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The Debate Over Water Fluoridation

Adding fluoride to drinking water is an issue that has generated much discussion and controversy for decades. Most doctors, dentists, and health professionals have come to agree that it is a safe, effective, and inexpensive way to improve the dental health of communities. However, a smaller but determined group of medical researchers, journalists, and concerned citizens have mounted a steady resistance to this practice. Their claims against water fluoridation range from problems of the central nervous system to higher incidences of hip fractures in the elderly. The words are strong from both sides: The Centers for Disease Control and Prevention in the United States has called water fluoridation one of the ten major public health achievements of the 20th century, while pharmacologist Dr. Arvid Carlsson, 2000 Nobel Prize Laureate for Medicine, says that nations who practice it “should feel ashamed of themselves.” The aim of this report is to sort out these views and facilitate understanding of the controversy behind water fluoridation.

Many respectable organizations support water fluoridation (hereinafter referred to as simply “fluoridation”), including the World Health Organization, the American Dental Association, the British Dental Association, the National Institute of Dental and Craniofacial Research, as well as many others. Their mass of evidence shows again and again that

people in fluoridated communities have lower levels of dental caries (tooth decay). The small amounts of fluoride put in water wash over teeth and strengthen the protective enamel, as well as destroy the enzymes of cavity-producing bacteria.

In July 2004, United States Surgeon General Richard H. Carmona cited an economic analysis that estimates that for every \$1 spent on fluoridation, an average \$38 or more is saved in treatment costs. Another benefit is that fluoridation breaks through social and economic barriers; almost no one is left out because almost everyone consumes tap water in some capacity. That the poor and the rich benefit equally is not something easily said about most medical advances. And the support is not limited to giant Western medical associations. A study of 13,480 Brazilian schoolchildren by the State University of Campinas in Piracicaba, Brazil showed that children in non-fluoridated areas had higher percentages of dental caries.

Despite this, fluoridation has had opponents from the start. Even as far back as 1937 a Danish scientist named Kaj Eli Roholm published “Fluorine Intoxication”, which detailed fluoride poisoning and argued against giving fluoride to children. Many proponents of fluoridation give the impression that the debate is over, and that the issue was resolved years ago. However, a cursory glance through the opposition literature shows that this is far from the truth. The battle is on at all levels—scientific, academic, political, and cultural.

Opponents start with the basic findings of lower rates of dental caries in fluoridated communities. In October, 2005 Time magazine reported that 17 out of 21 Western European countries refuse to fluoridate their water, and that their recent decline in dental caries is “as sharp as that in the U.S.” The magazine also mentioned a 2001 Centers for Disease Control and Prevention study that “found that by the time they were 12, kids in fluoridated communities averaged only 1.4 fewer cavities than those in non-fluoridated areas.” The British government in 2000 reported that fluoridated water might result in a 15% reduction in cavities. (Early advocates promised a roughly 65% reduction.) Opponents say that improved nutrition, better dental

hygiene, and the use of antibiotics are doing most of the work.

The primary source of conflict, however, comes from studies considering the role of fluoridation in bone cancer, behavioral problems, Down Syndrome, and more, some of which have either shown positive associations or have been inconclusive—either way, not something to be taken lightly. Whether these findings are true demands further investigation, but proponents continue to say that the issue has already been settled.

Possible conflicts of interest, suppression of scientific findings, and political maneuverings are also in the mix. When digging deeper into the history of fluoridation, one finds a wealth of shady figures and alliances that prompt further questioning. As a scientist for the US Army’s Manhattan Project, Harold Carpenter Hodge supervised experiments in which hospital patients were unknowingly injected with uranium and plutonium. Hodge became the leading scientific promoter of fluoridation during the Cold War. Edward L. Bernays, famous for his campaign on behalf of tobacco companies to persuade women to smoke, was an early promoter of fluoridation and a consultant for the National Institute of Dental Research. Robert A. Kehoe was the leading defender of the safety of adding lead to gasoline (now banned); he later defended fluoride in lawsuits brought against industries and corporations including U.S. Steel. On the other side of the fence, William J. Marcus, a senior toxicologist in the EPA’s Office of Drinking Water, was fired in the early nineties after protesting that the results of studies involving cancer and fluoride were systematically downgraded. He was later reinstated by a federal judge, who ruled that he had been fired because of his scientific opinions on fluoride.

