



**Refute of "Fluoridation (Re) education" Article of Joel Landau**

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An article on water fluoridation, recently appeared in *Yes Weekly*. The article written by Joel Landau reports on a presentation to a committee of the Greensboro City Council and is rife with the same unsubstantiated claims, misinformation, and false statements that are characteristic of fluoridation opponents who rely upon antifluoridationist websites and blogs for their information in lieu of reliable respected sources of accurate information. The following is a fully referenced, point-by-point rebuke of the entire article.

**Explanation and Correction of Landau Misinformation**

1. Landau: *"The 2008 Material Safety Data Sheet for hydrofluorosilic acid states: 'Emergency Overview: Danger Corrosive. Causes severe burns to eyes, skin, and respiratory "*

Facts: Yes, raw, undiluted routine additives such as chlorine, HFA, ammonia, and myriad others, are toxic and dangerous. That is precisely why they are diluted to proper concentration levels by water treatment personnel who are educated and trained to do so properly.

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2. Landau: *"This substance, hydrofluorosilic acid, also known as HFS, is the chemical used to fluoridate Greensboro's water. Water Department employees have to wear full body hazardous material protective gear when handling it."*

Facts: See #1 above in regard to raw, undiluted routine water additives.

3. Landau: "When HFS is added to our water, it is diluted to supposedly safe levels. But it turns out that "safe" is a controversial judgment call."

Facts:

There is nothing controversial or judgmental in regard to the strict mandates and recommendations of the US EPA and The US Department of Health and Human Services. The EPA mandated maximum allowable level of fluoride in drinking water is 4.0 parts per million. This is enforceable by law. The optimal level of fluoride is a non-enforceable official recommendation of the US DHHS. The current optimal level is 0.7 part per million. Yes, the substance most widely utilized to fluoridate water systems is hydrofluorosilic acid (HFA). HFA is a co-product of the process which extracts the other co-product, phosphoric acid, from naturally occurring phosphorite rock. Phosphoric acid is used in soft drinks we consume and in fertilizers which become incorporated into foods that we eat. The HFA co-product is carefully diluted to a 23% aqueous solution which is utilized to fluoridate water systems. To irrationally fear one co-product of this process is to irrationally fear the other.

Once introduced into drinking water, due to the pH of that water (~7), the HFA is immediately and completely hydrolyzed (dissociated). The products of this hydrolysis are fluoride ions identical to those which have always existed in water, and trace contaminants in barely detectable amounts far below US EPA mandated maximum allowable levels of safety. After this point, HFA no longer exists in that water. It does not reach the tap. It is not ingested. It is of no concern, whatsoever. (1)

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4. Landau: "Fluoridation causes tooth discoloration known as dental fluorosis, now seen in 36 percent of white children and 58 percent of black children. In moderate and severe forms fluorosis can negatively affect a child's self-image. Cosmetic dentistry to hide it is expensive."

Facts:

A. The only dental fluorosis in any manner attributable to 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 (Iita, Kumar) has demonstrated mildly fluorosed teeth to be more decay resistant, many consider this effect to not even be undesirable, much less adverse. Rozier, et al demonstrated that mildly fluorosed teeth are viewed neutrally by children and their parents, while dental decay which can be prevented by water fluoridation is viewed negatively. Moderate/severe dental fluorosis is not caused by optimally fluoridated water. It is attributable to exposure to improper ingestion of toothpaste and/or exposure to high levels of environmental or well-water fluoride during the teeth developing years of 0-8. The only dental fluorosis considered to be an adverse effect by the 2006 NRC Committee on Fluoride in Drinking Water, is severe. This level of dental fluorosis does not occur in association with water with a fluoride content of 2.0 ppm or less. Water is fluoridated at the optimal level of 0.7 ppm, one third this level. (16) (2) (29)

B. The study on which fluoridation opponents rely in regard to incidence dental fluorosis is the 2010 CDC study by Beltran-Aguilar, in which 41% of adolescents they examined were found to have signs of dental fluorosis. This 41% was composed of 37.1% with mild to very mild dental fluorosis, with the other 3.8% being those with moderate dental fluorosis. (3)

The hypocrisy of fluoridation opponents is clearly evident by their intentional omission of the different levels of dental fluorosis, while callously ignoring the lifetimes of extreme pain, debilitation, development of serious medical conditions, loss of teeth, and life-threatening infection directly resultant of untreated dental decay which can be, and is, prevented by water fluoridation.

