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Chlorine -"A Crippler and Killer"

by
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Throughout the United States and Canada and other countries, chlorine is commonly used to kill disease-causing organisms in the water that come from rivers, lakes, and reservoirs which are used by millions of people everyday for drinking, bathing, showering and swimming. But what many people do not know is that this same chlorine they are exposing their body to is a very poisonous and deadly chemical that according to the Environmental Protection Agency (EPA), is essentially a pesticide. And since we are living organisms, chlorine is damaging and killing some part of our body each time we drink, shower, bathe, or swim. A University of Minnesota researcher, Dr. Robert Carlson, whose work is sponsored by the EPA, had this to say about chlorine, ' the chlorine problem is similar to that of air pollution:, and that "chlorine is the greatest crippler and killer of modern times!"

To understand how this "crippler and killer" came to be used in the drinking water, we need to go back in time to its first application.

The History of Chlorine Use for Disinfecting Water
Chlorine was first used to disinfect water in 1850 London, England. At this time, John Snow was trying to disinfect the Broad Street Pump water supply after an outbreak of cholera. Later, following a typhoid outbreak in 1897, Sims Woodhead used a chlorine bleach solution to disinfect potable water distribution mains at Maidstone, Kent in England. It wasn't until the early 1900's that the wide and continuous use of chlorine greatly reduced the number of deaths from typhoid in Great Britain.

Use of Chlorine in the United States
Due to the success in England of reducing the death rate from infectious diseases such as typhoid, the use of chlorine in the United States began in 1908 in Jersey City, New Jersey. Soon after, cities and towns across the United States began to effectively treat their water supplies, reducing the danger from waterborne diseases such as dysentery, cholera, typhoid, and hepatitis A.

The First Use of Chlorine By the Military
Chlorine is a very toxic and poisonous chemical and has been used effectively in warfare as a deadly weapon. It was administered as a gas and given the code name bertholite, by the Germans who first used it against the French in 1915 during the second battle of Ypres. Almost immediately, it was used on the eastern front against the Russians and continued to be used throughout the war resulting in thousands of casualties.

Other Uses of Chlorine
Other uses of this chemical include being used as a bleach in the paper and pulp industry and to bleach flour. It is also used to make other chemicals such as ethlene dichloride for the manufacture of polyvinly chloride which is used to make siding, flooring, tubing, coatings, piping, film, and other products. Another chemical made from chlorine is propylene oxide for manufacturing plastics called polyesters that are used to make boat and car bodies, bowling balls, carpets, and fabrics. Chlorine is also found in cosmetics, medicines, solvents, sealants, computer chips, paints, and other types of disinfectants.

Industrial Chlorine
Chlorine is not the natural mineral sodium chloride found in sea water. To produce industrial chlorine, natural sodium chloride is exposed to powerful electrical charges that separate the chlorine from the chloride producing a toxic and poisonous chlorine gas. This chlorine has been used to treat drinking water, poison and kill soldiers during world wars I and II, and is used for the manufacturing of a variety of other chemicals used to produce other man made products and chemicals.

What Research Has Been Done on Chlorine Before Adding it to the Water Supply?
Since chlorine is a toxic and poisonous substance, even being labeled a pesticide by the EPA, one would think that research would have been conducted before allowing its use in drinking, showering and bathing, and swimming. However, it's interesting that in the July 28, 1951 Journal of the American Medical Association, there was a question to the editor in the section physicians could ask questions regarding whether or not any studies had been done to ascertain negative effects to drinking chlorinated water. The editor's reply was that he carefully examined all available material and found there was never any research conducted on the effects of chlorine on the human body. However, the editor revealed that there were cases of skin inflammation and many outbreaks of asthma *traced to chlorine*, but said these were due to *allergies*.

At the time of that statement in 1951, forty-three years had passed and people in the United States had been drinking and exposing their bodies to a chemical that was used as a weapon to kill people in two world wars. It boggles the imagination to think that such a powerful and deadly chemical would be allowed to be added to water that would be used for drinking, showering, bathing, swimming, and making baby formulas without first conducting a study to determine if the long-term low dosage use of chlorine would cause negative effects.

Available Research on the Negative Effects of Chlorine on the Human Body
While people have debated for years whether chlorine is harmful or not there are studies and research by many physicians, scientists, and other researchers from around the world that have found chlorine to be very destructive to our health. As you continue reading you will find abundant information as to how toxic and damaging chlorine is to the body and how you can protect yourself.

Chlorine and Cardiovascular Disease

Cardiovascular Disease in 1908
When chlorine was first added to the drinking water, it was intended to benefit mankind by eliminating disease-causing organisms such as typhoid and cholera, and it worked very well. Before chlorine became widely used in1908 in the United States, the deaths resulting from typhoid were about 35,379, or 31 per 100,000 of population. The deaths from heart disease were about 64,439, or 137 per 100,000 of population. **PLEASE NOTE**: Deaths from heart disease were actually lower before 1900 with the first recorded cases occurring in the late 1800's.

Cardiovascular Disease in 1950
By 1950, or forty-two years later, chlorine had become widely used in the water supplies of the United States. Due to the chlorine and improved sanitary conditions the number of deaths from typhoid had dropped to under 90 per 100,000 of population. However, the death rate from heart disease had dramatically increased to 535,920, or 355 per 100,000 of population - a total increase of 471,481 since 1908 when chlorine was first used in the water supplies.

Cardiovascular Disease in 2003
In 2003, ninety-five years after chlorine was first added to the drinking water in1908, it had become a common household word that wasn't, and still isn't, given a second thought and used in almost every municipality's water supply in the United States. What are the result's of the American public's exposure to chlorine for almost 100 years? While typhoid still remains under control and no longer poses a major health risk, the death from heart disease has increased dramatically.

Based on the estimates of The American Heart Association for 2003, there were 71,300,000 Americans affected by some form of cardiovascular disease resulting in over 910,614 deaths, an estimated 479,305 were due to coronary heart disease, the leading cause of death in the United States.

Then in 2004, The American Heart Association estimated that 13,200,000 people alive at that time had histories of either heart attack, angina pectoris or both. They also estimated that another 1.2 million Americans would have a new or recurrent coronary attack.

Coronaries/Cholesterol/Chlorine

During the 1960's, Dr. Joseph Price wanted to know why cardiovascular heart disease, such as heart attacks, strokes, and atherosclerosis, had become so prevalent during this time when prior to 1900 it was virtually non-existent. In his book Coronaries/Cholesterol/Chlorine published in 1969 he said, "that something has dramatically changed in the last six to seven decades of human history." Dr. Price felt that there was some sort of environmental factor that was being overlooked by the medical community contributing to the development of atherosclerosis.

