. With so many people health conscious today you can find out more by clicking here [http://www.absolute-clean-water.com]

Article Source: http://EzineArticles.com/?expert=Ismay_Ramus
Chlorine and Cancer: What Can a Water Filter Do for You?

By Vanessa Lauch | Submitted On March 28, 2005

Every day, cases of cancer are rising in astounding and unprecedented numbers. While medical professionals work tirelessly to find a cure for this most deadly of diseases, the numbers of terminally ill patients continue to climb. Although the cure for cancer continues to elude medical professionals, it is completely within our own power to protect our families and ourselves and to reduce our risks whenever possible.

In recent years, individuals have begun to seriously examine known carcinogens and to protect themselves from these cancer-causing agents. Sunscreen has become an important defense against skin cancer, and its use is on the rise. The number of smokers attempting to quit rises each day, precisely because of new information about the carcinogenic nature of cigarettes.

The increase in such protective behaviors clearly indicates an increased interest in protecting oneself from cancer risks. Still, droves of people continue to use and drink unfiltered tap water, not knowing about or not believing in the insidious nature of this substance. Whether we like it or not, the water that emerges from our taps, however pristine it may appear, is filled with carcinogenic compounds. A simple water filter can now serve as a valuable safeguard against cancer.

Chlorine and Tap Water:
Untreated tap water is filled with such dangerous contaminants as nitrate, arsenic, microorganisms, and chemicals from pesticide runoff. Once this water reaches a municipal treatment plant, many contaminants are removed. However, one of the most dangerous contaminants is actually added to drinking water as a part of the treatment process.

Chlorine, added as an inexpensive and effective drinking water disinfectant, is also a known poison to the body. It is certainly no coincidence that chlorine gas was used with deadly effectiveness as a weapon in the First World War. This gas was known to severely burn the lungs and other body tissues when inhaled; it is no less powerful when ingested by mouth. Each day, as we use unfiltered tap water, we are effectively pouring bleach into our water before we drink it.

This poisonous chemical, accompanied by its byproducts, is now known to cause at least three types of cancers, among other serious health problems. The U.S. Council of Environmental Quality recently released a report stating that the risk of cancer is 93% higher among those drinking chlorinated water than among those not drinking chlorinated water! In the following paragraphs, you can read about the specific cancer risks of chlorinated water and learn how to protect your family and yourself from this insidious poison.

Bladder and Rectal Cancer:
Chlorine has long been known to be a leading cause of bladder and rectal cancer. Once in water, chlorine interacts with organic compounds to create trihalomethanes (THMs). These THMs are particularly harmful to the body when ingested. When taken into the body, THMs encourage the production of free radicals. These free
radicals proceed to destroy or damage vital cells in the body. Because so much of the water we drink ends up in the bladder and/or rectum, ingestions of THMs in drinking water is particularly damaging to these organs. THMs cause innumerable cases of bladder and rectal cancer each year.

Bladder and rectal cancer occur when malignant cells, often created by THMs, infect the inner tissues of the particular organ. Once they have taken hold in the bladder or rectum, the malignant cells can isolate themselves in the infected area or they can spread to infect other areas of the body, potentially causing more deadly forms of cancer. Each year, 13,000 new cases of bladder cancer are diagnosed in women while 37,000 new cases are diagnosed in men. Of these 50,000 new cases each year, slightly more than 20% of individuals will die from the disease. For rectal cancer, more than 40,000 new cases are diagnosed each year and approximately 55% of those individuals diagnosed will die from the disease.

Ironically, one of the best means of protection against these two types of cancer is drinking plenty of fluids. However, drinking larger amounts of contaminated water only exacerbates the risk.

Breast Cancer:
Breast cancer is the newest type of cancer to be connected to ingestion of chlorinated water. Breast cancer affects one out of every eight women in the United States alone, and it kills approximately 1 of its victims.

Recent research has linked this deadly cancer to a buildup of chlorine compounds in the breast tissue. In a shocking study conducted in Hartford, Connecticut, researchers found that "women with breast cancer have 50% to 60% higher levels of organochlorines (chlorination byproducts) in their breast tissue than women without breast cancer." While chlorine can make its way into our bodies in several ways, there is no means of access more common or more frequent than the ingestion of common, unfiltered tap water.

