MYTHS & FACTS

Responses to common anti-fluoride claims

For more information, go to ILikeMyTeeth.org

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Fluoride occurs naturally in water, though rarely at the optimal level to protect teeth.	*"Fluoride doesn't belong in drinking water."*	• It's already there. Fluoride exists naturally in virtually all water supplies and even in various brands of bottled water. If the people making this statement truly believed it, they would no longer drink water or grape juice — or eat shellfish, meat, cheese or other foods that contain trace levels of fluoride. • What's at issue is the amount of fluoride in water. There are proven benefits for public health that come from having the optimal level of fluoride in the water — just enough to protect our teeth. In 2011, federal health officials offered a new recommended optimal level for water fluoridation: 0.7 parts per million. That's our goal: getting just enough to help all of us keep our teeth longer.
Numerous scientific studies and reviews have recognized fluoride as an important nutrient for strong healthy teeth.	*"Adding fluoride is like forcing people to take medication"*	• Fluoride is not a medication. It is a mineral, and when present at the right level, fluoride in drinking water has two beneficial effects: preventing tooth decay and contributing to healthy bones. • U.S. court decisions have rejected the argument that fluoride is a "medication" that should not be allowed in water. The American Journal of Public Health summarized one of these rulings, noting that "fluoride is not a medication, but rather a nutrient found naturally in some areas but deficient in others." • There are several examples of how everyday products are fortified to enhance the health of Americans — iodine is added to salt, folic acid is added to breads and cereals, and Vitamin D is added to milk.
Fluoridation is one of the most cost-effective health strategies ever devised.	*"Our city council can save money by ending fluoridation of our water system."*	• A community that stops fluoridating or never starts this process will find that local residents end up spending *more* money on decay-related dental problems. Evidence shows that for most cities, every $1 invested in fluoridation saves $38 in unnecessary treatment costs. • A Texas study confirmed that the state saved $24 per child, per year in Medicaid expenditures because of the cavities that were prevented by drinking fluoridated water. • A Colorado study showed that water fluoridation saved the state nearly $149 million by avoiding unnecessary treatment costs. The study found that the average savings were roughly $61 per person.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Fluoridation is a public health measure where a modest community-wide investment benefits everyone.	*"Fluoridation is a „freedom of choice" issue. People should choose when or if they have fluoride in their water."*	• Fluoride exists naturally in virtually all water supplies, so it isn't a question of choosing to get fluoride. The only question is whether people receive the optimal level that's documented to prevent tooth decay. • It is completely unrealistic to make water fluoridation a person-by-person or household-by-household choice. The cost efficiency comes from a public water system fluoridating its entire supply. • Maintaining an optimal amount of fluoride in water is based on the principle that decisions about public health should be based on what is healthy for the entire community, not based on a handful of individuals whose extreme fears are not backed by the scientific evidence. • Fluoridation is not a local issue. Every taxpayer in a state pays the price for the dental problems that result from tooth decay. A New York study found that Medicaid enrollees in counties where fluoridation was rare needed 33% more fillings, root canals, and extractions than those in counties where fluoridated water was much more prevalent.
Fluoridated water is the best way to protect everyone's teeth from decay.	*"We already can get fluoride in toothpaste, so we don't need it in our drinking water."*	• The benefits from water fluoridation build on those from fluoride in toothpaste. Studies conducted in communities that fluoridated water in the years after fluoride toothpastes were common have shown a lower rate of tooth decay than communities without fluoridated water. • The CDC reviewed this question in January 2011. After looking at all the ways we might get fluoride — including fluoride toothpaste — the CDC recommended that communities fluoridate water at 0.7 parts per million. Any less than that puts the health of our teeth at risk. • Fluoride toothpaste alone is insufficient, which is why pediatricians and dentists often prescribe fluoride tablets to children living in non-fluoridated areas.
