

**Valparaiso City Utilities
Fluoride Commission
Commissioners' Written Questions & Responses**

Question A (Kevin Steele): Several times at meetings Lowell was mentioned and people said that it now used Indiana American as its water source. I believed that to be incorrect because Lowell is outside the Lake Michigan watershed. Therefore, I looked at Lowell's website. Its watersource is well fields located south of town. Also, in its 2013 water report Lowell reports its fluoride level as 2.2 mg/l. See <http://www.lowell.net/file/2013%20CCR%20%281%29.pdf>(Referred to J. Hardwick)

Answer: I recall when they tried to get I-A (Indiana American Water Co.) water. They could not due to Great Lakes Compact Regs. (J. Hardwick-6/26)

Since there is an interesting "the rest of the story", I have provided a link for an excerpt from the book entitled "The Great Lakes Water Wars" written by Peter Annin, which discusses in some detail the water problems Lowell experienced in the late 80s. The link is: <http://www.greatlakeswaterwars.com/chapter08.htm>.

Since there is a reference to Lowell's high Fluoride content in their well(s), I am sending this response to the full commission. (J. Hardwick-6/27)

Question B (J. Waldo): I know one thing on my mind has been, if we decide to take fluoride out of our water supply, will it still be closely monitored for the naturally occurring presence? I know it seems like a silly question, but not sure if it will be as tightly monitored, or if the level and presence are all part of the package? Referred to S. Chen-6/27)

Answer: The main reason we monitor the fluoride now is to make sure the added fluoride stays at the recommended level (based on the currently known scientific studies), so that no adverse health effects would be posed.

If Valparaiso decides not to add Fluoride to the water, we could still be monitoring the levels, but it doesn't help much. There is nothing we can really do about the naturally occurring fluoride since the amount is way below EPA's regulated level. At this point, I would say "the level and presence (in Valparaiso water) are all part of the package". (S. Chen-6/27) We have been checking the background level in the existing wells on a weekly basis. About 0.2-0.3 mg/L depending on the well combinations (which wells were running). (S. Chen-6/27)

Question C (J. Schoer): 1) What is the mechanism(s) by which fluoridation protects teeth from dental caries? As an analytical chemist, I want a more detailed explanation than "topical vs ingested". What are the chemical reactions occurring at the tooth (or bacteria that are being inhibited) and to what extent do they occur? I understood what Dr. Hirzy was describing in terms of enzyme

inhibition by fluoride and also what the dentist was describing in terms of replacing the hydroxyl group in hydroxyapatite with fluoride to increase resistance to attack by the acids created by the bacteria. I would like to see the specific chemical reactions and their associated equilibrium constants (K-equilibrium) and thermodynamic values such as Gibbs energy (ΔG), enthalpy (ΔH) value, entropy (ΔS), etc. where known. or at least have references to them.

1a) Sodium fluoride dissociates in aqueous systems to form sodium ions and fluoride ions. However, fluoride ion is a weak acid that will extract a proton from water to form small concentrations of hydrofluoric acid and hydroxide ion. Which form of the fluoride is actively participating in the remineralization of the enamel or in the reaction with the hydroxyapatite to form the fluorapatite?

1b) What is the mechanism for fluorosilicic acid, i.e. what are the chemical steps in its action on tooth enamel? What are the acid dissociation constants for its 2 protons? How prone is it to lose a fluoride ion(s)? Silicon is analogous to C in the periodic table and readily forms 4 bonds. It will need to use d-orbitals to form bonds with the 6 fluorine atoms. What is the equilibrium constant for this loss of a fluorine(s)? etc. All of this assumes that the benefit is topical.

1c) What are the kinetics of the fluoride substitution in tooth enamel? For example, a reasonable experiment would be placing some enamel or pieces of hydroxyapatite into solutions that contains saliva and known amounts of various fluoridating compounds and determine how quickly the replacement occurs and how extensively it occurs.

2) If the benefits of fluoridation are primarily from inhibiting enzyme activity of the bacteria, please remind me of the enzymes that are inhibited. If enzyme inhibition is the main mechanism, have other inhibiting agents been tested? Maybe there is something better than fluoride!

3) I would like to see the MSDS sheet for the fluorosilicic acid that the city is using, as well as a complete chemical analysis of the contents and purity, including trace compounds that may be present at ppm levels and below. Both of these should be readily available. (referred to S. Chen)

Answer to No. 3 As requested by Dr. Schoer, attached (see below - jah) is the MSDS for Hydrofluorosilicic Acid (or Fluorosilicic Acid HFSA or FSA) used at water treatment plants. The heavy metals in this concentrated acid were also detected and reported in the attached file titled "Heavy metals in HFSA.pdf". In addition, the testing results for some metals in the treated water are also included in the file titled "Inorganic chemicals in treated water(valparaiso 2013).pdf" for comparison purpose. As you may recall during the tour, the HFSA is added to the water at a low HFSA to water ratio and gets diluted. This explains why we see

higher levels of metals in the HFSA but not in the treated water. (S. Chen/E. Pilarski)

Per Mr. Schoer's request, attached are the fluoride levels at various locations in the distribution system and at FL plant in the past several days. As indicated in the attached table (Addendum 4 – Valpo Fluoride levels Water Distribution & WWTP (2014-16)), the fluoride levels in the distribution system are fairly consistent with the levels measured at the Flint Lake water plant. (Steve Poulos)

<<See Addendum 1 – FC Q&A Addendum 1 - MSDS Sheet – Hydrofluosilicic Acid>>

<<See Addendum 2 - FC Q&A Addendum 2 - Heavy metals in HFSA>>

<<See Addendum 3 - FC Q&A Addendum 3 - Inorganic chemicals in treated water(valparaiso 2013)>>

<<See Addendum 4 – FC Q&A Addendum 4 – Valpo Fluoride levels Water Distribution & WWTP (2014-06)>>

In answer to Question 3 James Powers, ISDH submitted the following addendum:

<<See Addendum 5 – FC Q&A Addendum 5 - NSF Fact Sheet on Fluoridation Products>>

4) I have a vague recollection of reading a news story several years ago about a study in which the bacteria commonly found in human mouths and blamed for creating the acids that decay the teeth were replaced by other bacteria that did not generate the acid. Is someone familiar with this study and can they briefly summarize it and provide a reference.

5) How has the rate of tooth caries changed as the rate of brushing/flossing has increased and as overall human nutrition has improved? We have seen charts showing the impact of fluoridating water, but what about nutrients, calories, and other minerals, vitamins, etc. Same for economic and socioeconomic status. We have seen graphs that clearly show an socioeconomic component to reducing dental caries.

6) Is there any benefit from ingesting fluoride? At this point, it seems that both groups acknowledge that the greatest benefit to teeth is from topical application of fluoride while there is little benefit from ingestion. Am I correct in this interpretation? If not, what fraction of the dental benefit is attributed to fluoride ingestion?

(Q 1,2,4,5,6 referred to Dr. Martinez-Mier-6/28 & Gary Foreman/Dr. Hirzy – Q 3 referred to S. Chen – Follow up referred to C. Shen/E. Pilarski)

Answer: (for Schoer's Questions 1, 2, 4, 5 & 6)

[Dr. William Hirzy Answers](#) - This answers some of the chemistry questions from John Hardwick (ed: Dr. Jon Schoer) in his Question 1 a - c.

URL to access a 2001 Toxicological Summary for sodium hexafluorosilicate and fluorosilicic acid: <http://www.fluoridealert.org/wp-content/pesticides/fluorosilicates.nih.2001.pdf>

Regarding his questions about mechanism(s) of action, I refer him to Reference #2 from my written submission:

2. Fluoride's predominant effect is posteruptive and topical. Centers for Disease Control and Prevention. (2001). Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. Morbidity and Mortality Weekly Report 50(RR14): 1-42.

Regarding his Questions 2,4,5 and 6 I defer to Dr. Kennedy, particularly about better substitutes.....

Regarding his Question 3, no MSDS for HFSA will give the information on trace contaminants he seeks. He will be fortunate to get any detailed information from Certificates of Analysis (CoA), which are supposed to convey that sort of information, but which often do not.

For instance, for HFSA CoAs often say no more about trace contaminants than "Complies with NSF Standard 60"

Dr. Bill Osmunson Answers: (also see separate zip file)ⁱ

Some of these questions are best answered with Dr. Hardy Limeback's book Comprehensive Preventive Dentistry. You can order at the lowest cost at: http://www.bookdepository.com/book/9780813821689?redirected=true&viewCountry=US&selectCurrency=USD&gclid=CjgKEAjw8r6dBRDZprbmndPi90sSJAB2U6dRCiXhr5u9R_Z-wJIRgofmGhfOJCOFdmUNK6TcfbemxfD_BwE

Hardy's textbook has the references for many of the questions below and may I suggest a copy for each member of the committee. Certainly one copy and perhaps photo copy of the answers to the questions below for each member of the committee.

Dear John Hardwick,

Judgment. Each aspect of fluoride exposure should be woven together to provide a picture for judgment. Most public health departments and dental associations in developed countries have rejected fluoridation supplements.

Fluoride with intent to prevent caries is a drug. (See attachment fad-2000a.pdf)

The foundation for public health judgment starts with fluoride when marketed with the claim of treatment or prevention is a drug. Ask your Pharmacist whether fluoride for ingestion is a drug and whether it is FDA CDER approved. And fluoridated toothpaste says, "drug facts" and is FDA CDER approved.

As a Public Health, General, Cosmetic and TMD Dentist I am not qualified to answer your excellent scientific chemistry questions. Like most of fluoridation, I don't think your questions and many others have been adequately addressed and part of the reason the FDA CDER has never approved the ingestion of fluoride with the intent to prevent disease, the evidence for efficacy is lacking. I first defer to the FDA CDER with the experts, policy and experience to evaluate efficacy and safety of medications. All developed countries drug regulatory agencies agree with the FDA CDER, to my knowledge.

Public health judgment must defer to the FDA CDER. Does the FDA CDER make mistakes? Of course. But they are the best we have. Personal disagreement with the FDA CDER is reasonable. But public health policy must not use unapproved drugs. Federal courts have been clear, even in time of war, drugs cannot be used or approved drugs used off label. And even if the ingestion of fluoride were approved by the FDA CDER, the use of police powers to mass medicate or treat everyone without a doctor's prescription is illegal outside of a highly contagious disease. And judgment must include dosage of fluoride from all sources, total exposure which is too much even without fluoridation. Do not forget some people are more chemically sensitive than others. And some drink more water than others.

Proponents (that was me at one time) have promoted fluoridation and the ingestion of fluoride without requiring answers to the tough scientific questions such as you have raised, simple physiologic questions or reasonable public health questions.

Proponents talk about the "optimal" concentration of fluoride in water, but fail to suggest an "optimal" amount of fluoride in the blood or tooth they want to achieve from the "optimal" amount of fluoride in the water. Simple progression of the fluoride to the target organ. Why do we avoid that thorny question of optimal tooth concentration? Because teeth with decay and without decay have similar fluoride concentrations. In other words, no one knows the "optimal" amount of fluoride for the tooth because the concentration of fluoride in the tooth with and without dental caries is similar. The exception is perhaps the outer few microns of the tooth where fluoride concentration maybe higher with lower caries. A possible result of topical rather than systemic fluoride ingestion.

A Medline and Fluoride Journal search of fluoride provides thousands of research articles. Thousands of hours can be spent reviewing the literature.

Even with thousands of articles, we still don't have good answers to your questions. When reading the fluoridation research, it is important to separate "fact" from "assumption." In order to get an article published in the main dental Journals, the authors cannot deviate far from accepted theory. Almost all must include statements of fluoride is safe and effective or at least "is widely accepted" as effective. Always keep in mind total fluoride exposure versus studies evaluating fluoride from one source. (See Warren attached)

(Schoer's Question 5)

Perhaps the thorniest problem with the most confounding factors is diet. And each individual is unique. Absorption, excretion, dosage, exposure, and sensitivity have considerable variations. To suggest fluoridation for everyone is "safe and effective" is one of the greatest public health blunders of the 20th Century.

Dr. Limeback's addition of red lines to Colquhoun's published graph below sheds some light on your question. First, we don't know for sure where the caries have gone. We are certain, the reduction of caries in half or more was not the result of fluoride ingestion.

Colquhoun and others speculate that perhaps transportation and socioeconomics of year round fresh foods have contributed. How much, we don't know.

And part of judgment should contain a humble approach to science. (See Ioannidis attached)

Socioeconomics and dental caries:

No prospective blinded randomized controlled trials with fluoridation exist. All studies have significant limitations of various kinds.

Comparing 50 USA states finds significance. Osmunson attached.

Reisine (2001) Considered 3,138 abstracts on socioeconomics and dental caries.

They reviewed 358 and selected 272 studies. "There is fairly strong evidence for an inverse relationship between SES and the prevalence of caries among children. . . ." <http://www.jdentaled.org/content/65/10/1009.short>

Any study on fluoridation which does not control for socioeconomics has limitations.

(Schoer's Question 6)

If there were no alleged benefit, fluoridation would not have started. Perhaps the increased fluoride exposure from numerous sources over the last several decades, or better research, shows limited if any public health benefit from the additional exposure of fluoridated water today. If there is a benefit in dental caries reduction, the evidence is currently hard to detect.

Topical effect with fluoride varnish (22,600 ppm) glued on the tooth has between none and fair evidence of efficacy.

One of the better studies is attached by Milsom 2011.

Sample size almost 3,000 children. 3 years. 9 applications of fluoride varnish. Blinded examiners. Random schools. No statistical significance, although those without fluoride varnish had slightly fewer cavities.

If topical fluoride has benefit, the benefit is still small.

To estimate a fraction of contested benefit between ingestion and topical is not possible. In practical terms, ingestion has less benefit and topical benefit is hard to detect and research is not consistent. Neither fluoridation nor fluoride varnish are FDA CDER approved. Fluoridated toothpaste is FDA CDER approved.

Dr. David Kennedy Answers: (also see separate zip file)
(Schoer's Question 1)

Fluoridation at the current alleged beneficial level does not protect teeth from dental caries. It will however dramatically increase dental fluorosis in young children.

The systemic inhibition of the MMP-20 enzyme by fluoride during tooth development has been identified as the likely the cause of incompletely developed enamel called dental fluorosis.

