

July 2014

**Community Water Fluoridation  
Gloucester Board of Health and Health Department**

**Ad Hoc Working Subcommittee on Fluoridation:** Rich Sagall, M.D., Joe Rosa, Ph.D, Ben Polan, D.M.D., Noreen Burke, M.P.P., Public Health Director.

Several questions have been raised recently by the Cape Ann Fluoride Action Network (CAFAN) concerning the fluoridation of the water supply in Gloucester. This overview provides concise answers to those questions with significantly more data provided separately.

Some background:

- Fluoride is the ion of the element fluorine (just as chloride is for chlorine) and is naturally found in virtually all water sources as water dissolves minerals from rock e.g. calcium fluoride ( $\text{CaF}_2$ ) and sodium fluoride ( $\text{NaF}$ ) (similarly for sodium chloride ( $\text{NaCl}$ , table salt))<sup>1</sup>. This naturally occurring compound reduces tooth decay.
- Surface waters, such as our reservoirs, typically have lower amounts of fluoride, than ground waters<sup>2</sup>.  
Fluoridation is the adjustment of the natural fluoride in the drinking water to the optimal level for reducing tooth decay.

Most of the issues raised by CAFAN question the safety and efficacy of fluoridation and are posed as a pursuit of scientific fact. Unfortunately the science has been reduced to searching the web for 'bias confirmation', the cherry-picking of data and misleading or, at best, misunderstood, representations of fact.

Given the decades of fluoride use by literally hundreds of millions of people to reduce tooth decay and its endorsement as safe and effective by individual dentists and dozens of respected health and medical organizations that care about child health - only one tenet of the scientific method need be observed:

*Extraordinary Claims Require Extraordinary Data*

And those data have not been forthcoming.

**CAFAN Question 1: What scientific studies support the original decision to fluoridate Gloucester drinking water, and which support the current recommendations?**

Throughout nearly 70 years of research and practical experience, the best available scientific evidence has consistently indicated that fluoridation of community water supplies is safe and effective.

The City, under the public health leadership of Dr John Wolfe (who died in 2013), followed the recommendations of the U.S. Public Health Service, American Dental Association, Centers for Disease Control and Prevention, Mass Department of Health etc. Official policy of the USPHS was driven by the clear association between fluoride levels in drinking water and fluorosis (at high levels) and the prevention of tooth decay (at moderate levels). This was established by the work of many researchers between 1900-1960<sup>3</sup>. That and the subsequent implementation<sup>8</sup> have led to continued support of the original decision.

**CAFAN Question 2: WHO, CDC and NIDR data all conclude that cavities have been declining for 6**

**decades in both areas with and without fluoridation.  
What scientific studies support any correlation  
whatsoever between drinking water fluoridation and the  
decline in cavities in children?**

It is certainly true that the initial studies in the US (~1945, in Grand Rapids, MI) showed a 50-70% decrease in cavities due to the use of fluoridation. At the time, fluoridated drinking water was the only source of fluoride<sup>4, 5</sup> since the Great Lakes have low levels of naturally occurring fluoride.

More recent studies indeed show that the difference in the decay rates in fluoridated and non-fluoridated areas has declined to 20-40%. This is largely due to the availability of fluoride from other sources (toothpastes, rinses and dietary supplements)<sup>6</sup>. Nonetheless, the 20-40% difference remains important to society (it is estimated that each \$1 spent on fluoridation saves \$38 in dental treatment<sup>7</sup>) and to the health of individuals, especially the most disadvantaged<sup>8</sup>.

There have been several studies outside the U.S. that have reported no increase in cavities after fluoridation of the water supply was stopped. However, in all of the cases reported, the discontinuation coincided with the start of other measures to prevent decay, often involving alternative delivery of fluoride<sup>9</sup>.

**CAFAN Question 3: What scientific studies support the individual or group endorsements made in the current BOH recommendation, if any?**

Th  
e Gloucester Board of Health continues to be persuaded by  
1) the experience of hundreds of millions of people over  
many decades;

2) the extensive literature regarding the safety and efficacy of fluoride<sup>8</sup>;

3) the testimony of individual dentists from Gloucester and the recommendations of dozens of respected health or medical or health organizations- including, American Medical Association, American Academy of Pediatrics, Centers of Disease Control and Prevention, World Health Organization, European Academy of Pediatric Dentistry, Mayo Clinic, and three deans from the Harvard Medical, Dental and Public Health Schools.

A jointly signed letter from the deans of these Harvard Colleges: Harvard Medical School, Harvard School of Dental Medicine, and Harvard School of Public Health /and Kennedy School is provided in the binder prepared for Council.

**CAFAN Question 4: How does drinking water fluoridation support the individual's freedom from forced or mass medication?**

This is not a question of health or science but the Board, as is true of most public health groups, does strongly believe in social justice. As such, it believes that fluoride benefits society in general (by reducing health costs, for example) and should be available to all regardless of age or socioeconomic status. The legal issues have already been adjudicated and multiple rulings have concluded that fluoridation is Constitutional and a warranted and proper means of furthering public health<sup>10</sup>.

