Response to *Fluoride Ingestion: Connecting the Dots for Health Action, By Steven Gilbert*

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The document *Fluoride Ingestion: Connecting the Dots for Health Action, by Steven G. Gilbert, PhD,* now being promoted by the New York antifluoridation group, "fluoride action network" (FAN), is a reiteration of antifluoridation arguments which have been repeatedly refuted with evidence-based science through the years. The false claims, misleading statements, and misinformation rife within the document are likely resultant of the author's heavy reliance on information from "FAN" rather than on that obtained from the proper research of this issue which would normally be expected of one with his educational background. Perhaps most perplexing is that Dr. Gilbert, a reported toxicologist, consistently associates fluoride at the level in fluoridated drinking water with effects of fluoride with no distinction between concentration levels. He thereby ignores the basic toxicological principle that concentration is the difference between safety and toxicity for any substance. The following is an evidence-based point-by-point correction of this paper.

I. Introduction

1. Gilbert: "Currently, about 74% of the U.S. population, often without their knowledge or consent, drinks fluoridated water."

Facts:
A. The contents of public water supplies are a matter of public record. Anyone can, and should, access this information through the annual water quality report of his/her community.

B. There is no personal consent required for local officials to determine the contents of public water supplies under their jurisdiction. Consent for them to do their jobs is conveyed upon election/appointment to office.

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2. Gilbert: "There has been a 70-year controversy over the efficacy, safety and ethics of the consumption of fluoridated water."

Facts:
The only "controversy" over water fluoridation has been that created by antifluoridation activists who have used false statements, unsubstantiated claims, misrepresented science, and misinformation to create the appearance of "controversy" where none exists.

While there is no credible organization in the world which opposes water fluoridation, the public health benefits of the initiative have been publicly recognized by the past 6 US Surgeons General and well over 100 of the most highly respected healthcare and healthcare-related organizations in the world. This could hardly be rationally considered as a "controversy".

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3. Gilbert: "Risks of ingesting fluoride include lowered IQs and increased ADHD and hypothyroidism rates."

Facts:
There is no valid, peer-reviewed scientific evidence to support this claim in regard to fluoride at the optimal level at which water is fluoridated.

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4. Gilbert: "Since the 1960s, fluoride toothpaste became widespread, a topical use generally acknowledged to be more effective in preventing cavities than ingestion. This is thought to be a major reason why tooth decay trends have decreased so much, regardless of whether the water was fluoridated (see graph – Tooth Decay Trends: Fluoridated vs. Unfluoridated Countries). For these and other reasons, a growing number of public health professionals are recommending that fluoridation of drinking water be discontinued."

Facts:
A. There is no valid evidence to support the claim that topical use is more effective than ingestion of fluoride.

The effects of fluoride are both topical and systemic. The systemic effects are demonstrated in the mild to very mild dental fluorosis which may be associated with optimally fluoridated water. Mild to very mild dental fluorosis is a barely detectable effect which causes no adverse effect on cosmetics, form, function, or health of teeth. As peer-reviewed science has demonstrated mildly fluorosed teeth to be more decay resistant, many consider this effect to not even be undesirable, much less adverse. Dental fluorosis can only occur systemically. (1)

Additionally, saliva with fluoride incorporated into it provides a constant bathing of the teeth in a low concentration of fluoride all throughout the day, a very effective means of dental decay prevention. Incorporation of fluoride into saliva occurs systemically.

From the CDC:

"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. As cariogenic bacteria metabolize carbohydrates and produce acid, fluoride is released from dental plaque in response to lowered pH at the tooth-plaque interface. 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.. Fluoride is more readily taken up by demineralized enamel than by sound enamel.. Cycles of demineralization and remineralization continue throughout the lifetime of the tooth." (2)

Additionally, in a 2014 study Cho, et al. found:

"Conclusions: While 6-year-old children who had not ingested fluoridated water showed higher dft in theWF-ceased area than in the non-WF area, 11-year-old children in theWF-ceased area who had ingested fluoridated water for approximately 4 years after birth showed significantly lower DMFT than those in the non-WF area. This suggests that the systemic effect of fluoride intake through water fluoridation could be important for the prevention of dental caries." (3)

Additionally, from Buzalaf:

“Evidence also supports fluoride’s systemic mechanism of caries inhibition in pit and fissure surfaces of permanent first molars when it is incorporated into these teeth pre-eruptively.”