C. Mild dental fluorosis requires no dental treatment.

5. *Landau*: "Fluoride is a neurotoxin and hormone disruptor. Fluoridated water is associated with hip fractures (by making the bones brittle), joint problems, lower IQ, ADHD and low thyroid. Folks, this is nasty stuff."

Facts:

Fluoridation opponents constantly attempt to attribute the properties of high concentrations of fluoride to the minuscule optimal level of fluoride at which water is fluoridated. In actuality, there is no substance known to man which is not toxic at improper levels, including plain water. There is no valid, peer-reviewed scientific evidence that optimal level fluoride is "a neurotoxin and hormone disruptor" or that it is "associated with hip fractures, (by making the bones brittle.), joint problems, lower IQ, ADHD, and low thyroid". In fact, there is just the opposite.

A. In 2014, Broadbent, et al., found:

"Results. No significant differences in IQ because of fluoride exposure were noted. These findings held after adjusting for potential confounding variables, including sex, socioeconomic status, breastfeeding, and birth weight (as well as educational attainment for adult IQ outcomes)."

"Conclusions. These findings do not support the assertion that fluoride in the context of CWF programs is neurotoxic. Associations between very high fluoride exposure and low IQ reported in previous studies may have been affected by confounding, particularly by urban or rural status." (4)

B. In 2013, Näsman, Ekstrand, et al., found:

"Overall, we found no association between chronic fluoride exposure and the occurrence of hip fracture. The risk estimates did not change in analyses restricted to only low-trauma osteoporotic hip fractures. Chronic fluoride exposure from drinking water does not seem to have any important effects on the risk of hip fracture, in the investigated exposure range." (5)

C. The Malin ADHD study on which fluoridation opponents based their claim of association of ADHD with fluoridated water has been widely discredited in the peer-reviewed scientific literature for its poor methodology, inadequate control for confounders, and reaching a conclusion not supported by the peer-reviewed scientific literature. Clear demonstration of the inadequate controls by Malin is the fact that Huber, et al., in 2015, utilizing the exact same data as did Malin, concluded the reported cases of ADHD to be attributable to elevation at which the children resided, not to water fluoridation. (6)

From a critique of Malin, et al by *Fluoride Science*:

"It's an ecological study design with 51 observations (50 states & DC), and is not appropriate to test a hypothesis. ADHD prevalence was based on self-reported data, and hence had a potential of misclassification of disorder status. State-wide fluoridation measures were used. Individuals' exposure to fluoridation were not measured. Due to ecological assessment of exposure to fluoride in drinking water and the use of prevalence data of self-reported ADHD and water fluoridation from different years, the findings are at high risk for ecological fallacy. Authors did not adjust for important confounders (smoking, low birth weight, age, sex etc.). Moreover, authors' poor literature review and skewed interpretation of literature concerning fluoride and neurodevelopmental defects may have introduced bias." (7)

D. In regard to claims of "low thyroid", the following is from the British Fluoridation Society:

The available medical and scientific evidence suggests an absence of an association between water fluoridation and thyroid disorders.

Many major reviews of the relevant scientific literature around the world support this conclusion. Of particular importance are: an exhaustive review conducted in 1976 by an expert scientific committee of

the Royal College of Physicians of England; a systematic review in 2000 by the NHS Centre for Reviews and Dissemination at the University of York; and a 2002 review by an international group of experts for the International Programme on Chemical Safety (IPCS), under the joint sponsorship of the World Health Organisation (WHO), the United Nations Environment Programme (UNEP), and the International Labour Organisation (ILO).