DenBesten PK, Yan Y, Featherstone JD, Hilton JF, Smith CE, Li W. Effects of fluoride on rat dental enamel matrix proteinases. Arch Oral Biol 2002 Nov;47(11):763-770

ADA News Posted Jan. 2, 2003
<http://www.ada.org/prof/pubs/daily/0301/0102en.html>

Researchers isolate key enzyme for dental enamel formation in mice
Boston—A team of scientists from the Forsyth Institute and the National Institute of Dental and Craniofacial Research have discovered that an enzyme known as matrix metalloproteinase-20 is essential for proper formation and development of dental enamel in mice, a December Forsyth news release reported.

Since matrix metalloproteinase-20, or MMP-20, is expressed in human teeth, the finding may be relevant to science's understanding of a human disease known as amelogenesis imperfecta, which causes one in approximately 7000 children to be born with defective dental enamel, according to John Bartlett, Ph.D., associate member of the staff at the Forsyth Institute and the principal investigator.... published in the January/February 2003 issue of the Journal of Biological Chemistry.

The finding is also significant because the family of MMP enzymes is involved in degrading almost all tissues of the body, Dr. Bartlett said, and is

important in tissue turnover and replacement.

"Understanding how MMP-20 relates to proper enamel formation may help scientists understand the importance of other MMP enzymes to normal development or in disease states such as cancer, where MMPs are known to be involved in tumor metastasis," Dr. Bartlett noted.

As an analytical chemist, I want a more detailed explanation than "topical vs. ingested". What are the chemical reactions occurring at the tooth (or bacteria that are being inhibited) and to what extent do they occur?

The inhibition of *Streptococcus mutans* (decay causing bacteria) does not occur at 1 PPM F. FDA refused to approve any toothpaste intended for topical use less than 1000 PPM. It has approved higher, 1500 PPM, but not lower. Some countries do offer what is called "Children's toothpaste" but attempts by manufacturers using new drug applications (NDA) to show the US FDA that this reduced level is beneficial have thus far failed.

(Schoer's Question 1)

I understood what Dr. Hirzy was describing in terms of enzyme inhibition by fluoride and also what the dentist was describing in terms of replacing the hydroxyl group in hydroxyapatite with fluoride to increase resistance to attack by the acids created by the bacteria.

These two publications are a but mall sampling of the volumes of scientific investigation that have confirmed there is no reasonable purpose in elevating the fluoride in enamel since even levels as high as some brands of toothpaste did not inhibit acid dissolution [tooth decay].

(Schoer's Question 1)

I would like to see the specific chemical reactions and their associated equilibrium constants (K -equilibrium) and thermodynamic values such as Gibbs energy (ΔG), enthalpy (ΔH) value, entropy (ΔS), etc. where known. or at least have references to them.

This was discussed in a number of publications by chemical engineer Myron Coplan and others.

You will also likely find the answers in Westendorf's PhD thesis. Sorry I do not have a copy but he measured incomplete dissociation of HFSA at water plant conditions.

(Schoer's Question 1a & 1b))

FYI Dr. Masters and Coplan were the first to show that HFSA (Hydrofluosilicic acid) using NHANES Well baby data dramatically increased blood lead levels especially in minority populations.

Masters, R, Hone, B, and Doshi, A. (1998). "Environmental Pollution, Neurotoxicity, and Criminal Violence," in J. Rose, ed., Environmental Toxicology: Current Developments (London: Gordon and Breach, 1998), pp. 13-48.

His findings were loudly criticized and he personally was called names by advocates for fluoridation. That is PR and not science. Below is his response to some of the criticism by Urbansky he shared with me. He subsequently published an even more detailed study that confirmed his earlier findings and dealt with the criticism of dirty fingers by using only venipuncture data.

Masters RD, Coplan MJ, Hone BT, and Dykes JE Association of Silicofluoride Treated Water with Elevated Blood Lead Neurotoxicology Vol. 21 #6 pp 1091-1100, 2000

TO: Edward Urbansky
FROM: Roger Masters

Thank you for your thoughtful message on familial health problems.

I've been meaning to respond to your statements especially since the email correspondence with Cherie Trine has been so widely disseminated. Her recent answer makes it more important for me to emphasize a number of factual and scientific errors in your criticism of the many peer-reviewed articles that I have published (most with Myron J. Coplan) on the neurotoxicity of fluosilicic acid and sodium silicofluoride as water treatment chemicals.

First, however, a personal note to confirm a remark that Cherie Trine made in her last email to you. I am NOT an "anti-fluoridationist": I use fluoridated toothpaste and a fluoride gel (both with sodium fluoride). Since our research does not show that water treated with sodium fluoride has effects comparable to those observed where silicofluorides are in use and since sodium fluoride was at least tested for its toxicity, I find myself disagreeing with ANY discussion of "fluoridation" (pro OR con) that does not refer precisely to the chemicals used for this purpose. Our specific position is that there should be a moratorium on the use of fluosilicic acid and sodium silicofluoride (the "silicofluorides") until extensive independent testing on animals shows their safety.

Second, although silicofluorides are added to public water supplies for a health-related purpose, the effect of chronic exposure to these compounds has never been tested and neither the EPA nor the CDC has POSITIVE evidence of their safety. An ASSUMPTION in the chemistry of dissociation is not adequate as evidence of safety: for example, many silicon compounds can be toxic and no one knows whether such compounds are formed when fluosilicic acid or sodium silicofluoride is injected in a public water supply. I would appreciate knowing of

ANY drug newly developed for medical usage that is sold in drugstores with a comparable lack of testing. Even more questionable, of course, is the compulsory exposure of large populations to such untested chemical compounds. As a result, the testing of silicofluorides should not be limited to chemical studies of "dissociation" since such research ignores the possibility of the formation of new compounds with toxic effects either in the water flow or after ingestion of water treated with silicofluorides.

Third, you have often written that we have no evidence that the silicofluorides leach lead from water pipes as if this was a reason to dismiss our publications. SUCH AN EFFECT IS IN NO WAY ESSENTIAL TO OUR FINDINGS AND INDEED HAS NEVER BEEN DISCUSSED AS THE PRINCIPAL HYPOTHESIS EXPLAINING THE HARMFUL ASSOCIATIONS WE HAVE FOUND.

Fourth, we have repeatedly stated a different point. WHERE THERE IS LEAD IN THE ENVIRONMENT (e.g., older housing with lead paint), water treated with silicofluorides enhances biological UPTAKE of this exposure to environmental lead (as measured by children's blood lead levels). We have even published empirical evidence consistent with this hypothesis. (If you don't understand why a two way analysis of variance with a significant interaction term is an important finding in this regard, please let me know and I'll explain it to you).

Fifth, as evidence that an untested chemical is a toxin that needs laboratory study, one does NOT have to present a demonstrated experimental finding of the mechanism involved. That's absurd: our point is that the necessity of such studies is established by the repeated finding of a statistically significant association between silicofluoride usage and harmful effects (using different methods and different dependent variables) -- especially when multivariate models control for up to a dozen or more co-founding independent variables.

Sixth, as a test of ecological factors that increase lead toxicity, I have found-- along with many other famous scientists (most notably Prof. Herbert Needleman of Pittsburgh) -- that behavioral dysfunctions related to lead neurotoxicity are especially important. YOU PERSISTENTLY AVOID ANY REFERENCE TO MY RESEARCH IN THIS FIELD, WHICH BEGAN LONG BEFORE MY STUDIES WITH MYRON COPLAN ON SILICOFLUORIDES AND WHICH ARE BASED ON KNOWN EFFECTS OF LEAD ON NEUROTRANSMITTERS SUCH AS DOPAMINE, WHOSE ROLE IN LEARNING AND BEHAVIORAL INHIBITION IS WELL ESTABLISHED.

The data on lead and crime are well known and, indeed, Prof. Needleman just published another paper showing this effect. (If there were even a single additional murder in a city using silicofluorides, how many cavities would have to be prevented by adding fluosilicic acid to a city's water supply to justify the practice?) Since I've recently published two different papers with further evidence linking silicofluoride treated water with higher rates of violent crime,

your refusal to accept our finding is making some observers suspect that non-scientific factors influence your position. Having spent two years in the Foreign Service (as Cultural Attaché at the U.S. Embassy to France), I'm well aware of the difference between bureaucracy and science.

If that isn't the explanation, I am puzzled since your remarks on our work fail to refer to the substance of our research methods and findings in a competent and comprehensive manner. For convenience, I am adding below a bibliographical summary. Should you want to see any of these papers (such as the most recent publication in the book on violence edited by Bloom and Dess), please let me know.

Sincerely,

Roger D. Masters

Publications on Silicofluorides, Neurotoxicity, and Behavior

Masters, R., Hone, B, and Doshi, A. (1998). "Environmental Pollution, Neurotoxicity, and Criminal Violence," in J. Rose, ed., Environmental Toxicology: Current Developments (London: Gordon and Breach, 1998), pp. 13-48.

Survey of evidence linking lead and manganese neurotoxicity to aggressive behavior and crime, presenting multivariate analysis correlating Toxic Release Inventory for lead and manganese with crime data for 1991 from all 3141 US counties Emphasizes effects of heavy metals on neurotransmitter function and behavior.

Masters, Roger D., with Baldwin Way, Brian T. Hone, David J. Grelotti, David Gonzalez, and David Jones (1998) "Neurotoxicity and Violence," Vermont Law Review, 22:358-382.

Legal implications of the evidence linking neurotoxicity and crime (including data from Toxic Release Inventory and crime for partial sample of US counties)

Masters, R. and Coplan, M. (1999a) "Water Treatment with Silicofluorides and Lead Toxicity," International Journal of Environmental Studies, 56: 435-49

First published analysis of data linking silicofluoride treatment of public water supplies with higher uptake of lead, focused on survey of children's blood lead in Massachusetts (by town).

Masters, R. and Coplan, M. (1999b) "A Dynamic, Multifactorial Model of Alcohol, Drug Abuse, and Crime: Linking Neuroscience and Behavior to Toxicology," Social Science Information, 38:591-624.

Articulation of the linkages between neurotoxicity, brain chemistry, environmental pollution, and behavior (with focus on substance abuse and crime), using data from National Institute of Justice study of drug use in over 30,000 criminal offenders at time of arrest). Data show that where silicofluorides are in use, criminals are more likely to consume alcohol, more likely to have used cocaine at time of arrest – and that communities have significantly higher crime rates.

Masters, R.D., Coplan, M. J., Hone, B.T., and Dykes, J.E. (2000). "Association of Silicofluoride Treated Water with Elevated Blood Lead," *Neurotoxicology* 21: 101-1100.

Follow-up epidemiological study of the association between silicofluoride treated community water and enhanced child blood lead parameters. This statistical study of 151,225 venous blood lead (VBL) tests taken from children ages 0-6 inclusive, living in 105 communities with populations from 15,000 to 75,000 in New York state, shows for every age and racial group a significant association between silicofluoride treated community water and elevated blood lead.

Roger D. Masters (2001), "Biology and Politics: Linking Nature and Nurture" in Nelson W. Polsby, ed., *Annual Review of Political Science*, vol. 4, pp. 45-369.

A survey of the scope of the emerging subfield called "biopolitics," reflecting the activities of the membership of the Association for Politics and the Life Sciences.

Four areas are discussed in some detail: 1). genetics and health; 2), toxins and behavior (including hyperactivity, depression, and violent crime), 3) the specific case of silicofluorides in water treatment and their effect in enhancing lead uptake; and 4) biopolitics and political theory.

Note: one-time e-print available at following URL:

<http://polisci.annualreviews.org/cgi/content/full/4/1/345?ijkey=0K1GnNcUKf2Gg&keytype=ref&siteid=arjournals>

Myron J. Coplan and Roger Masters. 2001. "Guest Editorial: Silicofluorides and fluoridation," *Fluoride Quarterly Journal of the International Society for Fluoride Research*, 34: 161-220.

Masters, R.D. (2002). "MacLean's Evolutionary Neuroethology: Environmental Pollution, Brain Chemistry, and Violent Crime," Gerald A. Corey Jr. & Russell Gardner Jr., eds. *The Evolutionary Neuroethology of Paul MacLean* (Westport: Praeger), pp. 275-296 (Ch. 15).

Survey of research on neurotoxicity, brain chemistry and behavior, including evidence of the role of lead and other heavy metal pollution and crime (as

demonstrated by individual data, neurochemistry, and both geographic and longitudinal data} as well as survey of data linking silicofluorides to enhanced lead uptake. First presentation of findings on the extremely high correlation ($r = .90$) between gallons of leaded gasoline sold and the crime rates sixteen years later, confirming special vulnerability of pregnant mothers and newborns to lead toxicity.

Roger D. Masters, 2003. "Neurotoxicology and Violence," in Richard W. Bloom and Nancy K. Dess, eds., *Evolutionary Psychology and Violence: A Primer for Policymakers and Public Policy Advocates* (Praeger/Greenwood), Ch. 2.

Analysis of evidence of neurotransmitter dysfunction due to toxins associated with increased rates of violent crime, with extensive discussion of silicofluoride neurotoxicity as an important instance.

Coplan, M.J. and Masters, R.D. (1999). "Is Silicofluoride Safe? Comments Re EPA Response to Rep. Calvert's Inquiry" Submission to Representative Kenneth Calvert, Subcommittee on Energy and Science, Committee on Science, U. S. House of Representative (August 12, 1999).

Analysis and rejoinder to letter dated 12 June 1999 from J. Charles Fox, Assistant Administrator, EPA, to Hon. Kenneth Calvert, U. S. House of Representative, commenting on errors and omissions in a "Question and Answer" statement and "Fluorosilicate Fact Sheet" enclosed by Mr. Fox. This document contains a preliminary review of scientific data on the differences between sodium fluoride (NaF) and the silicofluorides (H_2SiF_6 and Na_2SiF_6), with an emphasis on the complex production process and chemical interactions of the latter compounds.

Masters, R. D. and Coplan, M. J., with Hone, B.T., Grelotti, D. J., Gonzalez, D. and Jones, D. (in press). "Brain Biochemistry and the Violence Epidemic: Toward a 'Win-Win' Strategy for Reducing Crime," in Stuart Nagel, ed., *Super-Optimizing Examples Across Public Policy Problems* (NOVA Science Publishers) (in press).

Review of the evidence linking neurotoxicity and crime, using data from both county-level study (correlating EPA Toxic Release Inventory with FBI crime reports) and Massachusetts data on silicofluorides and lead uptake.

Web-site: Address for research (with M. J. Coplan) on health and behavioral effects of silicofluorides: <http://www.dartmouth.edu/~rmasters/ahabs.htm>

Presentations to Scientific Conferences:

Masters, R.D. and Coplan, M.J. "Silicofluoride Usage and Lead Uptake," Presentation to XXIInd Conference of the International Society for Fluoride Research, Bellingham, Washington, August 24-27, 1998.