B. The graph to which Gilbert refers is a misrepresentation of WHO data created by staff of the antifluoridationist group, FAN. New Zealand chemist, Ken Perrott, has provided a detailed explanation of this misrepresentation.

“The huge influence of inter-country differences on these data, irrespective of fluoridation, surely sticks out like a sore thumb in Connett’s graphs. That doesn’t require a scientific training to see. These differences introduce so much noise into the data that no conclusion is possible about the influence on fluoridation.” (5)

As the cause and preventive factors involved in dental decay are myriad and diverse, an attempt to assess the effectiveness of but one preventive measure based on raw data of dental decay incidence which controls for no other variables is naïve and meritless.

C. The number of public health professionals which may be “recommending that fluoridation of drinking water be discontinued” is negligible in comparison to those who fully support the initiative, including the American Public Health Association. (6)

II. Action

5. Gilbert: There is no question that ingested fluoride can be detrimental to human health. The challenge is determining if there is a level of exposure to fluoride that is safe and improves dental health

Facts:
There is no valid, peer-reviewed scientific evidence that fluoride at the optimal level at which water is fluoridated is, in any manner, "detrimental to human health".

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6. Gilbert: Dental fluorosis, which damages tooth enamel, is caused by an excess of ingested fluoride by young children. At a very mild or mild level, it causes white splotches or stripes on teeth. At moderate or severe levels, the mottling is more pronounced and can cause yellow or brown stains and pitting of the enamel, which can increase cavities.

Facts:
The only dental fluorosis which may be associated with optimally fluoridated water is mild to very mild, a barely detectable effect which causes no adverse effect on cosmetics, form, function, or health of teeth. As peer-reviewed science has demonstrated mildly fluorosed teeth to be more decay resistant, many consider this effect to not even be undesirable, much less adverse. (1)

The only level of dental fluorosis which may damage teeth, and can "increase cavities", is severe. As clearly noted by the 2006 NRC Committee on Fluoride in Drinking Water, this level of dental fluorosis does not occur in communities with a water fluoride content below 2.0 mg/liter. Water is fluoridated at one third this level. (7)

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7. Gilbert: 2019 study found that both prevalence and severity of fluorosis have jumped. Nearly 65% of 12-15 year-olds in the U.S. are afflicted, with 27.9% moderate and 2.6% severe levels, reinforcing a 2018 study that found similar increases in 16-17 year-olds. Fluoridated water is a major contributor to all levels

Facts:
A. The study to which Gilbert refers is one by staff and close affiliates of the anfluoridation group, "FAN", based on NHANES data on dental fluorosis. In an April 2019 report, the US Department of Health and Human Resources, the department overseeing NHANES data collection and reporting, reassessed this data. It found that the reported findings were not "biologically plausible", and cautioned that the questionable quality of this data should be strongly considered before use.

"The observed increase in dental fluorosis prevalence with age between 2001–2004 and 2011–2014, based on the synthetic cohort analyses, is not biologically plausible. This suggests that

there may have been some change in the way the examiners evaluated the level of fluorosis over time. The quality assessment findings in this report should be strongly considered when determining whether these data are appropriate for the user's analytic objectives, including studies of prevalence and trends." (8)

B. The claim that fluoridated water is a "major contributor" to all levels of dental fluorosis, is false.

This would be akin to stating that a drop of water is a "major contributor" to a tsunami. While technically true that the drop contributes to the tsunami, removal of it would have no effect on the tsunami, nor could that drop cause the tsunami in the absence of the volumes of other water required for this event to occur.

The same is true for fluoridated water and moderate/severe dental fluorosis. While technically the 0.7 mg/liter fluoride in optimally fluoridated water contributes to this fluorosis, removal of that minuscule amount from the water would not prevent moderate/severe dental fluorosis in areas in which it may occur, nor could this amount cause that level of fluorosis in the absence of exposure to the abnormally high levels of environmental and/or well-water fluoride required to cause this effect.

As clearly noted by the 2006 NRC Committee on Fluoride In Drinking Water, severe dental fluorosis does not occur in communities with a water fluoride content below 2.0 mg/liter. Water is fluoridated at one third this level. (7)

Any concerns with dental fluorosis are due to fluoride exposure from sources other than optimally fluoridated water. They are therefore not a reason to deprive entire populations of the benefits of water fluoridation.

