June 26, 2008

Ida Bediou
Legislative Assistant
City of Hamilton
77 James Street North
Hamilton, ON
L8R 2K3

Re: Fluoridation of the Drinking Water of the City of Hamilton

Dear Ida,

I would like to request that this letter and the enclosed supporting documentation be submitted to the Board of Health meeting on July 9th 2008.

I have been a resident of Waterdown since 1991. I have lived my whole life in Ontario.

Everyday there are new advances in our health system. At times there is confirmation of past practices as being good for our health and continued. There are also cases where the evidence proves that the past practices should be changed. The fluoridation of our drinking water is a current practice that needs to change. This is in no way a criticism of past practices, but with new knowledge and supporting documentation, a practice that needs to be stopped.

In the attached documents I would like to specifically point out the following.

- The City of Kingston has recently stopped fluoridation of the drinking water for their City. Also, this was supported by the Canadian Armed Forces. The Armed Forces has a number of personnel stationed in Kingston at a number of facilities. It was my honour to serve in the Military and to attend the Royal Military College. I know that the health and well being of all the personnel of the Armed Forces is a major priority. I personally know a large number of the Senior Officers and there is no question of this priority. If there was any issue with the need to continue the fluoridation of the drinking water, the Armed Forces would have strongly supported that position.
- The cost to maintain and operate the fluoridation system should be considered. There is a substantial amount of money and resources used for this system. The efforts of the people working in staff and operational positions used for this system could be directed to other
needed activities. The money expended for fluoridation could be used in other much needed programs.

- Consideration should be given to the health and safety of the workers that maintain the equipment and that handle this material for the City of Hamilton. This issue extends to and impacts these people.
- The health issues documented in the attached information needs to be considered. There is a clear danger in this practice that affects us all.

Again, this is not a criticism of past practices. However, with this new information, the new practices that are being implemented in other communities such as Kingston, the time for the City of Hamilton to act and to take a leadership position for its citizens is now.

Thank you for your time and consideration of this material. I would also like to thank the Board of Health for their time and consideration.

Sincerely,

Craig Wood P.Eng.

Enclosure
Residents in the east end of Kingston should soon be drinking water from their taps that is free of fluoride.

For years, CFB Kingston required the chemical additive to its water supply. Utilities Kingston added fluoride to the water that it supplied to the base and to the rest of Pittsburgh district.

The base has signalled to the city that it can do without fluoride. That piece of information comes about a week before city councillors were to debate a proposal that, if passed, could have led the city to remove fluoride from the water.

Deputy Mayor Rob Matheson said the city needed to look at stopping the practice because of the cost to do so and the potential health problems associated with fluoridated water.

Recent studies have linked fluoride in drinking water to some diseases, including cancer.

"Those new scientific concerns [drive] me," Matheson said. "The only reason we're still doing it is [because of] antiquated regulations from CFB Kingston."

Utilities Kingston adds fluoride to the drinking water at the James Street booster station in Barriefield. It doesn't do so at any other drinking water plants or booster stations in the rest of the city.

The fluoride goes into the system to create a "fluoride residual" for the base. The Department of National Defence requires fluoride in the water for the base to help prevent tooth decay, according to the Utilities Kingston website.

However, the base has told the city that it no longer requires fluoride because there are other sources for the dental chemical. As well, more than 80 per cent of workers at the base live in the community, meaning they don't all drink fluoridated water.

Utilities Kingston president Jim Keech said the addition of fluoride to the water in the east end isn't a major strain for Utilities Kingston.

"It's a bit of a maintenance issue," he said.

Adding fluoride into drinking water has recently returned to the mainstream of public debate. Scientific data and media reports have linked fluoride in water to impaired thyroid function, reduced intelligence in children and possibly the onset of osteosarcoma in teenage boys.

Osteosarcoma is the rare form of bone cancer that killed Terry Fox. Opponents say that the health risks outweigh the potential benefits. Fluoride, opponents argue, is better absorbed through brushing with a toothpaste and not through drinking water.
Proponents of the practise say that the introduction of fluoride has caused a sharp decrease in the development of cavities in children. They argue it is a safe practice that should be sustained.

jpress@thewhig.com

Personal Note:

Interesting news from CFB Kingston. Army bases were previously required to fluoridate. The majority of Kingston has not been fluoridated for years. The mayor for a long time was John Garrettsen, currently MPP and Minister of the Environment for Ontario. I believe he was born in the Netherlands (unfluoridated) and he is a lawyer.
WATER FLUORIDATION COSTS

WHAT ARE WE PUTTING INTO OUR DRINKING WATER?

The fluorosilicates Hydrofluorosilicic acid and Sodium Silicofluoride used in more than 90% of fluoridation systems in North America, are derived from the smoke stack scrubbers of the phosphate mining/manufacturing industries. Because of their origins, these products are known to contain arsenic, lead, mercury, cadmium, barium, radionuclides, etc.

1. "Hydrofluorosilicic acid is classified as a dangerous good" and a "class 8 corrosive substance" according to a recent report from Health Canada. A class 8 corrosive substance causes visible necrosis of skin or corrodes steel or non-clad aluminum. http://www.rcmp-learning.org/copp/encopp/p_danger.htm#10

2. Hydrofluorosilicic acid, arsenic and lead are all toxic substances according to the Canadian Environmental Protection Act (CEPA).

3. According to the US EPA they are Class 1 Hazardous Waste products.

HAZARDOUS WASTE IMPORTS


The countries (e.g. China, USA) and companies (e.g. Lucier, Cargill in Florida, USA) which produce this substance are removing contaminants from the air and selling it to municipalities to put into their drinking water. Instead of paying for disposal of these toxic substances/dangerous goods, the companies in Florida and China which import these toxic substances to Canada are permitted to sell them to municipalities to put into our drinking water, hence source water.