There is also something inherently suspect about the fact that much of the fluoride added to water is bought from the pollution scrubbers of the phosphate fertilizer industry in Florida. It’s an industrial waste product, and it is cheaper for industry to dispose of it by selling it to municipalities than to abide by the usual industrial waste disposal methods. But the fertilizer industry isn’t the only industry in the game, for the Aluminum Company of America, DuPont,

and other corporations have grappled with lawsuits relating to fluoride pollution. The Federal Security Administrator of the Truman administration, Oscar R. Ewing, endorsed water fluoridation for the United States. He was also a lawyer for the Aluminum Company of America. What's going on?

Less entangling and more basic issues of morality are also at stake. Not surprisingly, the range of statements on morality is wide. Proponents argue that our oral health is essential to our overall health, and if we have the power to reduce dental caries on a grand scale, we would be remiss not to do so. Pro-fluoridation senator Hubert H. Humphrey said in 1962, "The moral test of government and all of society is how we treat those who are at the dawn of life, the children...". Opponents give those words a new meaning when citing the fact that the Environmental Protection Agency allows 4 parts per million of fluoride in drinking water, while the National Academy of Sciences' Food and Nutrition Board states that the safe level for infants under six months of age is 0.7 parts per million.

Philosopher Dr. Howard Cohen and professor of dentistry Dr. David Locker, both from the University of Toronto, frame it in a slightly different way. They argue that because the science behind fluoridation is debated, and since it is virtually impossible for individuals to opt out of consuming fluoridated community water, fluoridation is a morally questionable act. Many parts of Europe are thinking along similar lines:

Luxembourg: "Fluoride has never been added to the public water supplies in Luxembourg. In our views, the drinking water isn't the suitable way for medicinal treatment and that people needing an addition of fluoride can decide by their own to use the most appropriate way, like the intake of fluoride tablets, to cover their [daily] needs." - Jean-Marie RIES, Head, Water Department, Administration de l'Environnement, May 3, 2000

France: "Fluoride chemicals are not included in the list [of 'chemicals for drinking water treatment']. This is due to ethical as well as medical considerations." - Louis Sanchez, Directeur de la Protection de l'Environnement, August 25, 2000

Belgium: "This water treatment has never been of use in Belgium and will never be (we hope so) in the future. The main reason for that is the fundamental position of the drinking water sector that it is not its task to deliver medicinal treatment to people. This is the sole responsibility of health services." - Chr. Legros, Directeur, Belgaqua, Brussels, Belgium, February 28, 2000

Finland: "We do not favor or recommend fluoridation of drinking water. There are better ways of providing the fluoride our teeth need." - Paavo Poteri, Acting Managing Director, Helsinki Water, Finland, February 7, 2000

Those more certain of fluoridation's allegedly harmful effects put it in stronger terms: "How many cavities would have to be saved to justify the death of one man from osteosarcoma [bone cancer]?" asked Dr. John Colquhoun, former chief dental officer of Auckland, New Zealand.

Some communities across the country share these concerns, for while the majority of US cities are fluoridated, many have recently voted against it. The Fluoride Action Network website lists over 70 North American cities that have done so since 1990. The following cities have struck down fluoridation measures since April 2005: Neosho, MO; Hood River, OR; Homer, NY; Mono County, CA; Tooele, UT; Xenia, OH; Springfield, OH; as well one Canadian city, Golden, BC. The vote has become so close and heated in some places that National Public Radio covered the Bellingham, WA vote in November 2005.

