

Water Fluoridation: the Science, Citizens Beliefs, and Politics

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Chicago: My Dental Roots



Chicago, June 2009

Portland: Cavities, A "Different Animal"



**KEEP PORTLAND
WEIRD!**

Volunteering: 23 Years Later



Public Health

- Goal is to improve the health of a population
- It values the "collective good"
- 3 Criteria to justify public health measure:

Public Health

- 3 Criteria to justify public health measure:
 1. reduction of ill health
 2. reduction of health disparities
 3. concern for children who constitute a vulnerable group

Good Oral Health: E.P.A.

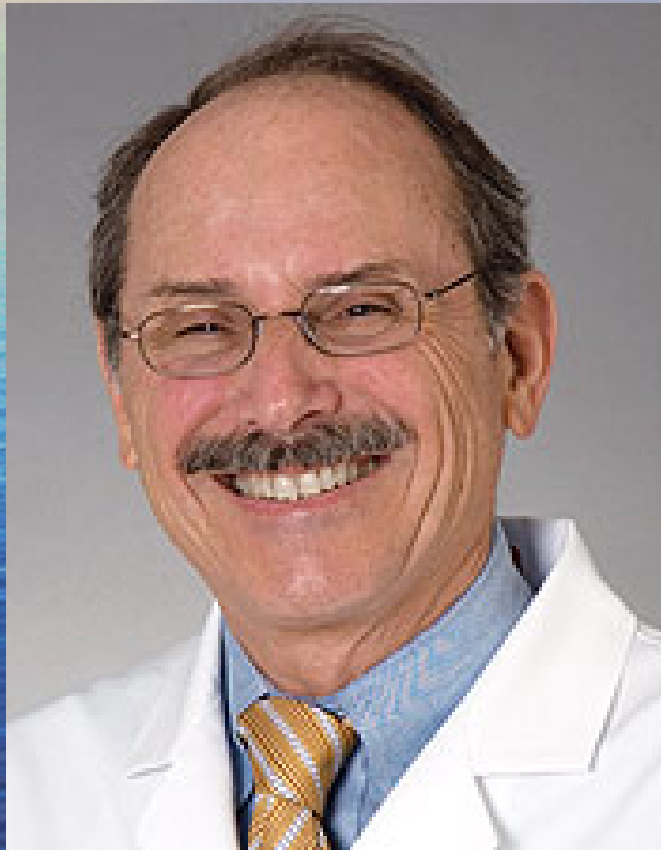
- Education
- Prevention
- Access to Care



Oral Disease “Learnings”

- Cannot have good health without good oral health
- Healthy kids learn better
- Cannot drill our way out of this “mess”
- Prevention is key

Peter Milgrom DDS



"Filling teeth and treating oral disease are not necessarily the same thing."

Peter Milgrom DDS, MPH
University of Washington School
of Dentistry

Cavities: An Infectious Disease



- Treating oral disease and filling teeth are not necessarily the same thing.

How Does Fluoride Work ??

- As the teeth grow and develop, fluoride is incorporated into the enamel.
- After the teeth erupt fluoride reverses the acid breakdown of the enamel surfaces.
- Surface enamel with fluoride is more resistant to future acid attacks.

What Causes Cavities ??

- Sugar is the food for the bacteria
- Bacteria produce acid within seconds
- A microscopic war at the tooth surface
- It is at this enamel surface that fluoride comes to the rescue in the form of a fluoroapatite crystal

We drink through our mouths



Water Fluoridation: **Definition**

Fluoridation is the adjustment, either upward or downward of the existing naturally occurring fluoride levels in drinking water to an optimal level that has been determined by our public health experts in the U.S.

The Father of Fluoridation

- 1901-1931: 30 years it took to figure out that it was the fluoride in the water.
- 1939: To figure out what the optimal level of fluoride in water.



