

Fluoridation opponents: Who they are, what they say



Who opposes fluoridation?

- Some well-intentioned people who have been misled by what they have heard or read
- People who may be drawn to conspiracy theories
- **Fluoride Action Network**



Royal Society of Chemistry

We promote, support and celebrate chemistry

The world's leading chemistry community, advancing excellence in the chemical sciences





The Royal Society of Chemistry (RSC) is *neither* pro *nor* anti water fluoridation but ***they are pro the accurate interpretation of scientific research.***

RSC Spokesperson Dr. Susan Vickers: “On the basis of published **robust** evidence water fluoridation **was both safe and effective in reducing dental decay**”



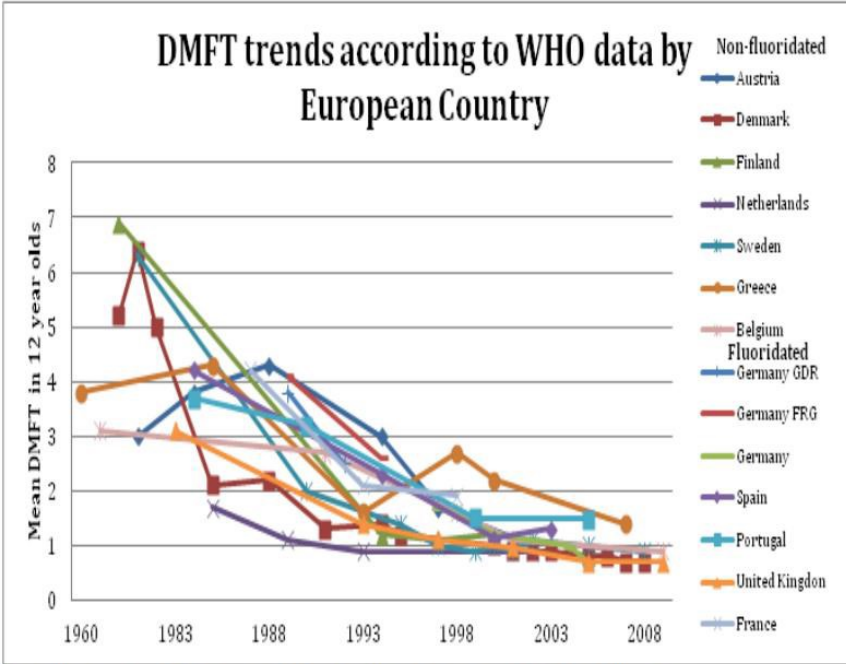
Paul Connett, PhD, Executive Director of the Fluoride Action Network, FAN, is a Chemist from the U.K. He opposes community water fluoridation

He is out of step with Royal Society of Chemistry organization's 58,000 members

Claim: “Cavity rates coming down worldwide regardless of water fluoridation or not”

FACTS: This is manipulated World Health Organization data by CWF opponents

Figure 1: Data from WHO Database

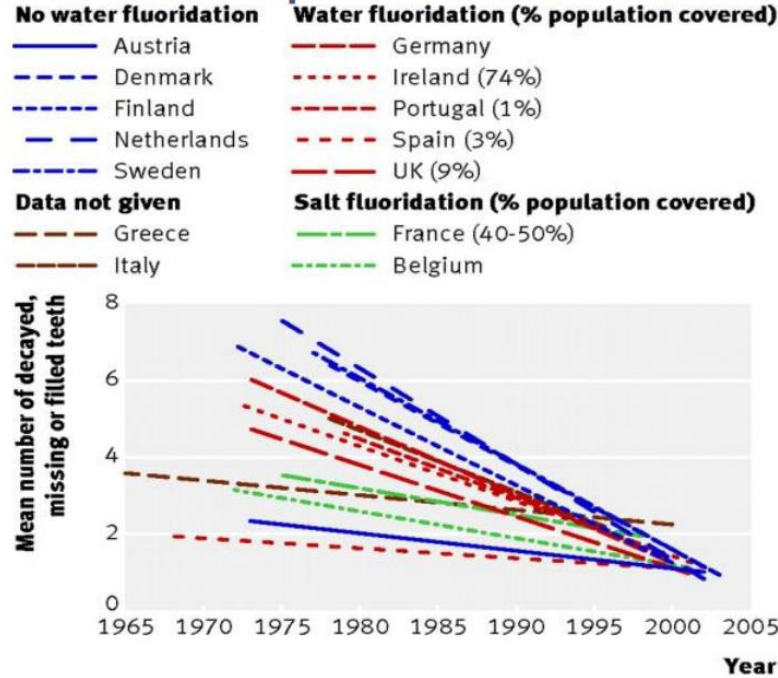


Graphs created to depict declining trends in tooth decay

Figure 1. Source: Data from the World Health Organization database. Available at <http://www.mah.se/CAPP/Country-Oral-Health-Profiles/> ;

Figure 2: Source: Cheng, KK, Chalmers, I, Sheldon, TA. Adding Fluoride to water supplies. *BMJ*; 2007;335(7622):699-702.