"In regard to the use of fluosilicic acid as a source of fluoride for fluoridation, this agency regards such use as an ideal environmental solution to a long-standing problem. By recovering by-product fluosilicic acid from fertilizer manufacturing, water and air pollution are minimized." letter from Rebecca Hamner 1983 EPA

"If this stuff gets out into the air, it's a pollutant; if it gets into the river, it's a pollutant; if it gets into the lake, it's a pollutant; but if it goes right straight into your drinking water system, it's not a pollutant. That's amazing!" Dr. Hirzy 2000 Senior Vice-President of EPA Headquarters Union. http://www.fluoridealert.org/phosphate/overview.htm
Is this “an ideal environmental solution” to pollution?

MAINTENANCE COSTS OF WATER FLUORIDATION SYSTEMS

“[hydrofluorosilicic acid] is difficult to handle and the handling costs can only be offset by the volume discount in large water treatment plants.” Urbansky ET, Schock MR. 2000 Can fluoridation affect lead(II) in potable water? hexafluorosilicate and fluoride equilibria in aqueous solution. 57(5): 597-637.

Maintenance includes purchase of the raw chemical, manpower required in the operation and preventive maintenance of existing infrastructures, power costs for chemical feed pumps. According to the Chief Dental Officer for Health Canada, Dr. Peter Cooney, it is about $3/person/year (2004 Red Lake Council Minutes).

The cost for power (kW) for the chemical feed pumps to inject the F into the treated water is estimated by Peter Van Caulart, director of the Environmental Training Institute, Ontario, to be $350/yr/pump. (500W * 24h / 1000W/kWh * 365 d/yr * $0.08/kWh = $350.40/yr).

Sample Maintenance Costs:

population 100,000 = $300,000/year
population 500,000 = $1,500,000/year
population 1 million = $3 million /year
population 2.5 million = $7.5 million/year
population 5 million = $15 million/year

CAPITAL COSTS/UPGRADES OF WATER FLUORIDATION SYSTEM

“The cost of installing fluoridation addition equipment for a community water system varies from approximately $5 to $20 per person, depending on a number of factors http://www.cdc.gov/fluoridation/engineering/faqs.htm

Sample Capital Costs:

population 100,000 = $500,000 - $2 million
population 500,000 = $2,500,000 - $10 million
population 1 million = $5 million - $20 million
population 2.5 million = $12.5 million - $50 million
population 5 million = $25 million - $100 million
WATER DISTRIBUTION INFRASTRUCTURE

Fluorosilicates shorten the lifetime of water distribution infrastructure. Fluoride is the most corrosive of all known elements. (Merck Index) Fluorosilicates cause the following problems:

2. leach lead from lead pipes and lead solder - cast iron (CI), ductile iron (DI) piping
3. antagonists to the Asbestos Cement pipe matrix used in transmission water mains, hastening decay of this important infrastructure. (IAOMT p24)
4. corrode stainless steel, nickel. (Class 8 corrosive substance - Transport Canada)
5. makes water more acidic, creating need for neutralizing agents such as lime to increase pH.

Quicklime is calcium oxide (CaO) and is made by heating limestone. It's the cheapest form of lime. To use quicklime it must be slaked by adding water and allowing the insolubles to precipitate, leaving the limewater to be used for water treatment coagulation, softening or raising pH. The slaking process is labour intensive and dirty. Quicklime must be stored in sealed silo hoppers, onsite. It's a cheap ingredient that requires a high capital cost for storage and slaking equipment, plus an ongoing operational labour cost to run the system. Beachville Lime is a supplier of lime products from Tillsonburg, Ontario. http://www.carmeusena.com/Markets/faqs.asp?indid=4#3

Liquid Sodium hydroxide NaOH may also be used to raise pH. It is simple to use, feed directly to pump, easier to store, but it is 5x higher price. It is used in small communities because they do not have the human resources to deal with lime sludge/limewater separation.

Average prices for high-calcium quicklime and high-calcium hydrated lime, f.o.b. plant, in Ontario, in bulk, were quoted at $70.80/t and $80.40/t respectively at the end of 2000. (Vagt)

New San Diego stainless steel HFSA vat destroyed within weeks of installation “After waiting four years to complete billions of dollars of improvements at five water treatment plants, the Metropolitan Water District had expected to start fluoridating in October.”...“Metropolitan spokesman Bob Muir said Wednesday the latest delay came after the agency's staff discovered the galvanized steel it planned to use could corrode if it came in contact with the fluorosilicic acid that will fluoridate supplies.” (Conaughton 2007) Obviously these individuals did not realize that hydrofluorosilicic acid is a class 8 corrosive substance.
Fluorosilicates and Lead

Direct additive: Lead is the second most common contaminant found in the silicofluoride products.

Indirect additive: Lead is now known to leach from lead pipes, lead solder and leaded brass because of the chemical action of fluorosilicates.

An increase in blood lead levels is demonstrated with fluorosilicates (Maas et al 2007, Coplan et al 2007, Masters et al 1999, 2000)

Increases lead levels in teeth increases the risk for caries (Moss et al, 1999).

992 Tacoma, Washington had to shut down the fluoridation equipment due to the fact that fluoride had eaten the pipes. The municipal water had approximately 32 parts per billion (ppb) lead at the time of the breakdown. After the breakdown, the lead level dropped to 17 ppb. When the equipment was fixed, the lead level shot back up to 32 ppb. The city fathers decided to discontinue the use of fluoride, and the lead level again dropped. Over the next several years the lead level continued to drop, and today it is about 5 ppb. IAOMT p24-25

Thurmont, Maryland had an identical experience with fluoride raising lead levels in their municipal water system. IAOMT p25

HEALTH CARE

Hydrofluorosilicic acid is extremely toxic and corrosive. See website of Brenntag Canada Inc. HFSA Safety Precautions

The cost of fluoridation accidents?

