

CHLORINE AND YOUR SHOWER

“Sprite Industries, the only true specialists in shower filters, once again led the field with new shower filter configurations... Sprite uses a patented filtration media called KDF Chlorgon that performs well under high water temperature and pH conditions.”

[WATER CONDITIONING & PURIFICATION- March 2001](#)

“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 skin. Scientific studies have linked chlorine and chlorination by-products to cancer of the bladder, liver, stomach, rectum, and colon, as well heart disease and 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 regulations 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. The best available method of chlorine removal, for the individual consumer is found in the Shower Master Shower Filter Unit. The Shower Master Shower Filter Unit is of great value to those who are concerned about the adverse health effects of exposure to chlorine due to absorption through the skin or by inhalation. The Shower Master Shower Filter will provide superior protection from chlorine, when used in accordance with the Manufacturer’s recommended operating procedures.”

[KEMYSTS LABORATORY - Dr. Riddle Ph.D.](#)

“In June 1988 the US National Cancer Institute released the results of an intensive 10,000 - person study, which showed that people who drink chlorinated water for long periods of time have twice the incidence of bladder cancer as those who don’t drink chlorinated water. A new American invention, the Shower-Master (by Sprite), filters out chlorine by-products.”

[ON THE WATER FRONT: MAKING YOUR WATER SAFE TO DRINK](#)

“Conservative calculations indicate that taking a shower exposes you to the equivalent of consuming an additional two liters of chlorinated water each day. Inhalation and skin absorption of chloroform and chlorine by-products is greatest in the shower, where these gases are vaporized.”

[THE WATER YOU DRINK: HOW SAFE IS IT?](#)

“While the purity of our drinking water is of primary importance, contaminants and chlorine byproducts also enter our bodies through the skin via the water in which we bathe. Also, our lungs absorb toxic fumes from the gaseous chlorine byproducts that are released in a steamy shower. Chlorine in shower water can strip protein from our hair and skin causing dry, irritated eyes, itchy skin, and dandruff.”

[WATER: THE ULTIMATE CURE](#)

“The total inhalation exposure (summation of the three scenarios; shower, pre- and post-cooking activities and cooking) was found to be comparable with that for direct ingestion, indicating that inhalation is an important pathway for THM exposure from drinking water.”

[SCI TOTAL ENVIRON-Jan 31, 2000](#)

“The use of chlorine for water treatment to reduce the risk of infectious disease may account for a substantial portion of the cancer risk associated with drinking water.”

[ENVIRON HEALTH PERSPECT- Nov. 1995](#)

“Strong relationships were identified between the THM breath concentrations collected after a shower and both the THM water concentration and the THM exposure from a shower...”

[ENVIRON HEALTH PERSPECT- Feb. 1999](#)

Exposures to chlorination by-products (CBP) within public water supplies are multi-route in water. Cold water is primarily used for ingestion while a mixture of cold water and hot water is used for showering, bathing others, dish washing, etc. These later two activities result in **inhalation and dermal exposure**. The overall THM exposures calculated using the THM concentration in heated water were 50% higher than those calculated using the THM concentration present in cold water.”

[RISK ANAL- Feb. 1994](#)

“Especially for volatile organic micro-pollutants, exposure routes from drinking water other than ingestion must be taken into account (**inhalation and percutaneous uptake**).”

[FOOD CHEMISTRY](#)

“Individuals are exposed to volatile compounds present in tap water by **ingestion, inhalation and dermal absorption**.”

[ENVIRON HEALTH PERSPECT- Jan. 1996](#)

“As a result, **entry by inhalation route is as important as entry by ingestion route** when conducting exposure analyses of contamination from volatile organic compounds such as TCE.”

[TOXICAL IND HEALTH- Mar-April 1996](#)

“Although ingestion is commonly considered to be the primary source of exposure to chloroform from tap water, **inhalation and skin absorption exposure concentrations were found to be even higher**.”

[SCI TOTAL ENVIRON- 11 Jul. 1998](#)

“However, other exposure routes, such as **dermal absorption and inhalation, may be important components of an individual’s total exposure** to drinking water disinfection by-products.” “The results from this study indicate that household activities such as **bathing and showering are important routes for human exposure** to THMs.”

[EXOP ANAL ENVIRON EPIDEMIOL- Jul-Aug. 2000](#)

“Recently, **showers have been suspected to be an important source of indoor exposure** to volatile organic compounds (VOC).” “Since estimates of chloroform risk from domestic water use for the three **exposure routes—ingestion, inhalation and dermal**—are similar, all routes must be used to calculate the total risk when making policy decisions regarding the quality of the municipal water supply.”

