

Common Questions About Fluoride

1. What do we know about fluoride and fluoridation?

- [Fluoride exists naturally](#) in nearly all water supplies. Water is “fluoridated” when a public water system adjusts the fluoride to a level that is optimal for preventing tooth decay.
- About 75% of Americans whose homes are connected to public water systems receive fluoridated water. However, more than 72 million Americans do not have access to drinking water that is fluoridated to prevent decay.



2. Does fluoridated water prevent tooth decay?

- Yes. Research proves that fluoridation reduces tooth decay by about 25%. As the rate of fluoridation steadily increased in the U.S., the average number of decayed, filled or missing teeth among 12-year-olds fell 68% between 1966 and 1994.
- The evidence supporting [fluoridated water’s effectiveness](#) has been building for decades—and recent studies strengthen earlier findings:
 - A New York study (2010) revealed that low-income children in less fluoridated counties needed 33% more fillings, root canals, and extractions than those in counties where fluoridated water was common.
 - A study of Alaskan children (2011) showed that kids living in non-fluoridated areas had a 32% higher rate of decayed, missing or filled teeth than kids in fluoridated communities.
 - A Nevada study (2010) examined teenagers’ oral health and found that living in a community *without* fluoridated water was one of the top three factors associated with high rates of decay and other dental problems.
 - A study of Illinois communities (1995) reviewed changes in decay rates during the 1980’s. This study concluded that water fluoridation was “the dominant factor” in the decline of cavities.
 - Teenagers living in non-fluoridated areas of Ireland had an average rate of decay or related dental problems that was 52% higher than those living in fluoridated communities.
- Research demonstrates the long-term benefits of fluoridation. A 2010 study confirmed that the fluoridated water consumed as a young child makes the loss of teeth (due to decay) less likely 40 or 50 years later when that child is a middle-aged adult. The coauthors wrote that this study “suggests that the benefits of [fluoridation] may be larger than previously believed and that [fluoridation] has a lasting improvement in racial/ethnic and economic disparities in oral health.”

3. Decay is more of a problem for low-income people. Does fluoridated water help address this gap in oral health?

- Yes, it does. Fluoridation reduces the disparities in tooth decay rates that exist by race, ethnicity and income.
- A 2002 study called water fluoridation “the most effective and practical method” for reducing the gap in decay rates between low-income and upper-income Americans. The

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study concluded, “There is no practical [alternative to water fluoridation](#) for reducing these disparities in the United States.”

4. Does fluoridation also benefit adults or only children?

- Tooth decay is a health problem throughout one’s lifespan. Nearly all (96%) of middle-aged adults have had tooth decay and the rate of new decay per year is at least as high for adults as it is for children.
- Fluoridation benefits people of all ages. A 2007 report examined 20 studies to estimate fluoride’s impact on adult teeth, and the report concluded that fluoridated water reduced decay by 27%.
- Seniors benefit from fluoridation, partly because it helps prevent decay on the exposed root surfaces of teeth—a condition that especially affects older adults.

5. Is fluoridated water still needed?

- Yes. Fluoridation remains critically important. Tooth decay is widespread, affecting more than 90% of Americans by the time they reach their adult years.
- At a time when more than 100 million Americans lack dental insurance, fluoridation offers an easy, inexpensive preventive strategy that everyone benefits from simply by turning on their tap.
- Although Americans’ dental health has improved considerably in recent decades, tooth decay and other oral health issues remain a challenge. A 2010 study revealed that nearly one out of seven children aged 6 to 12 years had suffered a toothache over the previous six months.
- Even the U.S. armed forces recognize the need for fluoridated water. A senior official with the Department of Defense called tooth decay “a major problem for military personnel” and notes that fluoridation will “directly reduce their risk for dental decay and improve [military] readiness.” Most military bases have provided fluoridated water for decades.
- Fluoridated water is also the most inexpensive way to provide fluoride. The per-person annual cost of fluoride rinse programs is roughly double the [cost of fluoridated water](#). The per-person annual cost of fluoride supplements is more than 70 times higher than fluoridated water. Fluoride varnishes or gels also cost more than providing fluoridated water.

6. Isn’t using fluoride toothpaste enough?

- No. Many years after fluoride toothpaste became widely used, an independent panel of experts examined the specific impact of water fluoridation and determined that fluoridation reduces tooth decay by about 29%. Even today, fluoridated water plays a critical role of maximizing protection against decay.
- The co-author of a 2010 study noted that research has confirmed “the most effective source of fluoride to be water fluoridation.”