Figure 2: Data manipulated to show linear trend



Bottom graph shows >25% cavity reduction when CWF is started

Figure 1: Data from WHO Database

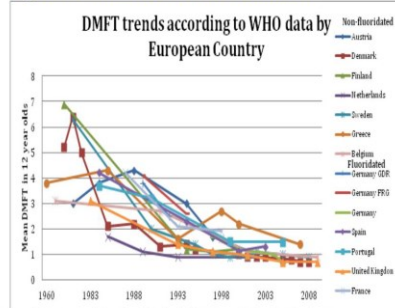
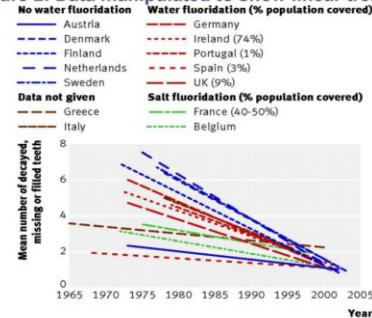


Figure 2: Data manipulated to show linear trend



Graphs created to depict declining trends in tooth decay

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Figure 3: Mean DMFT 12 Year olds in Ireland by Water Fluoridation Status

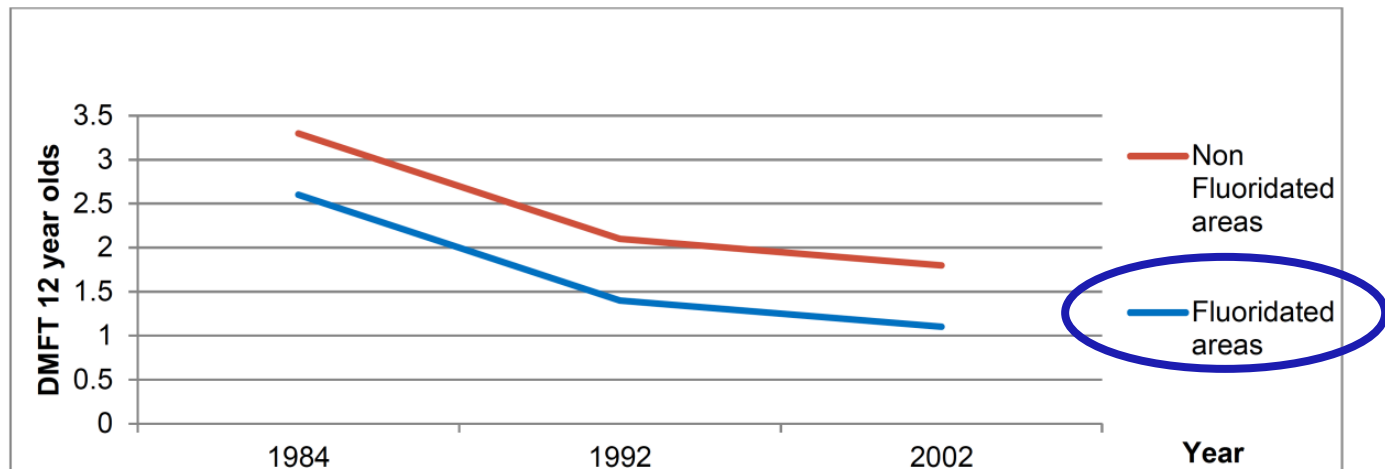


Figure 3: Data from the World Health Organization database. Available at <http://www.mah.se/CAPP/Country-Oral-Health-Profiles/>

CLAIM: Europe is 97% fluoridation-free



Don't be misled:

- ✓ **Fluoridated water** reaches 13 million people in England, Ireland and Spain.
- ✓ **Fluoridated salt** reaches over 75 million in Germany, France, Belgium and other countries.
- ✓ Nearly all European nations use **fluoride-rinse** programs, **fluoridated milk** or other targeted fluoride programs.