Report on findings of elevated blood lead associated with communities using silicofluoride, based on sample of over 250,000 children in Massachusetts (see Masters and Coplan, 1999a)

Masters, R. D. . "Poisoning the Well: Neurotoxic Metals, Water Treatment and Human Behavior," Plenary address to Annual Conference of the Association for Politics and the Life Sciences," Four Seasons Hotel, Atlanta, GA (September 2, 1999).

Review of evidence linking heavy metal pollution with substance abuse and crime, including presentation of data linking ban on sales of leaded gasoline with decline in crime 16 years later. Summary of geographical data analyses contradicting the "null hypothesis" that there is no difference in the effects of sodium fluoride and the silicofluorides.

Coplan, M. J., Masters, R. D., and Hone, B. (1999a) "Silicofluoride Usage, Tooth Decay and Children's Blood Lead," Poster presentation to Conference on "Environmental Influences on Children: Brain, Development and Behavior, New York Academy of Medicine, Mt. Sinai Hospital, New York, May 24-25, 1999.

Preliminary report on data from analysis of national sample of over 4,000 children in NHANES III, showing that while water fluoridation is associated with a significant increase in children's blood lead (with especially strong effects among minority children), data on tooth decay from the same survey show limited benefits that are no longer evident among those aged 15-17.

Coplan, M.J., Masters, R.D., and Hone, B. (1999b) "Association of Silicofluoride Treated Water with Elevated Blood Lead," Poster presentation to 17th International Neurotoxicology Conference, Little Rock, AR, October 17

Preliminary report on data from analysis of sample of blood lead testing of over 150,000 children in New York State communities of 15,000 to 75,000 population. Once again, average blood lead levels were significantly higher ($p < .0001$) in communities using silicofluorides in water treatment than in those with unfluoridated water. The effect was found independently in every age group for three ethnic subsamples

Roger D. Masters (2002) "Science, Bureaucracy, and Public Policy: Can Scientific Inquiry Prevail Over Entrenched Institutional Self-Interest?" presentation at the annual meeting of the Association for Politics and the Life Sciences, Montreal, Que. (August 19-23, 2002).

Analysis of bureaucratic opposition to reconsideration of public policy decisions challenged by new data on silicofluoride chemistry and its effects on human biology and behavior..

Roger D. Masters (2002). "Toxins and Behavior: Implications of 'Toxicogenomics' for Public Policy," Paper presented to XXth International Neurotoxicology Conference, Little Rock, ARK, Nov. 19, 2002.

--- You wrote:

Dear Professor Masters:

I am sorry to learn that your wife is not well. I hope that she returns to good health and back home soon.

Most of us have had our share of experiences with illnesses, either personally or via those we love.

Regardless of any professional differences we might have, I wish people happiness and health in their personal lives.

masters

--- end of quote ---

(Schoer's Question 1c)

Featherstone has done these types of experiments and so have others but as discussed above this is irrelevant since the level found in enamel is not associated with any reduction in acid dissolution (mechanism of tooth decay). Featherstone JD, Prevention and reversal of dental caries: role of low level fluoride. Community Dent Oral Epidemiol 1999 Feb;27(1):31-40

(Schoer's Question 2)

Fluoride inhibits almost all enzymes. It disrupts hydrogen bonds even when combined to other elements as chemistry professor Paul Connett pointed out in the 1990's. Dr. Yiamouyiannis in his book *Fluoride the Aging Factor* stated that over 35 enzymes had at that time 1994 been identified. They do not have to have a metallic cofactor so the mechanism is likely be changing the shape of the molecule.

Maybe there is something better than fluoride!

You there are far better and safer substances to use. In my book *How to Save Your Teeth* I detailed the death of a child who died from an overdosed of "topical" F applied by a professional in the dental office. The coroner testified during the malpractice trial that the child's autopsy revealed he had received 3 times a lethal

dose. Both the supervising dentist and dental hygienist testified they had not realized fluoride was poisonous.

While it is possible to have a minor reaction to iodine I know of no lethal incidents every.

Lopez in the study below took a topical form of iodine (povidone) and dabbed high risk baby's teeth 6 times in a year and dramatically reduced the decay over the controls. F at 4 ppm from tea had no measurable effects.

20% of children (mostly poor) have 80% of tooth decay. Thus an appropriate public health intervention is to determine which child is at risk and then treat that child in a public school setting until they are no longer at high risk. Average child in the US today has very few cavities. This is true of both fluoridated and non-fluoridated areas.

What I recommend is that all children of preschool age have their decay germs measured. It is a very simple spit-in-a-test-tube test. The company that makes the test is Ivoclar.

I recommend you measure the Strep levels in a child's mouth and if the bug is present begin to institute measures both at home and in the office or school to kill off (disinfect) the child's oral flora. This is not difficult and can and should be done in a school setting. The product can be found on the Vivadent web page: <http://www.ivoclarvivadent.com/>

Topical antimicrobial therapy in the prevention of early childhood caries:
a follow-up report.

Lopez L, Berkowitz R, Spiekerman C, Weinstein P.

School of Dentistry, University of Puerto Rico Medical Center, San Juan, USA.

PURPOSE: The purpose of this study was to assess the efficacy of antimicrobial therapy in the prevention of early childhood caries (ECC). **METHODS:** The study population consisted of 83 subjects (age: 12 to 19 months ($x= 15.6$); gender: 40 females and 43 males). Inclusion criteria included: (1) unremarkable medical history; (2) presence of 4 maxillary primary incisors (MPI) with no visible defects; (3) clinically caries free; (4) use of a nursing bottle at naptime and/or bedtime which contained a cariogenic substrate; (5) 2 consecutive ms positive cultures from pooled MPI plaque. The subjects were randomized into 2 groups. The 39 subjects in the experimental group and the 44 subjects in the control group were evaluated every 2 months during the study period. At each evaluation, the subjects had 10% povidone iodine (experimental group) or placebo (control group) applied to their dentition. Treatment failure was defined as the appearance of a white spot lesion(s) on any of the MPI during the study period. **RESULTS:** Using the Kaplan-Meier procedure, the estimated percents (+/- SES) of

participants to experience 12 months of disease-free survival were 91 +/- 5% for those receiving treatment and 54 +/- 9% for those in the control group. Via the log-rank test, the hazard of treatment failure is statistically significantly higher in the placebo group (log-rank statistic 10.28, two-sided P=0.0013). **CONCLUSIONS:** These observations indicate that topical antimicrobial therapy increases disease-free survival in children at high risk for ECC.

Publication Types: MID: 12064491 [PubMed - indexed for MEDLINE]

Clinical Trial Randomized Controlled Trial

Splash of iodine prevents early childhood cavities

Last Updated: 2002-06-13 16:50:20 -0400 (Reuters Health)

NEW YORK (Reuters Health) - Swabbing the teeth and gums of infants with a small amount of diluted iodine may keep early childhood cavities away, new study findings suggest.

Cavities in the first few years of life can have devastating consequences on the primary teeth of infants, toddlers and young children, according to researchers led by Dr. Lydia Lopez of the University of Puerto Rico Medical Center in San Juan.

Since the primarily culprit responsible for cavities is the bacterium *Streptococcus mutans*, the researchers note, it stands to reason that suppressing the bug could help prevent cavities.

To investigate, Lopez's team investigated the effectiveness of applying 10% solution of the antimicrobial iodine to the teeth and gums in a study of 83 infants between the ages of 12 and 19 months.

All of the children were healthy, free of cavities and were getting a baby bottle at naptime and bedtime that contained a beverage other than water, such as milk or juice. Such beverages can promote the development of cavities. The children also tested positive twice in a row for the presence of *S. mutans*, the authors report in the June issue of the journal *Pediatric Dentistry*.

Iodine was applied every other month for 1 year to the teeth and gums of 39 infants, while the remaining 44 infants, in the "control group," had their teeth and gums swabbed with a solution of unsweetened tea.

Lopez and her team found that 91% of the infants who received the iodine solution were free of cavities after 12 months compared with only 54% of infants in the control group.

"The experimental results of this clinical trial indicate that topical antimicrobial therapy significantly increases disease-free survival in children at high risk for developing early childhood cavities," the authors conclude.

(Schoer's Question 4)

I am retired since 2000 and honestly I did not personally use probiotics for the oral cavity but I have many colleagues that do and found them very beneficial. They are very safe and so it can't hurt to try them. <http://nccam.nih.gov/health/probiotics/introduction.htm>

On another note I have personally found that probiotics were instrumental in saving my wife's life ten years ago after she had intractable diarrhea following removal of 2 feet of bowel because of cancer. The only thing that helped her regain normal function was daily probiotics which are still necessary to this day.

(Schoer's Question 6)

At this point, it seems that both groups acknowledge that the greatest benefit to teeth is from topical application of fluoride while there is little benefit from ingestion. Am I correct in this interpretation?

No. Not entirely.

Personally since scientific fraud has been shown to have occurred on numerous occasions by fluoride supporters I seriously question the current claims of benefit even from topical.

Dale reported that workers exposed to fluoride benefited from decay reduction but did not report the data. it was kept as top secret for an additional 50 years. The data showed that in fact the workers lost their teeth and the so called "benefit" was an artifact from tooth loss. This is not the first time that fraud was found and certainly not the last.

DP P Dale, H B McCauley, Dental Conditions of Workers Chronically Exposed to Dilute and anhydrous Hydrofluoric Acid, Journal of the American Dental Association Vol. 37 #2 Aug. 1948

PDF sent separately due to size.

(Schoer's Question 6)

No. Virtually all the published research has identified only harm

I imagine one could spend several billion dollars showing brushing with arsenic was "beneficial" if it made the germs sick but seriously what parent would allow their child to do this? The research has show that even when supervised during brushing with a measured amount of fluoride and admonished to spit all of it out some children only spit a small fraction of it out and none of them were successful in expectorating 100%.

So even if you were supportive of using fluoride toothpaste you would first have to do a very careful risk vs. benefit analysis with special attention to periodontal inflammation (gum disease) and total body burden. This is especially true when compared to other safer substances.

While it may be correct that a slight dip in decay can be measured I would also want to know if they were a slight dip in IQ or early onset of puberty and how strong the bones are following a lifetime of tiny amounts. This work has not been done to any great extent but we do have some indications that eh answers will not be good because from studies of slightly higher amounts being ingested for shorter periods of time found IQ harm, endocrine dysfunction and weakened bones. It will likely be found far to risky for any child in the not too far distant future.

The most thorough recent review was in 2006 by the National Research council. I would direct your attention to Table 8-2 and especially note the amount associated with harm to an iodine deficient infant.

(Schoer Question 6)

If not, what fraction of the dental benefit is attributed to fluoride ingestion?

I have advocated for preventive dentistry my entire career. I've made films, given lectures and published articles and a book. Decay is very preventable but it is not simply truck in some toxic substance and add it to the public water supply. That is magic and I don't believe in magic. I do believe in science however and today we know a lot about why children develop cavities and how to stop that from occurring. I sincerely hope that Valparaiso takes this information and applies it to developing a forward looking prevention program for the next generations of our nation and becomes a leader in advocating for safe sane intelligent decay prevention.

The majority of dentists advocating fluoridation are not evil although harm can and has resulted from this. They are merely repeating what they were told in school. That is why it was so vital for this commission to learn from both sides so you could learn that one side advocates based upon their beliefs and training while the other uses science to support water that is safe for us all to drink including infants.

Answer(s) (C 1 through 6)

Answer (1) From the CDC recommendations: *“Fluoride works to control early dental caries in several ways. Fluoride concentrated in plaque and saliva inhibits the demineralization of sound enamel and enhances the remineralization (i.e., recovery) of demineralized enamel (12,13). As cariogenic bacteria metabolize carbohydrates and produce acid, fluoride is released from dental plaque in response to lowered pH at the tooth-plaque interface (14). The released fluoride and the fluoride present in saliva are then taken up, along with calcium and phosphate, by de-mineralized enamel to establish an improved enamel crystal structure. This improved structure is more acid resistant and contains more fluoride and less carbonate (12,15--19) (Figure 1). Fluoride is more readily taken up by demineralized enamel than by sound enamel (20). Cycles of demineralization and remineralization continue throughout the lifetime of the tooth.*

*Fluoride also inhibits dental caries by affecting the activity of cariogenic bacteria. As fluoride concentrates in dental plaque, it inhibits the process by which cariogenic bacteria metabolize carbohydrates to produce acid and affects bacterial production of adhesive polysaccharides (21). In laboratory studies, when a low concentration of fluoride is constantly present, one type of cariogenic bacteria, *Streptococcus mutans*, produces less acid (22--25). Whether this reduced acid production reduces the cariogenicity of these bacteria in humans is unclear (26).”*

Please see attached power point presentation as well as these two articles for additional details: Featherstone 1999 and Recommendations for Using Fluoride to Prevent and Control Dental Caries. (Dr. Martinez Mier 7/11)

Answer (1a) - Sodium fluoride dissociates in aqueous systems to form sodium ions and fluoride ions. However, fluoride ion is a weak acid that will extract a proton from water to form small concentrations of hydrofluoric acid and hydroxide ion. Which form of the fluoride is actively participating in the remineralization of the enamel or in the reaction with the hydroxyapatite to form the fluorapatite?

The fluoride ion participates directly in remineralization. Please see attached power point presentation as well as these two articles for additional details: Featherstone 1999 and Recommendations for Using Fluoride to Prevent and Control Dental Caries. (Dr. Martinez Mier 7/11)

Answer (1b) - The studies that have addressed the equilibrium of the free fluoride ion and fluorosilicate species in aqueous solutions have concluded that in the pH-range and at the concentrations of hexafluorosilicates/fluoride relevant for drinking water, hydrolysis of hexafluorosilicates to fluoride is fast and there is a total release of fluoride ions. Residual fluorosilicate and other hydrolysis products like Si(OH)_4 are rapidly transformed. As a matter of fact, Si(OH)_4 is present naturally in drinking water in large quantities and is not considered a health risk by the EPA.

Based on the available evidence, we can say that human exposure to fluorosilicates from hexafluorosilicic acid or hexafluorosilicate in fluoridated water is negligible as fluorosilicates in water are rapidly hydrolyzed to fluoride. The ionic form of fluoride which can be either generated within the body by the biochemical modification of the different fluoride-containing compounds or ingested directly is metabolized by the body in a simple manner.