NOTE: Atherosclerosis occurs when the large and medium sized arteries develop plaques on the inner layers of the walls where lesions or tears occur. These plaques are made up of cholesterol, other blood fats called lipids, blood platelets and other clotting factors such as fibrinogen, or protein nets, and cellular debris. As the muscle cells in the artery wall enlarge in the affected area and the plaque continues to form, blood flow diminishes to the organs normally supplied by the artery. Also, due to the hardening of the plaque, or calcification from calcium being deposited with the fats, there is a risk of pressure from blood flow breaking off a piece of the plaque which can travel to various parts of the body causing a blockage.

Dr. Price further comments in his book, "Chlorination gained relatively wide acceptance in the second decade of this century (20th century) and in the third decade (1920's) it was found that satisfactory killing of organisms was dependent upon a residual of chlorine in the water above the amount necessary to react with organic impurities. When it was remembered that evidence of clinical disease from atherosclerosis takes 10-20 years to develop, it becomes evident that there is a correlation between the introduction and widespread application of chlorination of water supplies and the origin and increasing incidence of heart attacks that is exceedingly difficult to explain away."

Dr. Price Presents Evidence from Around the World

Japan:

When Doctor Price looked at people from around the world, he discovered that the Japanese who have a low rate of heart attack one-sixth of the United States, develop atherosclerosis, or blockage of the arteries by cholesterol and other fat deposits, when they move to Hawaii and drink chlorinated water. It's interesting to note that when the Japanese where rebuilding their cities after the war, they installed water purification systems using chlorine recommended by the American engineers who were assisting. Prior to this time, they had never used it. Not soon after this the Japanese medical community began to notice that the people were starting to have many cardiovascular health issues, namely heart attacks. Their investigation led them to chlorine as the source of the causative factor. They discontinued the use of chlorine.

Africa:

In Africa, Dr. Price found people, who although ate a diet high in fat and cholesterol, and did not drink chlorinated water, did not get heart attacks.

Ireland:

Another physician, Dr. Paul Dudley White mentioned by Dr. Price, noted that Irish farm workers who drank their own well water free of chlorine never suffered from coronary heart disease.

Young Men and Advanced Arterial Disease
Dr. Price commented on the findings of Dr. William Enos who lead a team of physicians to autopsy 300 American soldiers who died in the Korean war. The average age of the deceased soldiers was 22.1 years. All were examined before their induction and found to be healthy. The autopsies revealed that 77% of the 300 soldiers had, "gross evidence of atherosclerosis ("hardening" of the arteries caused by the formation of multiple plaques) in the coronary arteries." In some of the soldiers, one or more arteries of the heart were partly or completely occluded, or blocked. Dr. Enos' and the team of physicians' explanation of their findings was that these young men had early development of "degenerative-disease."

In other words, they felt that this unusual and severe development of coronary heart disease in young healthy men in such a short period of time was just a natural development of degeneration not attributed to anything they may have been exposed to or ingested.

However, Dr. Price commented, "If you ask any man who served in that war, he will tell you that the water in Korea for our soldiers was so heavily chlorinated for sanitary reasons that it was almost undrinkable... Apparently, there is a direct causal correlation between the amount of chlorine ingested and the speed and degree of development of atherosclerosis."

PLEASE NOTE: American soldiers in Vietnam, just like the ones in the Korean war, drank heavily chlorinated water as well. And their autopsies revealed the same sort of severe artery damage and atherosclerosis in a short period of time.

Chlorine and Heart Problems
In a book called Poisoning by Dr. W. F. von Oettingen he says this about chlorine on page 72, "It has been claimed that injury of the mitral valve (of the heart) and cardiac (heart) insufficiency may result from *severe exposure to chlorine* or carbon monoxide. Coronary thrombosis characterized by palpitation, irregularities of the heart beat, and anxiety, has been reported in poisonings with chlorine, carbon monoxide and ferric chloride." (A chlorine compound.)

The doctor's statement is referring to a *severe exposure to chlorine*. As we already noted the young soldiers who were examined during induction and were certified healthy before going to war in Korea and Vietnam did have *severe exposure to chlorine* in a short period of time. Based on what they know about the effects of severe chlorine exposure to the cardiovascular system and how much the soldiers drank in such a short period of time, one can conclude that the main cause of their heart disease was the chlorinated water.

Heart Attacks in the United States Since 1908
When chlorination of water supplies first began in 1908 in the United States, it wasn't until 10 to 20 years later that heart attacks first began to increase. That's because unlike the soldiers in the Korean and Vietnam Wars who drank very high concentrations of chlorinated water, causing a faster rate of developing plaques on the blood vessel walls within a year or less, the public water supplies had much lower amounts which produced a slower rate of developing plaques over a 10 to 20 year period.

Dr. Price's Result of an Experiment Using Chlorinated Water
In his book Coronaries/Cholesterol/Chlorine, Dr. Price reveals the results of an experiment he conducted with several hundred healthy young chickens separated into two groups. One group drank water with chlorine and the other group drank water without chlorine. Both groups were raised until they had reached complete maturity. The birds were then autopsied revealing that every chicken in the group that drank the chlorinated water had some level of cardiovascular disease and the ones without the chlorinated water had none. When the amount of chlorine was increased in the water, the severity of destruction to the cardiovascular system was more severe and occurred sooner.

As the chickens matured it was observed that even when the birds were under winter conditions, the ones without the chlorinated water grew faster, larger and were healthier, while the chickens that drank the chlorinated water displayed outward signs of poor circulation, shivered, had drooping feathers, and

a reduced level of activity. Due to Dr Price's experiment, most of the large poultry producers today provide water without chlorine for the chickens.

Dr. Price's Conclusion on the Safety of Chlorine
After studying the results of chlorine on living tissue, Dr. Price states in his book that, "nothing can negate the incontrovertible fact, the basic cause of atherosclerosis and resulting entities such as heart and stroke, is chlorine."

Chlorine and Cancer

Chlorine, Disinfection-By-Products, and Cancer
Fifty-percent or more of municipalities' water sources come from rivers and lakes. As the surface water in these rivers and lakes come into contact with organic matter such as humus from dead leaves and plants, soil, silt, mud, and different forms of effluent, such as sewage, humic acids are produced. When chlorine is used to disinfect water, it comes into contact with these humic acids producing what are called DBPs, or Disinfection-By-Products. One class of these chemicals is called trihalomethanes which would include chloroform, trichloroethylene, and carbon tetrachloride, all shown to be carcinogens, or cancer causing.

Bladder and Rectal Cancer
In a study by physicians from Harvard and the University of Wisconsin, it was discovered that Disinfection-By-Products may be responsible for over 10,700 cases of bladder and rectal cancers per year.

Greater Risk of Bladder Cancer
The Journal of National Cancer Institute reported in 1987 on a study that was found that people who drank chlorinated water had an 80% greater risk of developing bladder cancer.

Gastrointestinal and Urinary Tract Cancer
A study by the Columbia University School of Public Health revealed that women who drank chlorinated water from seven upstate New York counties had a 44% higher death rate from gastrointestinal and urinary tract cancers than women who drank water from home wells.