IQ



AMERICAN PSYCHOLOGICAL ASSOCIATION

- Over the past 100 years, IQ in the U.S. has risen nearly **30 points**
- “Flynn Effect” named after Dr. James Flynn who discovered this >30 years ago

38 year Study Finds No Association Between IQ in CWF vs Different Fluoride Levels



Community Water Fluoridation and Intelligence: Prospective Study in New Zealand

Jonathan M. Broadbent, PhD, W. Murray Thomson, PhD, Sandhya Ramrakha, PhD, Terrie E. Moffitt, PhD, Jiaxu Zeng, PhD, Lyndie A. Foster Page, PhD, and Richie Poulton, PhD

- Over 1,000 children studied over 38 years
- No clear differences in IQ because of fluoride exposure were noted

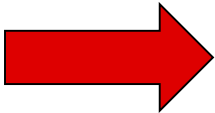
EPA Denies Latest Petition from Fluoridation Opponents



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 17 2017

OFFICE OF CHEMICAL SAFETY
AND POLLUTION PREVENTION



Michael Connett
Fluoride Action Network
3454 Vinton Avenue
Los Angeles, Calif. 90034

Dear Mr. Connett:

The U.S. Environmental Protection Agency has completed its review of the petition you filed on November 23, 2016, on behalf of the Fluoride Action network and other parties identified in your

DENIED

CLAIM: Fluoride has a neurotoxic effect

- In 2017, EPA ruled that this petition “has not set forth a scientifically defensible basis to conclude that any persons have suffered neurotoxic harm as a result of exposure to fluoride” through water fluoridation.
- EPA stated that many studies cited by critics were previously found to “pose a very serious overall risk of bias” because of their methodology or data reporting.

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Chapter I

[EPA-HQ-OPPT-2016-0763; FRL-9959-74]

Fluoride Chemicals In Drinking Water; TSCA Section 21 Petition; Reasons for Agency Response

AGENCY: Environmental Protection Agency (EPA).

ACTION: Petition; reasons for Agency response.

SUMMARY: This document announces the availability of EPA’s response to a petition it received on November 23, 2016, under section 21 of the Toxic Substances Control Act (TSCA). The TSCA section 21 petition was received from the Fluoride Action Network, Food & Water Watch, Organic Consumers Association, the American Academy of Environmental Medicine, the International Academy of Oral Medicine and Toxicology, and other individual petitioners. The TSCA section 21 petition requested that EPA exercise its authority under TSCA section 6 to “prohibit the purposeful addition of fluoridation chemicals to U.S. water supplies.” After careful consideration, EPA has denied the TSCA section 21 petition for the reasons discussed in this document.

FAN Petitioned the National Toxicology Program – Neurotoxic Effect

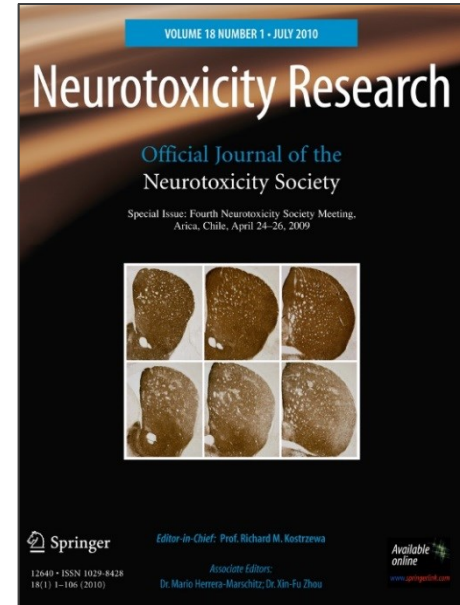




The **National Toxicology Program (NTP)** is an inter-agency program run by the United States Department of Health and Human Services to coordinate, evaluate, and report on toxicology within public agencies.

Study Results

- Researchers with the National Toxicology Program led an animal study to examine the impact of fluoride in water and food.
- They found “no exposure-related differences in motor, sensory, or learning and memory performance” for any of the **nine** different tests they conducted.
- The NTP study: thyroid hormone levels were **not** affected — even at levels of 0, 10 or 20 parts per million of fluoride in water.