Hooper Bay, Alaska - May 1992:

- overfeed resulting in ONE DEATH!
- 260 poisoned; one airlifted to hospital in critical condition.
- "poor equipment, lack of a qualified operator”.
- widow is suing the Yukon-Kuskokwim Health Corporation for $3 million

Kodiak, Alaska (Old Harbor) May 1993:

- overfeed (xxx ppm decreasing to 24 ppm until it was noticed) residents were warned by phone and public radio of problems.
- fluoridation equipment appeared to be operating normally;
- Fluoride only tested monthly
Pharmaceutical grade fluoride is also toxic. DO NOT SWALLOW.

FDA-mandated warning on toothpaste in USA: "Drug Facts. Do not swallow. If more than used for brushing (a pea size) is accidentally swallowed, get medical help or contact a poison control center right away."

Health Canada monograph mandated for 2009: "If more than used for brushing is accidentally swallowed, get medical help or contact a Poison Control Centre right away".

Health Canada: “Children under six years of age should be supervised while brushing, and children under the age of three should have their teeth brushed by an adult without using any toothpaste.” Fluorides and Human Health 2005

Health Canada: “Never give fluoridated mouthwash or mouth rinses to children under six years of age, as they may swallow it.” Fluorides and Human Health 2005

Ont Min Health: “Use non-fluoridated toothpaste or no toothpaste for young children.” letter to MOH 2000

ADA: “parents should not use fluoride toothpaste for children less than two years of age.” Nov 6, 2005

US Public Health Service letter: “Children under two years of age do not have control of their swallowing reflex and do not have the skills to expectorate [spit] toothpaste properly.” Melinda Plaisier Dec 21, 2000

A pea size amount of fluoridated toothpaste contains about 0.25 mg of fluoride. One glass of fluoridated water (1/3 liter) contains the same amount of fluoride. We are told not to ingest the fluoridated toothpaste. We are told to ingest the fluoridated water.

Toothpaste uses pharmaceutical grade fluoride. Water fluoridation uses an industrial grade which may be significantly more toxic (see Simonin in Waldbott et al 1978, Westendorf 1975, Machalinski 2003).

NRC 2006 p 87: “for typical individuals, the single most important contributor to fluoride exposures (~60%) is fluoridated water and other beverages and foods prepared or manufactured with fluoridated water”

According to Health Canada, prescribing controlled doses under the care of a doctor is no longer recommended but the uncontrolled use of it in our drinking water is promoted.

"Health Canada does not recommend the use of fluoride supplements (drops or tablets). This guideline is consistent with recommendations made by Health Canada’s First Nations and Inuit Health Branch (FNIHB) and the Canadian Association of Public Health Dentistry (CAPHD). " http://www.hc-sc.gc.ca/iyh-vsy/environ/fluor_e.html
Guidelines For Canadian Drinking Water Quality Fluoride Supporting Documentation:

"Although Health Canada classified fluoride as an essential element in the past, it now recommends that fluoride requirements can 'only be based on the beneficial effect on dental caries' and notes that 'attempts to demonstrate its essentiality for growth and reproduction in experimental animals have not been successful.'

A Pea-sized amount of fluoridated toothpaste contains the same amount of fluoride as a glass of water

Don't Swallow!  Swallow!

0.25mg Pharmaceutical Grade Fluoride  0.25mg Industrial Grade Fluoride

INCREASED DENTAL COSTS

Flouridation of water, "has contributed to the birth of a multi-billion dollar industry of tooth bleaching and cosmetic dentistry. More money is being spent now on the treatment of dental fluorosis than what would be spent on dental decay if water flouridation were halted." Dr. Hardy Limeback, DDS, PhD, Head of Preventive Dentistry, University of Toronto

“As Cosmetic Dentists we enjoy the financial benefits of treating flouridation's damage. If children on fluoridation had a reduction in decay, the benefits might outweigh the risks. No Dentist disagrees with the risks of flouridation and the tremendous cosmetic costs, coverage born for retreatment by Dental Insurance.” And “Dental Health Care costs are going up in fluoridated communities due to no improvements in dental cavities, rapid increases in dental fluorosis, and increased fragility of fluorosed teeth.” Dr. Bill Osmunson, DDS, MPH, (http://www.skagitcleanwater.com/Fluoridatio_concern_%20Brief_%20Outline.pdf)
Water fluoridation accounts for the Majority of Fluoride Exposure therefore
Water fluoridation is the single most important cause of Dental Fluorosis

"The major dietary source of fluoride for most people in the United States is fluoridated municipal (community) drinking water, including water consumed directly, food and beverages prepared at home or in restaurants from municipal drinking water, and commercial beverages and processed foods originating from fluoridated municipalities." US National Research Council Report on Fluorides in Drinking Water 2006 p24
http://www.nap.edu/catalog/11571.html

Artificial Fluoridation Concentrations in the USA and Canada are virtually identical

- US PHS recommended guideline for water fluoridation: 0.7ppm – 1.2ppm
- Health Canada recommended guideline for water fluoridation: 0.9 – 1.0ppm

The recommended guidelines between the US and Canada are virtually identical.

**DENTAL FLUOROSIS CLASSIFICATION BY H.T. DEAN - 1942.**

CLASSIFICATION CRITERIA

**Normal:** The enamel represents the usual translucent semivitriform type of structure. The surface is smooth, glossy, and usually of a pale creamy white color.

**Very Mild:** Small, opaque, paper white areas scattered irregularly over the tooth but not involving as much as 25 percent of the tooth surface. Frequently included in this classification are teeth showing no more than about 1-2 mm of white opacity at the tip of the summit of the cups of the bicuspid's or second molars.