Another study in the 1970s which analyzed thousands of cancer deaths in Louisiana, North Carolina, Illinois, and Wisconsin revealed that those who drank chlorinated water over a lifetime, have a fifty to one-hundred percent greater risk of dying of gastrointestinal cancer. It is interesting to note that this risk is from water containing chlorine at or below the Environmental Protection Agency's standard of "safe?" Dr. Robert Harris, the lead scientist, commented that this standard "is going to make the EPA look ridiculous."

Kidney, Liver, Nervous System, and Birth Defects
It has been established that chloroform and carbon tetrachloride destroy the kidney, liver, nervous system and cause birth defects.

"Studies show - a strong link between chlorinated water supplies with elevated trihalomethane levels and cancers of the bladder, kidney, liver, pancreas, gastrointestinal tract, colon and brain." - from: The Maker's Diet; Jordan S. Rubin, N. MD., PhD.

Chlorine, Women and Breast Cancer
Approximately one in every eight women in the United States has breast cancer and studies show that chlorine and chlorine by-products, called organochlorines, may be responsible for about one-third of them. The source of the chlorine is of course from the drinking water, showering, bathing, swimming, and food such as bleached flour. Organochlorines would come from plastics, agricultural chemicals,

and cleaning and bleaching products. Women with breast cancer have been found to have 50 to 60% more organochlorines in their breast tissue than women without breast cancer.

A report by the organization Greenpeace summarizes several ways organochlorines can promote breast cancer:

- They cause adverse mutations in genetic material which can then give the wrong instructions to the rest of the cell for cell division, differentiation, and proliferation.
- They strengthen the ability of other chemicals to cause cancer by inducing enzymes that transform them into a cancer promoting form.
- They interfere with the body's natural controls on cell growth and differentiation.
- They mimic or interfere with natural hormones like estrogen.
- They may suppress the body's immune system's mechanisms for defending against tumorous cells.

Chlorine and Skin Cancer
Studies by scientists in Belgium and other places have linked the development of deadly malignant melanoma, a serious form of skin cancer, to chlorine exposure from drinking water and swimming pools. In the Ames and other mutagenicity tests, sodium hypochlorite has been shown to be mutagenic.

Compared to darker skin people, redheads and blondes are more likely to develop skin cancer since their skin contains more pheomelanins, meaning lighter pigmentation, than melanins, or darker pigmentation.

Skin Cancers Not Due to Ultraviolet Light
It's interesting to note that skin cancer is not due to exposure to ultraviolet light from the sun and that people who spend a lot more time indoors exposed to fluorescent light have the most skin cancer. Also, skin cancer most often appears on areas of the body not exposed to the rays of the sun.

Skin Cancers Increases Worldwide
Due to worldwide pollution of rivers and oceans and chlorination of swimming pools, Franz H. Rampen of the Netherlands said it has caused an increase in skin cancer.

Chlorinated Acids -Extremely Dangerous Chemicals
Besides the cancer causing Disinfection-By-Products such as trihalomethanes (THMs) produced when chlorine interacts with humic acids in the surface water of rivers and lakes, it also creates two other chemicals called chlorinated acids, Mutagen X and DCA. Many scientists feel that these two chemicals are the most dangerous to be exposed to.

Mutagen X, also called **MX** ,is the common name for 3-Chloro-4-(dichloromethyl)-5-hydroxy-2(5H)-furanone (C5 H3Cl3O3) - found in all chlorinated water for which it was tested. H. Paul Ringhand, an EPA chemist, feels that MX may be the single most mutagenic chemical in city water sources. And anything that can mutate, or in this case adversely alter the genetic material of healthy cells, will increase their cancer-causing potential.

DCA (dichloroacetic acid) - adversely alters cholesterol metabolism increasing the bad forms of LDL (low density lipoprotein), VLDL (very low density lipoprotein), and lipoprotein (a), all of which travel from the liver to the blood stream where they can plug the arteries producing plaques. This increases the risks of heart attack and stroke, while at the same time decreasing the good HDL (high density lipoprotein) cholesterol which travels from the blood to the liver reducing cholesterol and the risks of

heart attack and stroke. DCA has also been shown to cause liver cancer in lab animals.

Chlorine and Its Other Negative Effects on the Body

Chlorine and Diabetes

Healthy blood sugar levels are maintained by the insulin produced by the beta cells from the islets of langerhans located in the pancreas. When chlorine enters the body, it produces a powerful oxidizing agent, or uric acid derivative, called alloxan. This alloxan creates free radicals that damage the DNA in the beta cells of the islets of langerhans in the pancreas causing the cells to malfunction and eventually die. Alloxan also interferes with the activity of zinc. This mineral is required for the activation of an enzyme, DNA ligase, that helps produce the genetic material for the production of new beta cells. And the chlorine deactivates the niacin the B vitamin needed to place the zinc into the enzyme. Zinc is also required for the storage and function of insulin. When beta cells fail to produce sufficient insulin, or no longer produce insulin, and the mineral zinc has insufficient activity, diabetes will be the result.

The deleterious effects of alloxan on the pancreas is so powerful that the Textbook of Natural Medicine calls it “a potent beta-cell toxin.”

Chlorine In Bleached Flour Contributes to Alloxan Production

Commercial yeasted breads, even the whole-grain varieties, often have other problems. They typically contain flour bleach, which forms alloxan, a compound known to cause diabetes in animals by destroying the beta cells of the pancreas (*Clinical Nutrition Newsletter, Dec. 1982*). …
Healing With Whole Foods by Paul Pitchford, page 451

Zinc and Its Importance to Our Health

In order to thoroughly understand how the reduced activity of zinc by alloxan, produced from chlorine in our body, can affect our health we need to see how essential it is.

- Zinc is concentrated in the body tissues in the following order: prostate, retina, liver, kidney, muscle, bone, testes, pancreas, heart, spleen, lung, brain, and the adrenal gland.
- It is required for the proper function of over 25 enzymes for digestion and metabolism.
- It is involved in DNA synthesis to manufacture protein needed for growth, regeneration of new tissue, repair of damaged tissue, replacement of enzymes, and antibodies for healthy immune system function.
- It is necessary for absorption and activation of vitamins, particularly the B-vitamins.
- Is required throughout the reproductive process.
- Is necessary for normal prostate function.
- Is necessary for normal function of insulin for healthy blood sugar control.
- Is needed for wound healing as zinc integrates the amino acid cystine into the protein of skin and converts glycine and proline into skin collagen. Also, it promotes protein synthesis throughout the body for repair of tissues and wound healing.
- Is needed for proper metabolism of alcohol.
- It helps the body eliminate lactic acid buildup produced from muscles due to exercise or work
- It assists in movement of carbon dioxide from the blood to the lungs for removal.

It is clear that zinc is heavily involved throughout the entire human body and any deficiency or reduced

activity of this essential mineral could negatively impact its health in a number of ways.

Zinc and DNA
Deoxyribonucleic acid, or DNA, is found in every cell of the human body, a blueprint of all the instructions and information needed for the cell to reproduce itself. For example, a liver cell can become only a liver cell and a bone cell can become only a bone cell. When it is time for the cell to reproduce, enzymes are needed to put the DNA together within the cell.