Frederick McKay

Water Fluoridation: **History**

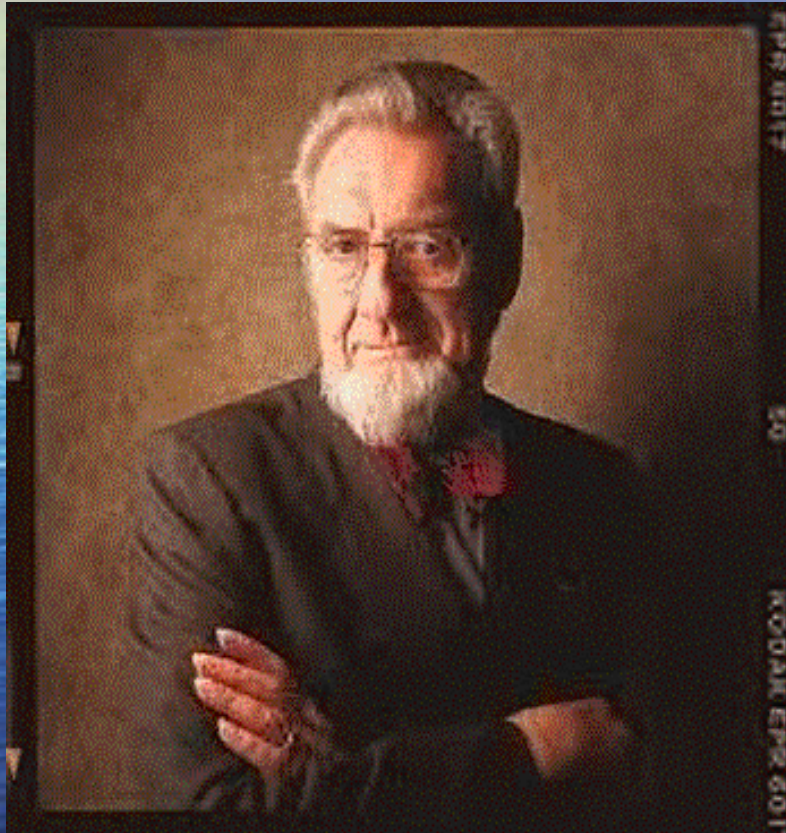
Fluoridation has been a public health practice in the U.S. for **72 years.**

Grand Rapids, Michigan, fluoridated its public water supply on **January 25, 1945.**

Water Fluoridation: **An Important Public Policy Issue**

Fluoridation is recognized by the U.S. Centers for Disease Control as one of the 10 greatest public health achievements in the 20th Century.

