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Dr. Hardy Limeback BSc, PhD, DDS

Sept. 21, 2016

Ms. Madeline Drexler, Editor
Harvard Public Health
The Magazine of the Harvard T.H. Chan School of Public Health
Office for External Relations
90 Smith Street, Fourth Floor
Boston, Massachusetts 02120
RE: "Is Fluoridated Drinking Water Safe?" article in Harvard Public Health, Spring 2016

Dear Ms. Drexler:

I'm the former head of Preventive Dentistry at the University of Toronto. In addition to being a practicing dentist, I am a basic dental researcher/biochemist who has spent decades studying the effects of fluoride on teeth and bones.

I was one of 12 scientists in North America chosen to serve on the National Academy of Science's committee that produced the 2006 report *Fluoride in Drinking Water*. Taking three years to complete, it's considered the most comprehensive work ever done on the toxicity of fluoride. Our report has been online for more than ten years here
<https://www.nap.edu/catalog/11571/fluoride-in-drinking-water-a-scientific-review-of-epas-standards>)

I was trained in traditional dentistry and for many years accepted the prevailing opinion of the dental/medical establishment in Canada and the U.S. that water fluoridation is 'safe and effective', as has been expressed by the handful of letters opposing the article by Nicole Davis in your Spring Issue of this year

I was mistaken. It became clear to me that even at low chronic daily intakes of fluoride, such as those provided by fluoridation, susceptible and vulnerable groups of the population can experience ill health effects.

Our own research showed that

1. fluoride from water fluoridation accumulates in bone in adults to undesirably high levels (levels at which the bone is at risk of fracture)¹
2. fluoride intake at low daily doses changes tooth dentin,²
3. fluoridation causes dental fluorosis in children, especially those who are fed infant formula made with fluoridated water.³
4. dental fluorosis is irreversible damage to the teeth the moderate level of which is aesthetically objectionable and undesirable.⁴ It costs families untold amount of extra dental expenses to treat the objectionable fluorosis, which many studies have recently shown has increased to at least 1 in every 10th child in the US in fluoridated areas.

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Dental fluorosis is a sign that fluoride at low daily intakes has harmed not only the teeth but also all the tissues that are susceptible to its effects: it has now been found to be associated with lowered IQ.^{5,6} Harvard's own Anna Choi's analysis of the fluoride and lowered IQ literature⁷ clearly implies that precautionary steps should be taken before the developing brains of any more newborn babies and young children are unnecessarily exposed to too much daily fluoride intake.

In addition, Table 8-2 of our NRC report identified endocrine injury at a small fraction of the dose a bottle fed infant receives.

The letters of support for fluoridation that were published on the website after the Davis article appear have tried to re-assure the readers that her article is incorrect or misleading and should even be retracted.

Here are some facts relative to those letters of support.

1. There has never been a level I quality study to show fluoridation works, especially today with widespread use of consumer products containing fluoride and fluoride provided professionally. As many of your readers would know Level I evidence is a Randomized Clinical Trial (a prospective, double blinded, randomized and placebo controlled clinical study), the same that is required for *any* drug to get approved by the FDA. It has been stated that an RCT for fluoridation on an individual basis cannot be conducted. This is untrue. I have proposed one for Alaska where all fresh water (including drinking water) is trucked into the small communities.
2. The Cochrane reviewers, failing to find any RCTs, settled for the much weaker, uncontrolled non-randomized before and after studies. Those studies were not double blinded and they were recognized for their high risk of bias because adjustments were not made to control for the many confounding factors that affect caries rates.
3. There have been claims that European countries provide alternative fluoride delivery systems such as adding fluoride to milk and salt. Only a small percentage of the European population has uses these sources of fluoride, and a handful of countries. Furthermore, studies trying to show the effectiveness of fluoridated salt or milk have had the same problems as the water fluoridation studies. There has never been a properly conducted RCT to show that these alternative delivery systems are effective {your can reference recent Cochrane reviews of F milk and F salt}.
4. One of the letters quoted our report saying, "The NRC report (2007) found that in the United States, the prevalence of severe dental fluorosis is "very low (near zero) at fluoride concentrations below 2 mg/litre." This is nearly three times the standardised fluoride concentration used in US fluoridation schemes." If one reads our report in its entirety, one would see another graph showing that severe fluorosis *does* occur below 2 ppm in communities where people have nutritional deficiencies. The 2 ppm fluoride in drinking water cut-off was obtained from US studies involving only healthy children. Nutritional deficiencies most certainly occur in the US. That is why the recent NHANES oral health survey found an increase in dental fluorosis in US children from previous years as more and more communities in the US adopted fluoridation.
5. It is often claimed that fluoridation results in very low exposure to humans at levels much lower than the studies that show harm. However, fluoridation at 0.7 ppm or 1 ppm is a concentration, not a dose. Drinking 1 L of fluoridated drinking water per day results in a daily *dose* of 0.7 to 1.0 mg/day. The weight of the subject is crucial. Thus, newborns weighing 5 kg that drink formula made with fluoridated water are exposed to a daily dose of 0.14 to 0.20 mg/kg. This level of exposure causes dental fluorosis. As stated above, dental fluorosis is linked to lowered IQ. Furthermore, fluoride accumulates in bone throughout life. No study has yet determined the lifelong effect of fluoride accumulation in the bone on the immune system (derived from bone)

or on the structural integrity of bone. It is disingenuous to claim that fluoridation is safe when its safety in the elderly exposed for an entire lifetime has never been tested.

References:

1. Chachra D, Limeback H, Willett TL, Gryn timer MD. The long-term effects of water fluoridation on the human skeleton. J Dent Res. 2010 Nov;89(11):1219-23.
2. Vieira AP, Hancock R, Dumitriu M, Limeback H, Gryn timer MD. Fluoride's effect on human dentin ultrasound velocity (elastic modulus) and tubule size. Eur J Oral Sci. 2006 Feb;114(1):83-8.
3. Brothwell D, Limeback H. Breastfeeding is protective against dental fluorosis in a nonfluoridated rural area of Ontario, Canada. J Hum Lact. 2003 Nov;19(4):386-90.
4. Limeback H, Vieira AP, Lawrence H. Improving esthetically objectionable human enamel fluorosis with a simple microabrasion technique. Eur J Oral Sci. 2006 May;114 Suppl 1:123-6; discussion 127-9, 380.
5. Tang QQ, Du J, Ma HH, Jiang SJ, Zhou XJ. Fluoride and children's intelligence: a meta-analysis. Biol Trace Elem Res. 2008 Winter;126(1-3):115-20.
6. Ding Y, Yanhui Gao, Sun H, Han H, Wang W, Ji X, Liu X, Sun D. The relationships between low levels of urine fluoride on children's intelligence, dental fluorosis in endemic fluorosis areas in Hulunbuir, Inner Mongolia, China. J Hazard Mater. 2011 Feb 28;186(2-3):1942-6.
7. Choi AL, Sun G, Zhang Y, Grandjean P. Developmental fluoride neurotoxicity: a systematic review and meta-analysis. Environ Health Perspect. 2012 Oct;120(10):1362-8.

Thank you for publishing Nicole Davis' article. Clearly it has sparked several responses from the proponents of fluoridation who continue to ignore the mounting evidence of fluoride toxicity in humans. I trust you will allow this letter in support of the Davis article to be posted on your website.

Sincerely



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