

Volume 8, Issue 30, April 2011

Community Water Fluoridation*Educating Maryland Citizens on Policy Changes in Community Water Fluoridation***Executive Summary**

Community water fluoridation is a public health measure that is vital for preventing and controlling tooth decay in the United States and around the world. The Centers for Disease Control estimates that community fluoridated water accounts for a 30 to 40 percent reduction in dental caries nation-wide¹. Recent analysis of fluoridation levels by the CDC and EPA reaffirms the importance of this public health intervention, while at the same time updating standards set in 1962 to take into account current exposure to sources of fluoride in addition to drinking water.

Importance of Fluoridation

The Center for Disease Control (CDC) has hailed community water fluoridation as one of the ten great public health achievements of the 20th Century.² An early fluoridation study of almost 30,000 school children in Grand Rapids, Michigan found that the caries rate in children born after fluoride was added to the water supply dropped by over 60 percent. Fluoridated water proved to be an enormous scientific breakthrough that moved tooth decay into the realm of preventable diseases for the majority of Americans.³

Research shows that fluoride prevents or slows down tooth decay by inhibiting demineralization of tooth enamel and by helping to re-mineralize it. In other words, fluoride works by giving back to teeth what bacteria associated with consumption of sugar and other refined carbohydrates⁴ have taken away, thus preventing or reversing the process of tooth decay. Fluoride also reduces hypersensitivity of the hard tissue of the tooth, which surrounds the nerves

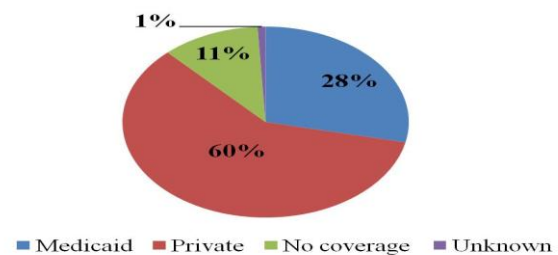
and blood vessels, and appears to be important for bone health.

Community water fluoridation has been shown to be a safe and cost-effective public health measure for the prevention and control of tooth decay in all age groups. For communities with over 20,000 people, it costs about 50 cents per person per annum⁵ to fluoridate the water. According to the CDC, every \$1 invested in community water fluoridation yields approximately \$38 savings in dental treatment costs.⁶

Fluoridation has been successful as a public health intervention because it does not require behavioral changes in order to reduce the prevalence of tooth decay--it simply requires drinking and cooking with tap water. Getting people to change daily routines and behaviors, such as brushing teeth after every meal, flossing and using mouth wash is far more difficult to achieve.

Water fluoridation also helps reduce oral health disparities by reaching everyone, irrespective of race, ethnicity or income. Children in low-income families, who often lack resources to access preventive dental care, are twice as likely as their counterparts to suffer from early childhood tooth decay, but they are less likely to receive treatment.

Dental Coverage for School Children in Kindergarten or 3rd Grade: Maryland, 2005-2006



While access to dental services for children enrolled in Maryland's Medicaid program has increased significantly in recent years, too many Maryland

¹ Centers for Disease Control "Fact Sheet: Preventing Dental Caries with Community Programs."

² Beltran-Aguilar ED, Barker LK, Canto MT, Dye BA, Gooch BF, Griffin SO, et al. Surveillance for dental caries, dental sealants, tooth retention, edentulism, and enamel fluorosis—United States, 1988-1994 and 1999-2002. *MMWR Surveill Summ* 2005; 54:1-43.

³ *Oral Health in America: A Report of the Surgeon General*, National Institute of Dental and Craniofacial Research, National Institutes of Health, U.S. Dept. of Health and Human Services, 2000.

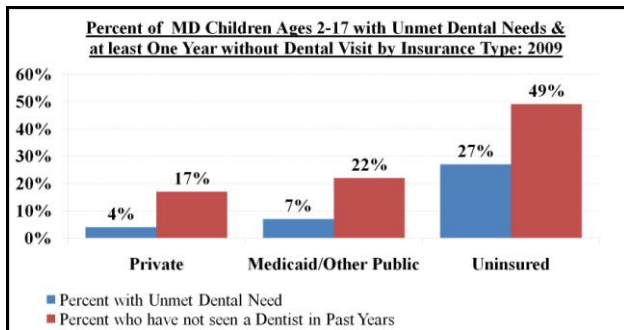
⁴ Refined carbohydrates are starches for which the bran, hull, fiber and some nutrients have been removed during processing, examples include foods such as white bread, white pasta, white rice and pretzels.