None has found any credible evidence of an association between water fluoridation and any disorder of the thyroid.

#### Report of Royal College of Physicians

A scientific committee was established by the Royal College of Physicians to review whether, and to what extent, water fluoridation benefited people's teeth and whether there were any harmful effects to general human health. As well as confirming that water fluoridation reduces levels of tooth decay, the review also found that it was safe.

Specifically, the report concluded that "there is no evidence that fluoride is responsible for any disorder of the thyroid". It also confirmed that iodine deficiency was the root cause of goitre, and that fluoride does not significantly influence the thyroid's uptake of iodine. (10)

#### The University of York Review

Published in 2000, the York Systematic review identified over three thousand references in total. However, they found no scientific studies of an acceptable scientific standard that would support suggestions of an association between water fluoridation and thyroid disorders, including goitre, in the populations drinking fluoridated water. (8)

When the Medical Research Council subsequently used the York report as a basis for determining whether further research on any aspect of water fluoridation was needed, it concluded on the basis of the evidence already available that new research on fluoride and thyroid disorders should be regarded as a low priority. (9)

#### Review by the International Programme on Chemical Safety (IPCS)

The IPCS review of fluoride was one of several published by the World Health Organisation intended to "provide critical reviews on the effects on human health and the environment of chemicals and of combinations of chemicals ..." , and to "assist national and international authorities in making risk assessments and subsequent risk management decisions." As such, it examined evidence on fluoride relevant to all aspects of human health.

The review, which included 788 original studies from the worldwide scientific literature – both published and unpublished - identified no evidence of an association between fluoride and thyroid dysfunction in humans. (11)

#### Experience in the UK's most extensively fluoridated region

The conclusions of these authoritative reviews are mirrored by the experience of specialist doctors diagnosing and treating thyroid disorders in hospitals in the West Midlands, which has had fluoridation schemes in operation since the mid-1960s and which is today the most extensively fluoridated region of the United Kingdom. Around seven out of ten people in the West Midlands now drink water whose natural fluoride content has been topped up to the optimum for dental health of one part of fluoride per million parts of water.

Dr Andy Toogood, a consultant endocrinologist in the Department of Medicine at the Queen Elizabeth Hospital in Birmingham, says that he and his colleagues have seen nothing to suggest a rise in thyroid disorder cases resulting from water fluoridation.

Nor have public health officials who monitor trends in disease across the West Midlands detected any impact on the health of local populations drinking fluoridated water - other than a reduction in tooth decay levels which puts children living in the West Midlands among the best in the country for dental health. (12)

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6. *Landau: "The HFS we use to fluoridate our water is a toxic byproduct of fertilizer production; it's costly for the manufacturer to dispose of properly. Then it was discovered they could save that expense and actually earn a few bucks by selling it for use as a fluoridating agent."*

Facts:

A. The substance most widely utilized to fluoridate water systems is hydrofluorosilic acid (HFA). HFA is a co-product of the process which extracts the other co-product, phosphoric acid, from naturally occurring phosphorite rock. Phosphoric acid is used in soft drinks we consume and in fertilizers which become incorporated into foods that we eat. The HFA co-product is carefully diluted to an 23% aqueous solution which is utilized to fluoridate water systems. To irrationally fear one co-product of this process is to irrationally fear the other.

Once introduced into drinking water, due to the pH of that water (~7), the HFA is immediately and completely hydrolyzed (decomposed). The products of this hydrolysis are fluoride ions identical to those which have always existed in water, and trace contaminants in barely detectable amounts that are so far below US EPA mandated maximum allowable levels of safety that it is not even a certainty that those detected aren't that already exist in water naturally. (1)

B. One of the most important points is the fact that the fluoride destined for water treatment is an inconsequential portion of the mined fluoride. The mining companies incur no special cost in the normal disposal and avoid no costs whatsoever from water additive sales. Because the process requires energy and reagent inputs, it saves no money. Recently almost all of the sodium fluoride comes from overseas sources because the phosphate rock based manufacture is too expensive to be price competitive.