**CAFAN Question 5: In 2011, the U.S. Department of Health and Human Services Agency proposed a drinking**

**water fluoride level of 0.7 ppm as opposed to the 1962 standard of 0.7 to 1.2 ppm. This was based upon studies of fluoridated towns in the U.S. and Canada where fluorosis rates were found to reach as high as 70 to 80% of adolescents. What scientific studies indicate that 0.7 is the correct number?**

The U.S. Department of Health and Human Services and the Environmental Protection Agency (EPA) periodically review new scientific assessments and actions on fluoride.

In January 2011, the Department of Health and Human Services (HHS) issued a notice in the Federal Register seeking public comment on proposed new guidance which will update and replace the 1962 U.S. Public Health Service Drinking Water Standards related to recommendations for fluoride concentrations in drinking water.

The U.S. Public Health Service recommendations for optimal fluoride concentrations are currently based on ambient air temperature of geographic areas and ranged from 0.7 – 1.2 mg/L across the United States. In general, the lower 0.7 mg/L is the optimal target in the far southern parts of the U.S. with the optimal target increasing to 1.2 mg/L in the northern U.S. It should be noted that based on ambient air temperature, Gloucester's optimal target fluoride level is currently 1.0 mg/L.

HHS proposed that community water systems adjust the amount of fluoride to 0.7 mg/L to achieve an optimal fluoride level. For the purpose of the guidance, the optimal concentration of fluoride in drinking water is defined as that concentration that provides the best balance of protection from dental caries while limiting the risk of dental fluorosis. Community water fluoridation is the adjusting and monitoring

of fluoride in drinking water to reach the optimal concentration.

It is likely that the new values reflect the additional sources of fluoride available in toothpastes, rinses, etc. and will no doubt be further adjusted in the future <sup>11</sup>.

**CAFAN Question 6: For formula fed infants the CDC recommends alternating fluoridated water with unfluoridated water to reconstitute powdered formula to prevent dental fluorosis. What studies indicate that this is sufficient reduction in fluoride use for infants? Were all drinking water customers warned about this?**

The proper amount of fluoride from infancy through old age helps prevent and control tooth decay. Community water fluoridation is a widely accepted practice for preventing and controlling tooth decay by adjusting the concentration of fluoride in the public water supply.

The actual statement <sup>12</sup> from the CDC is much less alarming:

*“Fluoride intake from water and other fluoride sources, such as toothpaste and mouth rinses, during the ages when teeth are forming (from birth through age 8) also can result in changes in the appearance of the tooth's surface called dental fluorosis. **In the United States, the majority of dental fluorosis is mild and appears as white spots that are barely noticeable and difficult for anyone except a dental health care professional to see.**”*

*Recent evidence suggests that mixing powdered or liquid infant formula concentrate with fluoridated water on a regular basis may increase the chance of a child*

*developing the faint, white markings of very mild or mild enamel fluorosis.*

*You can use fluoridated water for preparing infant formula. However, if your child is exclusively consuming infant formula reconstituted with fluoridated water, there may be an increased chance for mild dental fluorosis. To lessen this chance, parents can use low-fluoride bottled water some of the time to mix infant formula; these bottled waters are labeled as de-ionized, purified, demineralized, or distilled.”*

1

[http://www.who.int/water\\_sanitation\\_health/naturalhazards/en/index2.html](http://www.who.int/water_sanitation_health/naturalhazards/en/index2.html)

2

<http://iaspub.epa.gov/tdb/pages/contaminant/contaminantOverview.do?contaminantId=10700>

<sup>3</sup> see e.g.

<http://www.nidcr.nih.gov/OralHealth/Topics/Fluoride/TheStoryofFluoridation.htm>

4

Arnold FA, Likens RC, Russell AL, Scott DB. Fifteenth year of the Grand Rapids fluoridation study. J Am Dent Assoc 1962;65:780-5.

<sup>5</sup> <http://www.who.int/bulletin/volumes/84/9/05-028209.pdf>

6

<http://www.thecommunityguide.org/oral/supportingmaterials/RRfluoridation.html>

<sup>7</sup> <http://www.cdc.gov/fluoridation/factsheets/cost.htm>

<sup>8</sup> <http://silk.nih.gov/public/hck1ocv.@www.surgeon.fullrpt.pdf>;  
pp158-168

<sup>9</sup> For example:

Kunzel W, Fischer T. Caries prevalence after cessation of water fluoridation in La Salud, Cuba. *Caries Res*

2000;34(1):20-5.; Abstract:

<http://www.ncbi.nlm.nih.gov/pubmed/10601780>

<sup>10</sup> For example: *Safe Water Association, Inc. v. City of Fond du Lac*, 184 Wis.2d 365, 516 N.W.2d 13 (Wis. Ct. App. 1994).

<sup>11</sup> <http://www.cdc.gov/fluoridation/faqs/#overview5>

<sup>12</sup> [http://www.cdc.gov/fluoridation/safety/infant\\_formula.htm](http://www.cdc.gov/fluoridation/safety/infant_formula.htm)