7. Exactly how does fluoride work to prevent tooth decay?

- The fluoride in drinking water works in two ways. For people of all ages, it works *topically* on tooth surfaces. Fluoride mixes with saliva, and when the saliva neutralizes acids produced

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by bacteria on teeth, the fluoride joins the enamel crystals on the tooth surfaces, healing and protecting the teeth from further decay.

- Fluoridated water works *systemically* when it's swallowed by young children while teeth are forming. Fluoride combines with the calcium and phosphate of the developing teeth and makes them more resistant to decay, especially during the first few years after they come into the mouth. Research has confirmed that systemic use of fluoride increases the concentration of fluoride in the surface enamel of teeth.

8. If fluoridation is effective, why are people still getting cavities?

- Fluoride in various forms has reduced tooth decay, but fluoride *alone* cannot guarantee someone a life without any cavities. Diet and nutrition play a role, and so do other factors — like the frequency with which people get routine dental care. But we know from decades of research that fluoridation does reduce the rate of decay. More than 100 million Americans have a drinking water supply that is not fluoridated to the optimal level that helps prevent decay. Getting fluoridated water to more U.S. residents would help reduce the incidence of decay.

9. Is adding fluoride to water without individual consent acceptable?

- America has a tradition of fortifying foods and beverages to improve health. Adjusting fluoride in water is only one example of this. Here are other examples:
 - Vitamin D is added to milk to prevent a disease called rickets.
 - Iodine is added to salt to prevent goiter, which affects the thyroid gland.
 - Folic acid is added to many breads and cereals to strengthen the health of red blood cells.
- Our society respects individual rights, but there are certain public health policies we adopt communitywide or nationwide because they are more effective and efficient ways to strengthen health and security. Fluoridation is one good example of this approach.
- Chlorine is added to drinking water to prevent outbreaks of E. coli or other forms of bacteria. Having a community water system means a city or town cannot pick and choose which households receive chlorinated water and which ones do not. The same is true for fluoride. Adding it to the whole water system is exactly what makes fluoridation so effective and affordable.

10. Is ending fluoridation a way to save tax dollars?

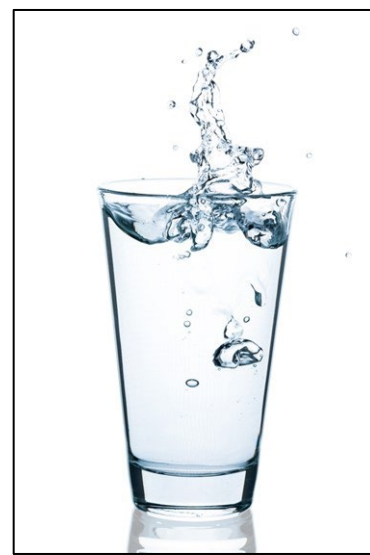
- No. In fact, ending fluoridation imposes a hidden “tax” on families and taxpayers because it is likely to increase their dental expenses to treat decayed teeth. The evidence proves that fluoridation is inexpensive to maintain and saves money down the road. The typical cost of fluoridating a local water system is between 40 cents and \$2.70 per person, per year—less than the cost of medium-sized latte from Starbucks.
- For most cities, every \$1 invested in water fluoridation saves \$38 in dental treatment costs. A 2003 study in Fort Collins, Colorado, estimated that if the city discontinued fluoridation, it would cost its residents more than \$534,000 per year. In 2003, water fluoridation saved Colorado nearly \$149 million by avoiding unnecessary treatment costs. The study found that the average savings in these fluoridated communities were roughly \$61 per person.

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- Scientists who testified before Congress in 1995 estimated that national savings from water fluoridation totaled more than \$3.8 billion each year.
- Taxpayers save money because fluoridation reduces Medicaid expenses on dental treatments. Studies in Texas and New York have shown that states save approximately \$24 per person per year in Medicaid expenditures because of the cavities that were prevented by drinking fluoridated water.