An Evaluation of Neurotoxicity Following Fluoride Exposure from Gestational Through Adult Ages in Long-Evans Hooded Rats

Christopher A. McPherson¹ · Guozhu Zhang² · Richard Gilliam¹ · Sukhdev S. Brar³ · Ralph Wilson³ · Amy Brix⁴ · Catherine Picut⁵ · G. Jean Harry¹

On over 10 different tests no difference in:

- learning
- memory
- sensory performance
- place preference
- pain perception
- motor performance
- nerve cell death
- brain cell microscopy
- Thyroid hormones
- Heart, liver, kidney, and sexual organs

CLAIM: Mexican study says fluoride is a neurotoxin

FACTS:



This study reported that higher prenatal fluoride exposure “was associated with lower scores on tests of cognitive function” in children.

(Sources: M. Bashash et al., “Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico,” Environmental Health Perspectives, Sept. 2017.)

*Fluoridated salt is widely used in Mexico and many areas have water with natural fluoride levels **above** optimal*

A closer look at the Mexican study

Coauthors of the study cautioned against reading too much into the findings:

- **Morteza Bashash:** “We need to do more work to identify the nature of the effect. And we have a lot of uncertainty in the results.”
- **Howard Hu:** “[The study] needs to be reproduced in other populations by other scientists.”
- **Angeles Martinez-Mier:** “We don’t have the whole picture.”

(Sources: Laird Harrison, “Association Reported Between Fluoride and Reduced IQ,” Medscape, Oct. 2, 2017; Nadia Kounang, “Fluoride exposure in utero linked to lower IQ in kids, study says,” CNN, September 21, 2017.)

Two days after the Mexican study was released, the leading U.S. organization of Ob-Gyns reaffirmed its support for pregnant women to drink fluoridated water



Fluoride Content in Urine of Pregnant mothers – Must measure intakes to correlate with outputs



1. Mexican Study:

- **Intakes not measured**
- F output in urine measured
- Salt fluoridation, fluoride in drinking water, toothpaste

2. Canadian Study :

- **Intakes not measured**
- F output in urine measured
- Water fluoridated areas, non-fluoridated, toothpaste

Similarities:

- Urine fluoride content from pregnant mothers were similar
- Outliers had ~4ppm of fluoride
- CWF can't be accounting for ~4ppm

A coauthor shares her perspective

“As an individual, I am happy to go on the record to say that I continue to support water fluoridation.

“You can also say that if I were pregnant today I would consume fluoridated water, and that if I lived in Mexico I would limit my salt intake.”



*E. Angeles Martínez Mier, DDS, MSD, PhD
Professor and Chair, Department of Cariology,
University of Indiana School of Dentistry*

Switching Gears from CWF to the EPA's Maximum Contaminant Level of Fluoride in Water

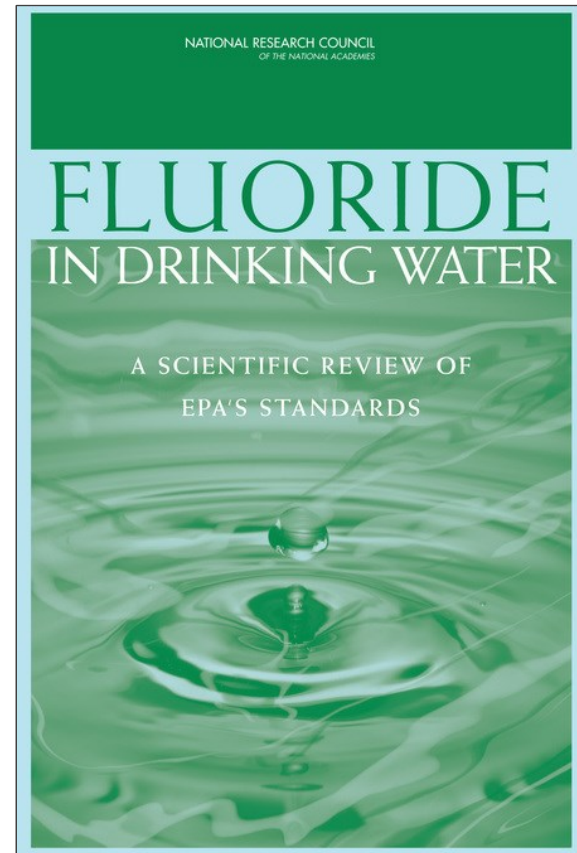
**The EPA sets the maximum
naturally occurring level of
fluoride in water that is
considered safe to drink**

Claim: NRC's 2006 report shows CWF is harmful

This claim ignores what the NRC committee said in a summary of its report:

*"... the committee's conclusions regarding the potential for adverse effects from fluoride at 2 to 4 mg/L in drinking water **do not apply** at the lower water fluoride levels commonly experienced by most U.S. citizens."*

