



## Rebuke of Claims Made by Ron Greinke

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Ron Greinke is a retired chemist, close affiliate of the New York antifuoridation faction, "Fluoride Action Network". As demonstrated in the following, Greinke has little understanding of fluoridation, the science behind it, or the peer-reviewed scientific literature which fully supports it. The misinformation he provides is sourced directly from "FAN", and can be found on most antifuoridation websites.

In a 2015 opinion piece in *Cleveland.com* Greinke makes numerous erroneous and false claims. These will be addressed in the following with references on the last page. <sup>1</sup>

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1. Greinke: "*Silica tetrafluoride is used to fluoridate water systems.*"

### **Facts:**

The substance most commonly used in fluoridation is hydrofluorosilic acid, not silica tetrafluoride. HFA is a compound containing 6 fluoride ions, Silica tetrafluoride contains only 4 fluoride ions, and is not utilized in fluoridation.

Greinke uses MSDS (Material Safety Data Sheets) to attempt to induce unwarranted fear about fluoridation substances. The MSDS for raw, undiluted fluoridation substances are irrelevant to all except those water treatment personnel who handle these substances. The silicofluorides are hydrolyzed (dissociated) immediately upon addition to drinking water. The products of this dissociation are fluoride ions, identical to those which have always existed in water, and trace contaminants in amounts far below EPA mandated allowable levels of safety. After this point, the silicofluoride substances no longer exist in that water. They are neither ingested, nor come into any contact with consumers. Attempting to use MSDS for fluoridation substances indicates either a total lack of understanding of the chemistry of fluoridation, or dishonesty. <sup>2, 3</sup>

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2. Greinke: "*Fluoride has been labeled a developmental neurotoxin, as supported by substantial evidence.*"

### **Facts:**

A. Fluoride has been on the EPA list of neurotoxins for the better part of the past decade. On that same list are such commonly ingested substances as aspartame (sweetener), ethanol (beer and other alcoholic beverages), salicylate (aspirin), caffeine, and nicotine. <sup>4</sup>

B. There is no valid, peer-reviewed scientific evidence of any neurotoxicity of fluoride at the optimal level at which water is fluoridated. The fallacy of the "substantial evidence" Greinke notes is clearly explained in the recent denial of a petition filed with the EPA by a group of fluoridation opponents. The petition was based on claims of neurotoxicity of optimal level fluoride. In the 40 page rejection, the EPA rebuked all of the arguments of the opponents, and exposed the irrelevance, invalidity, and misrepresentation of conclusions, of the studies put forth in that petition. <sup>5</sup>

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3. Greinke: *"The National Research Council's 2006 Report "Fluoride in Drinking Water" cautioned: "fluorides have the ability to interfere with the functions of the brain" and recommended that the EPA reduce its allowed maximum contaminant level for fluoride in drinking water. In response, the U.S. Department of Health and Human Services in 2011 proposed a recommended 0.7 milligrams of fluoride per liter of water in place of the prior recommended range of 0.7 to 1.2 milligrams."*

**Facts:**

This is an out-of-context half-truth followed by a false statement.

A. The 2006 NRC Committee on Fluoride In Drinking Water listed but 3 concerns with fluoride at the level of 4.0 ppm or below: Risk of severe dental fluorosis, bone fracture, and skeletal fluorosis, with chronic ingestion of fluoride at the level of 4.0 ppm or higher. If this committee had any concerns that fluoride at 4.0 ppm "interferes with the functions of the brain", it would have been responsible for so stating and recommending accordingly. It did not. <sup>6</sup>

B. The claim that DHHS acted in response to the 2006 NRC report is false. The EPA sets the legally mandated maximum allowable level, MCL, of fluoride in drinking water. This MCL is 4.0 ppm. This is the level the 2006 NRC Committee recommended be lowered, not the optimal range of 0.7 - 1.2 ppm.

The DHHS sets the non-enforceable recommended optimal level of fluoride in drinking water. This optimal level was originally set by the US Public Health Service in 1962, as a range of 0.7 ppm to 1.2 ppm in order to allow for different amounts of water consumption between different climates. Recent scientific evidence has demonstrated that, due to air-conditioning and other modern amenities, there no longer exist any significant difference in water consumption due to climate differences. Thus, there is no longer a need for a range. In recognition of this fact and of the greater availability of fluoride now, than when the optimal was originally established, the CDC, in 2011, recommended that the optimal range be consolidated into simply the low end of that range, 0.7 ppm. After several years of careful study and consideration as to whether this consolidation would significantly reduce the dental decay prevention of fluoridation, the US DHHS determined that it would not. In view of these assessments, in 2015, the DHHS eliminated the optimal level range resetting it to simply the low end of that range, 0.7 ppm. <sup>7</sup>

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4. Greinke: "A 2012 Harvard meta-analysis (a study of many studies) found an average seven-point IQ loss in children consuming high levels of fluoride. Most of the children studied lived in China."