In order for the enzymes to become activated, several minerals are required, including zinc. When zinc is inhibited from working properly, new DNA cannot be produced. As a result, new cell reproduction to replace the old dying cells of the liver, heart, brain, pancreas, kidneys, thyroid, gastrointestinal tract, arteries, muscle, tendons, lungs, bone, cartilage and other cells throughout the body, slows down or stops altogether. This results in the breakdown of cells in bones, cartilage, spinal discs, muscles, brain, organs and glands and whatever part of the body is affected by hampered DNA production. If this process were allowed to continue, one can see that this would have a devastating affect on the health of the body.

Zinc and Premature Aging of th Body
Any interference with the activity of zinc and new DNA production and cell replication would be affecting every cell in the body resulting in premature aging.

Signs of premature aging are:

- Excess wrinkling of the skin
- Reduced lubrication of the joints,
- Less flexibility and lost range of motion
- Cartilage and spinal disc deterioration
- Less energy
- Weakening eyesight
- Weight gain from excess fat and reduced muscle tissue
- Loss of appetite
- Hormone imbalances
- High cholesterol and blood fats
- Less flexible and healthy blood vessels
- Increased blood pressure
- Reduced sex drive
- Fluctuating blood sugar levels
- Lowered immune system function
- Poor digestion and elimination
- Reduced absorption of nutrients in the small intestine
- Impaired mental function
- Inflammation and increased sensitivity to pain
- Poor wound healing
- Poor teeth, gum, and enamel health
- Weak and thinning bones.

In essence, any impairment in DNA function would contribute to degeneration of the body at an accelerated rate!

Zinc and the Small Intestine
The small intestine is where most of the digestion and absorption of the food we eat takes place. Attached to the wall of the small intestine are what are called villi. The primary job of the villi is to absorb nutrients broken down by digestion into the blood stream where they are eventually delivered to individual cells throughout the body. Lining the small intestine and the villi are epithelial cells. Due to

the harsh environment of the small intestine, more than a 100 million intestinal cells die off every sixty seconds with a complete replacement of the lining of the small intestine every 3 days. The cell replacement on the tips of the villi are especially important since this is where the majority of the absorption of nutrients take place.

Without proper zinc activity, new DNA cannot be produced and replication of healthy epithelial cells would be affected hindering the repair of the surface of the villi reducing their ability to absorb nutrients. If this were not corrected, overtime malnutrition of the entire body would result.

For those people who are suffering form various digestive disorders such as crohns, colitis, celiac, diarrhea, poor absorption, and inflammation, it would be prudent to avoid exposure to chlorine as much as possible. That would mean either purchasing chlorine-free drinking water, or using water filters for drinking water, shower and bath tub. More about this will be mentioned at the end of the article.

Zinc and Vitamin D

Vitamin D is considered a hormone, since the body can produce it when the skin is exposed to sunlight, and a vitamin. Scientists have found that vitamin D is needed not only to promote absorption of calcium from the small intestine for bone formation, but also works with the immune system to keep it functioning normally and regulates the health and activity of 20 different tissues including the brain and cell growth.

The body can obtain vitamin D, also known as cholecalciferol, by sunlight hitting the skin which turns 7-dihydroxycholesterol into cholecalciferol, from the food we eat, and from vitamin D supplements, preferably D_3, the natural form.

Vitamin D Must Be Converted Into the Biologically Active Forms for Use

Once D_3, cholecalciferol, is available to the body, it must be converted into the more potent bioactive forms, 25-dihydroxycholesterol and 1,25-dihydroxycholesterol, also known as calcitriol for it to be useful to the body. Cholecalciferol first goes to the liver where an enzyme converts it into 25-dihydroxycholesterol. Then 25-dihydroxycholesterol goes to the kidneys where another enzyme is needed to convert it to 1,25-dihydroxycholesterol, or calcitriol.

Zinc Required for Enzymes to Produce the Bioactive Forms of Vitamin D

As mentioned earlier, enzymes are needed for the activation of the thousands of processes within the human body - in this case vitamin D. Minerals are required for the production and activation of these enzymes. To produce and activate the enzymes to convert vitamin D into the bioactive forms, minerals such as magnesium, boron, manganese, and *zinc* are required.

Zinc Inhibition by Alloxan from Chlorine Reduces Vitamin D Activity

If the minerals required for the conversion process are low, and/or zinc is inhibited by alloxan from chlorine, the body cannot produce the enzymes required to convert the natural form of D_3, cholecalciferol into the more potent and biologically active forms. This reduces and prevents the ability to absorb calcium from the small intestine, to maintain a healthy immune system, and regulate the health of the other twenty tissues such as the brain, breasts, prostate and cell growth.

Low Vitamin D Intake and Conversion Contribute to Health Problems

Low vitamin D_3 intake and conversion into the biologically active forms will contribute to bone loss and possible alteration in the immune system causing it to attack the body, producing inflammation and weakening the bones. Also, research has discovered that it can contribute to diabetes and autoimmune diseases such as lupus, rheumatoid arthritis, and multiple sclerosis.

Zinc, Vitamin A and Eye Health

Vitamin A in the body is stored in the liver. In order for vitamin A to be used, it has to be transported to the various locations throughout the body such as the retina which contains one of the highest

concentrations of zinc in the body. Zinc is required to make the transport protein to move vitamin A from the liver to the retina. The alloxan from chlorine would interfere with zinc's activity preventing the use of vitamin A and contributing to problems of the eye and any other areas of the body that require vitamin A.

Chlorine and Friendly Bacteria (Probiotics)

We have about four pounds of bacteria living in the digestive tract and is considered to be an organ. In a healthy bowel about 85% of it should be good and 15% bad bacteria. This is referred to as symbiosis because of the healthy beneficial relationship between the bacteria and our body. The two primary strains of bacteria are bifidus and acidophilus. From these two, the body develops other friendly strains with their own particular benefits. Please note the benefits of the two strains of friendly bacteria below:

Benefits of Bifidobacteria

1. Protects the integrity of the intestinal lining by preventing the growth of pathogenic bacteria and yeasts.
2. Maintains a healthy acid pH balance in the intestine which prevents disease-producing microbes from gaining a foothold.
3. Reduces the negative effects of antibiotics.
4. Strengthens infants' immune system and helps them grow.
5. Protects against bowel cancer by preventing the growth of bacteria that produce nitrates, cancer producing chemicals.
6. Reduces the toxic load of the liver by inhibiting the production and absorption of toxins by disease-causing bacteria.
7. Manufactures B vitamins such as B-12 and Folate.
8. Assists in the regulation of peristalsis - muscle movement of the intestines - for healthy bowel elimination.
9. Helps in the prevention and treatment of antibiotic-induced diarrhea.