**Mild:** The white opaque areas in the enamel of the teeth are more extensive but do not involve as much as 50 percent of the tooth.

**Moderate:** All enamel surfaces of the teeth are affected, and the surfaces subject to attrition show wear. Brown stain is frequently a disfiguring feature.

**Severe:** All enamel surfaces are affected and hypoplasia is so marked that the general form of the tooth may be affected. The major diagnostic sign of this classification is discrete or confluent pitting. Brown stains are widespread and teeth often present a corroded-like appearance.

**NOTE:** No fluorosis assessment is made for deciduous teeth, permanent teeth not in full eruption, or teeth in which more than one-half of the visible surface is obscured by a restoration, caries, or an orthodontic appliance. These tooth spaces will be excluded.
Moderate/Severe fluorosis (NRC 2006 p 79) "In moderate to severe forms of fluorosis, porosity increases and lesions extend toward the inner enamel. After the tooth erupts, its porous areas may flake off, leaving enamel defects where debris and bacteria can be trapped. The opaque areas can become stained yellow to brown, with more severe structural damage possible, primarily in the form of pitting of the tooth surface."

The following figure:


It shows a significant increase in dental fluorosis for 2005 and 2006.

Children's Oral Health Programs in Halton Region, Ontario 2007

It shows a significant increase in dental fluorosis from 2003-2005 (blue) to 2005-2007 (red).
Halton Region Table 4. Dental Fluorosis rates for children aged 5, 7, 9 and 13

<table>
<thead>
<tr>
<th>Age</th>
<th>Mild Fluorosis</th>
<th>Moderate Fluorosis</th>
<th>Severe Fluorosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-2005</td>
<td>8.0%</td>
<td>3.0%</td>
<td></td>
</tr>
<tr>
<td>2005-2007</td>
<td>11.1%</td>
<td>4.7%</td>
<td></td>
</tr>
<tr>
<td>9 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-2005</td>
<td>14.2%</td>
<td>7.8%</td>
<td>0.2%</td>
</tr>
<tr>
<td>2005-2007</td>
<td>25.8%</td>
<td>10.4%</td>
<td></td>
</tr>
<tr>
<td>13 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2003-2005</td>
<td>13.6%</td>
<td>5.3%</td>
<td>0.3%</td>
</tr>
<tr>
<td>2005-2007</td>
<td>22.0%</td>
<td>10.8%</td>
<td></td>
</tr>
</tbody>
</table>

The incidence and severity of dental fluorosis has increased significantly (doubling for 13 year olds) in Halton over a period of 4 years.

Compare what Dr. Nosal (Medical Officer of Health) says about Moderate Fluorosis on page 5 of this report to the actual definition given above: "Moderate fluorosis is defined as patchy white flecks on one-third or more of the tooth surface."

This definition by Dr. Nosal does not reflect any accepted definition of the term “moderate fluorosis”. Is this an attempt to minimize the consequences of this epidemic of dental fluorosis?

Fluorosis is an indication of fluoride toxicity due to fluoride over-exposure. Water fluoridation is the single largest source of fluoride, therefore water fluoridation is the single largest cause of dental fluorosis.

What other organs and tissues are being impacted?
Cavities

Halton Region Table 2. Percentage of children identified with urgent and non-urgent conditions by school year

![Bar chart showing percentage of 13-year-olds with dental decay by municipality and year, with columns labeled for Milton, Oakville, Burlington, and Haln Hills.

<table>
<thead>
<tr>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoridated Burlington</td>
<td>3.7</td>
<td>5.5</td>
<td>5.7</td>
<td>4.6</td>
<td>2.7</td>
<td>2.8</td>
</tr>
<tr>
<td>Fluoridated Halton Hills</td>
<td>4.8</td>
<td>3.9</td>
<td>5.2</td>
<td>7.6</td>
<td>5.0</td>
<td>5.9</td>
</tr>
<tr>
<td>Non-Fluoridated Milton</td>
<td>2.5</td>
<td>3.1</td>
<td>4.4</td>
<td>6.1</td>
<td>5.0</td>
<td>3.7</td>
</tr>
<tr>
<td>Fluoridated Oakville</td>
<td>3.5</td>
<td>3.8</td>
<td>4.1</td>
<td>4.5</td>
<td>2.9</td>
<td>4.3</td>
</tr>
</tbody>
</table>

Percentage of children with cavities in non-fluoridated Milton is lower than fluoridated regions.

Table 6. Mean number of teeth affected by dental decay by age and municipality

<table>
<thead>
<tr>
<th></th>
<th>Age 5</th>
<th>Age 7</th>
<th>Age 9</th>
<th>Age 13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoridated Burlington</td>
<td>1.1</td>
<td>1.6</td>
<td>1.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Fluoridated Halton Hills</td>
<td>1.5</td>
<td>2.4</td>
<td>2.3</td>
<td>1.5</td>
</tr>
<tr>
<td>Non-Fluoridated Milton</td>
<td>0.5</td>
<td>1.5</td>
<td>1.1</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Changes in Dental Fluorosis Following the Cessation of Water Fluoridation in Canada

Studies done in Canada demonstrate that communities in BC which discontinued fluoridation saw a significant decrease in the incidence of dental fluorosis. “When fluoride was removed from the water supply in 1992, the prevalence and severity of TFI [Thylstrup-Fejerskov index] scores decreased significantly…” Clark DC, Shulman JD. Maupome G, Levy SM. 2006 Changes in Dental Fluorosis Following Cessation of Water Fluoridation. Community Dent and Oral Epidemiology Jun;34(3):197-204.

Dr. Christopher Clark, a dentist in the faculty of Dentistry from the University of British Columbia found the incidence of dental fluorosis to be:

- 35 - 60% in fluoridated communities
- 20 - 45% in non-fluoridated communities

Dr. Clark also found that there was an increase in the severity of dental fluorosis in fluoridated communities vs non-fluoridated communities. Clark DC. Trends in prevalence of dental fluorosis in North America. Community Dent Oral Epidemiol 1994 22(3):148-152.