The issue is moving more into the general public eye. In September 2005 the Associated Press reported that unions from the Environmental Protection Agency representing 7,000 workers have called for a moratorium on fluoridation. Newsmagazines such as Time are featuring articles on the debate. The website of the Fluoride Action Network, the main

hub for anti-fluoridation activists, disseminates literature and conducts interviews from broad sources, attracting visitors and references from around the world. The homepage of the National Center for Fluoridation, a pro-fluoridation organization, features statements from surgeon generals, state health departments, and dental associations. A major publisher recently released a 358-page book (111 pages of which are endnotes and references) called *The Fluoride Deception* in which journalist Christopher Bryson details alleged collaborations and cover-ups between industries and the National Institute of Dental Research.

It is safe to say that the jury is still out on the effects of fluoridation. This harkens back to the point made by the philosopher and the dental professor: as long the jury is out, and citizens do not have a reasonable way to avoid it, adding fluoride to the public water supply just might be a morally questionable act. This issue demands honest discussion and new, solid, and unbiased science. If we get to that point, perhaps we will be able to reach a resolution that will benefit all parties involved.

References

- Bebermeyer, R. D. Water fluoridation and Down's syndrome evidence inconclusive. *Evidence-Based Dentistry* 2004, 5.2, 39.
- Bryson, C. *The Fluoride Deception*; Seven Stories Press: New York, NY, 2004; p. xix
- Bryson, C. *The Fluoride Deception*; Seven Stories Press: New York, NY, 2004; p. xxiii
- Ibid, p. xiv
- Ibid, p. xxiii
- Ibid, p. xxiv
- Ibid, p. xxii
- Carmona, Richard H. Statement on Water Fluoridation. <http://www.nidcr.nih.gov/HealthInformation/DiseasesAndConditions/Fluoride/WaterFluoridation.htm> (accessed December 9, 2005), from the website of the National Institute of Dental and Craniofacial Research. <http://www.nidcr.nih.gov/> (accessed December 9, 2005).
- Cohen, H.; Locker, D. The Science and Ethics of Water Fluoridation. *The Journal of Canadian Dental Association* 2001, 67.10, 578-580
- Communities which have Rejected Fluoridation Since 1990. <http://www.fluoridealert.org/communities.htm> (accessed December 9, 2005), from the Fluoride Action Network. <http://www.fluorideaction.net> (accessed December 9, 2005).
- Environmental Working Group: Fluoride and Bone Cancer in Boys. <http://www.ewg.org/issues/fluoride/20050606/index.php> (accessed December 9, 2005) from the "Fast Facts" sidebar.
- National Center for Fluoridation. <http://www.fluoridationcenter.org/> (accessed December 9, 2005).
- Roosevelt, Margot. Not in My Water Supply. *Time*, October 24, 2005, pp 62-63.
- Statements from European Health, Water, & Environment Authorities on Water Fluoridation. <http://www.fluorideaction.net/govt-statements.htm> (accessed December 9, 2005), from the Fluoride Action Network. <http://www.fluorideaction.net> (accessed December 9, 2005).
- Tagliaferro, E. P. S.; Cypriano, S.; Sousa, M. L. R. de; Wada, R. S. Caries experience among schoolchildren in relation to community fluoridation status and town size. *Acta Odontologica Scandinavica* 2004, 62.3, 124-128.
- The Polemics of Fluoridation. *Nation*, February 4, 1961, pp 98-100.
- Treasure, E.T.; Chestnutt, I.G.; Whiting, P.; McDonagh, M.; Wilson, P.; Kleijnen, J. The York Review - A systematic review of public water fluoridation: a commentary. *British Dental Journal* 2002, 192.9, 495-498.
- Water Fluoridation "Obsolete" According to Nobel Prize Scientist. <http://www.fluorideaction.net/carlsson-interview.html> (accessed December 9, 2005), from the Fluoride Action Network. <http://www.fluorideaction.net> (accessed December 9, 2005).