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City Council of Windsor, Ontario

Would the clerk, V. Critchley, kindly add this submission to the agenda of the city council meeting where the issue of water fluoridation will be addressed?

Dear Mayor Francis and Councillors Dilkens, Jones, Valentinis, Halberstadt, Sleiman, Gignac, Hatfield, Marra, Payne, Maghnieh:

I am Professor Emeritus of Medical Biophysics, University of Calgary, a physician and a scientist (biophysicist) and a co-author of a 2010 book on fluoridation. I have been moved by growing concern over fluoridation of public water supplies over the past decade as more evidence of limited effectiveness and of harm has appeared along with more misrepresentation of evidence by promoters.

I urge care in evaluating what you are told by both promoters and opponents of fluoridation. You should insist that we have evidence and common sense to back what we tell you. Promoters rarely cite primary research. Primary research is the definition of a problem and the collection, analysis and interpretation of data. Reviews are not primary research.

In the case of fluoridation most reviews have been done by panels of fluoridation promoters selected by governments that promote fluoridation. The members of such panels are often dentists and few if any are scientists or professional risk analysts. Probably the two most competently done reviews are the York review of 2000 and the National Research Council review of 2006. Both are often misrepresented by fluoridation promoters. The York review concluded that there is not sufficient evidence to conclude that fluoridation is effective and that there is not sufficient evidence to conclude that it is safe. It also concluded that the evidence does not support the claim that fluoridation overcomes the higher prevalence of cavities in children of low-income families.

The NRC 2006 review concluded that there is sufficient evidence to consider fluoridation a risk for adverse effects on the thyroid on the incidence of hip fracture and that fluoridation is a cause of dental fluorosis. The review panel was also concerned about the association of lower IQ with fluoride.

I have heard officials, dental and medical officers of health from Health Canada and from five different provinces give false statements to city and town councils in their support of fluoridation. For the most part I don't think they were lying; they just didn't know much about the issues and the evidence. But it is difficult to understand how they can deny the very existence of the hundreds of peer-reviewed publications in credible scientific journals that indicate association of fluoridation with adverse effects on health.

Perhaps the most extreme misleading testimony has been given by the chief dental officer of health of Health Canada, Dr. Peter Cooney. I heard him say before two municipal councils that one would have to drink 15 litres of fluoridated water per day for ten years before there would be a hint of harm. This is an outrageously false statement. Even a rational and minimally honest promoter would acknowledge that such exposure would cause dental fluorosis of all grades. And that extent of exposure is far above the exposures reliably associated with various other harms.

We should be wary of diversions such as comparisons of fluoridation with fortifying salt with iodine and milk with vitamin D. Vitamin D and iodine are nutrients with wide differences between what is essential and what is toxic. Fluoride is not a nutrient. It has never been shown to be essential for any biochemical or physiological function of the human body. Comparison with chlorination is another diversion. Chlorine (not chloride) is used to kill dangerous microorganisms and the chlorine does not stay in the water we use as does fluoride.

Another falsehood often heard is that the City Council of Calgary made an uninformed and hasty decision in stopping fluoridation. That is not only false but also insulting to a group of councillors who educated themselves over a decade on the scientific arguments about efficacy and safety of fluoridation. In the course of their deliberations they explicitly rejected proposals of another expert panel and another plebiscite. They rejected the panel because they believed, correctly, that it would not be possible to have an unbiased panel and that it would be an unnecessary delay. They rejected the plebiscite for the reason that it is absurd to decide whether to take a medicine by asking your neighbours to vote on it. The officials who offer this insulting fabrication show themselves not to be credible.

Along with many councillors in many towns and cities I have concluded that fluoridation of public water supplies is not substantially effective, not safe, and not ethical. The science may not be obvious, but it is clear. The ethics is both clear and obvious. According to the Fluoride Action Network, "Since October 2010...29 communities have halted fluoridation. The total population that has been freed from forced fluoridation over the past year is approximately 2,571,500 people...." This is in Canada alone. In Canada and the United States over 300 jurisdictions have rejected fluoridation since 1990.

European countries that had fluoridation stopped it during the 1970s for various combinations of three reasons (according to officials of those countries): not effective, not safe, not ethical.

The ethical failings are:

- The recipient has not given informed consent,
- An individual hasn't the option to stop it.

There is no monitoring of effects.

The medical failings are:

Hydrofluorosilicic acid and fluoride are untested for human toxicity and are unapproved by any government or qualified agency.

Especially susceptible groups are not protected.

The natural variation in a population of the response to a drug is not accounted for.

The dose is not controlled.