Benefits of Lactobacillus acidophilus

1. Prevents the overgrowth of disease-producing microbes such as *Candida, E. Coli, H. Pylori, and Salmonella.*
2. Helps in the prevention and treatment of antibiotic-induced diarrhea.
3. Improves the absorption of nutrients.
4. Maintains the integrity of the intestinal wall protecting against the absorption of antigens such as toxins, bacteria, and undigested food particles which could produce an antigenic response. An antigenic response is when the immune system produces antibodies called immunoglobulins in response to the presence of antigens in the blood. These antigens can also trigger other physiologic responses such as inflammation which, if left unchecked, can progress slowly and subclinically. This means the individual is not manifesting the characteristic clinical symptoms and adversely affecting the health of the intestines, including the digestion and absorption of food.
5. Reduces the stress due to food poisoning.

6. Maintains an acid pH in the intestines which creates a hostile environment inhibiting the growth of pathogens - agents that causes disease - especially a living microorganism such as a bacterium or fungus, and yeasts.

Chlorine's Contribution to the Destruction of the Friendly Bacteria

There are many things that disrupt and destroy the friendly bacteria such as processed foods - sugars, sodas, various drugs from your physician, over the counter medications such as Tylenol and Aspirin, low fiber, antibiotics obtained from your physician and food, alcohol, smoking, stress, and backed up rotting food in the intestines. Now add the toxic chemical chlorine and you have a bad situation made even worse. The friendly bacteria are destroyed and reduced down to 15% or lower and the bad bacteria now become 85% or more. This is referred to as dysbiosis because of the unhealthy relationship between the bacteria and the body.

With the majority of the bacteria being in a dysbiotic or bad state, there is reduced digestion and absorption of nutrients from our food and the unhealthy growth of bad bacteria, germs, microbes, and other harmful pathogens. The immune system will be weakened, as 50% to 70% of it is located in the small intestine.

The surface of the bowel wall becomes impaired and in many cases damaged, resulting in what is called leaky-gut syndrome where undigested food and other matter not normally permitted into the bloodstream enters and creates allergic and inflammatory reactions when the immune system becomes activated.

As the harmful pathogens grow in number and travel into the blood stream through the now weakened intestinal wall, the overburdened liver cannot eliminate them and the immune system, due to its weakened state, cannot fend them off. As a result, the individual's health becomes impaired and the immune system can become altered and begin attacking the body instead of defending it. This can result in increased inflammation of the muscles, tendons, ligaments, and connective tissue.

Excessive and long term inflammation can affect the joints contributing to stiffness and pain, increase the risk of osteoarthritis, and could possibly induce auto immune diseases such as lupus and rheumatoid arthritis. The cardiovascular system will be affected as well, increasing the risk of heart attack and stroke. In fact, physicians now perform a blood test for C-reactive protein which indicates the level of inflammation of the cardiovascular system. Higher C-reactive protein levels increase the risk of heart attack and stroke up to three times higher.

Parasites

Finally, rarely considered is the possibility of parasites. A parasite is an organism that obtains its food, nutrition, and shelter by living in or on another organism. People can be a host to over one hundred different types of parasites. Most parasites are destroyed and eliminated with a healthy digestive and immune system. Once the integrity of the bowel and immune system is impaired by an unhealthy diet, drugs, lifestyle and chlorine exposure this all changes and parasites can now make their home inside of the body contributing to poor health in many ways.

Chlorine, Asthma, Allergies and Bowel Problems

Many people in the United States suffer from asthma, allergies and bowel, problems. In many of these cases the cause cannot be found. In 1934 Dr. M. J. Gutmann of Jerusalem found an article in the *Journal of Allergy* in which chlorinated water was found to be the cause of asthma and functional colitis.

When chlorinated water was completely taken away and patients were given distilled water, within 3 days both disorders went away and did not reappear. When the physician added a small drop of sodium hypochloride in the distilled drinking water, the colitis and asthma returned.

Dr. Guttman also relates that he had other patients who were affected with hives by even the smallest amounts of chlorine. A 28 year old woman who suffered with hives from childhood experimented with various diets in order to locate the offending food. When she tried the recommendation to change her

drinking water, the hives disappeared within a few days. However, when she tried drinking chlorinated water again, the hives would return.

Another Case of Hives

Another case of chlorinated induced hives was reported by Dr. Gutmann from an article he read in the November 1944 issue of the *Journal of Allergy*. An English officer had a case of giant hives. In testing over forty different foods no sensitivity or cause was found for the allergic reaction and no indications of bacteria that would cause the allergy.

When the English officer, stationed in Jerusalem was transferred to other duty stations where he drank non-chlorinated mineral water, his hives disappeared. Otherwise his diet and lifestyle remained the same. When he was transferred back to the duty station in Jerusalem and drank the chlorinated water, the hives returned immediately.

Chlorine Destroys Essential Fatty Acids (EFAs)

Omega-3, and 6, known as essential fatty acids because the body cannot produce them, are required to maintain the health of the entire body. Some areas include:

- Cardiovascular, reproductive, immune, and nervous systems.
- The manufacture and repair of cell membranes enable the cells to obtain optimum nutrition and expel harmful waste products.
- Production of prostaglandins that regulate body functions such as heart rate, blood pressure, blood clotting, fertility, and conception. Prostaglandins play a role in immune function by regulating inflammation and encouraging the body to fight infection.
- Proper growth in children, particularly neural development and maturation of sensory systems, with male children having higher needs than females. Fetuses and breast-fed infants also require an adequate supply of EFAs through the mother's dietary intake.
- The polyunsaturated omega-3 fatty acids, EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) found in cold water fish are essential for maintaining our health in the following areas: DHA helps forming neural transmitters, such as phosphatidylserine, important for brain function, and is found in the retina of the eye, indicating a role in its function. They support a healthy cardiovascular and nervous system, cell function, control inflammation, and support joint health and function when converted into hormone-like compounds called prostaglandins that regulate their activity. DHA is needed for the fetus, the infant, and as we age as it is highly involved in the brain. As we age our body produces less EPA and DHA, which may contribute to poor mental focus and cognitive function, and may improve brain abnormalities such as Alzheimer's disease, and other forms of dementia when taken as a supplement or consumed from foods which naturally contain them such as fish and other sea foods. These two omega-3 fatty acids also help prevent the skin from drying and flaking, cushion organs and tissues, insulate the body against heat loss, and are used as an energy source.

Most people in the United States are deficient in essential fatty acids and have an imbalance because of eating too many processed fats and oils, free radical damage destroying the good fats because of inadequate antioxidant protection, and an unbalanced omega 6 to 3 ratio.

Another way that our essential fatty acids are destroyed is by chlorine. This occurs when chlorine destroys many of the antioxidants such as vitamins E and A which are needed to protect these fats from oxidizing. These essential fats are also destroyed when chlorine mixes with surface water and creates a compound called hypochlorite which produces excess free radicals that oxidize them and turns them rancid. This was demonstrated by an industrialist chemist J. P. Bercz in 1992.

