

**Testimony of Brian D. Hodgson, DDS
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Before the Milwaukee Common Council Steering and Rules Committee
May 31, 2012**

Good afternoon Council President and Chairman Hines and Members of the Committee. My name is Dr. Brian Hodgson and I am a board certified pediatric dentist, an Associate Professor in the Pediatric Dental Program at the Marquette University School of Dentistry, and immediate past president of the Wisconsin Society of Pediatric Dentists. I received my dental degree from Marquette University in 1987 and my certificate in pediatric dentistry from Children's Hospital of Wisconsin in 1993. I worked for Children's Hospital from 1993 to 2003 as an instructor in their Pediatric Dentistry Residency program prior to transferring to Marquette University School of Dentistry in 2003. I have been a practicing dentist for almost 25 years, and a pediatric specialist working in the Milwaukee area for almost 20 years. In addition, I am currently a Captain in the Dental Corps of the United States Navy and oversee all reserve dentists in Florida, Georgia, South Carolina and Puerto Rico. I have served in the United States Navy for over 26 years on both active duty and in the Reserves, most recently being recalled to active duty in 2009 to support our nation's efforts in Iraq. While in Iraq, I served as the Officer in Charge of the dental clinic located on Al Asad Air base. Since I have stated my military service, I must inform you that the following opinions are my own and do not reflect any official position of the United States Government, the Department of Defense, or the Department of the Navy. Thank you for allowing me the opportunity to testify before all of you here today on the issue of fluoridation in Milwaukee's water system and the 15 communities served by the Milwaukee Water Works.

I am here today on behalf of Dean William Lobb to represent the Marquette University School of Dentistry, which in 2010-2011 provided care to nearly 27,000 patients in nearly 97,000 patient visits and serves approximately 9,700 dental Medicaid patients between Marquette School of Dentistry operated clinics and affiliated clinical sites around Wisconsin. Marquette's School of Dentistry is one of the largest dental Medicaid providers in the State serving nearly 5,000 Medicaid patients in our Milwaukee Clinics alone. We are often the provider of last resort. I know I do not have to tell you the critical role the Marquette University School of Dentistry plays in providing care to the underserved in this community and around the State of Wisconsin.

In addition to spending time at the School's Main Clinic, I also provide pediatric dental care one day a week at Marquette's Community Dental Clinic North in the City of Milwaukee, and one day a week in a private practice in Lake Geneva. As you may imagine, the children I see, and have seen during most of my dental career are in great need of care and generally are from poor backgrounds.

On behalf of the Marquette University School of Dentistry, I urge you to continue the City of Milwaukee's nearly 60 year practice of adding fluoride to its water to help prevent tooth decay and respectfully oppose both resolutions before you. We believe eliminating fluoride from the City of Milwaukee's water as well as the water in the surrounding communities which purchase water from Milwaukee would be a major setback to the public's health.

Well-designed epidemiological studies that examined the relationship between water fluoridation and chronic diseases found no evidence to suggest that drinking fluoridated water (in the optimal range) is harmful to health of human beings. According to the United States Centers for Disease Control and Prevention (CDC):

The safety and effectiveness of fluoride at levels used in community water fluoridation has been thoroughly documented by scientific and public health organizations using scientific reviews and expert panels. These expert panels consist of scientists from the United States and other countries with expertise in various health and scientific disciplines, including oral health, medicine, biophysics, chemistry, toxicological pathology, and epidemiology. Experts have weighed the findings and the quality of the available evidence and found that the weight of peer-reviewed scientific evidence does not support an association between water fluoridation and any adverse health effect or systemic disorders.