By the way, in fluoridation hydrofluorosilicic acid and fluoride are drugs, a point often denied by promoters. They are non-nutrients administered for a medical purpose. The Supreme Court of Canada considered fluoride a drug in a case in 1957.

Controlling the concentration in tap water does not control dose, even less does it control the dose per unit body weight. The amount of water drunk by an individual per day varies easily twenty-fold. Outdoor construction workers in warm climates, athletes, diabetics, infants and young children, among others, drink much more per unit body weight than does the average adult. Furthermore, there is unknown but substantial exposure—from food, processed drinks and residues from pesticides—which is not accommodated for in fluoridating jurisdictions.

Any sizable population includes individuals and groups with different sensitivity to any drug. The standard margin of safety to account for this intraspecies variation is 10. For example, if a harm is seen at a dose of 10 mg/day, then a maximum allowable dose would be set at 1 mg/day. In the case of fluoridation especially sensitive groups include among others infants, persons with low dietary iodine, persons with kidney disease—all consisting of substantial numbers of people in a population of the size under consideration.

Proponents propose that we fluoridate until there is absolute proof of harm (there is for some harms). This is irresponsible. In contrast opponents propose that we don't fluoridate until there is strong evidence that it is not harmful to any component of the population. This is the acceptable procedure, consistent with the duty to protect the health of all. We should ask ourselves, "How would we feel if we allowed a program to continue for sixty years and then found out that it has been harmful?"

Proponents often say that we have had fluoridation for over sixty years and if there were adverse effects we would have seen them by now. But you don't see what you don't look for. Neither fluorosilicic acid nor fluoride have been subjected to the toxicological tests normally required for use of drugs. The harms and possible harms mentioned above have been found by investigators pursuing academic interests in particular effects on humans and animals.

The federal and provincial levels of government in Canada deny responsibility for

fluoridation and accept no liability for their recommending the practice. Municipal governments have the responsibility but do not have the certification of fluoride or hydrofluorosilicic acid required of drugs. I have heard provincial officials say that "fluoride" has been certified, as required, by the National Sanitation Foundation International, but the NSF says that it has not fulfilled the requirements for certification under its Standard 60.

The precautionary principle is a useful guide in making a decision of this sort. It requires that the benefit of a procedure must be balanced against the possibilities and consequences of the harms it is supposed to prevent. If there is credible evidence of harm and the possible harm would significantly compromise health or well-being then only a procedure that is sure to produce a benefit greater than the possible harm is justified. So the factors to be considered are the possible benefit, the possible harm, and whether there are feasible alternatives for producing the benefit.

In the case of fluoridation the possibility of harm is great, almost certain for some harms (dental fluorosis, thyroid suppression, hip fracture). The benefit is slight, probably nonexistent. There are harmless and accessible alternatives for attaining the desired benefit. Good diet and fluoridated toothpaste, not swallowed, are two such measures. So fluoridation does not pass the test of the precautionary principle.

Hydrofluorosilicic acid is very different from calcium fluoride which is the form of fluoride in lakes, rivers and aquifers, the usual sources of public water supplies. Hydrofluorosilicic acid dissociates in water to a large extent (calcium fluoride does not) but reassociates to some extent in the stomach and apparently causes harm to the stomach and intestines and is associated with higher levels of lead, a recognized neurotoxin, in children's blood. Hydrofluorosilicic acid is received as a 23% solution in water with contaminants such as lead, arsenic, uranium and other heavy metals. These impurities are present in small amounts but some of them are very toxic. Curiously it is illegal to dump this into an ocean, lake or river or to put it into or onto the ground, yet it is added to tap water. It is listed as a dangerous substance requiring special, and expensive, handling. It is costly in itself and also corrosive enough that water departments that use it face renovations costing millions of dollars every few years.

Proponents often say that fluoridation is merely "topping up" a natural component of a city's water. But the natural fluoride is calcium fluoride. Much of the fluoride as calcium fluoride is excreted while about half of the ingested fluoride ion is sequestered in the body where it accumulates throughout the life of a person using fluoridated water.

It is now widely recognized, even among promoters of fluoridation, that any benefit of fluoride in preventing cavities is topical—that is, acting directly on the tooth—not from ingestion. Furthermore, there are ways of getting this benefit—such as using fluoridated toothpaste, topical applications in dentist's offices, and sodium fluoride rinses—which provide alternatives by choice for those who want fluoride.

I urge you to reject artificial fluoridation. Ethically, no one, no government and no majority of voters has the right to force it on an entire population.

If any of you have specific questions you would like to put to me, you may contact me by e-mail at <[beck@ucalgary.ca](mailto:beck@ucalgary.ca)>.

Respectfully,

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