At the 2014 NOHC Kip Duchon, Chief Fluoridation Engineer for the CDC described some additional important manufacturing details. HFSA is accumulated at the phosphate rock processing plant in 20,000 gallon containers. When the container is full it is analyzed for contaminants. If it passes the grade the entire container is used for both pharmaceutical and water additive grades without further processing. (13)

The NSF Standard 60 for water additives is more specific and demanding than is the USP standard for medication, utilized by the FDA. The USP also does not provide for independent quality control oversight. The manufacturer is the only guarantor of USP purity. (14)

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7. *Landau: "So why do we add HFS to our water? Because back in the 1940s some studies were done that concluded that sodium fluoride in the water reduced the rate of cavities. These early studies didn't use HFS, and their methodology has since been discredited."*

Facts:

A. In the early part of the last century, it was noted by dental researchers that individuals who lived in a certain area of Colorado, had teeth that were significantly more resistant to dental decay. It was eventually determined that high levels of fluoride in the water of that area were the cause of the increased

dental decay resistance. Along with that increased resistance, however, it was also noted that a large number of these teeth exhibited brown stains and mottling, an effect which was termed "Colorado Brown Stain." Thus, researchers set out to find a level of that fluoride in water which would provide the benefit of increased dental decay resistance, without the stains and mottling. After years of observation and examination of individuals living in areas with different fluoride levels in their water, it was determined that the concentration of 1.0 part per million fluoride was that "optimal" level at which maximum dental decay resistance would be obtained, without the adverse effects. In 1962, the US Public Health Service established the official recommended optimal level of fluoride in water to be a range of 0.7 ppm to 1.2 ppm. It was established as a range in order to allow for different levels of water consumption between climates.

The first community to be fluoridated was Grand Rapids, Michigan. The results of this fluoridation showed a 50-70% reduction in dental decay. (15)

B. These "early studies" were of the same fluoride ion which has always existed in water, and which is added to water during fluoridation. HFA is simply a vehicle to deliver these fluoride ions into the water. It is gone before the water reaches the tap. It is of no relevance what method was used to incorporate the fluoride into water in these "early studies".

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8. *Landau: "Since those early days of fluoridation we've learned that fluoride's effect on teeth is topical. That means you have to apply it directly to the tooth surface to get a positive effect. Drinking it doesn't help you resist cavities."*

Facts:

The effects of fluoride are both topical and systemic. The systemic effects are demonstrated in the mild to very mild dental fluorosis, the only dental fluorosis in any manner 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 Kumar, et al. have demonstrated mildly fluorosed teeth to be more decay resistant, many consider this effect to not even be undesirable, much less adverse. Increased resistance to dental decay is a benefit. Dental fluorosis can only occur systemically. (16)

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 demineralized 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." (17)

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 the WF-ceased area than in the non-WF area, 11-year-old children in the WF-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." (18)

Additionally, Buzalaf concluded:

"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." (19)

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9. *Landau: "Many studies show that since WWII tooth decay has declined at the same rate whether or not water is fluoridated. Indeed, many cities and most European countries have ended their fluoridation programs."*

Facts:

The "studies" to which Landau refers are not studies at all, but are skewed interpretations of data by fluoridation opponents. They have cherry-picked a couple of data points out of a cluster of data points for each country, connected the dots and claimed that to be a "trend". A detailed explanation of this misrepresentation of scientific data, by antifluoridationists, has been prepared by New Zealand chemist, Ken Perrott, PhD. This may be found on his website:

<https://openparachute.wordpress.com/2015/08/12/fluoridation-connetts-naive-used-of-who-data-debunked/>

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10. *Landau: "Fluoridation of the municipal water supply violates personal liberty. Generally speaking, government does not mandate medical treatment. Vaccinations are an exception. With vaccines the argument is made that an unvaccinated person puts the vaccinated people at risk. There is no such argument with fluoridation. Whether or not I drink fluoridated water has no impact on your risk of getting a cavity. Also, fluoridated toothpaste is readily available. Each person can make their own decision whether to use it. When we put fluoride in the city's water, people lose their individual choice."*