This 2006 Canadian paper reports higher dental fluorosis rates than reported by the 1999 Ontario Ministry of Health Report which cited 25-70% rates of dental fluorosis in fluoridated communities and 12 to 45% in non-fluoridated communities.

Changes in Cavities following the Cessation of Water Fluoridation

PER CAPITA COST OF DENTAL CARE (MORIN 2005)

“Water fluoridation has been introduced in North America with the express purpose of reducing dental decay. An expected consequence of this would be a lowering of per capita dental repair costs. To test this hypothesis, we have examined the progression of per capita dental costs in the United States and attempted to correlate this data with the percentages of population exposed to water fluoridation. The yearly per capita dental costs were corrected for inflation using the group of medical services.
which are used to calculate cost of living increases. The above graph demonstrates the trend observed.

We have noted that in the United States, dental repair costs have progressed more rapidly than medical costs as a whole. There also appears to be a linear relationship between the percentage of the population drinking fluoridated water and the per capita increase in dental repairs, dental repair costs increasing with water fluoridation. The observed results are therefore contrary to expectations. In his book *Fluoride. The Aging Factor* 24, Yiamouyiannis presents data from the United States Public Health Service and the American Dental Association which shows that water fluoridation cannot be expected to decrease dental repair costs."

- **In British Columbia, Canada**, "the prevalence of caries decreased over time in the fluoridation-ended community while remaining unchanged in the fluoridated community," reported in Community Dentistry and Oral Epidemiology. (5)

- **In 1973, the Dutch town of Tiel** stopped fluoridation. Researchers counted drilled, missing, and filled tooth surfaces (DMFS) of Tiel's 15-year olds, then collected identical data from never-fluoridated Culemborg. DMFS initially increased in Tiel then dipped to 11% of baseline from 1968/69 to 1987/88 while never-fluoridated Culemborg's 15-year-olds had 72% less cavities over the same period, reports Caries Research. (2)

- "No increase in caries (cavities) was found in **Kuopio (Finland)** 3 years after the discontinuation of water fluoridation," according to Caries Research (6). In fact, when Kuopio was compared to a similar never fluoridated Finnish town, cavity rates in both towns either remained the same or decreased six years after fluoridation was stopped in Kuopio.

- **Seven years after fluoridation ended in LaSalud, Cuba**, cavities remained low in 6 to 9 year olds, decreased in 10 to 11 year-olds, significantly decreased in 12 to 13 year olds, while caries-free children increased dramatically, reports Caries Research (3).

- **East German scientists report**, "following the cessation of water fluoridation in the cities Chemnitz (formerly Karl-Marx-Stadt) and Plauen, a significant fall in caries prevalence was observed," according to Community Dentistry and Oral Epidemiology (4). Additional surveys in the formerly-fluoridated towns of Spremberg and Zittau found. "Caries levels for the 12-year-olds of both towns significantly decreased... following the cessation of water fluoridation."

- Not only did decay rates remain stable during an 11-month fluoridation break in **Durham, NC, USA** between September, 1990, and August, 1991 but dental fluorosis declined in children born during that period, according to the Journal of Dental Research (1)
• non-fluoridated BC had fewer cavities than fluoridated regions of Canada. “Survey results in British Columbia with only 11% of the population using fluoridated water show lower DMFT [decayed, missing, filled teeth] rates than provinces with 40-70% of the population drinking fluoridated water.” and “school districts recently reporting the highest caries-free rates in the province were totally unfluoridated.” (8) NOTE: less than 4% of British Columbia is now fluoridated.

A recently released government report out of Canada (7) shows similar negative results and offers a reason. Fluoridation was launched in the 1940's when dentists believed fluoride's beneficial effects were achieved internally, through the bloodstream then absorbed inside the teeth. The Canadians report that "this effect is likely to be minor...The evidence for a post-eruptive (topical) effect,... is much stronger."

7. Benefits and Risks of Water Fluoridation -- Reference

Social Costs of Dental Fluorosis

Attempts to minimize the importance of dental fluorosis on the basis that some people want to call it “merely” cosmetic or of “questionable” health concern is not appreciated by those who have dental fluorosis. Those who must deal with the social embarrassment of these fluoride-damaged teeth; those who must pay the costs to repair this damage do not agree.

If someone goes out to your car and takes a key and scratches the hood of your car, right in front where you have to look at it each day when you drive it, but it doesn't stop your car from being able to be driven, and it is only a small segment of the whole car, do you
believe you should have some recourse to collect damages from the person who scratched your car?


"Such changes in the tooth's appearance can affect the child’s self-esteem which makes early prevention that much more critical,” writes Dincer.

Children, aged 2 to 7 years, can swallow about one-quarter milligram of fluoride with every brushing because their swallowing reflexes are not fully developed, reports Dincer.

Children under the age of 6 months should not ingest any fluoride. “Children from the age of 6-months to 3-years should not have more than one-quarter milligram of fluoride per day. Brushing the teeth of a 2-year-old twice a day will expose the child to about one-half milligram, exceeding the allowable [daily] limits” from toothpaste alone, writes Dincer.

Intentionally swallowing the toothpaste which is likely, given the pleasant flavor of children’s toothpaste, increases children’s fluorosis risk, Dincer reports.