Water Fluoridation: **History**

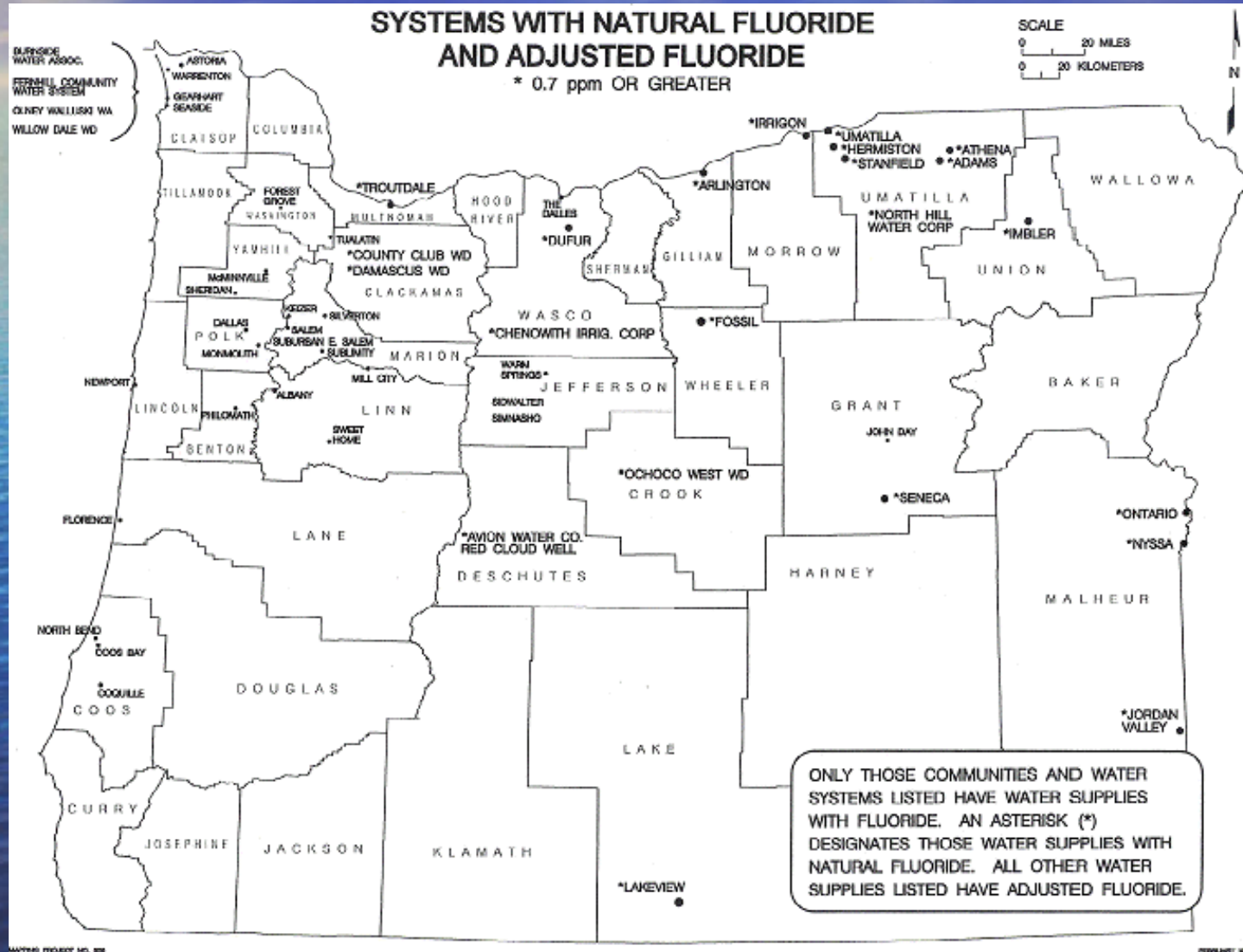


“Fluoridation is the single most important commitment a community can make to the oral health of its children and to future generations.”