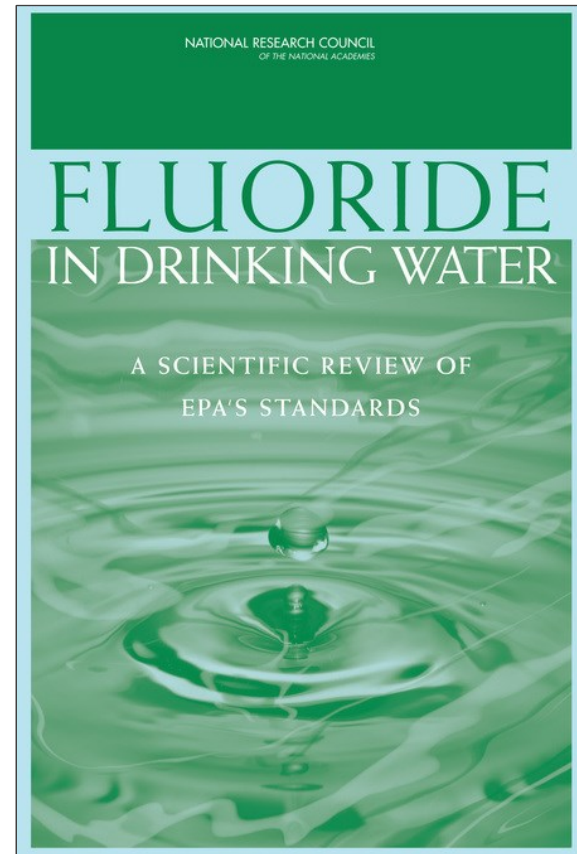
This study was not about community water fluoridation (p. 20)



(Source: Report in Brief, "Fluoride in Drinking Water: A Scientific Review of EPA's Standards," NRC Committee, March 2006)

Claim: NRC's 2006 report shows CWF is harmful

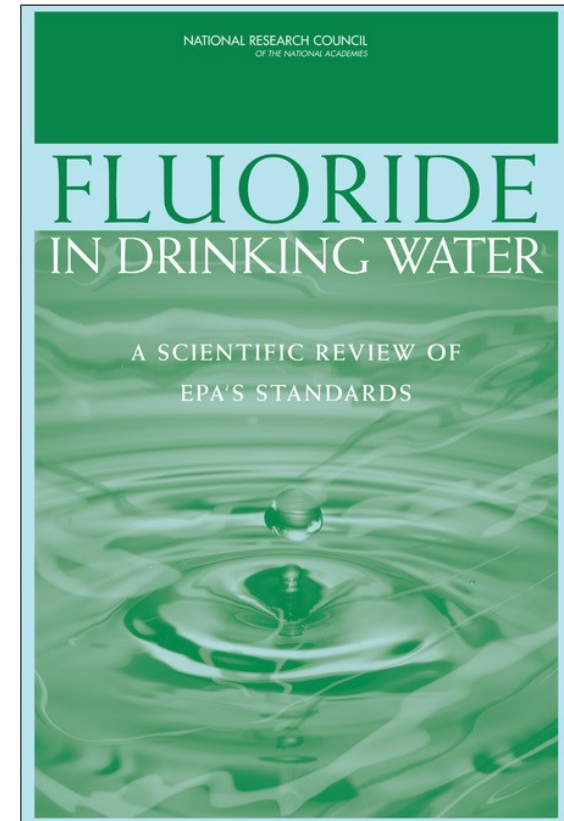
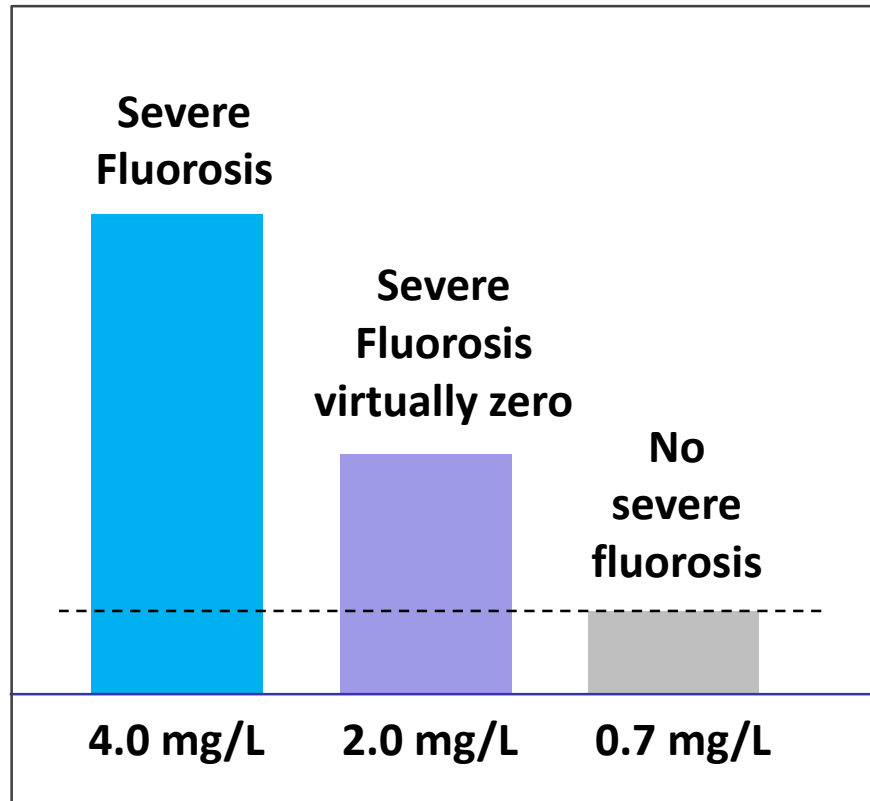
As the report explained, the EPA's maximum limit on fluoride is "set at a concentration at which **no adverse health effects** are expected to occur and the margins of safety are judged 'adequate'."