11. Has the momentum shifted against water fluoridation?

- No. Although it's true that some communities have chosen to stop fluoridating over the past year, the overall trend shows a continued increase in the number of Americans who receive fluoridated water. Between 2000 and 2008, an additional 34 million Americans gained access to fluoridated drinking water.
- Since 1992, the percentage of people on public water systems who receive fluoridated drinking water has risen from 62% to 72%. The rate of this increase has picked up in the past eight years.
- Since January 2011, Arkansas has enacted a state law guaranteeing access to fluoridated water for an additional 640,000 residents, and a water board in San Jose, Calif., has voted to fluoridate its water. The California vote means that more than 280,000 additional people will eventually gain access to fluoridated water.



12. Is fluoridated drinking water safe?

- Yes. Over the past several decades, hundreds of studies have confirmed the safety of fluoride. According to the Centers for Disease Control and Prevention, “panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective.” This issue has been studied thoroughly, and there is no credible evidence to support the claims that anti-fluoride activists make.
- The new recommended level for fluoridating water (0.7 milligrams per liter) should strengthen the public’s confidence that health officials are periodically reviewing standards and—when appropriate—updating them. The American Dental Association welcomed the new fluoride recommendation, noting that fluoridation remains “one of our most potent weapons in disease prevention.”
- The American Academy of Family Physicians, the World Health Organization, the National Academy of Medicine and many other respected health and medical authorities have endorsed water fluoridation as a safe and effective practice.
- What is true for calcium and potassium is also true for fluoride, a beneficial mineral, if consumed at extraordinarily high levels, can potentially be detrimental to one’s health. The good news is that federal health standards guide local water companies, enabling them to fluoridate water at levels that are safe and effective.

13. Should we do more studies on fluoridation before continuing this practice?

- More than 3,000 studies or research papers have been published on the subject of fluoridation, meaning few topics have been as thoroughly researched as fluoride. The

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overwhelming weight of the evidence—plus more than 65 years of experience—supports the safety and effectiveness of this public health practice.

- It's doubtful that even a hundred new studies would convince the anti-fluoride activists to reconsider the misleading attacks they make against fluoridation.
- Although additional studies are always welcomed, the existing research, including several studies in the past decade, provides solid support for fluoridation. As the Centers for Disease Control and Prevention has written, "For many years, panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective."

14. I read something on the Internet about a condition called "fluorosis." Is that a reason not to fluoridate drinking water?

- No. Nearly all fluorosis in the U.S. is a mild, cosmetic condition that leaves faint white streaks on teeth. It doesn't cause pain, and it doesn't affect the health or function of the teeth. In fact, it's so subtle that it usually takes a dentist to even notice it.
- Experts believe that in many cases fluorosis occurs because young children consume toothpaste while brushing their teeth. This is why dentists and health officials recommend that parents supervise young children while they are brushing their teeth. A study published in 2010 found that mild fluorosis was not an adverse health condition and that it might even have "favorable" effects on overall health. That's why the study's authors said there was no reason why parents should be advised not to use fluoridated water in infant formula.

15. I heard that the federal government reduced the level of fluoride recommended for drinking water in 2011. What was the reason for that change?

- In January 2011, the U.S. Department of Health and Human Services (HHS) recommended that the optimal level of fluoride in public water systems should be 0.7 milligrams per liter of water. HHS' new level reflects the fact that Americans today get fluoride from more sources—such as toothpaste and mouth rinses—than they received when the original level was set.
- The HHS recommendation will continue to protect Americans' dental health while minimizing the chance of fluorosis—a typically mild, cosmetic condition that causes faint white streaks on teeth. The effect of mild fluorosis is so subtle that only a dentist would notice it while doing an examination. This condition does *not* cause pain and does *not* affect the function or health of the teeth.

16. Should the public vote on whether to fluoridate local water systems?

- The health and well-being of Americans is a national concern. However, state laws and city ordinances determine the process for how a community decides whether to fluoridate. The key is to ensure that those making this decision are relying on sound, scientifically accurate information.
- Elected officials make a wide range of decisions about health issues. We feel comfortable having them set policies on water fluoridation, and we want to ensure they understand fully what the science shows before setting those policies.

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17. How do we know the fluoride additives used to fluoridate drinking water are safe?

- The quality and safety of fluoride additives are ensured by NSF/ANSI Standard 60, a program that was commissioned by the Environmental Protection Agency (EPA) and managed by NSF International. Standard 60 is a set of standards created and monitored by an independent committee of experts, involving the Association of State Health Officials and other key organizations. This committee provides regular reports to the EPA.
- More than 80% of fluoride additives are produced by U.S. companies, but no matter where they come from, Standard 60 certification operates worldwide and uses on-site