[RISK ANAL-Dec 1990](#)

“A new statistical analysis indicates that people who drink chlorinated water run a **21 percent greater risk of bladder cancer** and a **38 percent greater risk of rectal cancer** than people who drink water with little or no chlorine.” “I am quite convinced, based on this study, that there is an **association between cancer and chlorinated water**.”

[SCIENCE NEWS- 11 July 1992](#)

“People who regularly drink **water containing chlorine have been found to have a higher risk of bladder cancer** by some researchers.”

[PREVENTION- Aug. 1994](#)

“It’s time for government and industry to act on the knowledge that **chlorine is a profound threat to human health**” says Coling, “and the evidence has shown that the time to start is now.”

[CHEMICAL WEEK- 21 Dec. 1994](#)

“**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 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](#)

“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](#)

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

[BOTTOM LINE- August 15 1987](#)

“On one hand, chlorination has freed civilization from the constant dangers of waterborne epidemics. On the other hand in the mid -70s scientists discovered that chlorination could create carcinogens in water. 80% of the population drinks chlorinated water. There was a higher incidence of cancer of the esophagus, rectum, breast and larynx and of Hodgkin’s Disease among those drinking chlorinated surface waters. Volatile organics 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 just as much by inhalation during a shower as be drinking 2 liters of water a day. People who shower frequently could be exposed through ingestion, inhalation and/or dermal absorption.”

[IS YOUR WATER SAFE TO DRINK?](#)

“Skin absorption of contaminant has been underestimated and ingestion may not constitute the sole or even primary route of exposure.”

[AMERICAN JOURNAL OF PUBLIC HEALTH, Vol. 74-1984](#)

“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](#)

“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 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.”

“Epidemiological studies suggest a link between ingestion of toxic chemicals in the water and elevated cancer mortality risks.”

[THE NADER REPORT - TROUBLED WATERS ON TAP](#)

“The National Academy of Sciences estimate that 200 to 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](#)

“The cause of arteriosclerosis and resulting heart attaches and strokes in none other than the ubiquitous chlorine in our drinking water.”

[CORONARIES / CHOLESTEROL / CHLORINE](#)

"In the vast majority of cases where germ-free water is required whether for public supply, or in the swimming pool, the process of disinfection will involve the use of chlorine in one form or another."

CHEMISTRY AND CONTROL OF MODERN CHLORINATION

"Chlorine gas was despicably used during WW1. When the war was over, the use of chlorine was diverted to poisoning germs in our drinking water. The combination of chlorine (when in drinking water) and animals fats results in arteriosclerosis, heart attacks, and death."

WATER CAN UNDERMINE YOUR HEALTH

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

SAGINAW HOSPITAL- Joseph Price, MD

"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 LONG LIFE

"Known carcinogens are found in drinking water as a direct consequence of the practice of chlorination. A long established public health practice for the disinfection of drinking water."

MUNICIPAL ENVIRONMENTAL RESEARCH LABORATORY

BIBLIOGRAPHY

1. Martin, D., *Creative Marketing*. Water Conditioning & Purification, 2001 March: 16-18.
2. Riddle, D.V., *Evaluation of the Sprite RSF shower filter for chlorine removal characteristics*. 1997 June.
3. Archer, John. *On the Water Front: Making your Water Safe to Drink*. Pure Water Press, 1991.
4. Archer, Jonn. *The Water you drink: How Safe is it?* Pure Water Press, 1996.
5. Meyerowitz, Steve. *Water: The Ultimate Cure*. Book Publishing Company, 2000.
6. Lin T.F. & Hoang S.W., "Inhalation exposure to THMs from drinking water in south Taiwan". *Sci Total Environ*, 2000 Jan 31; 246(1).
7. Morris, R.D. "Drinking water and cancer". *Environ Health Perspect*, 1995 Nov; 103.
8. Weisel, C.P., Kim, H., Haltmeier, P. & Klotz, J.B., "Exposure estimates to disinfection by-products of chlorinated drinking water". *Environ Health Perspect*, 1999 Feb; 107(2): 103-10.
9. Weisel, C.P. & Chen, W.J., "Exposure to chlorination by-products from hot water uses". *Risk Anal*, 1994 Feb; 14(1): 101-6.
10. Van Dijk-Looijaard, A.M. & Van Genderen, J., "Levels of exposure from drinking water". *Food Chem Toxicol*, 2000; 38(1): S37-42.
11. Weisel, C.P. & Jo, W.K., "Ingestion, inhalation and dermal exposures to chloroform and trichloroethene from tap water". *Environ Health Perspect* 1996 Jan; 104(1): 48-51.
12. Maslia, M.L., Aral, M.M., Williams, R.C., et al., "Use of computational models to reconstruct and predict trichloroethylene exposure". *Toxicol Ind Health*, 1996 Mar-April; 12(2): 139-52.
13. Kuo, H.W., Chiang, T.F., Lo, I.I., et al. "Estimates of cancer risks from chloroform exposure during showering in Taiwan". *Sci Total Environ*, 1998 Jul 11; 218(1):1-7.
14. Backer, L.C., Ashley, D.L., Bonin, M.A., et al. "Household exposures to drinking water disinfection by-products: whole blood trihalomethane levels". *Exp Anal Environ Epidemiol*, 2000 Jul-Aug; 10(4): 321-6.
15. Nieuwenhuijsen, M.J., Toledano, M.B., Elliott, P., "Uptake of chlorination disinfection by-products; a review and a discussion of its implications for exposure assessment in epidemiological studies". *J Expo Anal Environ Epidemiol*, 2000 Nov-Dec; 10(6 Pt 1): 586.
16. Jo, W.K., Weisel, C.P., Liou, P.J., "Chloroform exposure and the health risk associated with multiple uses of chlorinated tap water". *Risk Anal*, 1990 Dec; 10(4): 581-5.
17. Fackelmann, K., "Hints of a chlorine-cancer connection". *Science News*, 1992 July 11, 142(2): 23.
18. Munson, M., Yueykal, T.A., Smith, S.C., "Clean-water acts: filter down bladder-cancer risk". *Prevention*, 1994 Aug; 46(8): 30.
19. Lucas, A., "Health studies raise more questions in chlorine dispute; but PVC markets remain unscathed". *Chemical Week*, 1994 Dec. 21; 155(24): 26.
20. Anderson, I., "Showers pose a risk to health", *New Scientist*, 1986 Aug. 18.