- Dr. C. Everett Koop
U. S. Surgeon General, 1981-1989



Naturally Fluoridated Communities



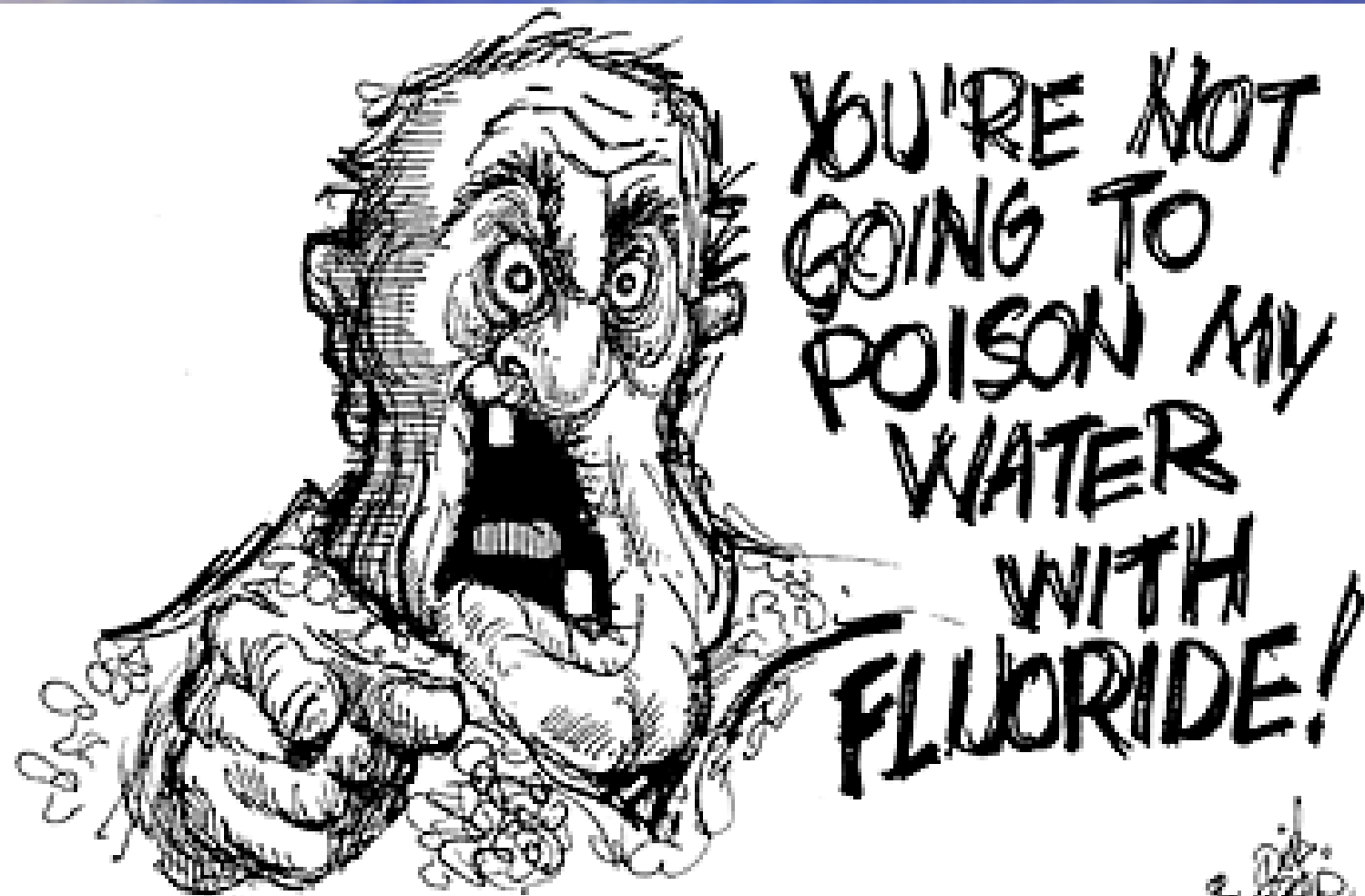
New Additive Delivery Vehicle



Pelletized/tablet

- ❑ Erosion of calcium binder to release Sodium fluorosilicate
- ❑ Less personnel handling exposure
- ❑ Simpler operating strategy
- ❑ Selected by NIH for BIO Innovation recognition

Fluoride Toxicity



Handwritten signature and date:
2/10/10
H. H. H. H.