Please follow this link for some additional information on Fluoride and Fluoridating Agents of Drinking water:

http://ec.europa.eu/health/scientific_committees/opinions_layman/fluoridation/documents/fluoridation.pdf (Dr Martinez Mier 7/11)

Answer (1c) - Please see attached power point presentation as well as these two articles for additional details: Featherstone 1999 and Recommendations for Using Fluoride to Prevent and Control Dental Caries. (Dr. Martinez Mier 7/11)

Answer (2) - The main preventive effects of fluoride are derived from its effects on remineralization and demineralization. The bactericidal effect of fluoride is secondary when compared to the two previous effects. There are multiple studies that have looked at the caries preventive effect of other antimicrobials and none have demonstrated a preventive effect superior than fluoride. (Dr. Martinez Mier 7/11)

Answer (4) - This is called replacement therapy and it has not been approved for use in humans. It is at the clinical trial stage. See Hillman 2007 article for more information. (Dr. Martinez Mier 7/11)

Answer (5) - This is a very complex question. At the dental school devote an entire semester to explore it in a graduate course. In summary, dental caries is a multifactorial disease and it is very complex to isolate the effect of a single factor in caries reduction. Please see Rugg Gunn 2013 for a summary explanation of current caries preventive strategies. (Dr. Martinez Mier 7/11)

Answer (6) - The lines between ingested and topical fluoride are not clear cut. Ingested fluoride is secreted in saliva and in turn has a topical effect. Please see attached power point presentation as well as these two articles for additional details: Featherstone 1999 and CDC recommendations for the safe use of fluoride (Dr. Martinez Mier 7/11)

Question D (D. Bengs): I have put together my questions below regarding the fluoride issue. They are not directed at any individual speaker and some may be similar to other members' questions as well:

1)What is percentage/number of cases of fluorosis in Indiana annually? Porter County?

- 2) Is fluoride or HFSA classified as a drug/narcotic, mineral, or nutrient/vitamin by the EPA or FDA?
- 3) Is HFSA treated or monitored by the manufacturer to insure it is safe for use in water distribution?
- 4) Can fluorosis be reversed or treated after the condition starts or is it irreversible? Is monitoring the fluoride levels in water the only way to prevent it?
- 5) Explain the fluoride benefits through ingestion versus topical application for infants, children, teens, and adults?
- 6) How much fluoride exposure must an individual receive to cause osteosarcoma?
- 7) What is the cost difference for VCU to use Pharmaceutical Fluoride vs. HFSA (current chemical)?
- 8) Is fluoride more toxic than Chlorine that is also used in treating the water supply? Or is it a matter of monitoring the concentrations to insure safety so both products can be used?
- 9) Explain any proof/study of a test that indicates that IQ Tests have shown that a 15 point deviation has occurred for people that consume fluoridated water?
- 10) How much water would an individual have to consume at 0.7 ppm fluoride that would harm an individual's health and what negative health factors would those be?

On most of these questions, I think Jim Powers, Dr Martinez Meir, and Dr. Hirzy are appropriate. (Referred to J. Powers, Dr. Martinez Meir, Dr Miller, G. Foreman, Dr. Hirzy)

Answer (1) - There are no recent epidemiological studies conducted to determine the prevalence of dental fluorosis in Indiana. The most recent national report found that less than one-quarter of persons aged 6–49 had dental fluorosis. For more information see Beltran et al 2010. (Dr. Martinez Mier 7/11)

Answer (4) - Fluorosis cannot be reversed. (Dr. Martinez Mier 7/11)

Answer (5) - The answer to this question is the similar to those for previous questions. Please see attached power point presentation as well as these two

articles for additional details Featherstone 1999 and Recommendations for Using Fluoride to Prevent and Control Dental Caries. (Dr. Martinez Mier 7/11)

Answer (6) - Osteosarcoma has been observed in animal experiments in extremely high doses that would cause acute toxicity in humans, so no human dose can be extrapolated. For more information see: <http://www.sciencedirect.com/science/article/pii/S1877782111001822> (Dr. Martinez Mier 7/11)

Answer (7) - I am looking for info concerning pharmaceutical grade fluoride costs (#7) but at this point, can't find anything. In all the years I have been doing this I have never had this question asked of me which I think is telling. Communities are always looking for ways to cut chemical costs (I just fielded a call about this today) so if this product was available and cheaper, they would be using it. The reason the present forms of fluoride are used in water treatment is because of cost, safety and effectiveness in water treatment. (J. Powers 7/7)

Answer (8) - It is a matter of monitoring. (Dr. Martinez Mier 7/11)

Answer (9)- I cannot explain it, since this has not been shown. A recent metadata analysis showed that *“The standardized weighted mean difference in IQ score between exposed and reference populations was -0.45 (95% confidence interval: -0.56, -0.35) using a random-effects model. Thus, children in high-fluoride areas had significantly lower IQ scores than those who lived in low-fluoride areas. Subgroup and sensitivity analyses also indicated inverse associations, although the substantial heterogeneity did not appear to decrease.”* For more information visit <http://ehp.niehs.nih.gov/1104912/> The reported difference at very high levels is 0.45 IQ points not 15 (Dr. Martinez Mier 7/11)

Answers (1 through 9) - Following are the answers from Dr. Osmunson, Dr. Hirzy and Dr. Kennedy.

Dr. Bill Osmunson Answers:

Dear Chairman Bengs,

Your questions are excellent and must receive answers before fluoridation is continued. Unfortunately, there are no quality answers. Demand quality researched prospective randomized double blinded studies for answers for your questions from proponents.

JUDGMENT: When evaluating each aspect of fluoridation, each specific fact needs to be viewed as it fits in a "global view" with all the other facts. Each item needs to fit within a large puzzle in your mind. And your committee, like the FDA CDER, should have a conversation and guidance principles on margin of safety and acceptable risk.

A. For example, you may hear proponents object to a study because it found harm with 4 ppm fluoride in water and we only have 0.7-1 ppm fluoride in fluoridation. What proponents fail to appreciate is the 4 ppm community may actually compare reasonably with artificial fluoridation when several factors are remembered.

1. Calcium fluoride naturally found in hard water is many times less toxic than hydrofluorosilic acid in soft water. HSF water at 0.7-1 ppm could be more toxic than hard at 4 ppm and/or a calcium rich diet.

2. In addition, only about half of the fluoride ingested in the USA is from fluoridated water, the other 1/3 to 2/3 of total exposure is from other sources such as toothpaste, pesticides, post-harvest fumigants, medications, etc. A 4 ppm fluoride water in China might be comparable to a 2 ppm fluoride in the USA when TOTAL EXPOSURE is considered. They are ingesting less fluoride from other sources.

3. Good judgment will have a margin of safety for individual chemical sensitivities. Some people are highly chemically sensitive and they react strongly to some or many toxicants. Fluoride for some increases the total body burden of toxicants.

4. Good judgment will require the studies which measure the concentration of fluoride in the teeth, blood serum and urine. Only measuring fluoride in water and assuming total exposure comes only from water or that two distant communities have the same fluoride exposure is seriously flawed. And assuming everyone drinks the same amount of water is seriously flawed. Some drink more than 10 liters of water a day.

5. Good judgment will include all sources of fluoride exposure and the variations in fluoride excretion. Not all kidneys work as efficiently as others.

B. The committee should set up criteria, procedures, policy (like the FDA CDER) to assist in making good judgment, such as what percentage of the people will be harmed and acceptable to be harmed?

For example, the EPA only includes in their data protection up to the 90th percent of the population, those drinking 2 liters of water a day. Those drinking more than 2 liters are not included for protection. In 2010 the EPA, in response to the NRC 2006 mandate, presented in their Relative Source Contribution the graph below.

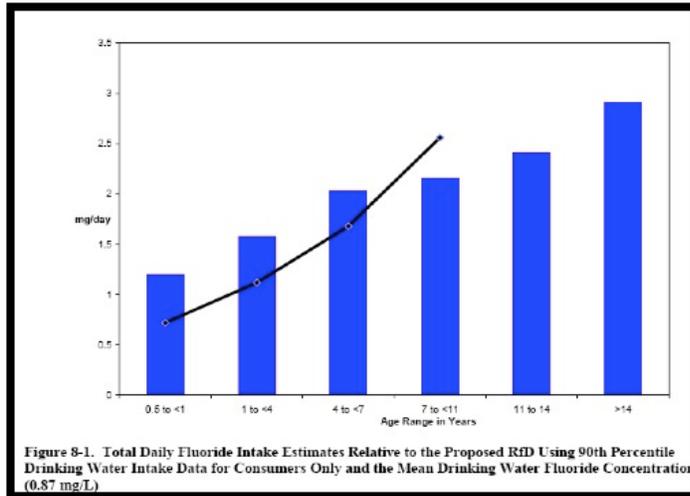
Note these are estimates, and include those with consumption up to the 90th percentile.

10% of the population drinking more than 2 liters of water are not included in this graph and NO infants are included. 100% of infants are ignored because 100% of infants on formula with fluoridated water are ingesting too much fluoride. The blue lines are estimates of how much fluoride each age group is estimated to ingest. As expected, older children ingest more fluoride because they ingest more water.

The black line is the new proposed RfD (EPA's reference dose). Remember, the NRC 2006 report found the EPA's standards were not protective. Instead of making the EPA standards MORE protective as the NRC requires, the EPA has proposed to make their standards 33.3% LESS protective. Based on the proposed less safe standards as shown in the graph, about a

quarter to one third of children will be ingesting too much fluoride. If the graph were drawn with the current safer standards, the black line would be about one third lower showing

about half of children are ingesting too much fluoride and again, 100% of infants ignored.



Your expert back grounds in Pharmacology, Toxicology, Physiology, Chemical Sensitivities, Nutrition, Dentistry, Endocrinology, Neurology, Chemistry, Law, Public Health, Epidemiology, and Ethics must, like the FDA CDER, need to be included for good judgment.

What percentage of the population do you think should be protected?

What percentage of infants should be protected?

What risks are acceptable?

What benefits are being achieved?

Does the benefit outweigh the risk to the degree that police powers must be used to remove freedom and mass medicate everyone?

Police powers maybe used for highly contagious diseases to, for example, isolate the carriers. Dental caries is not a highly contagious disease.

FIVE CRITICAL COMPONENTS FOR GOOD JUDGMENT:

- 1. TOTAL EXPOSURE.** Total exposure of fluoride from all sources is excessive for many, especially children. Total fluoride exposure is increasing as demonstrated by an ever increasing incidence of dental fluorosis. Most samples of mother's milk have no detectible fluoride. Mother's milk protects infants and is "the normative value against which all other nutritional sources should be compared." (American Academy of Pediatrics)
- 2. EFFICACY.** Many studies find there is no benefit to fluoridation (ingestion of fluoride). See attached, "Lack of Benefit."
- 3. RISKS.** Numerous risks should be considered and a great deal of research finds fluoride has serious risks.
- 4. THE DOCTOR.** With fluoridation, a committee or voters are the legal intermediary, the doctor, ensuring the benefits outweigh the risks and providing the patient with informed consent, PARQ, SOAP. All approved medications have a label of dosage and published risks. Fluoride ingestion is not approved and proponents provide no notice of cautions or dosage.
- 5. FREEDOM.** With highly disputed benefits, known risks, and other sources of fluoride readily available for ingestion, most developed countries have given individuals the freedom to

choose and do not fluoridate public water or food service salt or milk. Please do the same for all of us. Give us freedom to choose.

Specifically to your questions in red and my answers in black:

1. What is percentage/number of cases of fluorosis in Indiana annually? Porter County?

Excellent question and you need to insist on an answer from proponents. Their answer is not good enough for me to support fluoridation. The manufacturer(s) of fluoridated water, the single largest source of fluoride for the public, have the ethical, moral, legal duty as the prescriber(s) of the unapproved drug to provide the answer and should respond with the policy of how often the dental fluorosis is measured. As a practicing dentist, I failed to document a diagnoses of dental fluorosis for the first 25 years of practice. I saw what I looked for and did not look for dental fluorosis. Why? Nothing I would do about it unless a patient complained. Therefore, asking a practicing clinician how often they diagnose dental fluorosis is not valid unless the clinician has concerns or feels a duty to document fluorosis. Now I look for dental fluorosis and I diagnose about 20% of patients who are NOT on fluoridated water with dental fluorosis and about 40% of those on fluoridated water with dental fluorosis.

2. Is fluoride or HFSA classified as a drug/narcotic, mineral, or nutrient/vitamin by the EPA or FDA?

HFSA is a legend drug, not a narcotic. HFSA is not under the jurisdiction of the DEA which deals with narcotics. I called the DEA and they reminded me fluoride is not a narcotic, it is a legend drug. HFSA is a legend drug, requiring a legend, a label, and a doctor's prescription. Fluoridated water is dispensed without a label.

The FDA CDER classifies any substance used with the intent to prevent disease as a drug even if it is a placebo. The FDA CDER has not approved fluoride for ingestion. (If you want more details, ask. Fluoridated bottled water is not FDA CDER approved). The EPA classifies fluoride in water as a contaminant and the FDA classifies fluoride when used with the intent to prevent disease as a drug, unapproved.

3. Is HFSA treated or monitored by the manufacturer to insure it is safe for use in water distribution?

NO. The manufacturer of the concentrated HFSA takes no liability and makes no claim. The final responsibility for ensuring safety is with the final manufacturer, the water district or city which formulates the water and HFSA. That is your job and your mandate to be a quasi FDA CDER and determine the efficacy and safety of fluoridated water because the city/water districts have been unable to gain FDA CDER approval. You represent the final manufacturer and it is your job to take on the task of insuring safety, the roll of the FDA CDER.

4. Can fluorosis be reversed or treated after the condition starts or is it irreversible? Is monitoring the fluoride levels in water the only way to prevent it?

The half-life of fluoride in the body is about 20 years. Takes about 20 years for half the fluoride in the body to be eliminated. Once there, pretty much stays there. Water is only one source of fluoride exposure. Even with zero PPM fluoride in the water, some would swallow too much fluoride in toothpaste etc. Reducing fluorosis to the lowest levels is critical. MCLG should be zero. How much dental fluorosis do you find acceptable? 10% of the population? 40% of the population? 100% of the population?

5. Explain the fluoride benefits through ingestion versus topical application for infants, children, teens, and adults?

The FDA CDER has approved topical fluoride in toothpaste but NOT the ingestion of fluoride or fluoride varnishes, etc. The FDA CDER has the most competent scientists, policies and procedures for determining efficacy and safety. Until the FDA CDER approves the ingestion of fluoride in public water for all, stop fluoridation of public water.