A Simple Solution:
One preventive solution to these three deadly cancers could not be simpler. If chlorinated drinking water is a leading cause of cancer, then the obvious method of reducing one's risk of cancer is to refrain from drinking chlorinated water. We cannot choose whether or not to drink water, but we can choose the type of water we allow into our bodies.

Municipal water treatment plants add chlorine to water to help make it cleaner and more pure, but once that chlorine has performed its function, there is certainly no reason for it to continue its deadly presence in drinking water. A simple home water filter removes chlorine and its byproducts from drinking water, producing clean, pure drinking water that can also serve as a useful protection against cancer. Water filters are one of the only methods of water purification capable of removing chlorine.

So, what can a water filter do for you? The answer is simple but extremely valuable. A water filter can protect an individual from cancer, one of the deadliest killers of the 20th century.


Article Source: [http://ErineArticles.com/?expert=Vanessa_Lausch](http://ErineArticles.com/?expert=Vanessa_Lausch)
Chlorine Water Filter - Discover Why You Need to Remove Chlorine and Other Chemicals From Your Water

By Mark LeBreton / Submitted On September 24, 2010

Are you considering ways to remove chlorine from your drinking water? Well, many people are. Installing a chlorine water filter is becoming very popular as people learn about the harmful effects of this chemical. Let's take a closer look at the effects of chlorine in your drinking water and how you can remove it.

So, why do we have chlorine in our water anyways? Well, it started out with the military; it was used to kill off germs and parasites in the drinking water from foreign countries.

Decades ago, there were numerous outbreaks of waterborne illness in the United States. People would become violently sick and even die. So, government officials decide to use the knowledge of water treatment from the military.

But, chlorine was never intended to be a permanent additive in drinking water. It was only being used by the military for
short periods of time. Unfortunately, public water facilities today dump chlorine into our water sources by the truck load.

Studies have shown that drinking chlorinated water will dramatically increase your chances of getting cancer. In fact, one common factor that breast cancer patients have is their tissues contain over 50% higher levels of chlorine by-products than women who don't have breast cancer.

Another problem with chlorine is its effects on the piping systems. Over time, chlorine corrodes steel and lead pipes. These particles end up in your drinking water which is obviously very unhealthy.

Luckily, the right chlorine water filter will not only remove the chlorine from your tap water, it will also remove over 99% of other contaminants. Without a chlorine water filter, you and your family are being exposed to chlorine, heavy metals, pesticides, fertilizers, parasites, and many more disease causing toxins.

Even your shower water is not safe when left untreated and needs to have a chlorine water filter. In fact, you'll absorb more water in a ten minute shower than you will drinking 2 liters of water. So, all of the contaminants in your shower water will end up in your body.

Believe me. Once you apply what you've just learned about chlorine water filter systems, your water will be pure, safe, and healthy to drink.

Pure drinking water in your home is just one step away. Go to [http://clear-drinking-water.com] right now to get the BEST water purification systems.

Article Source: http://EzineArticles.com/?expert=Mark_LeBreton

6 Ad Results for "id=5090681":"}

- Environmental Issues
  About.com/Environmental Issues

- Environmental Issues In
  View Environmental Issues In; Get Answers Now on Ask.com!
  Ask.com/Environmental Issues In

- Environmental Problems
  Find Simple Changes You Can Make Today to Help Our Environment.
  Brita.com/FilterForGood

- Environmental Articles
  Online education is the next thing! Find out more about online degrees
  www.lionaedmy54z.com

- Environmental Issues
  Looking For Environmental Issues? Find It Nearby With Local.com!
  Local.com

- Environment News
  Watch Award-Winning, Independent News Coverage on DemocracyNow.org!
  DemocracyNow.org

0 Comments | Leave a Comment
Article Tools
EzinePublisher Report this article Cite this article
What Happens When You Pee in the Pool?

April 26, 2014 | 321,256 views

By Dr. Mercola

One in five Americans admit they have peed in a pool, and among Olympic swimmers, the practice is so widespread that a former US National team member said nearly 100 percent of competitive swimmers pee in the pool... regularly.¹

Swimming in a urine-contaminated pool is certainly not the most pleasant thought, but is it really so bad?

Olympic swimmer Michael Phelps doesn't think so, and famously said that "chlorine kills it [urine]," making peeing in the pool a non-issue. But it's not the urine itself that you need to worry about.

Urine is virtually sterile when it leaves your body, so it doesn't pose the risk of causing illness the way fecal matter in a pool does. In fact, urine is a valuable source of nutrients that is now being used as an effective and natural fertilizer.