Deficient and oxidized essential fatty acids and imbalances can contribute to accelerated aging, excessive weight gain, high cholesterol levels with unhealthy ratios of HDL (high-density lipoprotein) and LDL (low-density lipoprotein) and serious health problems such as excessive systemic inflammation, high blood pressure, stroke, heart attack, cancer, diabetes, multiple sclerosis, asthma,

lupus, postpartum depression, obesity, arthritis, immune system dysfunction, liver dysfunction, Alzheimer's Disease, ADHD, autism, schizophrenia, depression, bone loss, osteoarthritis, rheumatoid arthritis, and various digestive disorders such as leaky gut syndrome, crohn's disease, and inflammatory bowel disease.

Chlorine, Halides and the Thyroid
Chlorine belongs to a group of chemicals called halides. Other halides include fluorine or calcium and sodium fluoride in drinking water and dental products, and bromides found in disinfectants, pesticides, sodas, and dough conditioners for bread.

Iodine - A Beneficial Halide
Another halide which is beneficial to our health is organic iodine, iodine being the smallest of these halides. Iodine is required by the thyroid along with the amino acid L-tyrosine to produce a thyroid hormone called thyroxin. Almost every tissue in the human body is directly or indirectly affected by this hormone. When chlorine, and other halides such as sodium fluoride are taken into the body, being smaller in size than iodine, they will displace the iodine in the thyroid resulting in poor thyroid function and thyroxin production.

Without sufficient thyroxin the whole body will be affected such as the heart, nervous system, metabolism, and body temperature regulation. Health problems that can result due to thyroxine disruption are low energy, poor sleep patterns, slower metabolism with weight gain, edema or water retention, hormone imbalances, and poor bone remodeling contributing to osteoporosis.

Chlorine and Iron
Iron is the nucleus of each blood cell. Chlorine affects iron negatively as an oxidizing agent essentially threatening the healthy structure of blood. The book, Water Fit to Drink by Carol Keough, cites studies done by the University of Michigan linking chlorinated water to anemia, a condition where red blood cells are not providing adequate oxygen to body tissues.

Chlorine Destroys Vitamin E
Note what Dr. Richard Kunin said happens to vitamin E when subjected to chlorine, in his book, Mega-Nutrition published by New American Library, "Even in the minute quantities sufficient to kill germs, chlorine can undermine the body's defenses against atherosclerosis. Chlorine creates electrically charged molecules called free radicals, which can combine with alpha tocopherol (vitamin E) and eliminate it from your system. In addition, free radicals can directly damage the [lining] of blood vessels and so create the environment for the formation of plaque."

Vitamin E is an important antioxidant that protects us from excess free radicals that could damage our cells such as the ones in the heart and blood vessel walls helping to prevent cardiovascular disease and tumor formation. Insufficient amounts of vitamin E can contribute to poor heart muscle function and weakened and constricted blood vessels in turn contributing to elevated blood pressure and heart disease.

Chlorine Destroys Vitamins A, B-Complex, C and Amino Acid Tryptophan
In the book edited by J. I. Rodale and staff, Prevention Method for Better Health, 1968, the editor mentions on page 383 that he read an article at that time from a German magazine on the subject of chlorine and its ability to destroy, or reduce not only vitamin E, but also the vitamins A, B, C, and the amino acid tryptophan.

Importance of A, C, and E
Vitamins A, C, and E are antioxidants. They work together to support a healthy immune system, teeth, bones, joints, skin, eyes, lungs, DNA, and cardiovascular system preventing the oxidizing of cholesterol and other blood fats preventing plaque buildup on the blood vessel walls. Vitamin C is needed to insure the healthy turn-over of collagen throughout the body, including the cardiovascular system, bones, cartilage, tendons, ligaments, muscles, organs, and glands, because it is required as an enzyme cofactor for prolyl hydroxylase and lysyl hydroxylase to convert the amino acids L-lysine and L-proline into the hydroxy forms, hyroxylysine and hydroxyproline. This is especially crucial in maintaining the health of the covering on the blood vessel walls called the endothelium which reduces the friction of blood flow, and the actual muscle cells that make up the blood vessels. If proper

collagen levels are not maintained, the blood vessels can become stiff and inflexible increasing blood pressure. There is also a greater risk of internal bleeding from the blood vessels. Also, since collagen is likened to glue that holds our body together, any disruption in its turnover will weaken its entire structure.

The Importance of B Vitamins

The B-vitamins act as coenzymes for the activation of many other enzymes for the multiple complex chemical interactions, healthy gastrointestinal tract, the breakdown and utilization of carbohydrates, fats, and proteins, nervous system function, healthy blood sugar levels, brain function, energy production, skin, hair, liver, eyes, amino acid utilization, and DNA activation and function.

Chlorine, B-6, B-12, Folates, Homocysteine and Heart Disease

One of the major factors in maintaining the strength, flexibility, and health of the lining of the blood vessel walls, called the endothelium, and the muscle cells of the blood vessels is collagen. If this collagen becomes broken down and never gets replaced, the endothelium and the walls of the blood vessels essentially become damaged. One of the things that can damage the blood vessels is an amino acid called homocysteine.

Homocysteine production is a normal part of digestion when foods are eaten containing the amino acid methionine. In a healthy person with sufficient amounts of B-6, folates such as tetrahydrolfolate, folinic acid, and 5-methyltetrahydrofolate, and B-12 this is not a problem because these B-vitamins are used by the body to convert it into cystine, cysteine, and methionine, all harmless amino acids. However, if they are not available, the homocysteine can become overly elevated in the blood with the ability to breakdown the collagen damaging the lining of the blood vessels and the muscle cells of the blood vessel walls producing lesions, or small tears.

In an effort to repair these lesions several mechanisms in the body are set in motion: (1) The liver begins producing more cholesterol, reducing the good HDL (which carries cholesterol out of the circulatory system to the liver) and elevates the lipoproteins LDL and VLDL (which carries the cholesterol from the liver out to the circulatory system), and other lipoproteins such as Type (a) to go to the sites of damage and plug up, or cover over the lesion (2) the body activates the clotting system sending blood platelets and fibrinogen (protein nets) to the affected areas to cover over, or plug up as well (3) the muscle cells in the blood vessel wall where the damage has occurred begin to grow abnormally large.

All of this contributes to narrowing of the arteries as the plaque builds up and the muscle cells expand cutting blood flow to the heart and other affected areas eventually leading to a heart attack or stroke if left unchecked.

Homocysteine and Bone Loss

Homocysteine also contributes to osteoporosis or bone loss by interfering with the body's collagen cross-linking which causes a defective bone matrix. As a result, the normal bone-building process is severely diminished weakening the bone tissue.

Chlorine, B-6, Niacin, Zinc and Tryptophan

Tryptophan is an essential amino acid which is a precursor to a neurotransmitter in the brain called serotonin. Serotonin is also a platelet clotting factor and neurohormone found in the organs throughout the body. Two of the B-vitamins, B-6 and niacin along with the mineral zinc and other nutrients are needed to convert tryptophan into serotonin.