6. How much fluoride exposure must an individual receive to cause osteosarcoma?

We don't know for sure. Depends on several factors of age, host sensitivity, diet, genetics, etc. The word "must" in the question indicates a need to protect fluoridation rather than a need to protect people. The question should be asked, "What is the safe level of fluoride which will not cause osteosarcoma for anyone?" Consider a benefit/risk analysis. I can fix cavities but I can't prevent a cancer death or raise damaged IQ. If, and I must repeat if, fluoridation reduces cavities, how many cavities would be worse than my child's, your child's death from osteosarcoma? I would rather they lose all their teeth than die of osteosarcoma. The proponents of fluoridation must provide documented prospective randomized controlled trials of fluoridation's safety. There are none.

7. What is the cost difference for VCU to use Pharmaceutical Fluoride vs. HFSA (current chemical)?

HFSA is far more expensive at \$1 a day than swallowing a pea size of toothpaste which costs less than 2 cents a day. Give people the freedom to swallow fluoride if they want to.

8. Is fluoride more toxic than Chlorine that is also used in treating the water supply? Or is it a matter of monitoring the concentrations to insure safety so both products can be used? Yes and NO. Fluoride is more toxic than chlorine as used in treating water.

Chlorine's use is intended to treat water. EPA jurisdiction
Fluoride's use is intended to treat people. FDA CDER jurisdiction

There is no safe concentration of HFSA added to water. Monitoring the concentrations is important. The Maximum Contaminant Level Goal for fluoride should be zero. NO HFSA should be added to water.

9. Explain any proof/study of a test that indicates that IQ Tests have shown that a 15 point deviation has occurred for people that consume fluoridated water?

No one has claimed a 15 point deviation. A Harvard study found 0.45 deviation (7 IQ drop) and comparing states finds a 0.5 deviation (8 IQ drop) with fluoridated water.

Dr. William Hirzy Answers:

We have not claimed that there was a 15 point IQ loss demonstrated from the Choi et al. paper in *Environmental Health Perspectives*, and neither did Grandjean and Landrigan in their *Lancet Neurology* paper....that paper said an average of 7 points was seen in the papers that Choi et al. used in their meta-analysis.

This issue arose from Dr. Harrington's question about the statement in Choi et al. on the weighted average standard mean difference of -0.45 between exposed and reference groups. I apologize for any confusion I may have caused by my response to that question, and here, I hope, is a cleared explanation that is consistent with the actual average 7 IQ point loss observed by Choi et al.

Standard mean difference is calculated by taking the mean difference in the measured parameter (in this case IQ) and dividing by the standard deviation in the measured parameter. For example: in the Wang,SX study the observed mean difference in IQ between the exposed and reference groups was - 4.3 IQ points. The respective standard deviations in these two groups and the number of subjects in each were: S.D.=15.8, n=253; and S.D.=14.7, n=196. By multiplying the percent of the total subjects in each category by that category's S.D. one gets the weighted standard difference, which in this case comes to 15.5. So the weighted standard mean difference is $- 4.3/15.5 = - 0.28$.

I presume that when one repeated this process for the other studies in Choi et al., the average weighted standard mean difference comes out to the value reported, viz., - 0.45.

Bottom line: the average IQ loss observed in the 26 of 27 studies that showed a loss was about 7 points.

Bill Hirzy

10. How much water would an individual have to consume at 0.7 ppm fluoride that would harm an individual's health and what negative health factors would those be?
About one teaspoon of fluoridated water may produce negative health factors for infants.
Let me explain.

0.7 ppm is about 175 times more fluoride than the mean concentration of fluoride in mother's milk. There are about 195 teaspoons in a quart of water. Therefore, about one teaspoon of fluoridated water gives an infant the same daily dosage of fluoride as mother's milk. If we assume mother's milk to be an ideal dosage of fluoride for infants. Therefore, there is NO margin of safety using mother's milk as our reference.

The brain is developing at a young age and most susceptible to toxicants during development. We must protect our babies.

Thank you for your excellent questions and if you want more details, be sure to ask.

Sincerely,

Bill Osmunson DDS, MPH

Dr. David Kennedy Answers:

1. What is percentage/number of cases of fluorosis in Indiana annually? Porter County?

Fluorosis?

Fluorosis refers to the whole body which includes pineal gland, skeleton, ligaments, joints and thus far beyond the purview of dentists. Since dentists only look at the mouth they typically are only knowledgeable about dental fluorosis (DF).

Annually?

The DF injury is permanent so it is not an annual thing.

First you would have to know how many children live in Porter County and what percentage of the Porter County residents drink water with fluoride? With that information you can extrapolate/guestimate from 1987 NIDR data and probably add about a 20% increase since the data is over 25 years old and DF has increased substantially since then.

Or for about \$1,000,000 Dr. Osmunson will do a broad-based blinded survey and find out county specific data. I picked the dollar figure because that is what Howard Pollick has been paid to do the two California oral health surveys that have never been published because they are not of adequate quality (unblinded, non-randomized, dissimilar educational ethnic and economic backgrounds of the various children, no control groups etc.).

Alternatively they could determine how much fluoride from all sources that young children in Porter County consume from all sources. The best way would be to measure kidney function then do 48 hour urine collection. Normal kidney will remove 50% of F so they could obtain a fairly accurate estimate of existing daily exposure.

Dental fluorosis is the first outward visible sign of fluoride overdose in children during tooth formation ages from 0 to 8 years old. However, more seriously since thyroid dysfunction occurs at levels well below the levels that cause dental fluorosis (DF) it is far more important to consider physiological harm to the thyroid than to the teeth. The level known to harm

thyroid function was identified by the National Research Council (NRC) 2006 review in Table 8-2 in the NRC report as between 0.05-0.1 mg/kg/day normal child and iodine deficient 0.03.

The DF information would likely be available if you were to take the CDC data apart but even that is senseless. Lumping the dental fluorosis rate of both non-fluoridated and fluoridated along with bottled water drinkers nationwide CDC says 41% using Dean's ridiculous classification method where one tooth is ignored and the class is the lesser damaged of the two most visibly damaged teeth. The dose dependent DF information was first hidden from Dr. Yiamouyiannis' freedom of information request by the NIDR where they told the court the DF data had been lost. Some 10 years later Heller used the NIDR data to report the low in non-fluoridated areas of 13% and step wise up with incremental increase in water fluoride to slightly less than they admit today. So this area is not in dispute to the best of my knowledge. [Slide 21]

Levy in 1995 showed much greater risk of DF in infants on the bottle if the tap water contained fluoride. This is because the infant receives a dose of F greater than known to cause DF when drinking tap-water-formula.

Dr. Thiessen in her presentation dealt with the issue of dose and the injuries related to that dose. Some people in all communities who consume tap water will be given a dose of F greater than is known to cause harm. The infant and laborers or athletes due to higher water consumption and those with certain illnesses such as diabetes, cardiovascular disease, deficiencies of calcium, magnesium, vitamin C and iodine are even more vulnerable than an average person. [DCK Slide 25]

Is that clear?

National Research Council Review of Fluoride 2006 Chapter 8 Fluoride's Effects on the Endocrine System

2. Is fluoride or HFSA classified as a drug/narcotic, mineral, or nutrient/vitamin by the EPA or FDA?

This is a multipart question that has previously been answered by several speakers. To clarify:

A. Is fluoride a drug?

Yes [DCK slide 26] it is an unapproved drug from the Congressional Investigation 2000 FDA response to inquiry by Congressman Ken Calvert www.keepers-of-the-well.org

B. HFSA has never been submitted

C. Not a narcotic

D. Not a nutrient FDA. [DCK slide 26] FDA published in the federal register in 1979, "Remove all reference to fluoride as a nutrient or probable nutrient". There is no known use for F in any mammalian system and no deficiency state can be found.

E. The EPA does not determine nutrient status but it has classified fluoride as a contaminant. In fact it is a poison.

F. [DCK Slide 24-25] The Agency for Toxic Substances and Disease Registry (ATSDR) a division of the Centers for Disease Control (CDC) has developed a toxic profile for F and they only do this for toxins TP 91/17.

G. [DCK Slide 27] FDA rejected an application for fluoride/vitamins stating that *There is no substantial evidence of drug effectiveness as prescribed, recommended, or suggested in its labeling* and allowed 35 New Drug Applications to be voluntarily withdrawn.

3. Is HFSA treated or monitored by the manufacturer to insure it is safe for use in water distribution?

The EPA gave up all oversight of water additives in 1988 to industry self-regulation.

The product is waste water from the phosphate fertilizer mining industry and is not treated.

The standard for HFSA is ANSI 60 that has no requirements for safety or effectiveness.

ANSI 60 does have listed requirements such as annual unannounced inspections and annual batch testing along with requirements for the manufacturers to supply lists of all ingredients and toxicological data on all the ingredients. During the congressional investigation of 2000 the manufacturers were unable to provide any of the toxicological documentation for HFSA. Nor were they responsive for results of inspections and only a few batch tests that are required for approval yet the manufacturers do have the certificate of approval.

It was not clear how the certificates had been obtained since the stated "requirements" had not been fulfilled.

4. Can fluorosis be reversed or treated after the condition starts or is it irreversible?

No. Dental fluorosis is a permanent condition caused by systemic exposure to fluoride during tooth development.

4. Can fluorosis be treated?

Yes in some cases if you've got a lot of money. However, welfare does not cover cosmetic dentistry.

DF is the abnormal formation of enamel caused by systemic exposure to F while the enamel is forming. The F inhibits MMP-20 and protein is left in the place of enamel. [DCK Slides 14-15]

Normal enamel is not porous. DF enamel is porous and thus stain and decay get inside the outer layer of the tooth. If the damage is mild then the stain can be repeatedly bleached to make the entire surface white. The color of DF is not part of the classification since all DF starts out whitish. After the tooth erupts into the mouth then food colors and such gets inside the surface it will change color to match the food. I've seen black brownish mostly but also green and purple.

Dentists advocating for more fluoride tend to discount the severity of the condition. However the Department of Health in California determined that DF is an adverse health effect if for no other reason than the fact that other children with normal teeth would taunt children with odd looking spotted teeth and lower their self-image. When it was first suggested that we begin supplementing the public drinking water with fluoride the advocates claimed that at the most 10% of the children would have barely noticeable DF and it would not be objectionable. Surveys of people with mild DF found that the majority of the victims do in fact find it objectionable.

[DCK Slide 39] Notes: Dentists and promoters claim less than 10% of the children will ever have dental fluorosis. Recent surveys finds that more than 40% of children in fluoridated communities have dental fluorosis. Minority populations appear to be more susceptible to the effects of fluoride likely due to the synergistic effects of lead. Data from Table 23 found in the MMWR Dental Caries and Fluorosis Surveillance August 26, 2005 / 54(03); 1-44 <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5403a1.htm>

The 10% very mild DF has been repeatedly proven incorrect yet you still heard this claim during your recent hearing.

Is monitoring the fluoride levels in water the only way to prevent it?

No amount of water monitoring will completely prevent this systemic injury since the "recommended level will cause it and F is widely used in dental products and as found a pesticide residue in many foods. Areas with low water fluoride levels consistently report a substantial percentage of children with DF [DCK Slide 21].

5. Explain the fluoride benefits through ingestion versus topical application for infants, children, teens, and adults?

There is no benefit I am aware of from swallowing fluoride in any age group.

6. How much fluoride exposure must an individual receive to cause osteosarcoma?

Research has determined that it is likely not the amount of F but the timing. The trigger for this cancer is apparently not a question of total F exposure (body burden) but a question of timing of even very small exposures.

There have been several surveys that indicated a positive relationship between this rare but often fatal bone cancer in young males and fluoride. However all of the earlier studies have some methodological drawbacks that did not make it possible to draw a cause and effect relationship. In fact it is not possible to draw a cause and effect relationship using epidemiology alone.

More recently the NRC reviewed Eileen Bassin's PhD thesis subsequently published after the NRC report in the prestigious peer reviewed journal *Cancer Causes and Control*.

Bassin EB, Wypij D, Davis RB, Mittleman MA. Age-specific fluoride exposure in drinking water and osteosarcoma (United States). *Cancer Causes and Control* 2006;17:421–428. (Copy upon request)

Bassin limited her study to young males since the National Toxicological Program (NTP, National Toxicology Program Fluoride Animal Study 4/26/90) found only males animals afflicted with bone cancers. She found that the total exposure was not the apparent trigger for this deadly cancer but the F exposure at the time of the boy's two growth spurts around ages 6-8 and 14-15. She found a 6 fold increase if the boys were drinking F water at that time. This is disturbingly similar to Cohn's earlier finding of a 6 fold increase in young boys. Cohn, PD Association of Drinking Water Fluoridation and the Incidence of Osteosarcoma Among Young Males Environmental Health Services New Jersey Nov 8, 1992

Dr. Thiessen says that the NRC committee found the cancer/fluoride link plausible.

More recently Kim published a study that is purported to dispute Bassin's findings but reading Kim's study the article itself says it cannot dispute Bassin's findings. It did not segregate men from women, evaluated body burden and the age of the controls approached middle age.

Bone Cancer and Fluoridation Study Examines Boyhood Drinking of Fluoridated Water and Possible Links to Osteosarcoma By Daniel DeNoon WebMD Medical News Reviewed By Louise Chang, MD on Thursday, April 06, 2006

April 6, 2006 - Boys who drink fluoridated water have an increased risk of a deadly bone cancer, a new study suggests.

Elise Bassin, DDS, completed the study in 2001 for her doctoral dissertation at Harvard, where she now is clinical instructor in oral health policy and epidemiology. The study finally was published in the May issue of *Cancer Causes and Control*.

Bassin and colleagues' major finding: Boys who grew up in communities that added at least moderate levels of fluoride to their water got bone cancer -- osteosarcoma -- more often than boys who drank water with little or no fluoride.

The risk peaked for boys who drank more highly fluoridated water between the ages of 6 and 8 years -- a time at which children undergo a major growth spurt. By the time they were 20, these boys got bone cancer 5.46 times more often than boys with the lowest consumption. No effect was seen for girls.

Unexpected Results

In a prepared statement provided to WebMD, Bassin says she "was surprised by the results."

"Having a background in dentistry and dental public health, [I] was taught that fluoride at recommended levels is safe and effective for the prevention of dental [cavities]," Bassin says in the statement. "All of [our analyses] were consistent in finding an association

between fluoride levels in drinking water and an increased risk of osteosarcoma for males diagnosed before age 20, but not consistently for girls."

It's not surprising that Bassin found a risk for boys but not for girls. Osteosarcoma is about 50% more common in males than in females. And boys tend to have more fluoride in their bones than girls.