Was there evidence at 4.0 ppm showing that fluoride had an effect on...?

- Tooth enamel ✓
- Liver ✗
- Kidneys ✗
- Endocrine system ✗
- Gastrointestinal system ✗
- Immune system ✗
- Cancer ✗
- Musculoskeletal system ✗
- Reproduction and development ✗
- Neurotoxicity and neurobehavioral ✗
- Genetic damage ✗

A closer look at fluoride levels



U.S. Community Preventive Services Task Force



*(Note: studies used were evaluated by the Cochrane Oral Health Group and **approved**)*

Recommendations Reaffirmed 2013:

1. Community Water Fluoridation is **RECOMMENDED** based on **STRONG EVIDENCE** of effectiveness in **reducing cavities across populations**.
2. Evidence shows the **prevalence of cavities is substantially lower** in communities with community water fluoridation (CWF)
3. There is **NO EVIDENCE** that CWF results in **severe fluorosis**.

Claim: Fluorosis is a “toxic” effect

FACT: False

- Dental fluorosis is a change in the appearance of tooth enamel due to a high level of exposure to fluoride during the tooth-forming years.
- Dental fluorosis is typically a mild cosmetic effect that:
 - does not cause pain
 - does not affect the health or function of the teethIt's so subtle most people don't even notice fluorosis
- Dental fluorosis can **only** occur **up to age 8**, while permanent teeth are developing under the gums
- It does **NOT** occur in adults

Variations in tooth enamel (fluorosis)



Normal



Very Mild



Moderate

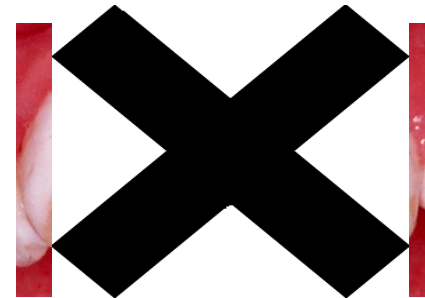
Improper
use of
fluoride
products



Questionable



Mild



Severe

Not caused by CWF

Claim: “*Randomized Control Trials (RCT) never been done on CWF*”

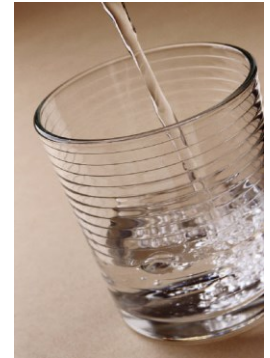
FACTS: RCT’S for CWF aren’t feasible-Cochrane Collaboration

Water Fluoridation Studies are Observational Designs

Observational: an effect is found, and the cause is researched

Same study design used to determine causes for:

- ✓ Smoking and lung disease
- ✓ Sexually Transmitted Diseases
- ✓ Chronic Alcohol Use



CLAIM: The Cochrane review found no evidence that fluoridation works

- **Wrong.** Cochrane found that fluoridation reduced decay in baby teeth by 35% and reduced decay in permanent teeth by 26%.
- **CDC:** Cochrane used strict criteria that excluded “many valid, peer-reviewed studies (that) document the effectiveness of community water fluoridation.”