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8. *Gilbert: "Fluoride has been identified as an endocrine disruptor. Fluoride is known to have lowered thyroid functions since the 1950's, when it was used to treat hyperthyroid patients. The 2006 National Academy of Science's review stated unequivocally that it "decreased thyroid function". Studies in Canada and England added further evidence that increases in fluoride exposure contributed to hypothyroidism."*

Facts:
A. There is no valid, peer-reviewed scientific evidence of endocrine disruption from fluoride at the optimal level at which water is fluoridated.

B. The 2006 NRC Committee on Fluoride in Drinking Water was charged to evaluate the adequacy of the EPA primary and secondary MCLs for fluoride, 4.0 ppm and 2.0 ppm respectively, to protect against adverse effects. The final recommendation of this Committee was for the primary MCL to be lowered from 4.0 ppm. The sole reasons cited by the Committee for this recommendation were the risk of severe dental fluorosis, bone fracture, and skeletal fluorosis, with chronic ingestion of water with a fluoride content of 4.0 ppm or greater. Nothing else. Had this Committee deemed there to be adverse effects on the thyroid, or any other concerns with fluoride at this level, it would have been responsible for stating so and recommending accordingly. It did not. (9)

Additionally, the NRC Committee made no recommendation to lower the secondary MCL of 2.0 ppm. Water is fluoridated at 0.7 ppm. one third that level.

In March of 2013, Dr. John Doull, Chair of the 2006 NRC Committee on Fluoride in Drinking Water made the following statement:

"I do not believe there is any valid, scientific reason for fearing adverse health conditions from the consumption of water fluoridated at the optimal level"

---John Doull, MD, PhD, Chair of the National Academy of Sciences, National Research Council 2006 Committee Report on Fluoride in Drinking Water

C. The Canadian study by Malin was of the effects of iodine deficiency on the thyroid, not of fluoride on the thyroid. This problem is resolved by addressing dietary iodine deficiencies, not by elimination of water fluoridation.

D. The UK study of Peckham has been widely discredited in the peer-reviewed scientific literature for its inadequate control for confounders, poor methodology, and reaching a conclusion not supported by the scientific literature.

"In summary, this study [Peckham] is an ecologic one that has several significant flaws, making it almost meaningless with regard to assessing any possible association between water fluoridation and hypothyroidism. As such, this study provides no evidence of a causal relationship between water fluoride concentration and hypothyroidism." (10)

"It is a fact that a question has been raised if not answered by this study. Rather than continue to debate with its authors we plan to repeat the analysis ourselves using more conventional statistical methods. In the meantime, it is unfortunate that this article and its claims remain in the literature despite its weaknesses." (11)

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9. Gilbert: "The 2006 NAS review also determined "fluorides have the ability to interfere with the functions of the brain"

Facts:
The final recommendation of this NAS Committee was for the primary fluoride MCL to be lowered from 4.0 ppm. The sole reasons cited by the Committee for this recommendation were the risk of severe dental fluorosis, bone fracture, and skeletal fluorosis, with chronic ingestion of water with a fluoride content of 4.0 ppm or greater. Nothing else. Had this Committee deemed there to be adverse effects on the "functions of the brain", or any other concerns with fluoride at this level, it would have been responsible for stating so and recommending accordingly. It did not. (9)

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10. *Gilbert: "The 2012 Harvard meta-analysis found children ingesting higher levels of fluoride tested an average 7 IQ points lower in 26 of 27 studies. Most had higher fluoride concentrations than in U.S. water, but in many the total exposure to fluoride was no more than what millions of Americans receive*."

Facts:
This was not a "Harvard meta-analysis". It was a meta-analysis performed by two adjunct faculty members of Harvard, Phillippe Grandjean and Anna Choi. These two reviewed 27 studies from obscure Chinese journals of the effects of high levels of fluoride (as high as 11.5 ppm) in the well-water of various Chinese, Mongolian, and Iranian villages.

By the admission of Grandjean and Choi, themselves, these studies had key information missing, inadequate control for confounders, and questionable methodologies. These 27 studies were so seriously flawed that Grandjean and Choi were led to issue a public statement in March, 2012 that the studies should not be used to judge water fluoridation in the US. .

"These results do not allow us to make any judgment regarding possible levels of risk at levels of exposure typical for water fluoridation in the U.S. On the other hand, neither can it be concluded that no risk is present. We therefore recommend further research to clarify what role fluoride exposure levels may play in possible adverse effects on brain development, so that future risk assessments can properly take into regard this possible hazard."