Caution About Study

However, a commentary accompanying Bassin's article warns to take her findings with a grain of salt. Ironically, it is from Harvard professor Chester W. Douglass, DMD, PhD. Douglass led Bassin's PhD committee, which approved of the study when it was presented as her doctoral dissertation.

Douglass warns that the Bassin study is based only on a subset of people exposed to fluoridated water. Preliminary results from the entire population of exposed individuals, Douglass writes, show no link between bone cancer and water fluoridation.

But Bassin specifically looked at the subgroup of people most likely to be affected by fluoridation: children. She limited her analysis to people who got bone cancer by age 20. That's because most cases of osteosarcoma occur either during the teen years or after middle age.

Fluoride collects in the bones. And it's particularly likely to accumulate in the bones during periods of rapid bone growth. So Bassin looked at fluoride exposures during childhood for 103 under-20 osteosarcoma patients and compared them with 215 matched people without bone cancer. Her study took into account how much fluoride was in the water in the communities where children actually lived and the history of municipal, well water, or bottled water use.

The Environmental Working Group, a nonprofit watchdog organization, says water fluoridation should stop until further research can refute or confirm Bassin's findings. Tim Kropp, PhD, is a senior scientist at EWG.

"About 65% of the U.S. water supply has added fluoride," Kropp tells WebMD. "With evidence this strong, it only makes sense to act on it. Right now, it makes the most sense to put fluoride in toothpaste, and not into our water. It's not like this is a huge contaminant that will cost billions of dollars to fix. We can just stop adding it to our water if we want to."

According to the American Cancer Society, every year some 900 Americans -- 400 of them children and teens -- get osteosarcoma.

Harvard Study Shows Fluoridation-Cancer Link

New Study Is One of Many Linking Fluoride to Cancer

New York -- April 7, 2006 -- Fluoridation is linked to bone cancer (osteosarcoma) in young boys reports the May 2006 Harvard peer-reviewed journal, "Cancer Causes and Control."

This fluoridation-cancer study, by Elise Bassin, PhD and colleagues, follows on the heels of the National Academy of Sciences National Research Council's (NRC) report revealing the scientific evidence showing how fluoridation can harm subsets of the population.

"Monitor your own intake. [high water drinkers], the elderly and people with severe renal deficiency who have trouble excreting fluoride in their urine are likely to have increased bone-fluoride concentrations," reports the Chicago Tribune. High fluoride levels damage bones and teeth. (2)

Many studies link fluoride to cancer. Examples:

1954 Taylor reports more tumors and shorter lifespan in fluoride treated mice. (3)

1956 Landmark 10-year Newburgh/Kingston fluoridation study shows more cortical bone defects (a suspected precursor to osteosarcoma) in children drinking fluoridated water. (4)

1977 Burk-Yiamouyiannis show cancer death rates in the 10 largest fluoridated U.S. cities were higher and rose faster vs. the 10 largest non-fluoridated U.S. cities after corrections for age, race, and sex. (5)

1977 National Academy of Sciences expresses concern about a possible water fluoridation/osteosarcoma link based on the Newburgh /Kingston cortical bone defect evidence. (6)

1977 Congressional hearings based on the Burk/Yiamouyiannis findings lead to fluoride cancer testing in rodents by the National Toxicology Program (NTP) (6)

1990 NTP reports fluoride is an "equivocal" (may or may not) cause of cancer. EPA drinking water senior toxicologist, William Marcus PhD, reports results were suspiciously downgraded in the final report.(7)
Marcus was fired for stating the truth but rehired with back pay under the whistle-blower's act.

1990 National Cancer Institute finds more osteosarcoma in young males in fluoridated vs unfluoridated areas; but finds cause to dismiss the results.(6)

1990 Procter & Gamble (P&G) makes public a 1981-1983 study showing more bone tumors in fluoride-treated rats but claims they were not statistically significant. Another P&G study finds a significant increase in benign bone tumors in fluoride treated mice. (6)

1992 New Jersey Department of Health study shows osteosarcoma rates higher among young males in fluoridated vs unfluoridated regions of New Jersey (6). The report's title was changed to obscure connection to fluoridation.

1993 Yiamouyiannis' analysis of National Cancer Institute's cancer data confirms fluoridation/osteosarcoma link in males. (6)

2001 Bassin's Harvard Dissertation shows osteosarcoma in boys in fluoridated areas is five times higher than in non-fluoridated areas.(6). Her dissertation is uncovered in the rare books section of library. Fluoridationists insist the study should be ignored because it's not published and it's only one study.

2002-2005 Chester Douglass, Elise Bassin's Harvard dissertation advisor, issues a report to his research funders at the National Institutes of Health in 2003 in which he concludes there is no link between fluoridation and bone cancer He references Bassin's thesis in support of his statement despite her conclusions which directly contradict his claim. (9)
Douglass also makes the same misrepresentation in an earlier presentation to the British Fluoridation Society in 2002. In 2005, Douglass becomes the subject of a joint federal and Harvard ethics investigation. (10)

2006 NRC Panel finds cancer/fluoride link plausible

2006 (May issue) Bassin's osteosarcoma/fluoridation study is published in "Cancer Causes and Control," along with a letter to the editor from Chester Douglas who cites unpublished, unfinished, non-peer-reviewed data in an attempt to downplay Bassin's peer-reviewed published findings of a significant link between osteosarcoma in boys and water fluoridation.

"EPA has more than enough evidence to shut down fluoridation, right now, with a special advisory," says retired EPA scientist, Robert Carton, PhD. "The safe drinking water act requires the EPA to act to protect all populations from known or anticipated harm (8)," says Carton.

FYI Chester Douglass is or was the editor for Colgate's Newsletter for dentists and cannot be considered a "disinterested" party. <http://fluoridealert.org/researchers/harvard/conflicts/>

7. What is the cost difference for VCU to use Pharmaceutical Fluoride vs. HFSA (current chemical)?

I don't know the cost but likely the problems we've identified from HFSA are similar in many ways to those from pharmaceutical F.

For the harm from either sodium fluoride in animals or aluminum fluoride I would direct your attention to the NRC report I previously furnished you in PDF format.

7. NEUROTOXICITY AND NEUROBEHAVIORAL EFFECTS, 173

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The primary author of this chapter was Robert Isaacson. Dr. Isaacson looking into Alzheimer's and possible for harm to the brain from aluminum conducted a whole series of experiments. Surprisingly he found that increased levels of aluminum in drinking water was PROTECTIVE against harm. He surmised that some other factor than aluminum alone was at play and that factor was likely combining with Aluminum to make it less toxic. In this experiment has exposed animals for 52 weeks to 1 PPM F derived either from pure sodium fluoride or aluminum fluoride. Varner JA, KF Jensen, W Horvath, RL Isaacson Chronic Administration of Aluminum-Fluoride or Sodium-Fluoride to Rats in Drinking Water: Alterations in Neuronal and Cerebrovascular Integrity,. Brain Research Vol. 784, pp. 284-298 1998

Both groups doubled their brain aluminum levels when exposed to the adulterated drinking water and had histological lesions in their brains, arteries and kidneys. The Fluoride-free controls suffered no histologically visible harm. This is a remarkable finding that stands to this day with no contrary evidence. This is especially true when one considers the ability of the test animal (rat) to resist the lethal effects of F. It takes between 80 to 120 mg/kg to kill half the rats (LD50) while the lethal dose EPA's Presumably Toxic Dose of fluoride in humans is 5 mg/kg. Considering the resistance of this animal it is likely that exposing humans to the same 1 PPM F will/has caused similar or even greater harm.

Since there is no measurable "benefit" from adding fluoride to the public water supply I do not understand the interest in cost. It would be a 100% waste of money at best.

8. Is fluoride more toxic than Chlorine that is also used in treating the water supply? Or is it a matter of monitoring the concentrations to insure safety so both products can be used?

Chlorine is a nutrient. Too much sodium chloride can raise your blood pressure but too little can cause collapse as well. It is an essential electrolyte and it is also used to disinfect water. Chlorine can easily be removed from drinking water at the tap with an inexpensive carbon filter or by boiling. Neither of these methods removes fluoride. In fact boiling increases fluoride levels since the F ion remains in the pot and not the vapor. The only way to effectively remove all of the F ion from water is by distillation. This method is energy demanding and not practical for a whole house. F absorbs through skin and thus even bathing or swimming in it will give you a significant dose.

Adding chlorine to drinking water has saved thousands of lives by preventing infectious waterborne illnesses. Unfortunately the use of this as a disinfectant has also increased other chronic diseases such as lung cancers, breast and prostate cancers. The lung cancers were assumed to be associated with chlorine inhaled during a hot shower or while sitting in a hot

tub because chlorine volatilizes from water especially when heated. Disinfection byproducts are also a concern such as Trihalomethanes and others. The cost to society of avoiding cholera and dysentery greatly exceed the cost of adding chlorine. Some however have suggested that a more accurate cost benefit analysis would have us going away from chlorine as a disinfectant to safer ultraviolet light and ozone. Both of these are more costly than chlorine but offer substantial benefits in terms of reduced cancers. And these arguments continue and they should continue until the exact costs are determined and policy that respects the integrity of human life is implemented.

Since only harm comes from adding hydrofluosilicic acid or any kind of F to the public drinking water and such addition is linked to many adverse health effects there is no cost benefit ratio. Only cost.

9. Explain any proof/study of a test that indicates that IQ Tests have shown that a 15 point deviation has occurred for people that consume fluoridated water?

If this is a serious question then I must correct some assumptions and the wording because as presented there is no way it can be answered. This is similar to "are you still beating your wife" technique.

Proof is not a word that is often used in science under any circumstances especially when dealing with human health. From the time smoking was first associated with harm to your health it took over 100 years for the Surgeon General of the US to finally state unequivocally that smoking causes cancer and heart and lung disease, in other words the cause and effect had been proven. He had at that time over 300,000 studies to rely upon.

A similar question I would propose is "prove that swallowing fluoride from municipal water produces any discernible benefit".

Please read the NRC chapter on Neurotoxicity and see that such harm is entirely plausible. I have not seen such a remarkable drop in IQ (15 points on a scale of 100) reported or even alleged by anyone.

Perhaps you are missing a decimal point or misunderstood the finding. The most recent review of IQ and fluoride was the Harvard review. I have personally met Sun Guifan and Philippe Grandjean at various toxicological conferences over the years and followed their work and found them to be very good scientists. Their work can stand on its own. I will send a copy of the Harvard review and especially direct your attention to the appendix of the studies not selected for inclusion. They reviewed a remarkable body of work and like all such work there are further steps that need to be taken before we can say it is causal but it certainly looks like there is an unquestionable association with F exposure and neurotoxicity.

The relative toxicity: fluoride is more toxic than lead and slightly less toxic than arsenic so it is certainly plausible that it can cause harm to the developing brain.

When lead was first shown to harm children's IQ the advocates for leaded gas called the researcher Herbert Needleman a bad scientist and other things not worth repeating. Today Dr. Needleman is heralded as a man who withstood the slings and arrows and the truth he uncovered is taught in every medical school worldwide and the US government has whole programs to reduce childhood exposures to lead. Saying someone is wrong is not the same as doing a better more thorough study to show they have arrived at a flawed conclusion.

However, as I pointed out in my talk [DCK slide 36] there is ample evidence from two huge studies with a combined total of more than 450,000 children, more children than all the decay studies to date combined, that found HFSA dramatically increased blood lead levels especially in subsets of the population where other sources of lead exposure were likely. Overall the children doubled their lead level when exposed to HFSA in drinking water but in a subset the Black children suffered a 6 fold increase of children blood lead levels over 10µg/dL and the Hispanic were 4 fold over 10 µg/dL. Or as the dentist like to represent the minuscule differences in tooth decay by percentages that would be 600% increase and 400% increase respectively. In the case of lead the differences were highly significant.

There is lead in most samples of HFSA tested and also arsenic but that is not what this study was measuring. It measured outcome. The outcome of adding HFSA to water is increased blood lead levels.

10. How much water would an individual have to consume at 0.7 ppm fluoride that would harm an individual's health and what negative health factors would those be?

Now you are beginning to see the picture more clearly and I am greatly encouraged that you understand that harm can come from systemic exposure that depends on dose and there is a wide variation in water consumption.

You heard Dr. Thiessen in her presentation addressed this very point. Some of her graphs were calculated to reflect 0.8 PPM F (Slide 3) because as that was the proposed level for MET's drinking water. I've attached her presentation. Read along with her as she gives it in person before the Metropolitan Water District.

I would also like to point out that her graphs are log scale. This scale is used to compress a wide range of data onto a single piece of paper. Someone not familiar with this scientific notation might consider a small deviation over the line linked to harm would be acceptable. It is not. In a log scale 0.001, 0.01, 0.1 each major tick is 10 fold greater than the previous. That means that even a tiny amount over is much greater than is currently thought to cause harm. As she pointed out the EPA's current Reference Dose for fluoride (RfD) is 0.06 mg/kg/day. FYI all doses are written in weight for weight. Therefore in order to answer your question we must convert volume to weight since it is the dose of fluoride that is related to the injury and not the volume of water.

0.7 PPM F is equivalent to 0.7 mg/L F.

In reviewing Dr. Thiessen's presentation you will note that she is extremely conservative using fluoride just from drinking water and not considering the wide variety of exposure from other sources.

She served on the NRC the most recent review of the effects of fluoride and thus used Limeback a fellow reviewer and NRC as her references for adverse effects.

Since a normal infant drinks its weight in water every 3 to 4 days roughly a 1 liter of formula per day and typically weighs around 8.8 pounds (4 Kg) it is a simple calculation to find what dose of fluoride a typical tap-water-formula baby receives from the public drinking water.

0.7 mg divided by the weight of 4 kg finds that infant receiving 0.175 mg/kg/day. FYI soy formula contains some fluoride as do many baby foods so this is just from water and not total exposure.

Referring to the list from the NRC report one can see that this amount 0.175 mg/kg/day greatly exceeds the EPA RfD 0.06 mg/kg/day by (292%) and numerous adverse effects are reported at levels well below the EPA's RfD and the average baby on tap-water-formula exceeds all of the listed effects of:

Impaired thyroid function (iodine deficiency) 0.005mg/kg/day

Moderate DF 0.02 mg/kg/day

Impaired thyroid function (adequate iodine intake) 0.03 mg/kg/day

Impaired glucose metabolism 0.03 mg/kg/day

Stage II skeletal fluorosis 0.04 mg/kg/day

Severe DF 0.05 mg/kg/day

Neurotoxicity 0.05 mg/kg/day

Increased risk of bone fracture 0.09 mg/kg/day

Answering in terms of volume then, "How much water would an individual have to consume at 0.7 ppm fluoride that would harm an individual's health", 0.02

A 4 Kg iodine deficient infant could consume about 0.02 mg of F before possibly suffer impaired thyroid function. And thus could swallow about 1/3 or 35% of one liter per day. An infant on such a low water/food intake will likely starve or die of dehydration first so the thyroid issue is secondary.