Very high fluoride concentrations can lead to a condition called fluorosis. Nearly all fluorosis in the U.S. is mild. This condition does not cause pain, and does not affect the health or function of the teeth.	*"Fluoridation causes fluorosis, and fluorosis can make teeth brown and pitted."* and *"One-third of all children now have dental fluorosis."*	• Nearly all cases of fluorosis are mild — faint, white specks on teeth — that are usually so subtle that only a dentist will notice this condition. Mild fluorosis does not cause pain, and it does not affect the health or function of the teeth. • The pictures of dark pitted teeth that anti-fluoride opponents circulate show *severe* cases of fluorosis, a condition that is almost unheard of in the U.S. Many of these photos are from India, and the reason is *natural* fluoride levels over there that are dramatically higher than the level used in the U.S. to fluoridate public water systems. Common sense shows how misleading these photos are. Think about it: Do one-third of the children's teeth you see look brown and pitted? No, they don't. • In 2011, the CDC proposed a new level for fluoridation — 0.7 parts per million — that is expected to reduce the likelihood of fluorosis while continuing to protect teeth from decay.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Getting enough fluoride in childhood will determine the strength of our teeth over our entire lifetime.	*"Fluoride is especially toxic for small children."*	• According to the American Academy of Pediatricians optimal exposure to fluoride is important to infants and children. The use of fluoride for the prevention and control of cavities is documented to be both safe and effective. • Medical experts disagree with opponents' "toxic" claim. In fact, the American Academy of Family Physicians recommends that parents consider using dietary fluoride supplements for children at risk of tooth decay from ages 6 months through age 16 if their water isn't fluoridated. • Children who drink fluoridated water as their teeth grow will have stronger, more decay resistant teeth over their lifetime. 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.
Children who swallow toothpaste are at increased risk of mild fluorosis.	*"There's a warning label on fluoride toothpaste that tells you to „keep out of reach of children", so fluoride in water must also be a danger."*	• The warning label simply reflects the fact that toothpaste contains roughly 1,000 times as much fluoride per milligram as fluoridated water. Even so, the American Dental Association (ADA) believes the warning label on toothpaste exaggerates the potential for negative health effects from swallowing toothpaste. The ADA has stated that "a child could not absorb enough fluoride from toothpaste to cause a serious problem" and noted that fluoride toothpaste has an "excellent safety record." • Many vitamin labels have similar statements: "Keep out of reach of children." That's because almost anything has the potential for negative health effects if it's left in the hands of unsupervised, young children.
Fluoridated water is safe for babies and young children.	*"Fluoridated water isn't safe to use for babies."*	• The evidence does not support what anti-fluoride groups say. The American Dental Association concludes that "it is safe to use fluoridated water to mix infant formula" and encourages parents to discuss any questions they may have with their dentists and pediatricians. • Although using fluoridated water to prepare infant formula might increase the chance that a child develops dental fluorosis, nearly all instances of fluorosis are a mild, cosmetic condition. Fluorosis nearly always appears as very faint white streaks on teeth. The effect is usually so subtle that only a dentist would notice it during an examination. Mild fluorosis does not cause pain, nor does it affect the function or health of the teeth. • A 2010 study examined the issue of fluorosis and infant formula, and reached the conclusion that "no general recommendations to avoid use of fluoridated water in reconstituting infant formula are warranted." The researchers examined the condition's impact on children and concluded that "the effect of mild fluorosis was not adverse and could even be favorable."

