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My water is hard - so what

So you can't see anything in the water - you're thinking ? How bad can it be? Even if I don't descale my machine regularly - no big problem, right?

OK, try this math. A grain is defined as a unit of weight equal to 1/7000th of a pound. Another way to think of it is that a common aspirin tablet is approximately 5 grains. A household with a water hardness of 10 grains per gallon (Hard water) would have the equivalent of the weight of 2 aspirin tablets dissolved per gallon of water. So each complete fill-up of a home espresso machine (say 2 litres) will be leaving 1 aspirin's worth of scale in your machine. In a year that would be 52 aspirins for a machine in light use.

That is larger than the size of many home boilers!

Or, put another way, an average household of 2, with water hardness of 7 grains per gallon, would have the equivalent of 73 lbs. of rock in their water supply in a given year!



Plugged Pipe

Note: Toronto is 6 gpg hard +/- , York Region is 10 to 14 gpg hard +/-, with 2ppm of Iron +/-.

If your water hardness is in mg/l or ppm you can convert that into gpg by dividing the hardness in ppm or mg/l by 17.1. Example: 170ppm of hardness equals 9.9gpg of hardness. Also, 1ppm of iron is equal to 5gpg of hardness when sizing a water softener. Example: if you have 17gpg of hardness and 3ppm of iron. You should size the softener for 32gpg. 3ppm of iron times 5=15gpg of hardness. Add the original 17gpg of hardness to the 15gpg of hardness giving you 32gpg of hardness.

Chlorinated Drinking Water by author Josef Tyls III, MSc, PhD

How harmful is it to consume chlorine and chlorine disinfection byproducts in our water? Proponents of chlorine claim there is no danger. But not all the information has been disclosed to the general public.

Water and Our Health and Wellness

Clean water is absolutely essential for all proper body functions, including skin and organ integrity, immune system balance, cellular respiration and repair, waste elimination, and longevity.

The primary purpose of clean water within the body is to transport nutrients to the cells and then transport waste byproducts to the eliminatory system. It is absolutely essential in maintaining the critical balance needed to support life. Yet this system, with its multiplicity of interrelated dependencies, can be grossly affected by minute traces of chemical toxins like chlorine.

Hazardous Byproducts of Chlorination

Chlorine is used to disinfect municipal water supplies and swimming pools from harmful bacteria. But chlorine is also a highly toxic element, which has an ability to oxidize all proteins, effectively rendering them useless. All living organisms are made up of proteins. Hence, any living organism that comes in contact with even trace amounts of chlorine is affected and, if exposed to sufficient quantities of chlorine, killed.

The major health issue regarding the chlorination of municipal water is that it exposes us to a variety of toxic chemicals called trihalomethanes (THMs), which are byproducts of chlorination. Studies have linked THMs to miscarriage and fetal malformations, and they may be also associated with an increased risk of stillbirths.

One of the most common of the THMs, chloroform, is classed as a potential cancer-causing agent. In public pools it has been measured at more than twenty times the level found in tap water. Little data exists regarding dermal and inhalation exposure routes to the chloroform body-burden from domestic and recreational use of chlorinated water.

And not all harmful bacteria are effectively disinfected by chlorine. The bacteria *Cryptosporidium parvum*, excreted in the feces of infected humans, cattle, and other mammals, is highly resistant to chlorine at the levels normally found in swimming pools and drinking water. *Giardia lamblia* is also more resistant to disinfection by chlorine, but can be effectively filtered.

How Safe is Showering?

Volatile chemicals like THMs can evaporate from water in a shower or bath. Conservative calculations indicate that inhalation exposures can be as significant as exposure from drinking the water; that is, one can be exposed to the same amount of THMs by inhaling during a shower as by drinking two litres of water a day. People who shower frequently could be exposed through ingestion, inhalation, and/or dermal absorption.

Some studies found that the dangers from inhaling chlorine can even exceed those derived from drinking chlorinated water. The amount of chloroform, the most common trihalomethane in chlorinated water, inhaled or absorbed through the skin during a typical shower may be **six times** higher than that absorbed from chlorinated drinking water.

The Cancer Connection

Epidemiological studies funded by Health Canada concluded that 14 to 16 percent of bladder cancers in Ontario may be attributable to drinking water containing relatively high levels of chlorination byproducts. According to the results of a 1992 Norwegian study published in the *International Journal of Epidemiology*, the consumption of chlorinated drinking water has been associated with a 20- to 40-percent increase in the incidence of colon and rectal cancer.

A study done by the Medical College of Wisconsin and Harvard University found that the consumption of chlorinated drinking water accounts for nearly **15 percent** of all rectal cancers and nine percent of all bladder cancers in North America. The study also concluded that drinking chlorinated water over long periods of time increases the chances of contracting rectal cancer by **38 percent** and contracting bladder cancer by **21 percent**. In addition, among those who drank chlorinated water, the researchers found a higher incidence of cancer of the esophagus, rectum, breast, and larynx, as well as Hodgkin's disease.

Alternatives to Chlorination

A healthier alternative in the treatment of drinking water is the use of ozone sterilization.

The first water treatment plant to use ozone for disinfection was installed in Ousbaden, Holland, in 1893. Today, after 110 years of usage, ozone sterilization is utilized in countries throughout the world including Germany, France, the US, Cuba, Japan, and Mexico.

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Source: *alive* #262, August 2004

***Note:** **The target in Ontario is 0.26 mg/l of chlorine**

* Toronto typically has 1.4 mg/l +/- of chlorine

* York Region typically has 2.96 mg/l +/- of chlorine

* e&oe Please consider verifying current data at your convenience