Facts:

Obviously, this is a ridiculous argument. No one is forced to drink fluoridated water. No one's personal liberties" are impacted one way or the other by fluoridated water. This is simply a brazen attempt to exploit emotions felt for those unfortunate souls throughout history who have, indeed, been unjustly deprived of their personal liberties. The attempt to equate the simple adjustment of the concentration level of an existing mineral in water, to the horrors of the actual unjust deprivation of personal liberties is unconscionable, and typical of the tactics utilized by fluoridation opponents.

No US court of last resort has ever affirmed the "forced medication" argument of fluoridation opponents, in spite of repeated attempts in court by opponents through the decades.

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11. *Landau: "Greensboro City Council's Infrastructure Committee received an informational report this month on Greensboro's fluoridation program. Water Resources Director Steven Drew reported that the annual cost of fluoridation is about \$90,000. This includes the cost of complying with OSHA safety regulations to safeguard employees handling the highly corrosive HFS."*

Facts:

A. The cost savings of water fluoridation are well documented in the peer-reviewed scientific literature. These studies have shown a savings of \$15 - \$50 or more, per every \$1 spent on fluoridation. The costs

of untreated dental disease are astronomical both for the individual and for society in general. These expenses involve, among other things, increased costs for taxpayer born public assistance programs such as Medicaid and HealthChoice.....increased hospital charges to compensate for unpaid hospital Emergency Room visits for dental problems,.....unpaid hospital charges for admissions, extended stays, and treatment of serious medical conditions directly resultant of untreated dental decay... operating room expenses for treatment of children with untreated dental decay.....increased medical insurance premiums to compensate for expenses of untreated dental disease..... lost productivity in the workplace and in school directly resultant of untreated dental decay,.....loss tax revenue....., etc, etc, etc. (20) (21) (22) (23) (24) (25) (26)

B. The OSHA safety regulations for handling the "highly corrosive HFS" are in all likelihood, no different than those for handling the myriad other "highly corrosive" raw, undiluted substances that these employees routinely add to the water supply.

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12. *Landau: "He noted that if Greensboro ceased adding fluoride to its water, people would still receive some fluoride. This is because there is a residual amount naturally occurring in the water. Plus, many of the prepared foods we consume are made with fluoridated water."*

Facts:

Yes, the exact same fluoride ions exist naturally in water as those which are added with fluoridation. Fluoridation is the adjustment of this naturally occurring fluoride up to the level where maximum dental decay benefit is obtained from this mineral which we ingest in our water anyway, fluoridated or not. The "residual amount" of fluoride is insufficient to provide that benefit. This is exactly the reason for fluoridation.

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13. *Landau: "And many people use fluoride toothpaste and/or receive fluoride treatments from their dentist."*

Facts:

While the one-shot fluoride exposure provided by fluoridated toothpaste and fluoride treatments in the dental office are valuable, they provide a spike of fluoride which is gone within an hour or so. Fluoridation 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. This bathing is provided by systemic incorporation of fluoride into saliva, and incorporation of fluoride into plaque adhering to the teeth. The constant replenishment of this low level of fluoride provides a very distinct advantage over the one shot application from toothpaste and dental office procedures, and it does so automatically, with no issues of patient compliance.

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14. *Landau: "Also, some of Greensboro's water comes from High Point, Burlington and Reidsville, each of which fluoridates their water. Mr. Drew's report noted that if City Council ended the fluoridation program, it would not affect water quality."*

Fact:

That a fraction of the water for Greensboro is sourced from other communities which are fluoridated is not a reason for Greensboro to cease fluoridating its own water, thereby depriving the overwhelming majority of its citizens the benefits of fluoridated water. Additionally is the question as to how much of this water from other communities will be intermingled with non-fluoridated Greensboro water, thereby diluting the fluoride to a level which will provide no benefit.