Toxicity: Dose Related

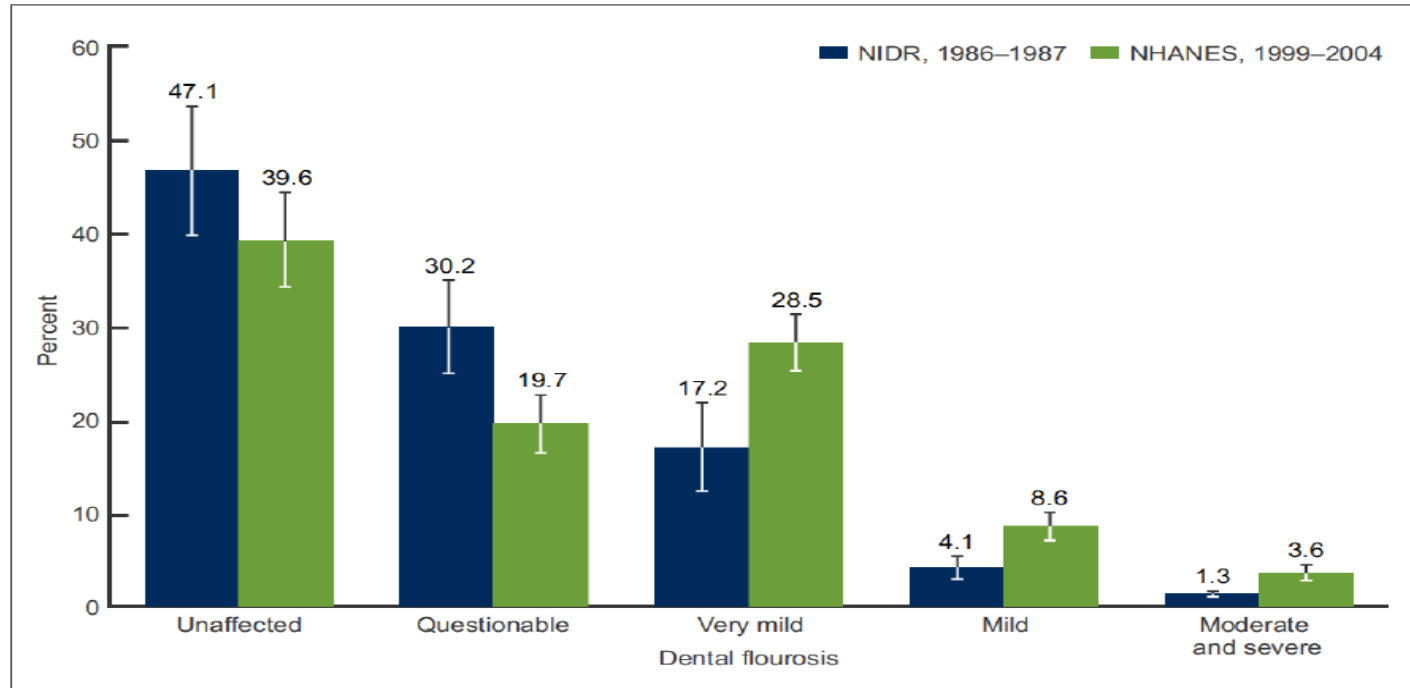
"All Substances are poisons: there is none which is not a poison. The right dose differentiates a poison and a remedy."

Dental Fluorosis Definition

- Opponents: "Chronic Fluorine Poisoning"
- Proponents: "A cosmetic marker": fluoride is ingested at level $>.05-.07/\text{mg/kg/day}$ in first 8 years of life.

CDC Statistics on Dental Fluorosis

Figure 3. Change in dental fluorosis prevalence among children aged 12–15 participating in two national surveys: United States, 1986–1987 and 1999–2004



NOTES: Dental fluorosis is defined as having very mild, mild, moderate, or severe forms and is based on Dean's Fluorosis Index. Percentages do not sum to 100 due to rounding. Error bars represent 95% confidence intervals.

SOURCES: CDC/NCHS, National Health and Nutrition Examination Survey, 1999–2004 and National Institute of Dental Research, National Survey of Oral Health in U.S. School Children, 1986–1987.