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Although Americans' teeth are healthier than they were several decades ago, many people still suffer from decay — and the overall impact it has on their lives.	*"Tooth decay is no longer a problem in the United States."*	• Tooth decay is the most common chronic health problem affecting children in the U.S. It is five times more common than asthma. Tooth decay causes problems that often last long into adulthood — affecting kids' ability to sleep, speak, learn and grow into happy and healthy adults. • California children missed 874,000 school days in 2007 due to toothaches or other dental problems. A study of seven Minneapolis-St. Paul hospitals showed that patients made over 10,000 trips to the emergency room because of dental health issues, costing more than $4.7 million. • Poor dental health worsens a person's future job prospects. A 2008 study showed that people who are missing front teeth are viewed as less intelligent and less desirable by employers. • In a 2008 study of the armed forces, 52% of new recruits were categorized as Class 3 in "dental readiness" — meaning they had oral health problems that needed urgent attention and would delay overseas deployment.
Leading health and medical organizations agree: fluoridated water is both safe and effective.	*"Fluoridation causes cancer and other serious health problems."*	• The American Academy of Family Physicians, the Institute of Medicine and many other respected authorities endorse water fluoridation as safe. The Centers for Disease Control and Prevention reports that "panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective." • More than 3,200 studies or reports had been published on the subject of fluoridation. Even after all of this research, the best that anti-fluoride groups can do is to claim that fluoride *could* cause or *may* cause one harm or another. They can't go beyond speculating because the evidence simply doesn't back up their fears. • The cancer claim is part of a pattern. According to the American Council on Science and Health, "Historically, anti-fluoride activists have claimed, with no evidence, that fluoridation causes everything from cancer to mental disease." • A 2011 Harvard study found no link between fluoride and bone cancer. This study reviewed hundreds of bone samples, and the study's design was approved by the National Cancer Institute. The study is significant because the National Research Council reported that ***if*** there were any type of cancer that fluoride might possibly be linked to, it would probably be bone cancer (because fluoride is drawn to bones). The fact that this Harvard study found no link to bone cancer strengthens confidence that fluoride is unlikely to cause any form of cancer. • Opponents usually cite a 2006 study when they raise the cancer issue, but they omit the fact that the author of this study called it "an exploratory analysis." Instead of measuring the actual fluoride level in bone, this 2006 study relied on estimates of fluoride exposures that could not be confirmed, which undermines the reliability of the data.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Dozens of studies and more than 60 years of experience have repeatedly shown that fluoridation reduces tooth decay.	*"Fluoridation doesn't reduce tooth decay."*	• An independent panel of 15 experts from the fields of science and public health reviewed numerous studies and concluded that fluoridation reduces tooth decay by 29%. • An analysis of two similarly sized, adjacent communities in Arkansas showed that residents without access to fluoridated water had twice as many cavities as those with access to fluoridated water. • In New York, Medicaid recipients in less fluoridated counties required 33% more treatments for tooth decay than those in counties where fluoridated water was prevalent. • The benefits of fluoridation are long-lasting. A recent study found young children who consumed fluoridated water were still benefiting from this as adults in their 40s or 50s. • The Centers for Disease Control and Prevention recognizes fluoridation's effectiveness in preventing tooth decay and cited fluoridated drinking water as one of the "10 great public health achievements of the 20th century." • The European Archives of Pediatric Dentistry published an analysis of 59 studies that concluded that "water fluoridation is effective at reducing [decay] in children and adults."
Millions of people living in Europe are receiving the benefits of fluoride.	*"European countries have rejected fluoridation, so why should we fluoridate water?"*	• Europe has used a variety of programs to provide fluoride's benefits to the public. Water fluoridation is one of these programs. Fluoridated water reaches 12 million Europeans, mostly residents of Great Britain, Ireland and Spain. Fluoridated milk programs reach millions of additional Europeans, mostly in Eastern Europe. • Salt fluoridation is the most widely used approach in Europe. In fact, at least 70 million Europeans consume fluoridated salt, and this method of fluoridation reaches most of the population in Germany and Switzerland. These two countries have among the lowest rates of tooth decay in all of Europe. • Italy has not tried to create a national system of water fluoridation, but the main reasons are cultural and geological. First, many Italians regularly drink bottled water. Second, a number of areas in Italy have water supplies with natural fluoride levels that *already* reach the optimal level that prevents decay. • Technical challenges are a major reason why fluoridated water isn't widespread in Europe. In France and Switzerland, for example, water fluoridation is logistically difficult because of the terrain and because there are tens of thousands of separate sources for drinking water. This is why Western Europe relies more on salt fluoridation, fluoride rinse programs and other means to get fluoride to the public.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Community water fluoridation is proven to reduce decay, but it isn't the only factor that affects the rate of tooth decay.	*"There are states with a high rate of water fluoridation that have higher decay rates than states where water fluoridation is less common."*	• Water fluoridation plays a critical role in decay prevention, but other factors also influence decay rates. Researchers often call these factors as ~~"c~~onfounding factors." Someone who ignores confounding factors is violating a key scientific principle. A person's income level is a confounding factor in tooth decay because low-income Americans are more at risk for decay than upper-income people. This makes sense because income status shapes how often a person visits a dentist, their diet and nutrition, and other factors. • Comparing different states based solely on fluoridation rates ignores key income differences. For example, West Virginia and Connecticut reach roughly the same percentage of their residents with fluoridated water — 91 percent and 90 percent, respectively. Yet the percentage of West Virginians living below the poverty line is nearly double the percentage of those living in Connecticut. West Virginians are also more likely to get their drinking water from wells, which are not fluoridated to the optimal level. • It's misleading to compare states without considering other, confounding factors. A much more reliable approach is to compare residents of the *same* state who share similar traits, such as income levels. A 2010 study of New York counties did just this and found that people living in areas with fluoridated water needed fewer fillings and other corrective dental treatments.
Community water fluoridation is the most cost-effective way to protect oral health.	*"There are better ways of delivering fluoride than adding it to water."*	• A 2003 study of fluoridation in Colorado concluded that ~~"e~~ven in the current situation of widespread use of fluoride toothpaste," water fluoridation ~~"r~~emains effective and cost saving" at preventing cavities. • Studies conducted in communities that fluoridated water in the years after fluoride toothpastes were widely used have shown a lower rate of tooth decay than communities without fluoridated water. • The co-author of a 2010 study stated that research confirms the ~~"t~~he most effective source of fluoride to be water fluoridation." • Water 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 low-income individuals who are at higher risk of dental problems, fluoride rinses are a costly expense, which is why these products are not the ~~"e~~asy" answer that opponents of fluoridation claim they are.

