

Drinking Water Fluoridation Program

Department of Utilities/Public Works
Rappahannock Area Health District

January 23, 2018

Departmental Recommendation

- Maintain public drinking water treatment in line with the requirements and recommendations of local, state, and federal agencies.

Fluoride Levels in Raw Water Supplies

- Drinking Water Wells
 - 2012 Virginia Cooperative Extension Study Regional Study
 - Included 65 drinking water wells from Spotsylvania
 - **Natural fluoride level: 0.11 to 0.77 mg/L**
- Public Drinking Water Raw Water Sources
 - All sources used by Spotsylvania County
 - **Natural levels at or less than 0.1 mg/l**

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- Spotsylvania County uses fluoride additives that meet American Water Works Association (AWWA) and National Sanitation Foundation/American National Standards Institute (NSF/ANSI) standards
 - Not pharmaceutical grade

Pharmaceutical Grade Fluoride

- “Pharmaceutical grading standards used in formulating prescription drugs are not appropriate for water fluoridation additives” (US Center for Disease Control)
 - Pharmaceutical standards based on a one time use at a set amount
- “Pharmaceutical grading standards could exceed the amount of impurities allowed by NSF/ANSI and AWWA in drinking water.” (US Center for Disease Control)
 - Potential impurities have no restrictions by the US Pharmacopeia
 - Includes arsenic, heavy metals and radionuclides
 - No independent verification testing
- Hydrofluorosilicic Acid (HFS) is used for the addition of Fluoride
 - HFS is graded, not the fluoride ion

Hydrofluorosilicic Acid - Grade

- Drinking Water Standards are regulated by EPA
- EPA directed the NSF/ANSI to develop standards
 - All Drinking Water Products must meet these standards
 - Maximum level for contaminants
 - Third Party Laboratories verification
 - No or low level of impurities
- AWWA developed further standards
- All Spotsylvania County water treatment chemicals meet AWWA and NSF/ANSI standards



Community Water Fluoridation (CWF)

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Questions raised about water fluoridation

- Is water fluoridation effective?
- Is it safe?
- Is it necessary, since other sources of fluoride (i.e. toothpaste) are available?
- Is it ethical to add fluoride to drinking water?

Effectiveness of water fluoridation

- Multiple studies show the benefits and effectiveness of community water fluoridation in reducing tooth decay
- 2015 Cochrane Database Review: Reviewed 155 studies. Concluded that water fluoridation reduced dental caries by 35% in primary teeth and 26% reduction in permanent teeth compared to those without water fluoridation
- 2007: Griffin and others. *Journal of Dental Research*. Reviewed 20 studies – found that water fluoridation prevented 27% of dental caries
- Water fluoridation beneficial for children and adults of all ages

Safety of community water fluoridation

- Current optimal level of fluoridation = 0.7 parts per million = 0.7 mg/L
- US Community Preventive Task Force – independent panel of public health and prevention experts who make recommendations about community preventive services
- Original recommendation in 2001 supporting water fluoridation; reaffirmed recommendation in 2013
- Reference:
https://www.thecommunityguide.org/sites/default/files/assets/Oral-Health-Caries-Community-Water-Fluoridation_3.pdf. Accessed 1/14/2018

Safety of community water fluoridation

- 2013 Task Force report: no evidence that community water fluoridation leads to severe dental fluorosis (staining and pitting of teeth)
- Task Force: no evidence that water fluoridation leads to bone fractures
- Task Force: regarding cancer, low IQ, endocrine dysfunction – evidence does not demonstrate that water fluoridation results in any unwanted health effects other than perhaps mild dental fluorosis which is not considered to be a cosmetic concern and is difficult to see except by a trained dental professional
- Agency for Toxic Substances & Disease Registry 2003: Skeletal fluorosis extremely rare in U.S. – caused by long-term exposure to very high levels of fluoride (i.e. has occurred in some people consuming more than 30 times the amount of fluoride typically found in fluoridated water, see <https://www.atsdr.cdc.gov/ToxProfiles/tp11-c1-b.pdf>)

Safety of community water fluoridation

- 2011 State of California's Carcinogen Identification Committee: "fluoride and its salts has not been clearly shown to cause cancer."
- 2017 National Cancer Institute: "...no evidence of an association between fluoride in drinking water and the risk of osteosarcoma or Ewing sarcoma"
See <https://www.cancer.gov/about-cancer/causes-prevention/risk/myths/fluoridated-water-fact-sheet>
- 2015 study in New Zealand – published in *American Journal of Public Health* – compared IQ over 38 years of follow-up in young children who used fluoride vs. those who didn't. Results = no difference in IQ.
Conclusions: "These findings do not support the assertion that fluoride in the context of CWF is neurotoxic"

Necessity of water fluoridation

- 2013 Community Preventive Services Task Force: Fluoride occurs naturally in water, but usually at lower levels than needed to prevent cavities
- Combination of good dental hygiene with optimal water fluoridation works better to prevent cavities than either intervention alone
- CDC 2017: “community water fluoridation has been identified as the most cost-effective method of delivering fluoride to all members of the community...” (see <https://www.cdc.gov/fluoridation/pdf/cdc-statement.pdf>, accessed 1/14/2018)
- CDC 2017: by preventing tooth decay, water fluoridation has a positive return on investment (estimated ROI of \$42.57 in large communities)
- As of 2015, estimated that 10.4% of Spotsylvania County residents under 65 are without health insurance—these individuals likely have reduced access to medical & dental care. Water fluoridation may be beneficial (Source: US Census Quickfacts, www.census.gov, accessed 1/14/2018)

Ethics of adding fluoride to drinking water

- Fluoride is naturally occurring substance already found in water
- Water fluoridation recognized as a safe and effective, evidence-based intervention that helps achieve a positive public health outcome
 - Similar to fortification of milk with Vitamins A & D and fortification of foods with a variety of vitamins and nutrients
- Fluoride Legislative User Information Database (<http://fluidlaw.org/>): Comprehensive database containing legal decisions by U.S. courts and current information on federal, state and local policies regarding community water fluoridation.
 - Lawsuits by fluoride opponents claiming fluoridating water is unlicensed practice of medicine/compulsory medication → multiple courts have upheld water fluoridation

Thank you for your attention

Questions?