--Anna Choi, research scientist in the Department of Environmental Health at HSPH, lead author, and Philippe Grandjean, adjunct professor of environmental health at HSPH, senior author. (12)

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11. *Gilbert: "In 2017, an NIH-funded prospective study found that every one part per million increase in fluoride in pregnant women's urine was associated with a reduction of their children's IQ by 5-6 points. By 2018, out of 60 studies, 53 had linked higher fluoride levels with lower IQ's in children*."

Facts:
The Bashash, et al. study to which this refers was of the effects of prenatal fluoride exposure on the offspring of pregnant women residing in non-fluoridated Mexico, whose primary sources of fluoride were from fluoridated salt and/or well-water. As is clearly apparent from the limitations stated in the study itself, it has no applicability to optimally fluoridated water in the US.

A critique explaining the flaws of this study has been prepared by an ADA panel including noted researchers. (13)

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12. Gilbert: Finally, the chemical typically used to fluoridate water, fluorosilicic acid, can be contaminated with lead and/or arsenic. Both are known to be neurotoxic and there are no safe levels for either.

Facts:
While the substance utilized to fluoridate the majority of systems is fluorosilic acid (FSA) it is false to imply that there unsafe levels of "lead and/or arsenic" or any other contaminants within this substance.

The amount of contaminants detected in water at the tap fluoridated with FSA is so minute that it takes 10 times the manufacturer recommended single use amount of FSA to determine any at all. In water fluoridated with that excessive amount of FSA for purposes of testing, only 50% of the random samples show any detectable contaminants. (14)

The statement that there are "no safe levels of either" is in contradiction with the findings of the US EPA. The EPA mandated maximum level of safety (MCL) for arsenic is 10 parts per billion. The same for lead is 15 parts billion. The maximum level of arsenic in fluoridated water at the tap as determined by rigorous testing under Standard 60 of NSF International is 0.6 parts per billion, only 6% of the EPA mandated maximum allowable. The maximum of lead detected under the same testing is negligible, even farther below EPA maximum allowable levels than is arsenic. Any other contaminants are hardly detectable. (14)

In addition, recent evidence that arsenic may be a required nutrient, further undermines Gilbert's claim that there are "no safe levels" of this element. (20)(21)

A complete list of the contents of water at the tap fluoridated with FSA can be viewed in the "Fact Sheet on Fluoridation Products" on the website of NSF International.

III. History

13. Gilbert: "From the 1950s the PHS recommendation for the concentration of fluoridated water has been 1.0 mg/L (milligrams per liter or ppm) for most of the U.S., with a range of 0.7 to 1.2 mg/L. In 2015, this recommendation was lowered to 0.7 mg/L to reduce the toxic side effects of fluoride ingestion while attempting to maintain its beneficial effects."

Facts:
The reason stated by Gilbert for the 2015 reset of the US DHHS recommended level of fluoride in drinking water, is false. Mild dental fluorosis is not a "toxic side-effect", nor was this of major concern. DHHS simply updated its recommendation to reflect current scientific findings indicating that range was no longer necessary, that there are more sources of fluoride now than when the optimal range was established, and in keeping with the original fluoridation goal of providing maximum dental decay prevention at the lowest fluoride concentration which would accomplish this.

From the 2015 USPH recommendation to reset the optimal fluoride level:

"This updated guidance is intended to apply to community water systems that currently fluoridate, or that will initiate fluoridation, and is based on considerations that include:

- Scientific evidence related to the effectiveness of water fluoridation in caries prevention and control across all age groups,

- Fluoride in drinking water as one of several available fluoride sources,
- Trends in the prevalence and severity of dental fluorosis, and
- Current evidence on fluid intake of children across various outdoor air temperatures." (15)

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14. *Gilbert: "All asserted fluoridation was safe, even though no long-term safety studies had ever been done on any diseases and no studies at all on endocrine disruption, neurotoxicity, cancer, diabetes or chemical sensitivities. Their statements on the certainty of no health risks have continued to the present day, even after the 2006 NAS review cited numerous health risks and the need for more research on several harmful medical conditions, including cancer, diabetes, kidney disease, neurotoxicity and others*."

Facts:
A. In the 74 year history of water fluoridation, hundreds of millions having chronically ingested optimally fluoridated water during this time, there have been no proven adverse effects. This is in spite of the constant, ongoing efforts of fluoridation opponents through the decades to find any adverse effects they could attribute to the initiative. They have been entirely unsuccessful.

