CDC Statement on the 2006 National Research Council (NRC) Report on Fluoride in Drinking Water

CDC recommends community water fluoridation as a safe, effective, and inexpensive way to prevent tooth decay (dental caries) among populations living in areas with adequate community water supply systems. Similar to many vitamins and minerals we consume for our health, fluoride should be taken in the proper amount. Past comprehensive reviews of the safety and effectiveness of fluoride in water have concluded that water fluoridation is safe and effective. Fluoride is present naturally in most water at a very low level, and more than 170 million people on public water systems in the United States enjoy the benefits of having their water adjusted to the optimal level (0.7–1.2 mg/L, or 0.7–1.2 parts per million [ppm]) for preventing tooth decay.

Some water has naturally occurring fluoride at levels much higher than the optimal. A recent report, Fluoride in Drinking Water: A Scientific Review of EPA’s Standards from the National Research Council (NRC), released on March 22, 2006, addresses safe maximum fluoride levels. The report addresses the safety of high levels of fluoride in water that occur naturally, and does not question the use of lower levels of fluoride to prevent tooth decay.

This new report was prompted as part of a routine, periodic review by the Environmental Protection Agency (EPA), the federal agency that is responsible for all regulated contaminants in drinking water, including fluoride. As part of its congressionally authorized mission, to protect the health of the public, the EPA sets standards for safe drinking water. Drinking water can contain many minerals, compounds, and organisms, some of which are considered “contaminants” under EPA’s regulations. There currently are 96 contaminants that are regulated under the Safe Drinking Water Act; fluoride is included as a naturally occurring mineral.

The purpose of the review of fluoride was to determine the adequacy of current guidelines set by the EPA on the maximum allowable concentration of fluoride in drinking water to protect children and others from adverse health effects. The National Research Council (NRC) Committee found that the current EPA maximum contaminant level goal (MCLG) of 4 milligrams of fluoride per Liter (mg/L) of drinking water should be lowered to better protect people from health risks associated with high natural fluoride levels. The report recommended that the EPA update its risk assessment in order to determine the appropriate level for the MCLG.

The NRC Committee evaluated many health effects that have the potential to be associated with fluoride in drinking water. The NRC concluded that only three adverse health effects warranted consideration in developing regulatory standards for high levels of fluoride in drinking water—severe enamel fluorosis from exposure to these high levels between birth to 8 years of age, and the potential risk for bone fractures and the more severe forms of skeletal fluorosis after lifetime exposure. Severe skeletal fluorosis is a rare condition in the United States.
This report is important for people living in areas with high concentrations of natural fluoride greater than 2 mg/L or 2 ppm. This represents approximately one half of one percent of the U.S. population. The EPA estimates that approximately 220,000 Americans receive water from public water systems with fluoride levels that are equal to or exceed 4 mg/L. The Committee concluded that people who consume water with this high fluoride content over a lifetime, when compared to people consuming water with 1 mg/L, are likely to be at increased risk for bone fractures. Another 1.4 million people in the United States drink water from community water supplies that have a natural fluoride level ranging from 2.0 mg/L to 3.9 mg/L. The Committee found that water at 2 mg/L or greater may put children 8 years old and younger at increased risk for severe enamel fluorosis, a condition that causes staining and pitting of the enamel surface of teeth. In communities with fluoride levels greater than 2 mg/L, CDC recommends that parents and caregivers of children 8 years and younger should provide children with drinking water from an alternative water source. At levels less than 2 mg/L (equivalent to 2 ppm), the committee found that the prevalence of severe enamel fluorosis was very low (near zero).

The findings of the NRC report are consistent with CDC’s assessment that water is safe and healthy at the levels used for water fluoridation (0.7–1.2 mg/L). CDC reviews the latest scientific literature on an ongoing basis and maintains an active national community water fluoridation quality assurance program. CDC promotes research on the topic of fluoride and its effect on the public’s health. CDC’s recommendation remains the same—that community water fluoridation is safe and effective for preventing tooth decay. Water fluoridation should be continued in communities currently fluoridating and extended to those without fluoridation.

CDC has previously recommended steps to prevent moderate and severe enamel fluorosis. These recommendations were made in the August 17, 2001, MMWR report, Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States and can be found at http://www.cdc.gov/OralHealth/waterfluoridation/guidelines/index.htm. In addition to using an alternate water source for children 8 years and younger if the primary drinking water source has naturally occurring fluoride above 2 mg/L, these recommendations include: seeking professional advice on use of fluoride toothpaste for children younger than 2 years; using a pea-sized amount of fluoride toothpaste and supervising toothbrushing for children younger than age 6; prescribing fluoride supplements judiciously; and using fluoride mouth rinses appropriately.

Consumers wishing to know the fluoride concentration in their water can contact their local water utility, or local, county or state health department. Currently, 32 states provide information on water systems that is available to the public through the My Water’s Fluoride section of the CDC Web site.

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