⁵ Griffin S., Jones, K. & Tomar, S. An Economic Evaluation of Community Water Fluoridation. *Journal of Public Health Dentistry* Vol.61, No. 2, Spring 2001.

⁶ Centers for Disease Control "Fact Sheet: Preventing Dental Caries with Community Programs."



children go without seeing a dentist on a regular basis.⁷ Community water fluoridation remains an efficient way of reaching underserved communities in the state.



Tooth Decay and Children

Tooth decay is the most common chronic disease of childhood, five times more common than asthma⁸. According to the American Dental Association, a child’s tooth is susceptible to decay as soon as it begins to erupt. In fact, the bacteria that cause decay can be transferred from a mother’s mouth to that of her baby/young child.

For many children, tooth decay starts early in life, affecting their primary teeth. Early decay is also predictive of later disease experience after the children acquire their permanent/adult teeth. Beyond the oral health consequences of tooth decay are problems associated with speech and language acquisition, missed school days, low self esteem and general ill-health.

In addition to water fluoridation, good preventive measures include: 1) age appropriate oral health education; 2) good oral hygiene—including flossing and brushing teeth with fluoride toothpaste; and 3) preventive dental visits, which include cleaning of teeth, application of fluoride varnishes or gels, and dental sealants.

Maryland and Fluoridation

Maryland has a good track record with respect to fluoridation. 93.8% of residents live in communities with fluoridated water. The University of Maryland Dental School now offers a fluoride varnish training program for primary care providers. The State’s

Medicaid Program reimburses medical providers who apply fluoride varnish to children between 9 months and 3 years of age who have participated in the training program.

Changes in Fluoridation Standards

The current water fluoridation standard of 0.7 to 1.2 parts per million was put into effect in 1962. Last year, the Department of Health and Human Services convened a panel of experts to review new information on fluoride intake. Scientists confirmed the effectiveness of water fluoridation in preventing and controlling tooth decay across all age groups, but also found that Americans were exposed to more fluoride in 2010 than they had been when the standards were set.⁹ Today, people are exposed to fluoride not only in drinking water, but also through fluoride in toothpaste, mouth wash, fluoride supplements, professionally applied fluoride varnish, gels and pastes, and through restorative materials which contain fluoride. While the risks of overexposure are cosmetic and relatively minimal,¹⁰ CDC and EPA experts have recommended that fluoridation standards for community water be reduced to the lower end of the original recommendation.

Discussion and next steps

The appropriate use of fluoride is the single best way to prevent tooth decay. Fluoride’s role is crucial, not just in drinking water, but in tooth paste, mouth wash, sealants and fluoride varnishes. Yet despite its impact, many people are unaware of fluoride’s significance in preventing tooth decay. Preliminary results of a study conducted by the University of Maryland: School of Public Health and designed to establish the knowledge base on which an extensive oral health literacy campaign will be based, indicate that very few of the adults surveyed understood the significance of fluoride or fluoridated water.

As Maryland moves forward in its quest to improve oral health for children and families, it must educate its residents on the importance of fluoride and good oral hygiene as well as make sure children and adults can access the dental care and preventive and restorative services they need.

⁷ National Center for Health Statistics: Summary Health Statistics for U.S. Children: National Health Interview Survey, 2009; Vital and Health Statistics; 10 (247) 2010.

⁸ *Oral Health in America: A Report of the Surgeon General*, National Institute of Dental and Craniofacial Research, National Institutes of Health, U.S. Dept. of Health and Human Services, 2000.

⁹ Federal Register: January 13, 2011 (Volume 76, Number 9) Page 2383.

¹⁰ Overexposure can cause an aesthetic condition (fluorosis) which is worse in children during the tooth forming years and appears as lacy white markings or spots on the enamel.