There can be no more definitive demonstration of the safety of an initiative than this.

B. Not only did the 2006 NRC Committee not provide support for antifluoridation claims, it actually affirmed the safety of fluoride at the optimal level with its final finding of but three concerns with chronic consumption fluoride at the level of 4.0 mg/liter in water: risk of severe dental fluorosis, bone fracture, and skeletal fluorosis.

- As the Committee, itself, noted in its report, severe dental fluorosis does not occur in communities with a water fluoride content below 2.0 mg/liter. Water is fluoridated at one third this level. (7)
- Bone fracture is a U-shaped curve, with too little or too much risking such fracture. The least amount of this risk is at the bottom of the U, right in the range of the optimal level of fluoride.
- Skeletal fluorosis is so rare in the 74.4% fluoridated US as to be nearly non-existent.

In regard to fluoride at the level of 4.0 mg/liter in water, had this committee any concerns with the "numerous health risks" cited by Gilbert, it would have been responsible for so stating in its final report and recommending accordingly. It did not.

C. Extensive study has, indeed, been done in regard to "cancer, kidney disease, neurotoxicity, and others" in regard to optimally fluoridated water. All have demonstrated there to be no concerns.

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15. Gilbert: "Today, fluoridation's endorsement by the U.S. government and much of the medical establishment is in stark contrast to most of the rest of the world."

Facts:
The reasons different countries may not fluoridate their water are numerous, few, if any, related to concerns with effectiveness or safety of the initiative. These reasons include such considerations as logistics of existing water systems rendering fluoridation to be cost-prohibitive; utilization of fluoridated salt and/or milk programs in lieu of fluoridation; existing water fluoride levels already at, or above, the optimal, thereby rendering fluoridation unnecessary; and equal access to comprehensive dental care by all members of the population.

"Many fluoridation systems that used to operate in Eastern and Central Europe did not function properly and, when the Iron Curtain fell in 1989-90, shut down because of obsolete technical equipment and lack of knowledge as to the benefits of fluoridated water. Water fluoridation is not practical in some European countries because of complex water systems with numerous water sources. As an alternative to water fluoridation, many European countries have opted for the use of fluoride supplements or salt fluoridation." (16)

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16. Gilbert: "A drug is defined by the FDA as any substance used in the diagnosis, treatment or prevention of disease. For example, the FDA requires a label on fluoridated toothpaste that says, for children under 6, 'If more than used for brushing is accidentally swallowed, get medical help or contact a Poison Control Center right away.'

Facts:
A. The US FDA has no jurisdiction over fluoride in drinking water supplies. As set forth in the US Safe Drinking Water Act, this jurisdiction falls entirely under that of the US EPA, which mandates compliance with strict water quality requirements for all public drinking water supplies. Therefore how the FDA defines anything at all is of no relevance to water fluoridation. (17)(18)

B. Fluoridated toothpaste contains fluoride at a concentration 1200-1500 times that in optimally fluoridated water. This is the reason for the label on the tube.

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17. Gilbert: "But when fluoride is added to drinking water, the FDA has looked the other way and refuses to regulate it."

Facts:
This is false. The FDA does not "refuse to regulate" fluoride in drinking water. By law, it has no authority to do so. The Safe Drinking Water Act specifies that the contents of drinking water supplies are under the jurisdiction of the EPA.

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18. Gilbert: "Fluoridated water is in a 'black hole' without any regulation."

Facts:
This is false. Fluoridated water from public water supplies is regulated by the US EPA. (17)(18)

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19. Gilbert: "The EPA regulates it as a contaminant when it occurs naturally, but has stated they will not even consider health risks when fluoride is intentionally added to drinking water.

Facts:
This is false. The US EPA periodically commissions the US National Academy of Sciences to perform a detailed review of fluoride literature to date, then issue recommendations in regard to the adequacy of the EPA MCL for fluoride to protect the health of the public. These reviews have been performed in 1977, 1993, and 2006.....the latter which Gilbert, himself, cites in his arguments.

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20. Gilbert: "Physicians prescribe drugs on an individual's needs, ensuring that it's pharmaceutical grade (not contaminated) and requiring a specific dose for a specific length of time. They also must inform their patients of potential harmful side effects. However, the final decision on whether to take the drugs rests with the patient. With fluoridation, all these safety protocols are violated, taking away the individual's right of informed consent."