**Facts:**

The "reduced IQ studies" are a reference to a 2011 review of 27 Chinese studies dug out of obscure Chinese journals by researchers Phillippe Grandjean and Anna Choi. These studies were 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. <sup>8</sup>

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5. Greinke: "It is not surprising that billboards in Washington State now warn parents about fluoride's neurotoxicity to children."

**Facts:**

There is no valid, peer-reviewed scientific evidence of neurotoxicity of optimal level fluoride in children, or anyone else.

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6. Greinke: "Infant warnings also have been issued on water bills in some U.S. cities regarding dental fluorosis."

**Facts:**

The "warnings" issued on water bills have been placed to appease fluoridation opponents. These "warnings" simply state that due to existing fluoride in powdered infant formula, reconstituting it with optimally fluoridated water risks barely detectable mild dental fluorosis in developing teeth of infants and children during the teeth developing years of 0-8. Nothing else. 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.

For those parents who are concerned with even mild dental fluorosis, in spite of the increased resistance to decay of these teeth, the ADA and the CDC have suggested they either use non-fluoridated bottled water to reconstitute the powder, or simply use pre-mixed formula, most, if not all, of which, is made with low-fluoride content water. <sup>9</sup>

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7. Greinke: *"They [dentists] do make a lot of money on this issue,"*

**Facts:**

Dentists make money by treating dental disease. A measure which significantly prevents dental disease, therefore means less income for dentists, not more.

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8. Greinke: *"The National Kidney Foundation no longer takes a position on fluoridation of drinking water."*

**Facts:**

In 2007, an attorney, Robert Reeves, sent the NKF an unconscionable letter threatening lawsuits against the then current and past members of the NKF Board of Directors, both collectively and against their personal assets, as well as against the NKF staff, if NKF did not remove its name from the list of organizations which support fluoridation. The NKF is a charitable organization which provides much needed services and activities on behalf of kidney patients. Rather than waste its limited resources and subjecting its Boards and staff to protracted and expensive litigation fighting an antifuoridationist attorney with nothing to lose, the NKF prudently decided to simply remove its name from the list.

It is important to note that neither the NKF, nor any other credible organization in the world opposes fluoridation, which the NKF would most certainly do if it deemed fluoridation to be any danger to kidney patients. <sup>10</sup>

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9. Greinke: *"The EPA has not applied margin of safety factors to any of the 21st-century reported harms caused by fluoride nor has it reduced the maximum contaminant level for fluoride in drinking water."*

**Facts:**

A. There is no valid, peer-reviewed scientific evidence to support any claims of "21st century reported harms" from optimal level fluoride. In the 72 year history of fluoridation, hundreds of millions having chronically consumed optimally fluoridated water during that time, there have been no proven adverse effects.

The "margin of safety" between optimal level fluoride and the threshold of adverse effects is obviously sufficient. There can be no greater demonstration of this adequacy.

B. The only adverse effects cited by the 2006 NRC Report in regard to its recommendation to lower the primary fluoride MCL down from 4.0 ppm, were risk of severe dental fluorosis, bone fracture, and skeletal fluorosis with chronic consumption of water with a fluoride content of 4.0 ppm or greater.

i) Severe dental fluorosis is rare in the US, and, according to the 2006 NRC Committee, does not occur in communities with a water fluoride content of 2.0 ppm or below.

ii) Skeletal fluorosis is so rare in the US as to be nearly non-existent.

iii) Risk of bone fracture has a U shaped curve from occurring with too little fluoride intake, to occurring with too much fluoride intake. The bottom of the curve is right at the optimal level

iv) Nearly three fourths of the US is fluoridated at 0.7 ppm. If there is any drinking water with a level of 4.0 ppm or greater in the US, it is very rare.

v) The 2006 Committee made no recommendation to lower the secondary MCL from 2.0 ppm.

Given all of these factors, there is no urgent need to reduce the primary fluoride MCL, nor did the 2006 NRC Committee deem this to be an urgent request. Any lowering would simply fall between 2.0 ppm and 4.0 ppm, the lower end of that range being three times the level at which three fourths of the United States already maintains fluoride in drinking water.

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10. Greinke: *"According to the city of Cleveland's [2014 Annual Water Quality Report](#), Cleveland's tap water contained an average fluoride concentration of 1.2 parts per million. That's 4,000 times more fluoride concentration than allowed by the EPA for microcystin levels in drinking water for vulnerable populations (0.3 parts per billion) such as very young children, in spite of similar health hazard warnings."*

**Facts:**

It is amazing that one who purportedly holds a PhD in chemistry does not understand the elementary concept that the effects of different substances on the human body occur at different concentrations of those substances. At what threshold concentration toxicity of microcystin occurs, is of no relevance to that threshold for fluoride, or any other substance, including plain water. These thresholds are specific for each substance, not for comparison purposes. This is precisely the reason why we carefully monitor intake levels of all substances we ingest, and do not assume that the safe concentration of one substance applies for all substances

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