So it's not the urine that is the problem... it's what happens when urine mixes with pool chemicals, including chlorine, that is catching researchers' attention.

Peeing in the Pool Creates a Chemical Warfare Agent

Highly toxic disinfection byproducts (DBPs) form from reactions between pool disinfectants and organic matter, including hair, skin, sweat, dirt and... urine. In a new study, researchers mixed uric acid from human urine with chlorine and found it creates two DBPs: cyanogen chloride (CNCI) and trichloramine (NCl3).²

The former, CNCI, is classified as a chemical warfare agent and is a known toxicant to your lungs, heart, and central nervous system. NCl3 is linked to lung damage.

As for how dangerous this is, practically speaking, the researchers found that, in a worst-case scenario, urine in a pool might lead to about 30 parts per billion (ppb) of cyanogen chloride, which is well below the 70 ppb used as the maximum cyanogen concentration allowed in drinking water, according to the World Health Organization (WHO).³

Cyanogen chloride leads to coma, convulsions and death only at much higher levels (about 2,500 ppb), an amount that would be difficult, and probably impossible, to generate in a typical swimming pool from urination alone.⁴ This doesn't mean that smaller doses are "safe," however, as DBPs have been linked to serious health problems at levels found in swimming pools.

According to the study researchers, since urinating in a pool introduces uric acid that will lead to the formation of a poison when it interacts with chlorine, it should be avoided:

"...uric acid chlorination may account for a large fraction of CNCI formation in swimming pools. Moreover, given that uric acid introduction to pools is attributable to urination, a voluntary action for most swimmers, these findings indicate important benefits to pool water and air chemistry that could result from improved hygiene habits on the part of swimmers."
Spending Just 40 Minutes in a Chlorinated Pool May Lead to DNA Damage

If you've ever wondered if the chlorine in a swimming pool poses a health risk, you'll find it unsettling to know that the DBPs created by chlorine reactions are far more dangerous. In fact, when researchers measured evidence of genotoxic (DNA damage that may lead to cancer) and respiratory effects on swimmers who swam in a chlorinated pool for just 40 minutes, they found:

- Increased micronuclei in blood lymphocytes, which are associated with cancer risk
- Urine mutagenicity, a biomarker of exposure to genotoxic agents
- An increase in serum CC16, which suggests an increase in lung epithelium permeability

Adding chlorine to a swimming pool results in the formation of hundreds of DBPs because of the organic matter in the water. The researchers found that total concentrations of four DBPs (trihalomethanes (THMs)) were seven times higher in exhaled breath after swimming than they were before. They noted:

"Our findings support potential genotoxic effects of exposure to DBPs from swimming pools. The positive health effects gained by swimming could be increased by reducing the potential health risks of pool water."

DBPs in Swimming Pools Are Linked to Cancer

It's known that trihalomethanes (THMs), one of the most common DBPs, are Cancer Group B carcinogens, meaning they've been shown to cause cancer in laboratory animals. They've also been linked to reproductive problems in both animals and humans, such as spontaneous abortion, stillbirths, and congenital malformations, even at lower levels.

It's not only swimming pools that are problematic, as DBPs also exist in chlorinated drinking water. Ingesting chlorinated water with levels of DBPs common in many industrialized countries has been linked to an increased risk of bladder cancer.

However, when researchers also looked at exposure to DBPs through your skin and via inhalation (such as occurs while showering, bathing and swimming in pools), it was found to be an even greater risk than drinking water.

Furthermore, people who frequent swimming pools have an increased risk of bladder cancer compared to those who do not and DBPs have even been suggested as partially responsible for the increased risk of melanoma cancer among swimmers.

According to one study published in the Journal of Environmental Sciences, the cancer risk of DBPs (in this case THMs) from various routes in descending order was:

1. Skin exposure while swimming
2. Gastrointestinal exposure from tap water intake
3. Skin exposure to tap water
4. Gastrointestinal exposure while swimming

The cancer risk from skin exposure while swimming comprised over 94 percent of the total cancer risk resulting from being exposed to THMs! The authors even went so far as to conclude that swimming in a chlorinated pool presents "an unacceptable cancer risk."