Facts:
A. There are no drugs involved in water fluoridation. The only substances ingested as a result of the initiative are fluoride ions, identical to those which already exist in water, and trace contaminants in barely detectable amounts far below US EPA mandated maximum allowable levels for safety.

B. There is no prescription required for anyone to drink fluoridated water, j

C. When the maximum dose of a substance which can be ingested falls below the threshold of adverse effects for that substance then dose is of no concern in regard to adverse effects. Prior to the threshold of adverse effects being attained from fluoride in optimally fluoridated water in conjunction with that from all other normal sources of fluoride, water toxicity would be the concern, not fluoride.

This is true not only for fluoride but for chlorine, ammonia, and the numerous other substances routinely added to public water supplies.

D. The claim that "pharmaceutical grade (not contaminated}" fluoride is false. The amount of contaminants in "pharmaceutical grade" fluoride is the main reason why it is not recommended for use in fluoridation.

All fluoride ions are identical, regardless of the compound from which they are released. Those released from the NaF compound commonly referred to as “pharmaceutical grade fluoride” are identical with those released from fluorosilic acid, or any other fluoride-containing compound. Therefore, the only difference is the amount of contaminants which may be introduced into the water from these compounds. While the level of contaminants in “pharmaceutical grade fluoride” is entirely safe for single-shot applications such as toothbrushing or mouthrinses, when used in the large volumes necessary for fluoridation of a water system, these contaminants are in greater amounts than those in fluoridation compounds such as fluorosilic acid, potentially even exceeding EPA mandated maximum allowable levels for those contaminants. (19)

Therefore, not only is “pharmaceutical grade fluoride” much more expensive than the fluoridation compounds, it is more dangerous in the amount of contaminants it introduces into water.

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21. Gilbert: “With fluoridation, all these safety protocols are violated, taking away the individual’s right of informed consent.”

Facts:
A. There are no safety protocols violated by the US EPA in its regulation of fluoride in drinking water supplies, any more than are there for chlorine, ammonia, and the numerous other substances routinely added to public water supplies. Such water at the tap is mandated to meet all of the stringent quality requirements under Standard 60 of NSF International. (14)

B. There is no “right of informed consent” involved in the approval by local officials of the concentration level of an existing mineral in drinking water supplies under their jurisdiction. Consent for these officials to do their jobs is conveyed upon their election/appointment to office.

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22. Gilbert: “Many European nations, including France, Germany, Belgium, the Netherlands and Czech Republic, cite the ethical problem of putting a drug in drinking water as a reason they disallow fluoridation.”

Facts:
Gilbert provides nothing more than a non-specific link to “fluoridealert”, the biased website of the New York antifluoridation group FAN, as his source for this unsubstantiated claim. As noted previously in item #15, the reasons why different countries may not fluoridate their water are numerous, few, if any, associated with concerns of effectiveness or safety.

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23. Gilbert: "Health conditions that render people more vulnerable to fluoride exposure, such as kidney disease and diabetes, are more prevalent among low-income populations, as are nutrient deficiencies. Moreover, low-income families cannot afford expensive filters or bottled water to avoid fluoridated water. They have no choice."

Facts:
A. There is no valid, peer-reviewed scientific evidence that anyone of any age or physical condition is "more vulnerable to fluoride exposure".

B. There is no scientific, healthcare, or common sense reason that anyone needs to avoid optimally fluoridated water. For any who desire to do so, for whatever personal reasons, any costs involved in such a choice are the responsibility of the individual making that choice.

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24. Gilbert: "Finally, the Precautionary Principle says that whenever there is evidence that a substance is causing health or environmental harm, preventive measures should be taken, even if the evidence isn't 100% conclusive"

Facts:
A. Even using Gilbert's definition of the precautionary principle, as there is no valid evidence of optimal level fluoride "causing health or environmental harm", this principle does not apply to water fluoridation.

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25. Gilbert: "The burden of proof should be to show beyond a reasonable doubt that the substance is safe, not absolute proof that it is harmful."

Facts:
In the 74 year history of fluoridation, hundreds of millions having ingested optimally fluoridated water during this time, there have been no proven adverse effects.

There can be no more definitive demonstration of the safety of an initiative than this. With this record of safety and provision of very value disease prevention to entire populations by fluoridation, the burden is on those who oppose it to provide valid evidence to support this opposition. Fluoridation opponents have as yet to meet this burden.

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