“Water and processed beverages (e.g., soft drinks and fruit juices) can provide approximately 75% of a person's fluoride intake,” according to the CDC. http://www.cdc.gov/FLUORIDATION/safety/enamel_fluorosis.htm

“It’s obvious that fluoridation is dosing our children with uncontrollable and undesirable amounts of fluoride,” says attorney Paul Beeber, President, New York State Coalition Opposed to Fluoridation, Inc. “Besides affecting teeth, fluoride can be hazardous to your general health” he says. "Since fluoride is neither a nutrient nor essential for healthy teeth and no child is, or ever was, fluoride deficient, it's time we stop adding fluoride chemicals into water supplies," says Beeber.

**Treatment options: (estimate by Dr. Hardy Limeback, PhD, DDS)**

<table>
<thead>
<tr>
<th>severity</th>
<th>procedure</th>
<th>cost</th>
<th>% children</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very mild and mild</td>
<td>polishing/bleaching</td>
<td>$500</td>
<td>25</td>
</tr>
<tr>
<td>Moderate</td>
<td>microabrasion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe</td>
<td>bleaching</td>
<td>$1000</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>porcelain veneers</td>
<td>$10,000</td>
<td>0.2</td>
</tr>
<tr>
<td></td>
<td>full crowns</td>
<td>$600-$900/tooth</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>lifetime (10-15 years)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Porcelain Veneers for dental fluorosis

Cost: $600-$900/tooth
Lifetime of veneers: 10-15 years
Cost of one-time replacement of 12 veneers: $7,200 - $10,800

"Dental fluorosis has significantly increased and no one disputes the damage fluoride and fluoridation causes to teeth. Two thirds of children show some signs of too much fluoride. Life time costs for repairs can exceed $100,000 per person. Parents often pay about $14,000 for treatment of dental fluorosis with expected 10-15 year longevity." (http://www.skagitcleanwater.com/Fluoridatio_concern_%20Brief_%20Outline.pdf)

"The tooth should not, during clinical and morphological examinations, be considered as only a tooth, but as part of a functional unit, a unit which, in addition to the tooth, includes the supporting tissues such as the Sharpey's fibers, transseptal fibers, gingiva, alveolar bone." Krook L, Maylin GA, Lillie JH, Wallace RS. Dental fluorosis in cattle. Cornell Vet 1983;73:340-62.

Fluoridation of water, "contributed to the of a multi-billion dollar industry of tooth bleaching and cosmetic dentistry. More money is being spent now on the treatment of dental fluorosis than what would be spent on dental decay if water fluoridation were halted." Dr. Hardy Limeback, DDS, PhD. Head of Preventive Dentistry, University of Toronto

"Dental Health Care costs are going up in fluoridated communities due to no improvements in dental cavities, rapid increases in dental fluorosis, and increased fragility of fluorosed teeth." Dr. Bill Osmunson, DDS, MPH

Edentulism

According to a US Centers for Disease Control 2002 report for people over 65 years: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5250a3.htm, Hawaii and California had the lowest rates of water fluoridation in the USA: 8.8% of the population in the state of Hawaii was fluoridated; 27.7% of the population in the state California was fluoridated.

Kentucky had the highest rate of water fluoridation with virtually 100% (99.7%) of the population receiving fluoridated drinking water. In 2003, the American Dental Association awarded Kentucky with a "50 Year Award" for virtually 100% fluoridation for 50 years. (http://www.skagitcleanwater.com/Fluoridatio_concern_%20Brief_%20Outline.pdf)

How did water fluoridation help to protect the population from tooth disease and tooth loss according to this report? The CDC has claimed that community water fluoridation is the most effective method for preserving oral health. If tooth loss is a measurement of
oral tooth health, then one would expect to see lower rates of edentulism in the fluoridated communities.

The results of the survey tell a different story. Generally speaking, when the percentage of fluoridated people in each state increases, so does the percentage of people with six or more missing teeth. There appears to be no life long reduction in dental decay with fluoridation and yet an increase in tooth loss associated with fluoridation. (Osmunson 2006)

More specifically, this 2002 CDC report states, “The prevalence of edentate persons (i.e., those who have lost all their natural teeth) ranged from 13% in Hawaii and California to 42% in Kentucky.” In other words, the highest rates of tooth loss occur in the states with the highest rates of water fluoridation. The lowest rates of tooth loss occur in the states with the lowest rates of water fluoridation.

Based on these numbers from the US CDC, fluoridation does not appear to have helped prevent tooth loss. Fluoridation does not benefit those without teeth. Fluoride is also known to cause gingivitis and periodontitis (see below).

**Poor Quality Epidemiology Studies**

Epidemiology studies of the past 3 decades have shown no significant benefit from water fluoridation. The early epidemiology studies by Dean and Cox have been repeatedly analyzed and shown to be methodologically deficient in many regards. The deficiencies of the early research are discussed in the Ontario Ministry of Health 1999 Review and the York Review 2000 from Great Britain and in Sutton 1959.

The York Review 2000 and the Ontario Ministry of Health 1999 Review also points out the lack of scientific evidence demonstrating that water fluoridation is effective which also demonstrates acceptable levels of scientific rigor in study design and analysis.

The Public Health Service and the Centers for Disease Control are quick to argue that water fluoridation is the “cause” of lower rates of cavities in some communities when compared with others, without examining important variables like nutrition, socio-economic status, breastfeeding and dental hygiene education which are known to influence the rate of cavities.