Claim: The FDA has never approved fluoride

The FDA *has* approved fluoride for use in bottled water for cavity reduction.



The EPA, not the FDA, has jurisdiction over tap water.



CLAIM: Fluoride works topically, not by being swallowed

FALSE: Fluoride works both topically and systemically



Studies show fluoride works through **both** topical and systemic effects.

- It's beneficial before teeth fully appear in a child's mouth
- Continuous exposure to small amounts of fluoride helps both adults and children by remineralizing the tooth enamel.

Claim: CWF is forcible “mass medication”

FALSE:

- America has a tradition of fortifying foods and drinks to improve human health:
 - ✓ Folic acid
 - ✓ Vitamin D
 - ✓ Calcium
 - ✓ Iodine
- **U.S. courts have consistently rejected this argument against fluoridation**
- Medications are used to **treat** a health problem. Fluoridation (like chlorination) is about **prevention**



Claim: Mother nature protects babies from fluoride

FALSE:

- Breast feeding is encouraged by leading scientific groups (nutrition, antibodies, etc.).
- **However...** breast milk is not perfect. For example, it lacks sufficient:
 - Vitamin D (brittle bones)
 - Vitamin K (clotting)
 - Iron (anemia)

Infants are recommended to start supplements of these shortly after birth.



Claim: *“The ADA warns parents not to add fluoridated water to infant formula because of its harmful effects”*

FACTS: False



ADA & CDC recommendations:

- **Continued use** of liquid or powdered concentrate infant formulas reconstituted with optimally fluoridated drinking water while being cognizant of the potential risk for **mild** enamel fluorosis
- Use ready-to-feed formula or liquid or powdered concentrate formula reconstituted with water that is either fluoride-free or has low concentrations of fluoride when the potential risk for **mild** enamel fluorosis **may be a concern for parents**

Claim: *“Fluoridation chemicals are different from naturally occurring fluoride”*

FACTS: FALSE



Fluoride Additives Are Not Different From Natural Fluoride

Some consumers have questioned whether fluoride from natural groundwater sources, such as calcium fluoride, is better than fluorides added "artificially," such as FSA or sodium fluoride. Two recent scientific studies demonstrate that the same fluoride ion is present in naturally occurring fluoride or in fluoride drinking water additives and that no intermediates or other products were observed at pH levels as low as 3.5. In addition, the metabolism of fluoride does not differ depending on the chemical compound used or whether the fluoride is present naturally or added to the water supply.

Claim: *“The fluoride additives are not Pharmaceutical grade”*

FACTS: Not appropriate



United States Pharmacopeia (USP) Grade Fluoride Products

Some have suggested that pharmaceutical grade fluoride additives should be used for water fluoridation. **Pharmaceutical grading standards used in formulating prescription drugs are not appropriate for water fluoridation additives.** If applied, those standards could actually exceed the amount of impurities allowed by AWWA and NSF/ANSI in drinking water.

Claim: “*Cannot manage fluoride intake*”

FACTS:

- There is no need to control water intake. Fluoride from *dental products, primarily swallowed toothpaste by young children*, needs to be used appropriately as they are a *major contributor* to fluorosis, even in areas *without* fluoridation.
- There is a history of over 70 years of safety record of fluoridation in the United States.
- **NRC Report** showed that severe fluorosis *near zero* below 2mg/L (2ppm)
- **EPA’s analysis** provides that the proposed recommendation of 0.7 mg/L of F⁻ *will* protect against *any* potential adverse health effects.

CLAIM: There are better alternatives WRONG!



“A significant advantage of water fluoridation is that anyone, regardless of socioeconomic level, can enjoy these health benefits during their daily lives ... simply by drinking fluoridated water or beverages prepared with fluoridated water.”

Dr. David Satcher, U.S. Surgeon General 1998-2002

CLAIM: There are better alternatives

- Wrong. Fluoridation is the single most cost-effective way to prevent tooth decay.
- Fluoride toothpaste is **not** a replacement for CWF. Both are needed
- Fluoride supplements: Compliance is a problem
- Supplements and school-based dental programs don't serve adults, whose oral health needs can increase as they age.