15. *Landau:* "Merle Green, director of Guilford County's Department of Public Health, spoke in favor of fluoridation, stating the official position on the subject. Her remarks brought to mind a conversation I had years ago with my friend Vic. He was a dentist who had retired after decades of doing children's dentistry for Guilford County's Health Department."

Facts:

Mr. Landau's unsubstantiated anecdotes about what he claims someone told him are, obviously, meaningless.

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16. *Landau:* "The CDC acknowledged in 1999 that the action of fluoride on teeth is topical and not systemic. Despite this admission and scores of studies and new information that have accumulated in recent years, there is still pressure on health professionals to support the 'conventional wisdom.' "

Facts:

A. The CDC has made no such acknowledgement. This is misinformation gleaned straight from antifluoridationist websites. The following is precisely what the CDC has stated:

"The laboratory and epidemiologic research that has led to the better understanding of how fluoride prevents dental caries indicates that fluoride's predominant effect is posteruptive and topical and that the effect depends on fluoride being in the right amount in the right place at the right time. Fluoride works primarily after teeth have erupted, especially when small amounts are maintained constantly in the mouth, specifically in dental plaque and saliva. Thus, adults also benefit from fluoride, rather than only children, as was previously assumed."

*Predominantly* topical does not mean, as antifluoridationists have falsely proclaimed, *only* topical. Additionally, a large part the topical effect of fluoride comes bathing of the teeth in saliva with fluoride incorporated into it. This incorporation of fluoride into saliva occurs systemically. (27)

B. Health professionals support water fluoridation because it is supported by the overwhelming consensus of the peer-reviewed science.

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17. *Landau:* "People have lost their jobs for not towing the line. In the early years of fluoridation it seemed to be a good thing. But that perception has been debunked. We now know it brings an array of health problems, plus the expense of fluoridating the water, the safety risk for employees and the denial of individual choice."

Facts:

A. Anecdotal tales about people losing jobs for opposing fluoridation are part and parcel of fluoridation opponent conspiracy theories. They have no merit.

B. There has been no debunking of the volumes of evidence supporting the effectiveness of fluoridation except in the minds of fluoridation opponents. The claims that fluoridation is based on "outdated science" are pure nonsense. Support for fluoridation is based on the most current science available, while, ironically, opponents generally provide little more than half-century old studies, and out-of-context information and quotes. A list of 10 of the countless peer-reviewed scientific studies clearly demonstrating the effectiveness of fluoridation.....most within the past 5 years.....is provided at the end of this document.

C. There is no valid, peer-reviewed scientific evidence that optimal level fluoride "brings an array of health problems, plus the expense of fluoridating the water, the safety risk for employees and the denial of individual choice."

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18. *Landau: "Ehren Nagel, one of the speakers, voiced this concern: ' believe that as a parent it is my right and my duty to make informed medical decisions to protect my daughter's health. I think that, no matter how good the intentions, adding a medication with known complications and side effects to the water supply where the dosage for each child cannot be known or controlled and where there is no informed consent for treatment from parents is wrong.'*

Facts:

A. The decision by local officials to adjust the level of existing fluoride in water supplies under their jurisdiction have no bearing on anyone's rights, or "duty to make informed medical decisions". Informed consent applies to treatment rendered. The only one rendering the "treatment" of drinking a glass of water is the one who chooses to do so for himself, or to those under his care. Everyone is entirely free to consume fluoridated water or not.

B. There is no valid, peer-reviewed scientific evidence of any "known complications and side effects" of optimal level fluoride.

C. There are no dosage issues in regard to optimally fluoridated water, for children or anyone else.

Simply put, water is fluoridated at 0.7 mg/liter (ppm=mg/liter). Thus, for every liter of fluoridated water consumed, the "dose" of fluoride intake is 0.7 mg. The average daily water consumption by an adult is 2-3 liters per day. The US CDC estimates that of the total daily intake, or "dose", of fluoride from all sources including dental products, 75% is from the water.