In fact, water fluoridation is considered to be an ideal public health measure as:

- There is a significant reduction in dental decay rates in the communities that fluoridate their water;
- Community water fluoridation is very inexpensive on large scales (51 cents per person per year on average);
- This practice does not require behavioral modifications at a community level to be effective in preventing dental decay;
- It has no Health Hazards (within optimal range);
- Research shows that disparities in dental decay rates between the rich and poor are lower in fluoridated communities than in non-fluoridated communities;

- Research shows that the Medicaid costs for treating dental decay are lower in communities that fluoridate their water supplies;
- The only cause for concern with water fluoridation is mild to moderate dental fluorosis and purely from an aesthetics standpoint. According to the U.S. Centers for Disease Control and Prevention, "Most dental fluorosis in the U.S. – about 92 percent – is very mild to mild, appearing as white spots on the tooth surface that in many cases only a dental professional would notice. Moderate and severe forms of dental fluorosis, which are less common, cause more extensive enamel changes... The severe form rarely occurs in communities where the level of fluoride in water is less than 2 milligrams per liter."
- Over 60 years of research shows that water fluoridation is safe and effective in preventing dental caries.

The use of fluoride to help prevent tooth decay is based upon the chemical changes that occur at the surface of the tooth on a microscopic level. Basically, there are three types of calcium-phosphate salts that make up the hard structures of the teeth. The basic mineral salt is called apatite, and the three forms are carbonated apatite, hydroxyapatite, and hydroxyfluorapatite (or fluorapatite). In acidic solutions, carbonated apatite starts to dissolve at a pH of approximately 6.5, hydroxyapatite dissolves at approximately 5.5, and hydroxyfluorapatite dissolves at approximately 4.8. Remembering that each change of 1 on the pH scale means a factor of 10, it takes approximately 10 times more acid in the plaque to dissolve hydroxyfluorapatite than hydroxyapatite, and almost 100 times more acid than to dissolve carbonated apatite.

The majority of the fluoride is incorporated into the outermost surface of the tooth by mineral substitution. When fluoride is in the saliva and plaque, the less stable minerals (carbonated apatite and hydroxyapatite) tend to dissolve out and are replaced by the most stable mineral, hydroxyfluorapatite. This is the importance of water fluoridation. Water fluoridation maintains higher fluoride levels in the saliva and plaque, which makes the teeth more resistant to the acid attack from biologically active plaque. However, if the plaque pH drops below the point where hydroxyfluorapatite dissolves (approximately 4.8), then even the hydroxyfluorapatite will dissolve and the patient will develop a cavity. In other words, without the continual presence of fluoride the pH level drops and the patient is more likely to develop a cavity. Water fluoridation is the most effective way to maintain the continual presence of fluoride in the saliva and plaque.

One of the resolutions before you suggests that the CDC believes in the benefits of fluoride surface application and not from ingestion. This is not the case as there are benefits to both as acknowledged by the CDC.

According to the CDC:

The combined use of fluoride toothpaste and fluoridated water offers protection above using either separately... Both drinking water and toothpaste provide important and complementary benefits. The drinking water provides long low-level protection, but the fluoride in toothpaste is at a high enough concentration that it has additional properties. Whether in water or toothpaste, fluoride works in two main ways: by slowing the activity of bacteria that cause decay, and by combining with the enamel on the surface of the teeth to make it stronger and more resistant to decay. Fluoride in the water, although at a lower concentration than in toothpaste, maintains a constant low level of fluoride in the dental plaque and saliva all day. Toothpaste provides a high level of fluoride, but only for 1-2 hours after brushing, so the water exposure during the remainder of the day takes over after that.

While there have been discussions regarding changing the recommended levels of fluoride, and we certainly would support the new recommendation of 0.7 milligrams of fluoride per liter of water, to replace the previous recommended range of 0.7 to 1.2 milligrams per liter—but we would think it would be a terrible mistake to eliminate fluoride from the City of Milwaukee water system. I'm not the first to note that the benefits of fluoride in drinking water to reduce tooth decay has been hailed as one of the 10 great public health achievements of the 20th Century by the Centers for Disease Control and Prevention. In my private practice, I have found that there is considerable disparity in the size and severity of cavities of children who consume fluoridated water and those who live in the surrounding rural area and have private wells. The children without fluoridated water have larger and more severe cavities which require more treatment – often as extensive as a root canal – as opposed to a basic filling.

Again, thank you for allowing me the opportunity to testify. I would be happy to answer any questions at this time.