DBPs Pose Risks of Allergies, Asthma, and Other Health Problems

Most public pools are overloaded with chlorine, as the well-intentioned people who maintain public pools overly shock them with chlorine to make sure bacteria and other organisms get snuffed out quickly. But even the swimming pool in your backyard could be toxic if you treat it with chlorine — even if you know no one is using it to pee in.
Remember, any organic matter— including hair, skin, sweat, and dirt— can react with chlorine to create DBPs. So if you use chlorine, it’s going to be virtually impossible to avoid some exposure. Many studies have pointed out the health risks associated with swimming in chlorinated water, and many of these are related to toxic DBPs:

- Swimming instructors are more than twice as likely to suffer frequently from sinusitis or sore throat, and more than three times as likely to have chronic colds, than pool workers with less DBP exposure, such as catering employees or receptionists.  

- Compared to the general population, pool workers with high levels of exposure were at a 40 percent greater risk for tightness of the chest and were over 700 percent more likely to suffer breathlessness while walking.  

- DBPs may cause weakening of your immune system, disruptions to your central nervous system, damaging effects to your cardiovascular system, unhealthy functioning of your renal system and harmful impacts to your respiratory system.

**Should You Avoid Swimming Pools?**

The risk of DBP exposure from swimming pools is real, but it doesn’t necessarily mean you have to give up swimming. Swimming in an ocean is an excellent alternative, as is swimming in a lake or other natural body of water. You can also find a way to keep your pool clean from bacteria, algae, and other organisms without the use of dangerous chemicals, such as choosing a saltwater pool.

One of the best solutions is NOT to chlorinate your pool and just use a maintenance “shock” treatment every five or six days, which will kill the algae buildup. The shock treatment volatilizes in about 24-48 hours and gives you a several-day window in which you can safely use your pool. You can also reduce the amount of organic material you bring into the pool, and thereby the amount of DBPs created, by showering prior to entering and teaching your children not to urinate in the water. You can also use ozone, which also oxidatively destroys the pool pathogens and lowers the need for chlorine.

This will be difficult if you’re visiting a public swimming pool or waterpark, however. Surveys show that 35 percent of Americans say they do not shower prior to entering a pool. Finally, because DBPs exist in all chlorinated water, I recommend installing water filters that remove chlorine for both your shower/bath and your kitchen tap.

**[+] Sources and References**

Sort Comments by: Top Rated, Newest, Oldest, Top Poster

Thank you! Your purchases help us support these charities and organizations.
Disinfectants – A Comparison

Chlorine (Cl)

A greenish-yellow gaseous element which combines directly with nearly all elements, is two and one half times as heavy as air, has an intensely disagreeable suffocating odor and is exceedingly poisonous. It is found commonly as NaCl (solid or seawater).

Advantages

- Strong oxidant, disinfectant and bleaching agent
- Eliminates tastes and odors
- Featured with after-effect
- Controls growth of algae, biological slimes and microorganisms
- Decomposes organic contaminants (phenols...)
- Oxidizes iron and magnesium. Decomposes hydrogen sulfide, cyanides, ammonium and other nitrogen compounds

Disadvantages

- Chlorine is a respiratory irritant. The gas irritates the mucous membranes and the liquid burns the skin. As little as 3.5 ppm can be detected as an odor, and 1000 ppm is likely to be fatal after a few deep breaths
- Special requirements for transportation and storage
- Potentially dangerous in case of a leak
- Formation of disinfection by-products such as chloroform. The MAC in water will be increased in the near future from 60 mg/l up to 60 mg/l because there is no proof of direct action of the chloroform on DNA.

Chlorine Dioxide (ClO₂)

Chlorine dioxide is a synthetic yellowish-green gas with chlorine-like odor. ClO₂ is unstable as a gas and will undergo decomposition into chlorine gas (Cl₂), oxygen gas (O₂) and heat. However, ClO₂ is stable and soluble in an aqueous solution. For example, solutions of approximately 1% ClO₂ (10 g/L) may safely be stored if the solution is protected from light and kept chilled. In solution, ClO₂ exists as a true gas.