(Slide 4) Please note that many other segments of the population from drinking water alone also exceed the levels shown to cause harm.

Dentists like to claim that if these figures were correct then we'd have a nation of sick babies and crippled adults. This claim remind me of the similar claims regarding Dr. Needleman's discovery that lead harms children. At best it is anecdotal and unscientific and very foolish to

assume that we do not already have significant harm from systemic exposure to fluoride but that is not the issue.

(CDC MMWR 2005 slide 39 44)

<http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5403a1.htm> Since the advocates admit that a substantial percentage of children already show visible signs of dental fluorosis and much of it moderate/severe 3 to 5% in minority populations it is reasonable to respond that we are already seeing a significant adverse impact from drinking water fluoridation. Everyone including well paid lobbyists and the ADA acknowledge that unless you want your baby to grow up with spotted teeth DF then you should not use fluoridated tap water to prepare formula. With that admission I find it troubling that they have continued to advocate that we add more F to the public water supply.

Sincerely,
David Kennedy, DDS

PS Please continue asking questions as you grow more familiar with the issues that systemic exposure to fluoride present. When you have arrived at a scientifically sound position and are willing to support that position with words and deeds please stand up for the children in your community and this nation and stop the government funded lobby to increase systemic exposure to fluoride.

Question E (M. Thiros):

- 1) Can you explain the chart in the 2nd pdf (FC Q&A Addendum 2 – Heavy Metals in HFSA – S. Chen) attachment please? (Referred to S. Chen)

Answer (1) - This report (Addendum 2) gives the concentrations of the heavy metals in the hydrofluorosilicic acid delivered to our plants.

The “Result” column indicates the actual concentrations for each analyte, in mg/L or ppm (part per million parts). The unit of mg/L or ppm means there is 1 part of this analyte in one million parts of the hydrofluorosilicic acid.

Column “RL” means Reporting Limit. Any analyte with a concentration less than the reporting limit is indicated by “< (less than)” symbol and its actual concentration (a definite value) is not reported here.

“Dil Fac” means Dilution Factor. Dil Fac of 5 indicated the sample was diluted 5 times during the sample preparation step; Dil Fac of 1 indicated the sample was analyzed as it was received and without any dilution. Dilution is one common technique widely used for sample analysis. The Qualifier V means serial dilution exceeds the control limit according to that laboratory’s procedure. The “Result” included in this report was corrected to take the dilution procedure into consideration.

Please keep in mind that the concentrations of heavy metals in this report are from the concentrated hydrofluorosilicic acid. At our plants, we add about 3 lbs of this acid to a million (1,000,000) lbs of treatment water, so all the heavy metals are

diluted by the treated water. For example, Arsenic in the hydrofluorosilicic acid was 15.1 mg/L (or ppm). In the treated drinking water after fluoride was added, the concentration of Arsenic would be around 0.0000453 mg/L. The EPA MCL (Maximum Contaminant Level) standard for Arsenic in the drinking water is 0.010 mg/L. We may confirm this from another report (Addendum 3) titled “Inorganic chemicals in treated water (valparaiso 2013).pdf”. As shown in that report, all the heavy metals that were required to test were under detection levels. Please also note all the chemical analyses were performed by certified laboratories using EPA approved methods.

In summary, the Arsenic level introduced by adding fluoride in our water is about 220 times less than the MCL on Arsenic. This is the same case for all the other heavy metals detected in the hydrofluorosilicic acid. (S. Chen 7/9)

Question F (K. Steele 7/8)

- 1) What level of fluorosis is seen in communities that maintain fluoride levels at .7 ppm? (James Powers, Dr. Martinez Mier) (Gary Foreman, Dr. Hirzy)
- 2) Does the HFSA purchased by VCU meet Standard 60? (Shihua Chen)
- 3) Has there been any study of the buildup of fluoride in the wastewater due to its addition to the drinking water? (Steve Poulos)(James Powers)(Gary Foreman)
- 4) What evidence is there of systemic benefit to water fluoridation as discussed by Dr. Mier? (Dr. Martinez Mier)
- 5) Given the fact that fluoride in toothpaste was not present when water fluoridation began, is it still necessary now that people use fluoride toothpastes/rinses? James Powers, Dr. Martinez Mier)(Gary Foreman, Dr. Hirzy)
- 6) If fluoride is a drug, as advocated by some of the speakers, why doesn't the FDA regulate its use in drinking water? (Steve Poulos/Shihua Chen)
- 7) Many of the local dentists who spoke stated an opinion that the teeth of children from fluoridated areas were “harder” than teeth of children from non-fluoridated areas. Is there any evidence, beyond the opinions of the local dentists, which supports that finding? (Dr. Schnechter)(James Powers)(Gary Foreman)
- 8) Several speakers stated that the number of communities with fluoridated water has continued to increase despite the movement to ban fluoride from drinking water. Is that correct? (James Powers)(Gary Foreman)

Answer (1) - For more information see Beltran et al 2010 (Dr. Martinez Mier 7/11)

Answer (3) – Since the fluoride in the drinking water would be .7-1.2ppm the wastewater would be in the same range.

Please refer to Question 49 in the “Fluoridation Facts” handbook included in the information packet I provided. (J. Powers 7/14)

Answer (4) - The benefits of water fluoridation are multiple and proven, as mentioned in my previous responses, the difference between systemic and topical are not clear cut. Please see Recommendations for Using Fluoride to Prevent and Control Dental Caries and JEBCAM Martinez Mier metabolism article for more details (Dr. Martinez Mier 7/11)

Answer (5) - Yes, the benefits of fluoride are additive. (Dr. Martinez Mier 7/11)
Yes, numerous studies have shown this to be the case. Please refer to the printout “Is Using Fluoride Toothpaste Enough?” included in the packet of information I provided. (J. Powers 7/14)

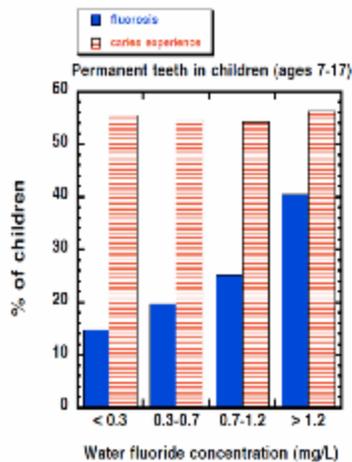
Answer (7) - Teeth are harder in the sense that their crystals are more resistant to acid dissolution. There are 20 years of studies supporting this statement. Please see Featherstone 1999 for a very thorough explanation. (Dr. Martinez Mier 7/11)

Answer (8) - Late last year, the CDC released the latest statistics showing that access to community water fluoridation in the United States increased from 72.4% to 74.6% That is an increase of 15 million people and is significant progress toward the Healthy People 2020 target of 79.6% In 1992 62% of the U.S. population had access to Fluoridated water. In addition, many communities have voted to retain fluoridation. Please refer to this section of The Campaign for Dental Health website. <http://www.ilikemyteeth.org/category/communities-supporting-fluoride/> (J. Powers 7/14)

Answer (1) First ask yourself what percentage of the population do you find acceptable to have dental fluorosis, skeletal fluorosis, and other health risks? Do you find 10%? 20%? 40%? 100% What do you want?

Remember this graph?

lida, H., and Kumar, J.V. 2009. The association between enamel fluorosis and dental caries in U.S. schoolchildren. JADA 140:855-862.



lida reported about 20% of the population on 0.7 ppm with dental fluorosis. That number is very conservative since the CDC reports 41% of the US children have dental fluorosis. (Foreman, etal.)

Answer (2) - No. Depends on how you ask and answer the question. Standard 60 does not evaluate the chemical itself but the contaminants within the chemical. If HFSA were not called "fluoride" and was called "arsenic" then the fluoride would be excessive and HFSA would not be permitted. To be specific, Standard 60 does not permit a contaminant to be increased in water more than 10% of the EPA's MCL (Maximum Contaminant Level). MCL for fluoride is 4 ppm. Therefore, standard 60 does not permit fluoride to be in a product as a contaminant which will result in fluoride reaching more than 0.4 ppm in water. But because fluoride is the chemical and not a contaminant within the chemical, NSF does not include the fluoride chemical in Standard 60. (Foreman, etal.)

Answer (3) - Yes, and it does affect Salmon. (Foreman, etal.)

Answer (4) - There is no physiologic benefit to the ingestion of fluoride. No body function requires fluoride. The only potential benefit is to teeth. (Foreman, etal.)

Answer (5) - The FDA CDER has not approved the ingestion of fluoride because the research does not demonstrate efficacy. The FDA CDER has approved fluoridated toothpaste. Your question is best asked of the FDA CDER. (Foreman, etal.)

Answer (6) - Ask the FDA CDER. I did an FOI and was told the FDA CDER was deferring regulatory action. The FDA CDER says there are thousands of illegal

drugs. HHS started to work on lowering the concentration and stopped due to political pressure. (Foreman, etal.)

Answer (7) - Yes. There is no dispute the teeth with more fluoride are harder. The dispute is whether harder is better. Does harder make for fewer cavities? No. Does harder make for more teeth fractures. Probably. (Foreman, etal.)

Answer (8) - In the United States more of the population is fluoridated because larger centers are forced to fluoridate but more smaller communities are stopping. In Canada, most communities do not fluoridate and more are stopping. Most of Europe never started or has stopped. (Foreman, etal.)

Answer (2) - Yes. (Chen)

Answer (5) - I don't have the definite answer to this one. My guess is FDA was not authorized under Safe Drinking Water Act to regulate chemicals in drinking water, but I am not sure. (Chen)

Question G (M. Thiros 7/10)

- 1) **If western European countries have ceased fluoridating their water, why did they do so?**
- 2) **Would it be possible to distribute pharmaceutical grade fluoride through our system and what would the cost be, if so?**
- 3) **What is the benefit of fluoridated water to a person who otherwise maintains his teeth in the ADA recommended fashion? If there is a benefit, is it significant?**
- 4) **Does the ADA dispute the CDC's finding that 41% of US children have flouridosis?**
- 5) **Are any other elements or toxins found in the naturally occurring fluoride in water (versus the fluoride we are adding to our water)?**
- 6) **Has the human body adapted to the naturally occurring fluoride in water?**
- 7) **Are there other vitamins or minerals currently deemed "beneficial" to humans that could be added to our water prior to its distribution?**
- 8) **Why aren't there more scientists or doctors speaking out about the "dangers" of fluoridated water?**

Answer (1) - Western European countries have not ceased fluoridating. Most of the fluoridation in Europe takes place in Western Europe where water systems are more like those in the United States. In some areas where there are multiple water sources or other technical issues, fluoride is added to salt or milk. Please refer to “Fluoridation Facts(Question 55 and 56, and “Community Water Fluoridation: What Opponents Say and Why It Doesn’t Hold Up” included in the packet of information I provided. (J. Powers 7/14)

Answer (2) - Fluorosilicic, which is what is used in Valparaiso, is not available in USP pharmaceutical grade. Only Sodium Fluoride, generally used in smaller water systems, is available in that grade. However, since USP pharmaceutical grade Sodium Fluoride does not meet the stricter NSF Standard 60 criteria it cannot be used in Indiana according to state law.(J. Powers 7/14)

Answer (3) - The benefits of fluoride are significant regardless of other preventive measures. The benefits of fluoride are significant and proven. (Dr. Martinez Mier 7/11)

Answer (4) - The ADA does not dispute prevalence figures. 41% includes all cases of fluorosis plus questionable cases. A more accurate number would be less than 25% of children and adults have enamel fluorosis. For more information see Beltran et al 2010 (Dr. Martinez Mier 7/11)

Answer (5) – Other naturally occurring chemical found in the Valparaiso water which has an enforceable MCL (maximum contaminant level) is Barium. Its level (0.05 mg/L on average) is 40 times less than EPA MCL (2 mg/L). (S. Chen)

Answer (6) - No adaptation is needed. The body metabolizes fluoride through regular pathways. Please see power point presentation for more information as well as JEBCAM Martinez Mier metabolism article (Dr. Martinez Mier 7/11)

Answer (8) - Because the overwhelming majority of scientists support the use of fluoride for caries prevention. (Dr. Martinez Mier 7/11)

Answer (1) – A brief answer is as follows from <http://fluoridealert.org/content/europe-statements/>

Although the U.S. Centers for Disease Control hails water fluoridation as one of the “top ten public health achievements of the twentieth century,” most of the western world, including the vast majority of western Europe, does not fluoridate its water supply.

At present, 97% of the western European population drinks non-fluoridated water. This includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Italy, Luxembourg, Netherlands, Northern

Ireland, Norway, Portugal, Scotland, Sweden, Switzerland, and approximately 90% of both the United Kingdom and Spain. Although some of these countries fluoridate their salt, the majority do not. (The only western European countries that allow salt fluoridation are Austria, France, Germany, Spain, and Switzerland.)

Despite foregoing “one of the top ten public health achievements of the twentieth century,” tooth decay rates have declined in Europe as precipitously over the past 50 years as they have in the United States. This raises serious questions about the CDC’s assertion that the decline of tooth decay in the United States since the 1950s is largely attributable to the advent of water fluoridation.

STATEMENTS FROM EUROPEAN OFFICIALS:

Austria:

“Toxic fluorides have never been added to the public water supplies in Austria.”

SOURCE: M. Eisenhut, Head of Water Department, Osterreichische Vereinigung fur das Gas-und Wasserfach Schuberting 14, A-1015 Wien, Austria, February 17, 2000.

Belgium:

“This water treatment has never been of use in Belgium and will never be (we hope so) into the future. The main reason for that is the fundamental position of the drinking water sector that it is not its task to deliver medicinal treatment to people. This is the sole responsibility of health services.”

SOURCE: Chr. Legros, Directeur, Belgaqua, Brussels, Belgium, February 28, 2000.

Denmark:

“We are pleased to inform you that according to the Danish Ministry of Environment and Energy, toxic fluorides have never been added to the public water supplies. Consequently, no Danish city has ever been fluoridated.”