The US Institute of Medicine has established that the daily upper limit for fluoride intake from all sources, for adults, before adverse effects will occur, short or long term, is 10 mg. as can be noted from a simple math equation, before the daily upper limit of fluoride intake could be attained in association with optimally fluoridated water, water toxicity would be the concern, not fluoride.

The range of safety between the miniscule few parts per million fluoride that are added to existing fluoride levels in your water, is so wide that "dose" is not an issue. (28)

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19. *Landau: "Some people are concerned that ending fluoridation would hurt poor people, since it is a free program. This is well-intentioned but mistaken. Fluoridation does not contribute to dental health. It DOES contribute to an array of health problems, including ADHD and lower IQ."*

Facts:

A. Countless peer-reviewed scientific studies clearly demonstrate the effectiveness of fluoridation in the prevention of dental decay in entire populations. A list of 10 such studies, many from within the past 5 years, is provided at end of this document.

B. There is no valid, peer-reviewed scientific evidence that optimally fluoridated water "DOES contribute to an array of health problems, including ADHD and lower IQ".

20. *Landau: So back to the lady I started with: Janet Nagel, EdD. Ms. Nagel is a retired health education professional and was one of the speakers at the Committee meeting. She says "My son has dental fluorosis. I've learned, contrary to what we're supposed to believe, fluoridation is not safe."*

Facts:

A. Unsubstantiated anecdotal claims about unconfirmed diagnoses of dental effects, or of disorders of any type, are meaningless in the absence of documented evidence.

B. Unsubstantiated claims that "fluoridation is not safe" are meaningless in the absence of valid, peer-reviewed scientific evidence to support such a claim. No such evidence exists.

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21. *Landau: "Janet has become a tireless anti-fluoridation activist. Her group's new website contains an encyclopedic collection of scientific studies and articles on the issue."*

Facts:

Janet Nagel is notorious for posting misinformation in forums all over the internet. Her lack of respect for truth and accuracy is clearly demonstrated in her countless posts.

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22. *Landau: 'Fluoride has a protecting action against (tooth decay), but this is a local (topical) effect. If you drink it, you are running the risk of all kinds of toxic actions. . . . This is something you shouldn't expose citizens to.' - Arvid Carlsson, MD, PhD 2000 Nobel Laureate in Physiology/Medicine'*

Facts:

There are so few scientists of any credibility, whatsoever, who oppose fluoridation that quotes from the small handful who do are used relentlessly by fluoridation opponents. This quote from Arvid Carlsson is one of these. A list of quotes from the volumes of highly respected individuals and organizations, worldwide, who support fluoridation, is provided at the end of this document.

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Effects of enamel fluorosis and dental caries on quality of life.  
Onoriobe, U, Rozier RG, Cantrell J, King RS.

## Effectiveness Studies

### 1) 2015

#### Results

In the 3 areas the proportion of children who received a dental examination varied; 77.5% (n=825) for the fluoridated area, 80.1% (n=781) for the pre-fluoridated area and 55.3% (n=523) for the non-fluoridated area. The mean dmft was 1.40 for the fluoridated area, 2.02 for the pre-fluoridated area and 2.09 for the non-fluoridated area. These differences were statistically significant ( $p<0.01$ ). Differences were also noted in the proportion of children who were caries free, 62.6% fluoridated area, 50.8% for the pre-fluoride area and 48.6% for the non-fluoride location.

#### Conclusion

The children living in the well-established fluoridated area had less dental caries and a higher proportion free from disease when compared with the other two areas which were not fluoridated. Fluoridation demonstrated a clear benefit in terms of better oral health for young children.

