

Fluoridation FAQs

There is a lot of misinformation in the media about fluoride. Here are science-based answers to questions you may have.

What is fluoride?

Fluoride is nature's cavity fighter and occurs naturally in varying amounts in water sources such as rivers, lakes and even the oceans. Fluoride is naturally present to some extent in certain foods and beverages but the levels vary widely. To help protect teeth from cavities, fluoride is also added to some dental products such as toothpaste.

How does fluoride protect teeth?

Fluoride benefits both children and adults. Here's how: Before teeth break through the gums (erupt), the fluoride taken in from foods, beverages and dietary supplements makes tooth enamel (the hard surface of the tooth) stronger, making it easier to resist tooth decay. This provides what is called a "systemic" benefit.

After teeth erupt, fluoride helps rebuild (remineralize) weakened tooth enamel and reverses early signs of tooth decay. When you brush your teeth with fluoride toothpaste, or use other fluoride dental products, the fluoride is applied to the surface of your teeth. This provides what is called a "topical" benefit.

In addition, the fluoride you take in from foods and beverages continues to provide a topical benefit because it becomes part of your saliva, constantly bathing the teeth with tiny amounts of fluoride that help rebuild weakened tooth enamel.

What is water fluoridation?

Community water fluoridation is simply the addition of fluoride to drinking water to increase the natural fluoride level up to the recommended level that helps prevent cavities. Almost 75 percent of the U.S. population is served by fluoridated community water systems as of 2012.

Why would communities want to fluoridate tap water?

Communities fluoridate their water supply because it is a cost-effective public health method that helps prevent cavities. The average cost per year for U.S. communities to fluoridate the water ranges from \$.50 per person for large communities to \$3.00 per person for small communities.

Cavities are caused by a disease called "caries," which is five times more common than asthma and seven times more common than hayfever in 5-to-17-year-olds. The pain from untreated cavities can cause people to lose sleep, have trouble eating, speaking and paying attention at school or work.

A report from the U.S. Surgeon General in 2000 estimated that 51 million school hours are lost per year because of dental-related illness. Without water fluoridation, that number would likely be much higher.

The American Dental Association (ADA) supports community water fluoridation as the single most effective public health measure to prevent tooth decay. Studies prove water fluoridation continues to be effective in reducing dental decay by at least 25% in children and adults, even in the of era widespread availability of fluoride from other sources, such as fluoride toothpaste.

The ADA, the American Medical Association, the World Health Organization and many others support fluoridation of community water supplies. The U.S. Centers for Disease Control and Prevention (CDC) has cited community water fluoridation as one of 10 great public health achievements of the 20th century (along with vaccinations, infectious disease control and motor vehicle safety).

So, by simply drinking fluoridated water, you are doing something good for your oral health.

Is water fluoridation safe? How effective is it in preventing cavities?

Water fluoridation is safe, effective and healthy. Seventy years of research, thousands of studies and the experience of more than 210 million Americans tell us that water fluoridation is effective in preventing cavities and is safe for children and adults.

Is Fluoride, as provided by community water fluoridation, a toxic substance?

No. Fluoride in water at the recommended level is not toxic according to the best available scientific evidence.

Toxicity is related to dose. While large doses of fluoride could be toxic, it is important to recognize the difference between the effect of a massive dose of an extremely high level of fluoride versus the fluoride level currently recommended for public water systems. Like many common substances essential to life and good health - salt, iron, vitamins A and D, chlorine, oxygen and even water itself - fluoride can be toxic in massive quantities.

Fluoride at the much lower recommended concentrations (0.7 mg/L) used in community water fluoridation is not harmful or toxic.

The single dose (consumed at one time) of fluoride that could cause acute fluoride toxicity is 5 mg/kg of body weight (11mg/kg of body weight of sodium fluoride). This dose is considered the probably toxic dose (PTD) which "is defined as the minimum dose that could cause serious or life-threatening systemic signs and symptoms and that should trigger immediate therapeutic intervention and hospitalization." Acute fluoride toxicity occurring from the ingestion of optimally fluoridated water is impossible. With water fluoridated at 1 mg/L, an individual would need to drink five (5) liters of water for every kilogram of body weight. For example, an adult male (155 pound/70.3 kilogram man), it would require that he consume more than 350 liters (nearly 93 gallons) of water at one time to reach an acute fluoride dose. With optimally water now set at 0.7 mg/L, it would take almost 30% more, or nearly 120 gallons (more than 1,900 eight ounce glasses) of water at one time to reach the acute dose.

Sources:

U.S. Department of Health and Human Services. Federal Panel on Community Water Fluoridation. U.S. Public Health Service recommendation for fluoride concentration in drinking water for the prevention of dental caries. Public Health Rep 2015; 130(4):318-331. Article at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4547570>. Accessed August 9, 2010.

Whitford GM. Acute toxicity of ingested fluoride. In Buzalaf MAR (ed): Fluoride and the Oral Environment. Monogar Oral Sci. Basel, Karger. 2011; 22:66-80. Abstract at: <https://www.ncbi.nlm.nih.gov/pubmed/21701192>. Accessed August 9, 2010.

What is dental enamel fluorosis?