Advantages

- The most effective disinfectant and strongest oxidation agent among all chlorine-containing ones
- Low dosing
No formation of chloramines
Formation of trihalomethane is not facilitated
Eliminates phenols which is the source of unpleasant taste and odor Effective oxidant and disinfectant for all types of microorganisms, including cysts, (Giardia, Cryptosporidium) and viruses
No formation of bromides from bromates
Removes iron and magnesium from water by oxidation and precipitation of oxides

Disadvantages
On-site generation only
Requires transportation and storage of chemicals
No formation of non-organic by-products
Forms chlorates and chlorite ions
The instability of ClO₂ has an important consequence. It negates the possibility of creating and transporting cylinders or rail cars of the gas

Hypochlorite (NaClO)

Hypochlorite is a chemical compound, a colorless, transparent liquid. It is dissolved in cold water and decomposed by hot water or carbon dioxide. As an excellent chlorine sterilizer, it serves as a strong oxidizer and bleaching agent.

Advantages
Applied in liquid or granulated forms (trade concentration - 10-20%), electrochemically available on-site
Effective against most of the pathogenic microorganisms
Relatively safe during storage and use
No transportation and storage of chemicals if generated on-site

Disadvantages
Ineffective towards cysts (Giardia, Cryptosporidium)
Loses effectiveness during long-term storage
Dangerous chlorine-gas emissions during storage
Forms trihalomethane
Immediate use is recommended if generated on-site. In case of storage, special measures are made to purify the initial water from heavy metal ions. When generated on-site, NaClO solution with an active chlorine concentration less than 450 mg/l will not form chlorates during storage

Chloramine (NH₂Cl)

Chloramine is formed through the reaction of dissolved chlorine gas (forming hypochlorous acid) and ammonia in tap water. Chloramine is a term that actually describes several related compounds: monochloramine NH₂Cl, dichloramine, NHCl₂ and trichloramine, NCl₃. Chloramine (monochloramine) is a toxic substance created by the chemical reaction of ammonia and sodium hypochlorite (chlorine bleach) under alkaline conditions. It is a yellow liquid at room temperature. It is commonly used in low concentrations as a disinfectant in municipal water systems as an alternative to chlorination. Unlike chlorine, chloramine cannot be removed from water by boiling, or
by letting an open container of water stand to dissipate chlorine. It can only be neutralized, or removed with specific treatment methods.

Advantages

- Stable and long-time after-effect
- Facilitates removal of foreign taste and odor
- Reduces the level of trihalomethane and chlorine-organic acid generation
- Prevents formation of biological slimes in water distribution systems

Disadvantages

- Weak disinfectant and oxidation agent compared to chlorine
- Ineffective against viruses and cysts (Giardia, Cryptosporidium)
- Considerable dosing and prolonged contact time are required for disinfection
- Danger to patients using dialyzers, since it penetrates dialyzer membranes and effect erythrocytes
- Forms nitrogen-containing by-products

Ozone (O$_3$)

Ozone (O$_3$ : 3 oxygen atoms) occurs naturally in the atmosphere. Ozone (O$_3$) is an allotrope of oxygen, the molecule consisting of three oxygen atoms instead of the more stable diatomic O$_2$. Ozone is a pale blue gas at standard temperature and pressure. It forms a dark blue liquid below -112 °C and a dark blue solid below -193 °C. Ozone is a powerful oxidizing agent. It is also unstable, decaying to ordinary oxygen through the reaction. This reaction proceeds more rapidly with increasing temperature and decreasing pressure.

Advantages

- Used for several decades in some European countries for the purpose of disinfection, color elimination, taste and odor control
- Strong disinfectant and oxidation agent
- Very effective against Giardia, Crypotosporidium and any other pathogenic microflora
- Facilitates removal of turbidity from water
- Does not form chlorine containing trihalomethanes

Disadvantages

- Ground level ozone is an air pollutant with harmful effects on lung function
- Forms byproducts, including: aldehydes, ketones, organic acids, bromine-containing trihalomethanes, (bromoform inclusive), bromates (in presence of bromides): peroxides, bromoacetic acid
- Necessitates the use of biologically active filters to remove by-products
- Does not ensure residual disinfection effect
- Requires significant initial expenses for the equipment
- Considerable expenses for operators’ training and installation support
- When reacting with organic compounds, ozone disintegrates them into smaller components, which could become a feeding media for microorganisms growth in water distribution systems
Ultraviolet (UV)

The name means "beyond violet" (from Latin ultra, "beyond"), violet being the color of the shortest wavelengths of visible light. Ultraviolet (UV) radiation is electromagnetic radiation of a wavelength shorter than that of the visible region, but longer than that of soft X-rays. The Sun emits ultraviolet radiation in the UVA, UVB, and UVC bands, but because of absorption in the atmosphere's ozone layer, 99% of the ultraviolet radiation that reaches the Earth's surface is UVA.