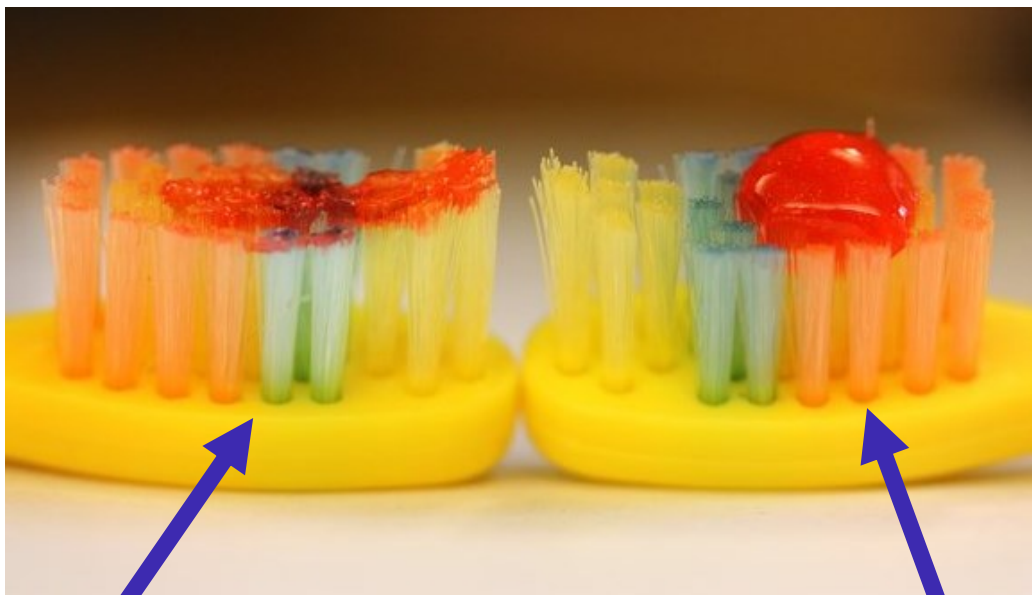


Claim: “Communities are putting an end to fluoridation..”

FACT: False

- The percent of the U.S. population on community water systems *increased* from 68.7% in 2004 to 74.4% in 2014 (5.7%)
- In 2014, >**211 million people** in the U.S. population on community water systems had access to fluoridated water-continuing the historic growth
- Community water fluoridation has continued to increase every year since it was introduced in 1945

The right amount of fluoride toothpaste



Once teeth appear, parents should **use a smear** of fluoride toothpaste (roughly a grain of rice) on their child's brush until age 3

For ages 3 to 6, parents should **use a pea-sized amount** on the toothbrush

Which would you rather have?

Cavities



OR

Mild Fluorosis



Summary

Community Water Fluoridation:

1. Is **Effective, Safe**, and most **Cost Efficient** means to reach everyone in the community with its cavity fighting benefits
2. No adverse health effects from drinking fluoridated water
3. Benefits all members of the community, regardless of age, race, SES, ethnicity, access to dental care
4. For pennies/year/person, **\$32.19 in dental treatment costs/person/year are avoided**
5. Is **recommended** by Health Canada, CPS, AAP, CDC, CDA, ADA, CMA, AMA, Mayo Clinic, WHO, and leading health and scientific organizations around the world

Reference Websites



www.iLikeMyTeeth.org

The Campaign for Dental Health is a coalition of organizations. The coalition and its website are managed by the American Academy of Pediatrics.



www.mouthhealthy.org/en/az-topics/f/fluoridation

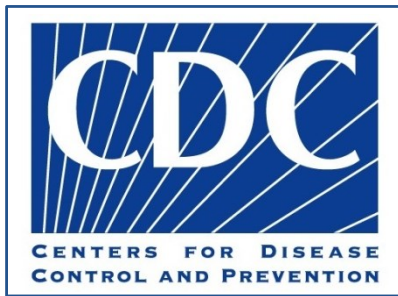
This is the American Dental Association's consumer-facing website. It provides basic information about the benefits and safety of community water fluoridation.

Reference Websites



www.AmericanFluoridationSociety.org

AFS's website provides a variety of fact sheets and other resources to support the efforts of health professionals and advocates. AFS's officers are volunteers who do not receive salaries for their work.



www.cdc.gov/fluoridation

This is the Centers for Disease Control and Prevention's resources related to community water fluoridation. There are a lot of helpful materials, including FAQs.

Thank you!

Questions? Comments?

Dr. Johnny Johnson

E: johnny@americanfluoridationsociety.com