SOURCE: Klaus Werner, Royal Danish Embassy, Washington DC, December 22, 1999.

To read the Danish Ministry of the Environment’s reasons for banning fluoridation, [click here](#).

Finland:

“We do not favor or recommend fluoridation of drinking water. There are better ways of providing the fluoride our teeth need.”

SOURCE: Paavo Poteri, Acting Managing Director, Helsinki Water, Finland, February 7, 2000.

“Artificial fluoridation of drinking water supplies has been practiced in Finland only in one town, Kuopio, situated in eastern Finland and with a population of about 80,000 people (1.6% of the Finnish population). Fluoridation started in 1959 and finished in 1992 as a result of the resistance of local population. The most usual grounds for the resistance presented in this context were an individual’s right to drinking water without additional chemicals used for the medication of limited population groups. A concept of “force-feeding” was also mentioned.

Drinking water fluoridation is not prohibited in Finland but no municipalities have turned out to be willing to practice it. Water suppliers, naturally, have always been against dosing of fluoride chemicals into water.”

SOURCE: Leena Hiisvirta, M.Sc., Chief Engineer, Ministry of Social Affairs and Health, Finland, January 12, 1996.

France:

“Fluoride chemicals are not included in the list [of 'chemicals for drinking water treatment']. This is due to ethical as well as medical considerations.”

SOURCE: Louis Sanchez, Directeur de la Protection de l’Environnement, August 25, 2000.

Germany:

“Generally, in Germany fluoridation of drinking water is forbidden. The relevant German law allows exceptions to the fluoridation ban on application. The argumentation of the Federal Ministry of Health against a general permission of fluoridation of drinking water is the problematic nature of compuls[ory] medication.”

SOURCE: Gerda Hankel-Khan, Embassy of Federal Republic of Germany, September 16, 1999.

Luxembourg:

“Fluoride has never been added to the public water supplies in Luxembourg. In our views, the drinking water isn’t the suitable way for medicinal treatment and that people needing an addition of fluoride can decide by their own to use the most appropriate way, like the intake of fluoride tablets, to cover their [daily] needs.”

SOURCE: Jean-Marie RIES, Head, Water Department, Administration De L’Environnement, May 3, 2000.

Netherlands:

“From the end of the 1960s until the beginning of the 1970s drinking water in various places in the Netherlands was fluoridated to prevent caries. However, in its judgement of 22 June 1973 in case No. 10683 (Budding and co. versus the City of Amsterdam) the Supreme Court (Hoge Raad) ruled there was no legal basis for fluoridation. After that judgement, amendment to the Water Supply Act was prepared to provide a legal basis for fluoridation. During the process it became clear that there was not enough support from Parlement [sic] for this amendment and the proposal was withdrawn.”

SOURCE: Wilfred Reinhold, Legal Advisor, Directorate Drinking Water, Netherlands, January 15, 2000.

Northern Ireland:

“The water supply in Northern Ireland has never been artificially fluoridated except in 2 small localities where fluoride was added to the water for about 30 years up to last year. Fluoridation ceased at these locations for operational reasons. At this time, there are no plans to commence fluoridation of water supplies in Northern Ireland.”

SOURCE: C.J. Grimes, Department for Regional Development, Belfast, November 6, 2000.

Norway:

“In Norway we had a rather intense discussion on this subject some 20 years ago, and the conclusion was that drinking water should not be fluoridated.”

SOURCE: Truls Krogh & Toril Hofshagen, Folkehelse Statens institutt for folkeheise (National Institute of Public Health) Oslo, Norway, March 1, 2000.

Sweden:

“Drinking water fluoridation is not allowed in Sweden...New scientific documentation or changes in dental health situation that could alter the conclusions of the Commission have not been shown.”

SOURCE: Gunnar Guzikowski, Chief Government Inspector, Livsmedels Verket — National Food Administration Drinking Water Division, Sweden, February 28, 2000.

See statement by Dr. Arvid Carlsson, the Nobel Laureate in Medicine, who helped lead the campaign to prevent fluoridation in Sweden in the late 1970s.

Czech Republic:

“Since 1993, drinking water has not been treated with fluoride in public water supplies throughout the Czech Republic. Although fluoridation of drinking water has not actually been proscribed it is not under consideration because this form of supplementation is considered:

- uneconomical (only 0.54% of water suitable for drinking is used as such; the remainder is employed for hygiene etc. Furthermore, an increasing amount of consumers (particularly children) are using bottled water for drinking (underground water usually with fluor)
- unecological (environmental load by a foreign substance)
- unethical (“forced medication”)
- toxicologically and physiologically debateable (fluoridation represents an untargeted form of supplementation which disregards actual individual intake and requirements and may lead to excessive health-threatening intake in certain population groups; [and] complexation of fluor in water into non biological active forms of fluor.”

SOURCE: Dr. B. Havlik, Ministerstvo Zdravotnictvi Ceske Republiky, October 14, 1999.

UPDATES

May 2007: A study of European public opinion on water fluoridation, published in the journal *Community Dentistry & Oral Epidemiology*, reports that the “vast majority of people opposed water fluoridation.”

According to the study, Europeans opposed fluoridation for the following reasons:

“Many felt dental health was an issue to be dealt with at the level of the individual, rather than a solution to be imposed en masse. While people accepted that some children were not encouraged to brush their teeth, they proposed other solutions to addressing these needs rather than having a solution of unproved safety imposed on them by public health authorities whom they did not fully trust. They did not see why they should accept potential side effects in order that a minority may benefit. In particular, water was something that should be kept as pure as possible, even though it was recognized that it already contains many additives.” (See study summary)

November 2004: After months of consultation, **Scotland** - which is currently unfluoridated – rejected plans to add fluoride to the nation’s water.

April 9, 2003: The City Parliament of **Basel, Switzerland** voted 73 to 23 to stop Basel’s 41 year water fluoridation program. Basel was the only city in Switzerland to fluoridate its water, and the only city in continental western Europe, outside of a few areas in Spain.

Tags: [europe](#)

(Dr. Osmunson, 7/16) (editors note: National flag representations were removed for brevity purposes)

Answer (2) - Cost prohibitive and chemicals are not available in sufficient quantities. (Dr. Osmunson, 7/16)

Answer (3) - No quality research to answer that question. If a quality diet and daily brushing and flossing are maintained, dental caries are seldom found. (Dr. Osmunson, 7/16)

Answer (4) - No. (Dr. Osmunson, 7/16)

Answer (5) - Yes. Natural fluoride is often found in areas of hard water. In the 1940's and 1950's when some speculated fluoride was reducing dental caries, other dentists felt the hard water was the benefit and not the fluoride. Calcium and fluoride bind and hard water tends to protect a person from the toxic effects of fluoride. (Dr. Osmunson, 7/16)

Answer (6) - No.

Dear Fluoride Commission,

Three letters are attached in response to Question #6. If you do not believe these people, contact them and ask them more questions. They are examples of wonderful people who have struggled with the problems of fluoride affecting their health and the health of their loved ones. Contact them and ask them the tough questions. They are not isolated cases. They just happened to spend the time and money to figure out what was causing some of their problems.

Putting numbers to suffering can remove us from the individual person's pain. Dental fluorosis is an undisputed biomarker of a chronic toxic overdose of fluoride. But there are many other problems for high risk individuals.

And fluoridation appears to affect our pets adversely as well as our children.

Sincerely,

Bill Osmunson DDS, MPH (Dr. Osmunson, 7/16)

Answer (6) - Yes. The human breast, which delivers about 500 ppm of chloride ion*, has evolved to filter fluoride (13th most abundant element in Earth's crust) levels to about 0.004 ppm. * 43 mg/dL. Jenness R and Sloan RE. Composition of milk. In: Larson BL and Smith VR, editors: *Lactation, Vol 3. Nutrition and Biochemistry of Milk/Maintenance*. New York, 1974, Academic Press. (Dr. Hirzy, 7/16)

Answer (7) - Lithium added to water has been considered. The idea was dropped when some people were found to have adverse reactions to lithium. The vast majority of water is not used for drinking. Adding anything to water for humans is not cost effective. (Dr. Osmunson 7/16)

Answer (8) - Several reasons. Speaking out is a career buster. Several good scientists have lost grant funding, research not published, and tenure withheld. Supervisors follow tradition and don't usually review the science. Public health officials must promote policy or lose their jobs. Dentists don't get referrals and are turned over to the Board's of Dentistry with complaints. Retaliation is rampant. Better to be quiet and make money. (Dr. Osmunson 7/16)

Question (Request) H (J.Harrington 7/10)

I would like to receive the two studies on intelligence – one was from IU, the other was one that was being presented the next week, I think. Both were non published papers, but supposedly available to us.

Answer (H) - Recently, Dave Bengs posed this challenge, which seems similar to your concern: "Explain any proof/study of a test that indicates that IQ Tests have shown that a 15 point deviation has occurred for people that consume fluoridated water."

John Hardwick shared that comment with Dr. Mier at Indiana University and she said "I cannot explain it, since this has not been shown." She referred us to the article "Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis" which is available here: <http://ehp.niehs.nih.gov/1104912/>

The abstract of this meta-analysis states: "The standardized weighted mean difference in IQ score between exposed and reference populations was -0.45 (95% confidence interval: $-0.56, -0.35$) using a random-effects model. Thus, children in high-fluoride areas had significantly lower IQ scores than those who lived in low-fluoride areas. Subgroup and sensitivity analyses also indicated inverse associations, although the substantial heterogeneity did not appear to decrease...The results support the possibility of an adverse effect of high fluoride exposure on children's neurodevelopment. Future research should include detailed individual-level information on prenatal exposure, neurobehavioral performance, and covariates for adjustment."

I skimmed the article and noted that the vast majority of the studies in this meta study dealt with various locations in China. I do not know the implications of that fact but do wonder about the fluoride concentrations encountered in the various studies. The article's discussion section explicitly raises many unanswered questions.

Hope this helps. (Walesh 7/14)

As requested, I will search for similar input from Dr. Hirzy -- I do remember him discussing IQ -- and get back to you.

Answer (H) – Dr. Hirzy’s response may be found in FC Q&A Addendum 6 – Fluoride and IQ deficits – A Research and Policy Review – SUPPLEMENTAL MATERIAL PART 1

Question I – (M. Thiros 7/31)

Hi John – Has VCU (or the city) ever received any recommendation from any governmental agency to fluoridate the water? If I understand correctly, the recommendations we get now are only about how much fluoride should be in the water. And who issues those? The CDC?

Answer (I) – The Indiana Board (now Department) of Health requested us to consider fluoridation back in the 1950’s (I believe we began fluoridating in 1952). The Department of Health follows the recommendations of the CDC. The latest recommendation was from the Department of Health has recently (last year or two) to reduce VCU’s amount that it Fluoridates at the recommendation of the CDC and U.S. EPA. I requested Shihua Chen to add to this response. He referred me to the following:

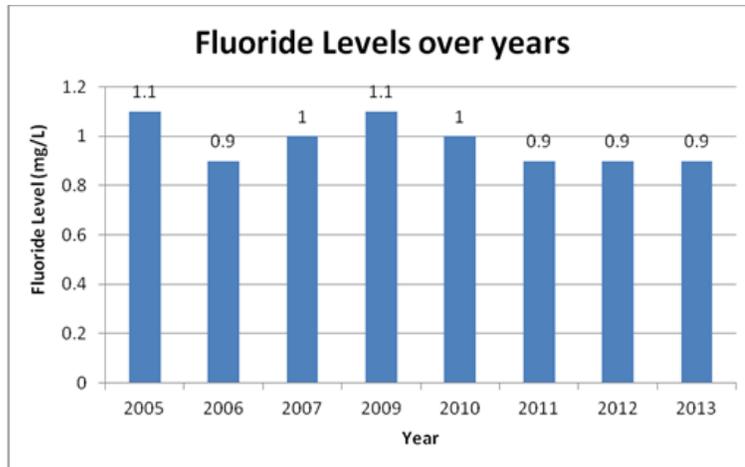
- 1. Know the history of fluoridation at the Valpo treatment plants. When we started.**

Fluoridating water supplies has occurred in the United States beginning with Grand Rapids, Michigan, starting on January 25, 1945.

Indiana began fluoridating water supplies in 1951 with the cities of Fort Wayne, Indianapolis and Huntingburg.

The Valparaiso Department of Water Works has been fluoridating its water supply since 1952 at the request of the Indiana State Board of Health.

- 2. Dosage History – Can you go back at least 10-15 years and find the average yearly dosage?**



3. What do we dose as of today? When was the most recent recommended decrease and why?

Valpo target dose: We try to maintain a dose around 0.7 ppm (about 3 lbs of Hydrofluorisilic acid mixed with 1 million pounds of water).

New recommendation: In January of 2011, the U.S. Department of Health and Human Services (HHS) and the U.S. Environmental Protection Agency (EPA) announced new scientific assessments and actions on fluoride. HHS' proposed recommendation of 0.7 milligrams of fluoride per liter of water replaces the previously recommended range of 0.7 to 1.2 milligrams. (Indiana hasn't officially adopted this new recommendation yet).

Reason: This updated recommendation was based on recent EPA and HHS scientific assessments to balance the benefits of preventing tooth decay while limiting any unwanted health effects. There are several reasons for the changes seen over time, including that Americans have access to more sources of fluoride than they did when water fluoridation was first introduced in the United States in the 1940s. Water is now one of several sources of fluoride. Other common sources include dental products such as toothpaste and mouth rinses, prescription fluoride supplements, and fluoride applied by dental professionals.

4. Hydrofluorosilicic Acid

a. Where do we get it from?

From a local supplier, Alexander Chemical, located in Kingsbury, Indiana about 20 miles away from Valparaiso.

b. From what manufacturer does the vendor get it from?

Solvay Chemicals located in Houston, Texas.

c. MSDS sheet

Attached.

- d. Any analytical information on the Acid.
Attached.
- e. How it is handled upon delivery
It's directly stored in fiberglass storage tanks upon delivery. The delivery truck driver makes the hose connection from the truck to the pipe which receives the chemical. The chemical is then pumped directly to the storage tank. Fluoride solution is then pumped out from the storage tank using chemical metering pump and injected to the finished water pipe.
- f. Any other safeguards as far as the isolation of the chemical at the plant and why.
- g. Chemical metering pump can be easily turned off if there is any issue on the fluoride product stored in the storage tank; Spill kit is available if there is small amount of leakage; Secondary containment is also built in place in case of serious leak

(J. Hardwick, S. Chen)

ⁱ Zip Files may be found on VCU Fluoride Website.