Disinfecting drinking water: UV radiation can be an effective viricide and bactericide. Disinfection using UV radiation was more commonly used in wastewater treatment applications but is finding increased usage in drinking water treatment. It used to be thought that UV disinfection was more effective for bacteria and viruses, which have more exposed genetic material, than for larger pathogens which have outer coatings or that form cyst states (e.g., Giardia) that shield their DNA from the UV light.

Advantages
- No special requirement for storage and transportation
- No formation of by-products

Disadvantages
- No residual effect
- Ineffective towards cysts (Giardia, Cryptosporidium)
- Expensive in equipment and maintenance
- High operational (power) costs
- Disinfection depends on water turbidity, its hardness and precipitation of organic impurities caused by sediments on the bulb surface
- Power supply deviations affect the wavelength
- Since microorganisms can be shielded from ultraviolet light in small cracks and other shaded areas, however, UV lamps are used only as a supplement to other sterilization techniques

Reverse Osmosis (RO)

Reverse osmosis is the process of pushing a solution through a filter that traps the solute on one side and allows the pure solvent to be obtained from the other side. More formally, it is the process of forcing a solvent from a region of high solute concentration through a membrane to a region of low solute concentration by applying a pressure in excess of the osmotic pressure. The membrane here is semipermeable, meaning it allows the passage of solvent but not of solute. The membranes used for reverse osmosis have no pores, the separation takes place in a dense polymer layer of only microscopic thickness. In most cases the membrane is designed to only allow water to pass through. The water goes into solution in the polymer of which the membrane is manufactured, and crosses it by diffusion. This process requires that a high pressure be exerted on the high concentration side of the membrane, usually 5 MPa - 20 MPa (50 bar - 200 bar).

Features
This process is best known for its use in desalination (removing the salt from sea water to get fresh water) and has been used in this way since the early 1970s.
Disadvantages

- Water is pressed through special filter membranes. These membranes have mesh sizes of approx. 0.1 micrometer (0.001 mm). That means that all minerals are extracted from the water since minerals are bigger than 0.1 micrometer
- Distilled stale-tasting water resulting from RO is not enjoyable to drink anymore
- The neutral pH-value in the water can be only re-established by adding minerals
- After the RO-process, the water must be disinfected

Silver

A fully different effective mechanism for drinking water disinfection is the oligodynamic efficacious silver. The method is mainly submerging silver ions in water for disinfection.

Advantages

- Silver water has curative properties against diseases
- Disinfects drinking water for a longer period of time

Disadvantages

- Long reaction time
- Chloride in water extends contact time to achieve disinfection effects

Electro-Chemical Activation Process (ECA)

Process used in the production of a disinfectant acidic-water without the use of chemical additives. Salt solution and electricity are used and separated by two electrodes in a Diaphragmalyser to produce two solutions: acid solution and alkaline solution.

Advantages

- Production of superior quality drinking water in conformity with the European Union Drinking Water Directive.
- Water is safe to drink for a longer period of time if appropriately treated
- Short-term amortization, long-term savings
- The process preserves all minerals in the water, resulting in a natural and pure water taste - no more chlorine taste
- The water does not lose its vitality. No essential ingredients are eliminated, filtered out or destroyed. All mineral contents in the water remain during and after the process
- Magnesium as an important and essential mineral in water is preserved. All enzymes are preserved through Ion-Exchange-Method, since only ions are exchanged through the membranes.
- Automatic production of acid-water and activated alkaline water; no acute or chronic toxicity when diluted in water
- User-friendly, very easy to operate, no qualified personnel required
- Conveniently run, monitored and maintained via internet (Internet access presumed).
- Easy installation; wall-mounting and requires minimum space; size of an equipment is as big as a shoe cabinet
- Environment-friendly technology, solutions are 100% biodegradable
- Powerful disinfectant and oxidation agent; used for general disinfection in households,
agricultural farms, hospitals/clinics and buildings
• Effectively eliminates bad tastes and odors
• Removes biofilms in flowing water and pipes
• Significantly less formation of chlorine compounds, halogens and TMT
• No toxic by-products: clorites (ClO2) and clorates (ClO3)
• No transport or storage problem
• Easy and safe storage and handling; no special protection required

Disadvantages
Installation rooms will need ventilation systems to avoid fumes