Serotonin's production can be inhibited by chlorine's interference of tryptophan, B-6, niacin, and zinc which can contribute to abnormal sleep patterns, insomnia, poor brain function, mental retardation, depression, suicide, schizophrenia, aggressive behavior, poor clotting, compulsive eating leading to excessive weight gain, anorexia, deficiency of growth hormone and possibly the hormone prolactin, required for healthy mammary development and milk production.

Lack of Vitamin E and Joint Problems

The body produces a specialized proteoglycan called hyaluronic acid which is required to produce a thick lubricating fluid called synovial fluid. If the level of the hyaluronic acid drops the synovial fluid will lose its viscosity, or lubricating ability, allowing too much friction during movement eventually wearing out the cartilage to the point of bone on bone and making the joint stiff and painful to move.

The enzyme hyaluronidase breaks down hyaluronic acid reducing the viscosity, or lubricating qualities of the synovial fluid. It also has the ability to destroy the synoival fluid and to send the decomposed fluid to the lymphatic system causing the joints to swell.

Adequate levels of the antioxidant vitamin E prevent the excessive production of this hyaluronidase enzyme. When chlorine enters the body it destroys vitamin E allowing the hyaluronidase to accumulate excessively destroying hyaluronic acid and the synoival fluid, resulting in the swelling and inflammation of the joints. If this situation is not corrected it would eventually lead to arthritis and destruction of the cartilage.

Chlorine - A "Crippler and Killer"

While we can't blame every disease or health problem on chlorine, we can however, say that chlorine's long history of use certainly is a major contributor allowing it to be called a "crippler and killer". As its history reveals, its use started as well intentioned and was the technology of its time saving many lives from cholera, typhoid, and other infectious and deadly diseases. But that was over 150 years ago. This is now the 21st century and the majority of water treatment plants in the United States continue to use technology from the 19th century.

Others Recognize Chlorine's Deadly Nature

There are some cities that recognize chlorine is a toxic poison and use safer means to disinfect water. For example, ozone was used to purify water in Europe in 1906. The first water treatment plant to use ozone was in Nice, France which now has over 600 plants. But because chlorine gas was used as a weapon during the two World Wars in Europe, and recognizing its deadly nature, many more communities there do not use chlorine, but instead use ozone (oxygen) and ultraviolet light to kill harmful microorganisms. Throughout Europe there are now 3,000 facilities using ozone. One of the largest water treatment plants in the world using ozone is located in Sylmar, Los Angeles. Another method used for purifying water is a sand filtration system such as the one in Holland.

Ozone Treatment of Water More Economical

Switching to ozone for water purification would be more economical as Andover, Massachusetts discovered. In 1996 Andover found three ways that it saved them money: (1) it cost only $83.00 per million gallons to purify the water which is two-thirds of what it use to cost, (2) it used less electricity and, (3) it saved $64,000.00 in chemicals costs.

Reducing and Eliminating Chlorine from Your Life

Until the time comes, if ever, when every major city removes chemicals such as chlorine and sodium fluoride from the drinking water, people will have to take responsibility and remove it themselves. Many people have begun to this do this already by either purchasing chlorine-free water or by using a filter on their tap. However, there are other areas of chlorine exposure.

Showers and Baths

Studies done on chlorine exposure have revealed that up to two-thirds of it comes from showering and taking a bath. That means that we absorb more chlorine when showering or bathing than if we drank eight glasses of chlorinated water a day. That's because when we take a shower or bath, we breathe chlorine gas called chloroform which goes not only into the lungs, but also directly into the blood stream, as we absorb the chlorinated water into the pores of our skin that have been opened by the hot water.

Comments from Others On the Toxic Effects of Chlorine

"Volatile organics can evaporate from water in a shower or bath." from: Is Your Water Safe to Drink? Consumer Reports"

"Taking long hot showers is a health risk, according to research presented last week in Anaheim, California, at a meeting of the American Chemical Society. Showers – and to a lesser extent baths – lead to a greater exposure to toxic chemicals contained in water supplies than does drinking the water. The chemicals evaporate out of the water and are inhaled. They can also spread through the house and be inhaled by others. House holders can receive 6 to 100 times more of the chemical by breathing the air around showers and bath than they would by drinking the water."

NEW SCIENTIST 18 September 1986
Ian Anderson

“Studies indicate the suspect chemicals can also be inhaled and absorbed through the skin during showering and bathing.” “Ironically, even the Chlorine widely used to disinfect water produces Carcinogenic traces.” “Though 7 out of 10 Americans drink chlorinated water, its safety over the long term is uncertain.” “Drinking chlorinated water may as much as double the risk of the Bladder Cancer, which strikes 40,000 people a year.”

U.S. NEWS & WORLD REPORT – July 29 1991
Is Your Water Safe – The Dangerous State of Your Water

“A long, hot shower can be dangerous. The toxic chemicals are inhaled in high concentrations.”

BOTTOM LINE - August 87
Dr. John Andelman, Ph.D.

“Showering is suspected as the primary cause of elevated levels of chloroform in nearly every home because of the chlorine in the water.”

ENVIRONMENTAL PROTECTION AGENCY
Dr. Lance Wallace

“A professor of Water Chemistry at the University of Pittsburgh claims that exposure to vaporized chemicals in the water supplies through showering, bathing, and inhalation is 100 times greater than through drinking the water.”

“As chlorine is added to kill pathogenic microorganisms, the highly reactive chlorine combines with fatty acids and carbon fragments to form a variety of toxic compounds, which comprise about 30% of the chlorination by-products.”

“During the mid-1970s monitoring efforts began to identify widespread toxic contamination of the nation’s drinking water supplies, epidemiological studies began to suggest a link between ingestion of toxic chemicals in the water and elevated cancer mortality risks. Since those studies were completed a variety of additional studies have strengthened the statistical connection between consumption of toxins in water and elevated cancer risks. Moreover, this basic concern has been heightened by other research discoveries.”

THE NADER REPORT – TROUBLED WATERS ON TAP
Center For Study of Responsive Law

“The National Academy of Sciences estimate that 200 – 1000 people die in the United States each year from cancers caused by ingesting the contaminants in water. The major health threat posed by these pollutants is far more likely to be from their inhalation as air pollutants. The reason that emissions are high is that because water droplets dispersed by the shower head have a larger surface-to-value ratio than water streaming into the bath.”

SCIENCE NEWS, VOL. 130
Janet Raloff

"Avoiding contact with chlorinated water is of the utmost importance. This includes bathing water and drinking water. Chlorine kills bacteria, friendly and unfriendly, in the intestines. it can be absorbed through the skin. I recommend installing a shower filter to remove Chlorine." -from: Patient, Heal Thyself Jordan S. Rubin, N.MD., PhD.