THE TRUTH	OPPONENT'S CLAIM	THE FACTS
Water fluoridation has been one of the most thoroughly studied subjects, and the evidence shows it is safe and effective.	*"The National Research Council's 2006 report said that fluoride can have harmful effects."*	• The NRC raised the possibility of health concerns about areas of the U.S. where the *natural* fluoride levels in well water or aquifers are unusually high. These natural fluoride levels are two to four times higher than the level used to fluoridate public water systems. • The National Research Council itself explained that its report was not an evaluation of the safety of water fluoridation. • The Centers for Disease Control and Prevention reviewed the NRC report and stated, "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."
Anti-fluoride groups cite many "studies" that were poorly designed, gathered unreliable data, and were not peer-reviewed by independent scientists.	*"Studies show that fluoride is linked to lower IQ scores in children."*	• The foreign studies that anti-fluoride activists cite involved fluoride levels that were at least double or triple the level used to fluoridate drinking water in the U.S. It is irresponsible to claim these studies have any real meaning for our situation in the U.S. • British researchers who evaluated these studies from China and other countries found "basic errors." These researchers pointed out that the lower IQs could be traced to other factors, such as arsenic exposure, the burning of high-fluoride coal inside homes and the eating of contaminated grain.
Much of the fluoride used to fluoridate public water systems is extracted from phosphate rock.	*"Fluoride is a by-product from the phosphate fertilizer industry."*	• Much of the fluoride used to fluoridate water is extracted from phosphate rock, and so is phosphoric acid—an ingredient in Coke and Pepsi. After fluoride is extracted from phosphate rock, much of that rock is later used to create fertilizers that will enrich soil. Opponents use this message a lot, maybe because they want to create the false impression that fluoride comes from fertilizer. • Corn produces several useful by-products, including corn oil, cornstarch and corn syrup. Fluoride is one example of many by-products that help to improve the quality of life or health.