Tooth Paste and Fluorosis

Risk of Fluorosis in a Fluoridated Population Implications for the Dentist and Hygienist

TABLE 1

ADJUSTED ATTRIBUTABLE RISK ESTIMATES FOR MILD-TO-MODERATE FLUOROSIS ON THE MAXILLARY ANTERIOR TEETH.*		
VARIABLE	PERCENTAGE OF CASES THAT CAN BE ATTRIBUTED TO EXPOSURE TO EACH VARIABLE†	95 PERCENT CONFIDENCE INTERVAL
Brushed teeth more than once per day using more than a pea-sized amount of toothpaste throughout the first eight years of life	71	51-99
Inappropriately given fluoride supplements during the first eight years of life	25	18-34

Toothpaste: 71%

Iowa Fluoride Study

“It is important to understand that fluorosis is not a disease, and that any child with these milder forms of fluorosis will also benefit from fluoride’s protection against tooth decay.”

Iowa Fluoride Study: 1993-ongoing. 10 NIH grants have supported this important research.

Which ones have fluorosis?



Sample A



Sample B



Sample C



Sample D

Which ones have fluorosis?



Sample A ✓



Sample B ✓



Sample C ✓



Sample D ✓

My Personal Fluorosis Statistics





**AMERICAN
FLUORIDATION
SOCIETY**

West Coast Members



Chicago, June 2015



3 Key Observations

- It's much easier to scare the public than to un-scare the public.
- The support for fluoridation is a mile wide, but the passion is an inch deep while the opposition support is an inch wide,.....
- Stopping a long-standing fluoridation program can be as difficult as starting a new fluoridation program.

Correlation is not Causation

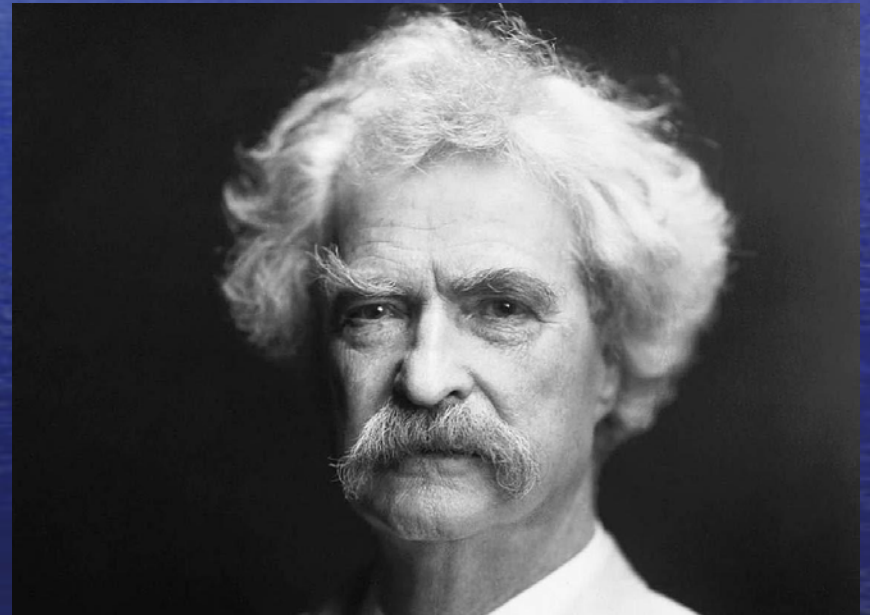


Understanding Fluoridation Politics

- "A lie can travel halfway around the world while the truth is putting on its shoes".