**Fluoride and Periodontal Disease, Gingivitis:**

“We have found that fluoride, in the concentration range in which it is employed for the prevention of dental caries, stimulates the production of prostaglandins and thereby exacerbates the inflammatory response in gingivitis and periodontitis. The present invention is a method for preventing dental caries by administering a fluoride salt into the oral cavity while at the same time controlling periodontal bone loss by administering, in addition to the fluoride salt, an amount of an NSAID sufficient to inhibit the production of prostaglandins induced by the fluoride.” (Aberg 1998)
"The results suggest that there is a strong association of occurrence of periodontal disease in high-fluoride areas. The role of plaque is well understood in contrast to the effect of fluorides on periodontal tissues. Fluoride must therefore be considered an important etiological agent in periodontal disease." (Vanadana 2007)

"Among the very inadequately studied physical signs of fluoride toxicosis are inflammation and destruction of gingival and periodontal (gum) tissue. Published and unpublished observations by many men suggest rather strongly that periodontoclasia (gum disease) may be induced or aggravated by certain chemicals, including fluoride." (Hume 1952)

**Occlusal Disharmonies – "Crooked Teeth"**

"This investigation has shown that high-fluoride area and low-fluoride area differences exist at a significant level for certain occlusal disharmonies." (Kirzloglu 2005)

**We cannot control the dose**

The dose is determined by many factors:

- quantity of fluoridated water or beverages made with fluoridated water consumed in a day (soda pops, fruit beverages, tea, coffee)
- quantity of food washed, cooked or processed with fluoridated water, grown with phosphate fertilizers, or pesticides containing fluoride consumed in a day
- fluoride content of air
- body size (dose per body weight – child sized aspirin vs adult sized aspirin)
- health of kidney and liver which filter fluoride

The following Chart provides a method for calculating the fluoride dose:

<table>
<thead>
<tr>
<th>Water/day</th>
<th>Fluoride consumed/day</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0.6</td>
</tr>
<tr>
<td>1L/day</td>
<td>0.6</td>
</tr>
<tr>
<td>2L/day</td>
<td>1.2</td>
</tr>
<tr>
<td>3L/day</td>
<td>1.8</td>
</tr>
<tr>
<td>4L/day</td>
<td>2.4</td>
</tr>
<tr>
<td>5L/day</td>
<td>3.0</td>
</tr>
<tr>
<td>6L/day</td>
<td>3.6</td>
</tr>
<tr>
<td>7L/day</td>
<td>4.2</td>
</tr>
<tr>
<td>8L/day</td>
<td>4.8</td>
</tr>
<tr>
<td>9L/day</td>
<td>5.4</td>
</tr>
<tr>
<td>10L/day</td>
<td>6.0</td>
</tr>
<tr>
<td>11L/day</td>
<td>6.6</td>
</tr>
</tbody>
</table>
According to the US National Research Council report on Fluorides 2006, high water consumers (athletes, lactating mothers, soldiers, outdoor workers, diabetic patients) consume up to 12 liters of water per day.

**PURCHASE OF ALTERNATE DRINKING WATER SOURCES**

Purchasing expensive reverse osmosis or distillation equipment for those who must medically avoid fluoridated water (young children, kidney disease patients). Household charcoal filters do not filter fluoride.

- $1 - $10,000 for capital outlay
- $500 for replacement filters
- R/O filters are very water wasteful: for every 1 litre of clean drinking water produced, 6 liters are wasted
- Distillation and R/O systems remove beneficial nutrients from water

**Who Cannot Drink Fluoridated Water? Young Children, Hypersensitive**

**Health Canada:** "If an individual is allergic to fluoride, they may purchase a device to remove fluoride from the water supply."

**PHYSICIANS' DESK REFERENCE, 1994, 48th Edition, p. 2335-6:** "In hypersensitive individuals, fluorides occasionally cause skin eruptions such as atopic dermatitis, eczema or urticaria. Gastric distress, headache and weakness have also been reported. These hypersensitivity reactions usually disappear promptly after discontinuation of the fluoride."

**American Dental Association November 6, 2006** recommended that children under the age of 1 use: "purified, distilled, deionized, demineralized, or produced through reverse osmosis."

**Ont Min Health & Long Term Care 1999 Review:** "In Canada, actual intakes are larger than recommended intakes for formula-fed infants and those living in fluoridated communities."

**Ont Min Health Long Term Care 1999 Review:** "Efforts are required to reduce intakes among the most vulnerable age group, children aged 7 months to 4 years."

**Ont Min Health Long Term Care 2000 letter:** "Where baby formula is used, non-fluoridated water should be used for mixing."

**OTHER ASSOCIATED HEALTH-RELATED COSTS** (Ambachsteer 2007)

Death from acute toxicity, cancer, and other health harm associated with fluoride toxicity such as harm caused to teeth (dental fluorosis, malocclusion, periodontitis, gingivitis) hypersensitive individuals who must be ever-vigilant in avoiding exposure to ubiquitous fluoride compounds, endocrine disruption, increased bone fractures, neurotoxic effects on brain resulting in Alzheimer’s, Down Syndrome, lowered IQ, ADHD, etc.
- Direct costs of medical treatment. e.g. medications, doctor visits, physical therapy, special equipment such as braces or crutches, and costs of hospitalization.
- Lost work. e.g. Workplace Safety and Insurance Board (WSIB) for employees of municipal water treatment facilities handling fluorosilicates - workplace hazard, public health-related loss of earnings
- Lost School Time (children and adults)
- Special education.
- Home and institutional care. Alzheimer's, Broken Bones
- Foregone future earnings.

A recent editorial in the *Calgary Herald* cites Dr. Hardy Limeback: "A lifetime of excessive fluoride ingestion will undoubtedly have detrimental effects on a number of biological systems in the body and it is illogical to assume that tooth enamel is the only tissue affected by low daily doses of fluoride ingestion."

**ENVIRONMENTAL COSTS**

**Carbon Footprint**

Toxic substances such as fluoride are removed from emitting industries such as coal plants, aluminum and steel plants and phosphate fertilizer plants with the use of smoke stack scrubbers. These toxic waste by-products are expensive to dispose. Government and associated industries have worked out agreements by which these toxic substances and hazardous wastes are sold to municipalities where they are put into our drinking water. They are transported great distances to their destination.