A Summary of Key Sources:

National Research Council. "Earth Materials and Health: Research Priorities for Earth Science and Public Health." National Academies Press. 2007.

Readey v. St. Louis County Water Co., supranote 25 at 628, 631 for the court's statement that it could not assume that the addition of 0.5 parts per million of fluoride to water that already contained 0.5 parts per million would result in infringement of any constitutional rights; Roemer, Ruth. "Water Fluoridation PH Responsibility and the Democratic Process." American Journal of Public Health. Vol. 55 (9), 1965. (2) Chapman v. City of Shreveport, supra note 25 at 146.

ADA Fluoridation Facts, 2005. http://www.ada.org/sections/professionalResources/pdfs/fluoridation_facts.pdf.

American Dental Association Website. www.ada.org/4052.aspx.

U.S. Centers for Disease Control and Prevention. "Water Fluoridation: Nature's Way to Prevent Tooth Decay," 2006, www.cdc.gov/fluoridation/pdf/natures_way.pdf

Pew Center on the States. http://www.pewcenteronthestates.org/initiatives_detail.aspx?initiativeID=42360

Nadereh Pourat and Gina Nicholson, "Unaffordable Dental Care Is Linked to Frequent School Absences," Health Policy Research Brief. (UCLA Center for Health Policy Research, Los Angeles, California) November 2009.

American Dental Association, "Statement on FDA Toothpaste Warning Labels," (July 19, 1997), http://www.ada.org/1761.aspx.

Advanced Dental Hygiene Practitioners Frequently Asked Questions. NNDHA Spring 2008, p. 8. http://www.nddha.org/DH%20FAQ.pdf

M. Neidell, K. Herzog and S. Glied, "The Association Between Community Water Fluoridation and Adult Tooth Loss," American Journal of Public Health, (2010).

M. Willis, C. Esqueda, and R. Schact, "Social Perceptions of Individuals Missing Upper Front Teeth," Perceptual and Motor Skills, 106 (2008): 423–435.

Thomas M. Leiendecker, Gary C. Martin et al., "2008 DOD Recruit Oral Health Survey: A Report on Clinical Findings and Treatment Need," Tri-Service Center for Oral Health Studies, (2008) 1 (accessed August 19, 2010).

B. Dye, et al., "Trends in Oral Health Status: United States, 1988-1994 and 1999-2004," Vital Health and Statistics Series 11, 248 (2007), Table 5, http://www.cdc.gov/nchs/data/series/sr_11/sr11_248.pdf (accessed December 4, 2009).

National Cancer Institute Website. Water Fluoridation Fact Sheet. http://www.cancer.gov/cancertopics/factsheet/Risk/fluoridated-water Accessed July 28, 2010.

Dr. Bill Bailey, CDC Podcast 7/17/2008. http://www2c.cdc.gov/podcasts/player.asp?f=9927#transcript

National Health and Medical Research Council (Australia) (2007). "A systematic review of the efficacy and safety of fluoridation" (PDF). http://www.nhmrc.gov.au/PUBLICATIONS/synopses/_files/eh41.pdf.

Centers for Disease Control and Prevention. "Water Fluoridation" Homepage. http://www.cdc.gov/fluoridation/65_years.htm.

Centers for Disease Control and Prevention. "Public Health Service report on fluoride benefits and risks." Journal of the American Medical Association 1991; 266(8).

Mouden, L. "Fluoride: The Natural State of Water." Arkansas Dentistry; Summer 2005; 77(2): 15-16.

Kumar, J. "Geographic Variation in Medicaid Claims for Dental Procedures in New York State: Role of Fluoridation Under Contemporary Conditions". Public Health Reports. Vol. 125, 2010.

Texas Department of Oral Health Website. www.dshs.state.tx.us/dental/pdf/fluoridation.pdf.

U.S. Department of Health and Human Services (USDHHS). Review of fluoride benefits and risks: report of the Ad Hoc Subcommittee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs. Washington: U.S. Department of Health and Human Services, Public Health Service; 1991.

"Ten Great Public Health Achievements – United States, 1900-1999," Centers for Disease Control and Prevention, 1999, http://www.cdc.gov/mmwr/preview/mmwrhtml/00056796.htm.

Guidelines on the use of fluoride in children: An EAPD policy document. European Archives of Pediatric Dentistry, 10 (3), 2009.

The British Fluoridation Society, The UK Public Health Association, The British Dental Association, The Faculty of Public Health of the Royal College of Physicians. "One in a million—the facts about water fluoridation." Manchester, England, 2004.

National median fee for a two-surface amalgam (silver) filling among general dentists. (Procedure code D2150, amalgam, two surfaces, primary or permanent.) See American Dental Association, "2007 Survey of Dental Fees"; Centers for Disease Control and Prevention, Division of Oral Health, "Cost Savings of Community Water Fluoridation" (August 9, 2007), http://www.cdc.gov/fluoridation/fact_sheets/cost.htm.

CDC Fluoridation Website. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5014a1.htm.

Report of the Fort Collins Fluoride Technical Study Group, (April 2003).