Mark Twain

1835-1910



Fluoridation Fib

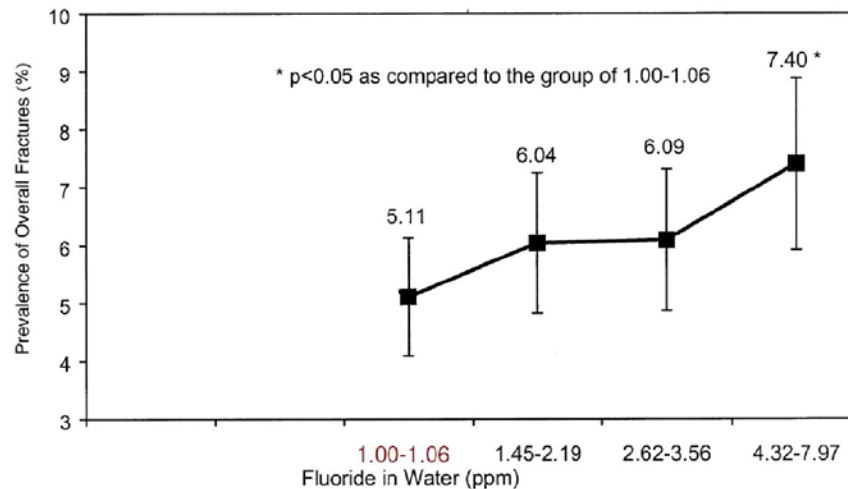
What the Fluoride Action Network Cites

Journal of Bone and Mineral Research
JBMR

J Bone Miner Res. 2001 May;16(5):932-9.

Effect of long-term exposure to fluoride in drinking water on risks of bone fractures.

Li Y, et al Center for Dental Research, Loma Linda University School of Dentistry, California 92350, USA.



Fluoridation Fib

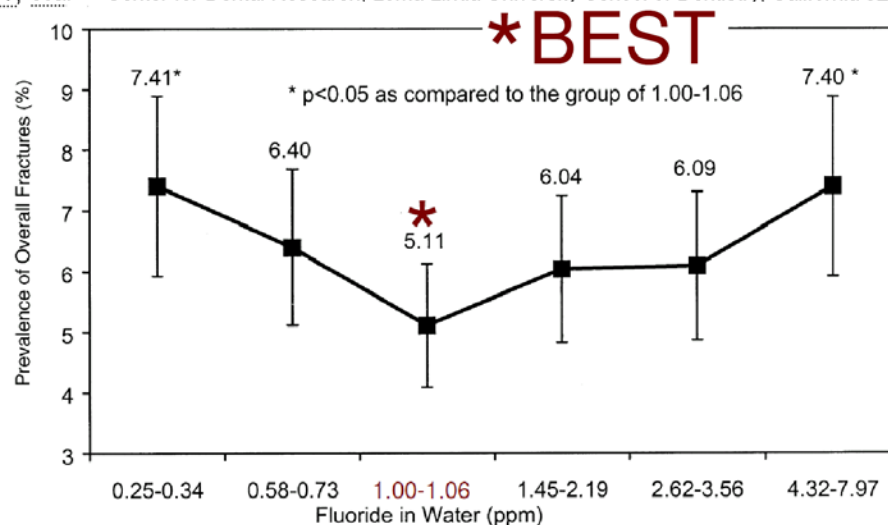
The Rest of the Story

Journal of Bone and Mineral Research
JBMR

J Bone Miner Res. 2001 May;16(5):932-9.

Effect of long-term exposure to fluoride in drinking water on risks of bone fractures.

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Fluoridation Fibs

ADA: Mild Fluorosis



Levy SM, Broffitt B, Marshall TA and colleagues. Associations between fluorosis of permanent incisors and fluoride intake from infant formula, other dietary sources and dentition during early childhood. JADA 2010;141(10):1190-1201. Copyright ©2010 American Dental Association. All rights reserved. Reprinted by permission.

Mild Fluorosis: PW Light



Fluoridation = Prevention For All

“In a perfect world we would not need safety net dental clinics or fluoridation. We do not live in that world.”

Charile LaTourette, immediate
past Executive Director, Dental
Foundation of Oregon



Got Teeth

Get Fluoride

Fluoride

Ride for

Island of Korcula, Croatia
September 2012

Fluoridation Websites

- www.ilikemyteeth.org
- www.cdc.gov/fluoridation
- www.ada.org/fluoride
- www.americanfluoridationsociety.org
- www.fluorideexposed.org
- Please "like" Campaign for Dental Health and the American Fluoridation Society on Facebook.