Dental fluorosis is a change in the appearance of the tooth enamel that only occurs when younger children consume too much fluoride, from any source, over long periods when teeth are developing under the gums. Most commonly, these changes are not readily apparent to the affected individual or casual observer and require a trained specialist to detect. The type of fluorosis found in the United States has no effect on tooth function and may make the teeth more resistant to decay.

If fluorosis occurs when teeth are developing, is it okay to use fluoridated water to reconstitute infant formula?

Yes, it is safe to use fluoridated water to mix infant formula. If your baby is primarily fed infant formula, using fluoridated water might increase the chance for mild enamel fluorosis, but enamel fluorosis does not affect the health of your child or the health of your child's teeth. Parents and caregivers are encouraged to talk to their dentists about what's best for their child.

What can I do to decrease the chances that my child's teeth will develop fluorosis?

For infants,

- You can breast feed your child. The American Academy of Pediatrics recommends human milk for all infants (except for the few for whom breastfeeding is determined to be harmful). Breast milk is very low in fluoride. Nursing mothers or pregnant women who drink fluoridated water do not pass on significant amounts of fluoride to their child.
- You can use ready-to-feed formula. This type of formula contains little fluoride and does not contribute significantly to the development of mild dental fluorosis.
- You can use powdered or liquid concentrate formula mixed with water that either is fluoride-free or has low concentrations of fluoride. These bottled waters are labeled as de-ionized, purified, demineralized, or distilled.

Parents and caregivers should consult with their pediatrician or family physician on the most appropriate formula for their child.

The chance of development of fluorosis exists through approximate age eight when the teeth are still forming under the gums. Fluoride intake from other sources during this time such as toothpaste and mouthrinse may also contribute to the chance of fluorosis for children living in non-fluoridated and fluoridated communities.

How can I get the benefits of fluoride and minimize the risk of fluorosis for my child?

Getting the right amount of fluoride is best—not too much and not too little. Your dentist, pediatrician or family physician can help you determine the proper amount of fluoride for your child.

What are the benefits of fluoridated water?

Fluoridated water helps prevent tooth decay in children and adults. Studies prove water fluoridation continues to be effective in reducing tooth decay by at least 25% in children and adults, even in the era of widespread availability of fluoride from other sources, such as fluoride toothpaste. Simply by drinking water, people can benefit from fluoridation's cavity protection whether they are at home, work or school.

Because of its role in the prevention of tooth decay, the Centers for Disease Control and Prevention has proclaimed community water fluoridation as one of ten great public health achievements of the 20th century.

What are the benefits of fluoride toothpaste?

All toothpaste helps remove plaque, a film of bacteria that forms on teeth and gums every day. Plaque can cause gum disease and tooth decay. In addition to helping remove plaque, fluoride toothpaste provides an extra benefit in preventing tooth decay by making tooth enamel stronger.

Should children use fluoride toothpaste?

For children younger than 3 years, parents and caregivers should begin brushing children's teeth as soon as they begin to come into the mouth by using fluoride toothpaste in an amount no more than a smear or the size of a grain of rice.

For children 3 to 6 years of age, parents and caregivers should dispense no more than a pea-sized amount of fluoride toothpaste.

Teeth should be brushed thoroughly twice a day (morning and night) or as directed by a dentist or physician. Children's brushing should be supervised to ensure that they use the appropriate amount of toothpaste.

What are the benefits of fluoride mouthrinse?

A mouthrinse with fluoride helps reduce tooth decay by making teeth more resistant to decay. Unless you are advised to do so by a dentist or other health professional, the ADA does not recommend the use of fluoride mouthrinses for children younger than six years old. Many children younger than six have not yet fully developed their swallowing reflex and may be more likely to swallow fluoride mouthrinse rather than spitting it out.

What are the benefits of dietary fluoride supplements?

Dietary fluoride supplements can be as effective in preventing tooth decay as water fluoridation. With supplements, fluoride is incorporated into the tooth during its formation making the tooth more resistant to decay. In addition, supplements provide a topical benefit as teeth are bathed in fluoride while the lozenges or tablets are chewed. Once the fluoride is absorbed, it will be present in the saliva which delivers fluoride to the tooth surface to help repair the enamel.

Dietary fluoride supplements should be prescribed only for children living in areas without optimal levels of fluoride in their community drinking water and who are at high risk of developing cavities. Talk to your dentist, pediatrician or family physician about your child's specific fluoride needs.

Note: The ADA's dietary fluoride supplement recommendations remain unchanged in light of the new guidelines for community water fluoridation in the U.S. released in April 2015 by the U.S. Public Health Service. The recommendation for fluoride levels in drinking water is newly calibrated at 0.7 milligrams of fluoride per liter of water. The new recommendation, which was supported by the ADA, does not change the ADA Council on Scientific Affairs' [systematic review and clinical recommendation](#) for the use of dietary fluoride supplements that was released in 2010.

Where can I find more information about fluoride?

- Read the American Dental Association's [Fluoridation Facts](#).
- Review [Evidence-Based Clinical Practice Guidelines](#) related to fluoride and fluoridation.
- Visit the [Centers for Disease Control and Prevention](#).
- Visit the [American Academy of Pediatrics'](#) Campaign for Dental Health website.

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