Florida, USA has historically been a large exporter of fluorosilicates for the North American market. Due to hurricane damage where the radioactive gypsum ponds containing these toxic chemicals were destroyed and the chemicals escaped into the surrounding environment, a shortage has developed. The shortfall has been compensated by imports from China, according to reports from the US CDC in 2007 from Boulder Colorado.

How much oil or gasoline is spent transporting these toxic waste products across the Pacific Ocean? How much oil or gasoline is spent transporting these toxic waste products across our countries and through our city streets?

- <1% of fluoridated water is actually consumed.
- >99% is returned to our environment and our source water.

Is this a cost efficient method for delivering this unregulated drug?
Fauna and Flora

Companies should pay for their pollution and disposal of pollutants, instead of getting paid to dispose a hazardous waste, toxic substance and dangerous good into our water supplies.

Background levels of fluoride for Lake Ontario and the St. Lawrence River are up to 0.25mg/L which is double the 0.12mg/L Canadian Water Quality Guideline (CWQG). DWSP http://www.ene.gov.on.ca/envision/water/dwsp/0002/eastern/eastern.htm

Evidence suggests that sewage effluent from fluoridating communities is between 1.0ppm and 1.5ppm. A review by Camargo 2003 states: "Discharges of fluoridated municipal waters also cause significant increases (about five times the natural background level) in the fluoride concentration of recipient rivers (Sparks et al., 1983; Camargo et al., 1992a)."

Evidence from the study by Daemker and Dey 1989 indicates that Pacific salmon are harmed at levels of about 0.25mg/L. Evidence from Camargo demonstrates that net-spinning caddisfly larvae are harmed at fluoride levels as low as 0.2mg/L.

Two food sources for salmon are also shown to be affected by fluoride at low levels. Fluoride levels below 0.1 ppm were shown to be lethal to the water flea, Daphnia magna. Alga (Porphyria tenera) was killed by a four-hour fumigation with fluoride with a critical concentration of 0.9 ppm.

Documents used in a 1961 court case involving Meader's Trout farm in Pocatello, Idaho, contain evidence that between 1949 and 1950 trout damage and loss was related to fluoride contamination due to rain washing airborne particles from leaves into hatchery water at levels as low as 0.5 ppm.

Because, in soft waters with low ionic content, a fluoride concentration as low as 0.5mg/L can adversely affect invertebrates and fishes, safe levels below this fluoride concentration are recommended in order to protect freshwater animals from fluoride pollution.

Such demonstrated harm of aquatic species is in violation of the Fisheries Act. These violations are not sustainable.

"In 1985 artificial water fluoridation was introduced by the Pagosa Area Water and Sanitary District at a concentration ranging from 0.35 to 1.3 ppm F. This water was the only source of water for the horses on the farm. No other sources of fluoride were present; fluoride-containing phosphate fertilizer was not used on the pastures, nor were fluoride-containing mineral supplements ever fed to the horses. "Over the years, five horses had to be sacrificed because of ailments that, in retrospect, appear to have been induced by fluoride." "The foregoing clinical and morphological observations, together with the bone fluoride analyses, establish the diagnosis of chronic fluoride intoxication of horses in this study caused by consumption of artificially fluoridated drinking water." "The levels of F ingestion and the bone F concentrations of these horses are far below those claimed to cause F intoxication in cattle."
"Beluga whales (Delphinapterus leucas) from the St. Lawrence Estuary have been reported to have dental and bone abnormalities. To determine whether these lesions could be caused by high exposure to fluorides, we measured bone fluoride levels in eight beluga whales stranded on the shores of the St. Lawrence Estuary (Quebec, Canada), and in nine beluga whales killed by Inuit hunters in the Hudson Bay (North Western Territories, Canada). In both groups, fluoride concentrations were higher than those found in terrestrial mammals intoxicated by fluorides."

"in addition to fluoride induced dental lesions, the occurrence of marked periodontal disease and tooth loss is an important factor responsible for a reduction of life expectancy in severely fluorotic wild red deer."

"Histopathologic and bone morphometric studies of the phalangeal bones of pigs from endemic area indicate that osteoporosis is the predominant change."

"The evidences obtained indicate that disturbances in soft tissues in chronic intoxication with fluorine develop early, usually long before the onset of typical changes in teeth and skeletal bones; these changes characterize the preskeletal phase of fluorosis."

Citations:

8. Dave G. Effects of fluoride on growth reproduction and survival in Daphnia magna, Comparative Biochemistry and Physiology, 78c (2) 425-431 1984;

**FINAL COMMENTS**

"Contemporary literature has clearly established that water fluoridation does not decrease the incidence of dental decay in populations exposed to it. Moreover, when water fluoridation is interrupted, the incidence of dental decay remains unchanged indicating that this measure is totally inefficient.

On the other hand, the incidence of dental fluorosis has reached unacceptable levels in both fluoridated and non-fluoridated cities. Since dental fluorosis is usually considered to be the first visible sign of chronic fluoride intoxication, the present situation necessitates urgent remedial action." (Morin et al 2005)

According to Dr. Bill Osmunson, DDS, MPH,

"Remember, the people who claim fluoridation is safe are also the people who tell us the mercury we place in our teeth is too toxic for the sewers and trash, yet is safe implanted in our bodies three inches from our brains. Although their claim is to protect the public health, please note that when asked in court, the American Dental Association representatives state, "Dissemination of information relating to the practice of dentistry does not create a duty of care to protect the public from potential injury."

I am proud of my Profession, but in just a few instances our pride and profit stand in the way of good science and ethics. Fluoridation is a moment in Public Health history which we will not remember with pride."

**Citations**


Public Health and Aging: Retention of Natural Teeth Among Older Adults --- United States, 2002 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5250a3.htm


Merck Index, Merck Research Laboratories, 1996.


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**Elevated Fluoride Exposure Increases Tooth Decay**

http://www.slweb.org/bibliography.html