21. 21. Carpenter, et. all, "Is your water safe?", *U.S. News & World Report*, 1991 July 29:48-55.
22. 22. Andelman, J., "Did you know that...a long hot shower", *Bottom Line*, 1987 Aug. 15.
23. 23. Gabler, R., *Is your water safe to drink?*, Consumer Reports Book, 1987.
24. 24. Brown, H., "The role of skin absorption as a route of exposure for volatile organic compounds (VOCs) in drinking water", *Amer Jour Pub Health*, 1984 May; 74.
25. 25. Wallace, L., Environmental Protection Agency.
26. 26. Duff, Conacher and Assoc. "The Nader Report-Troubled waters on tap", 1988 Jan. Center for Study of Responsive Law.
27. 27. Raloff, J., *Toxic showers and baths*, Science News; 130:190
28. 28. Price, J. M., "Coronaries/Cholesterol/Chlorine", Jove Book, Alta Enterprises, 1969.
29. 29. Walker, N.W., "Water can undermine your health", Norwalk Press, 1974.
30. 30. Andelman, J., *Non-injection exposure to chemicals in potable water*, working paper 84-03, University of Pittsburg, 1984
31. 31. Ashton, J. & Laura, R., *Nature and Health, Water*, 1988.
32. 32. McKone, T.E., *Human exposure to volatile organic compounds in household tap water: the inhalation pathway*, 1987, *Enviro. Sci. Technology*; 21(12): 1194-1201.
33. 33. Donsbach, D.C., "Water-Safe to drink? Safe to bathe in?", P.H., 1989.
34. 34. Scully, *Proteins in natural waters and their relation to the formation of chlorinated organics during water disinfection*, 1988, *Environ. Sci. Technol*; 22(5): 537-542.
35. 35. Carlo, G.L., *Cancer incidence and trihalomethane concentrations in a public drinking water system*, 1984, *Am J of Public Health*; 74(5): 479-484.
36. 36. Berenson, G.S. & Burch, G.E., *Studies of diffusion of water through dead human skin: The effect of different environmental states and of chemical alterations of the epidermis*, 1951, *Am J of Tropical Medicine*; 31:842-853.
37. 37. Maiback, H.J., *Regional variation in percutaneous penetration in man: Pesticides*, 1971; 23:209.
38. 38. Mololtsy, A., *Studies of epidermal water barrier, part 2: investigation of the chemical nature of the water barrier*, 1968, *J of Invest. Derm*; 50:19-20.
39. 39. Smith, V.L., *Temporal Variations in trihalomethane content of drinking water*, 1987, *Environ Sci & Tech*; 14(2): 190-196.
40. 40. Cotruvo, J.A., *THMs in drinking water*, 1981, *Environ Sci & Tech*; 15(3): 268-274.
41. 41. Dyke, K.V., *Volatile synthetic organic chemicals (VOCs)*, 1990, *Water Tech*; 13(4): 38.
42. 42. Carpenter, Hedges, Crabbe, Reilly & Bounds, *Is your water safe?* 1991, July 29:48-55.