“Chlorine is used almost universally in the treatment of public drinking water because of its toxic effect on harmful bacteria and other waterborne, disease-causing organisms. But there is a growing body of scientific evidence that shows that chlorine in drinking water may actually pose greater long-term dangers than those for which it was used to eliminate. These effects of chlorine may result from either ingestion or absorption through the skin. Scientific studies have linked chlorine and chlorination by-products to cancer of the bladder, liver, stomach, rectum, and colon, as well as heart disease, arteriosclerosis (hardening of the arteries), anemia, high blood pressure, and allergic reactions. There is also evidence that shows that chlorine can destroy protein in our body and cause adverse effects on skin and hair. The presence of chlorine in water may also contribute to the formation of chloramines in the water, which can cause taste and odor problems.”

“Since chlorine is required by public health regulation to be present in all public drinking water supplies, it is up to the individual to remove it at the point-of-use in the home.”

KEMYSTS LABORATORY
Dr. Riddle, Ph.D.

“Cancer risk among people drinking chlorinated water is 93% higher than among those whose water does not contain chlorine.”

U.S. COUNCIL OF ENVIRONMENTAL QUALITY

“Drinking tap water that is chlorinated is hazardous, if not deadly to your health.”

HEALTHY WATER FOR A LONGER LIFE
Dr. Martin Fox

“Chlorine gas was despicable used during WWI. When the war was over, the use of chlorine was diverted to poisoning germs in our drinking water. All water supplies throughout the country were chlorinated. The combination of chlorine (when in drinking water) and animal fats results in arteriosclerosis, heart attacks, and death.”

WATER CAN UNDERMINE YOUR HEALTH
Dr. N.W. Walker, D.S.

“Chlorine is the greatest crippler and killer of modern times. While it prevented epidemics of one disease, it was creating another. Two decades ago, after the start of chlorinating our drinking water in 1904. The present epidemic of heart trouble, cancer and senility began.”

SAGINAW HOSPITAL
Dr. J.M. Price, MD.

Asthma and Bronchitis Has Increased Dramatically
In the last twenty years asthma and bronchitis have increased 300%, especially in children. Researchers feel this is due to breathing chlorine gas, or chloroform. Note what Dr. Lance Wallace of the United States Environmental Protection Agency said about this, “ Showering is suspected as the primary cause of elevated levels of chloroform in nearly every home because of chlorine in the water.”

Chlorine and Dishwashers
When chlorine containing detergent is added to the dishwasher it blends with organic food matter creating various harmful chlorine compounds that get vented into the air we breathe. A dishwater can vent 5 to 7 quarts of air per minute of operation. To reduce this hazard either wash dishes by hand in a sink which has a filter, and if you do not have filtered water you can wear rubber gloves, or use chlorine-free automatic dishwashing gel by Seventh Generation. If you cannot find the gel in your area

their toll free number is 1-800-456-1191. Their web address is www.seventhgeneration.com.

Chlorine and Swimming Pools
Researchers found that the chlorine in the pool reacts to the organic matter of the human body such as sweat, urine, blood, feces, mucus, and skin cells producing toxic chlorine by-products called chloramines. Chloroform exposure is 70 to 240 times higher in the air over indoor pools than outdoor pools. One hour of swimming in a pool with chlorine showed chloroform concentrations in the swimmers' blood ranging from 100 to 1,093 parts per billion.

Chlorine and the Skin and Hair
Chlorine robs the skin and hair of moisture making it less elastic as it breaks down the protein structures that keep them healthy, strong, and flexible. Over time, the appearance would become less youthful and healthy looking.

The Truth About Beauty
Note this statement from Kat James, The Truth About Beauty, "at least 70% of the skin's blemish- and wrinkle fighting hydration comes from the water we consume. If you haven't done so already, switching from chlorinated tap water-the water you shower in- to reliably pure water will be perhaps the most important health and beauty lifestyle upgrade you will ever make." About dry skin, she points out. "Chlorinated water can contribute to dry skin. Installing a shower filter can make an unbelievable difference."

Premium Shower and Water Filters
For those who interested in a shower filter to remove chlorine from their water I recommend the *Premium Shower Filter* by *New Wave Enviro Products*. I have been using this filter for about 17 years and it works extremely well. And if you are looking for a water filter to remove chlorine from the water you use to drink and cook with they also have one called the Premium 10-Stage Filter that uses the same KDF® technology as the shower filter.

How Does the Premium Shower Filter Work?
A patented mixture of zinc and copper called KDF-55, plus crystal Quartz, converts chlorine into zinc chloride. Zinc is considered to be helpful in alleviating dandruff and is used in anti-dandruff shampoos. Unlike carbon, KDF® stands up to hot water and is very effective in filtering out chlorine, odors and dirt particles. KDF® possesses strong bacteriostatic character, inhibiting the growth of bacteria, fungus, algae and mildew. The Premium Shower Filter contains 14 oz. of KDF® and 2 oz. of crystal Quartz for enhanced performance.

Proven Effectiveness and Safety of KDF® Technology
The book, Don't Drink the Water published in 1996, by Lono Kahuna Kupua A'O, pages 65 and 66, state this about KDF® technology. "Independent laboratory tests confirm user experience that KDF® is one of the best tools for improving drinking and bathing water naturally and economically. Compared to carbon-only units, KDF® lasts far longer, doesn't permit bacterial growth, and removes a much wider range of inorganic matter (e.g. heavy metals). Compared to reverse-osmosis, KDF® is less expensive, wastes no water, does not require membrane replacement, works in most water temperatures, and removes chlorine. Compared to ultraviolet lights, KDF® works in turbid water, doesn't require bulb replacement or electricity, and takes out inorganics. Compared to ozone, KDF® lasts longer than 17 seconds for a continued residual bacteriostatic effect in water, does not require electricity, and costs less. Compared to water softeners, KDF® reduces hard scale and helps to condition water without the need for brine tanks, or salt replacement. It is also less expensive to install and operate."

"In 1992, the EPA ruled that KDF® qualifies as a mechanical device which filters water and imparts nothing harmful to the water. Later that year, the National Sanitation Foundation tested the media and found it to be in compliance with its Standard 61, which certifies that the media imparts nothing harmful to the filtered water."

If you cannot locate a Premium Shower Filter, or a Premium 10-Stage Filter, with the KDF® technology in your area I have them available on my site at www.livewellnaturally.com.

Summary

Besides learning to eat healthy, exercise regularly, and improve our overall lifestyle, we also need to remove and prevent toxic chemicals like chlorine from our drinking water, the shower and bath, dishwasher, swimming pools, and even food such as bleached flour.

We have already examined the consequences to the body when we allow chlorine to interfere with the way it functions. What good does it do to spend money on supplements, eat organic foods, and try to live the best healthy lifestyle possible if we allow chlorine to destroy our vitamins, minerals, enzymes, essential fatty acids, amino acids, proteins, DNA, skin, hair, and the trillions of cells that make up our body?

And, while it's true we cannot entirely prevent ourselves from growing old and eventually dying, we can take better care of ourselves so we can age more gracefully and enjoy better health and live our lives without the debilitating diseases common to many.

So, whether you are suffering from a health problem or you enjoy a fairly good level of health and vitality, the removal of chlorine would certainly improve your quality of life.

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