---The Dental Health of primary school children living in fluoridated, pre-fluoridated and non-fluoridated communities in New South Wales, Australia

Anthony S Blinkhorn, Roy Byun, George Johnson, Pathik Metha, Meredith Kay, and Peter Lewis

BMC Oral Health 2015, 15:9 doi:10.1186/1472-6831-15-9<http://www.biomedcentral.com/1472-6831/15/9>

### 2) 2000

#### RESULTS:

The prevalence of dental caries was inversely related and the prevalence of fluorosis was directly related to the concentration of fluoride in the drinking water. The mean DMFS in the communities with 0.8 to 1.4 ppm fluoride was 53.9 percent to 62.4 percent lower than that in communities with negligible amounts of fluoride. Multivariate analysis showed that water fluoride level was the strongest factor influencing DMFS scores. The prevalence of fluorosis ranged from 1.7 percent to 15.4 percent, and the increase in fluorosis with increasing fluoride exposure was limited entirely to the milder forms.

----J Public Health Dent. 2000 Summer;60(3):147-53.

The prevalence of dental caries and fluorosis in Japanese communities with up to 1.4 ppm of naturally occurring fluoride.

Tsutsui A, Yagi M, Horowitz AM.

Department of Preventive Dentistry, Fukuoka Dental College, Fukuoka, Japan. [tutuia@college.fdcnet.ac.jp](mailto:tutuia@college.fdcnet.ac.jp)

<http://www.ncbi.nlm.nih.gov/pubmed/11109211>

### 3) 2000

#### CONCLUSIONS:

Caries levels are lower among children with fluoridated domestic water supplies. Decay levels are much lower in 2002 than they were in 1984 and in the 1960s. The oral health of the less well off is worse than that of the rest of the population. The prevalence of dental fluorosis is higher amongst children and adolescents with fluoridated water supplies. Comparisons with 1984 data show an increase in the prevalence of fluorosis since that time.

----Community Dent Health. 2004 Mar;21(1):37-44.

Dental caries and enamel fluorosis among the fluoridated and non-fluoridated populations in the Republic of Ireland in 2002.

Whelton H, Crowley E, O'Mullane D, Donaldson M, Kelleher V, Cronin M.

Source

Oral Health Services Research Centre, University Dental School and Hospital, Wilton, Cork, Ireland.

4) 1995

<http://www.ncbi.nlm.nih.gov/pubmed/7643331>

CONCLUSIONS:

The ingestion of water containing 1 ppm or less fluoride during the time of tooth development may result in dental fluorosis, albeit in its milder forms. However, in these times of numerous products containing fluoride being available, children ingesting water containing 1 ppm fluoride continue to derive caries protection compared to children ingesting water with negligible amounts of fluoride. Thus, the potential for developing a relatively minor unesthetic condition must be weighed against the potential for reducing dental disease.

----J Public Health Dent. 1995 Spring;55(2):79-84.

Dental fluorosis and caries prevalence in children residing in communities with different levels of fluoride in the water.

Jackson RD, Kelly SA, Katz BP, Hull JR, Stookey GK.

Source

Oral Health Research Institute, Indianapolis, IN 46202-2876, USA.

<http://www.ncbi.nlm.nih.gov/pubmed/15074871>

5) 2004

Conclusions:

The results of this study support existing work suggesting water fluoridation together with the use of fluoridated dentifrice provides improved caries prevention over the use of fluoridated dentifrice alone. The social gradient between caries and deprivation appears to be lower in the fluoridated population compared to the non-fluoridated population, particularly when considering caries into dentine, demonstrating a reduction in inequalities of oral health for the most deprived individuals in the population.

----The association between social deprivation and the prevalence and severity of dental caries and fluorosis in populations with and without water fluoridation

Michael G McGrady, Roger P Ellwood, [...], and Iain A Pretty

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3543717/>

6) 2012

CONCLUSIONS:

Fewer studies have been published recently. More of these have investigated effect at the multi-community, state or even national level. The dmf/DMF index remains the most widely used measure of effect. % CR were lower in recent studies, and the 'halo' effect was discussed frequently. Nevertheless, reductions were still substantial. Statistical control for confounding factors is now routine, although the effect on per cent reductions tended to be small. Further thought is needed about the purpose of evaluation and whether measures of effect and study design are appropriate for that purpose.

----Community Dent Oral Epidemiol. 2012 Oct;40 Suppl 2:55-64. doi: 10.1111/j.1600-0528.2012.00721.x.

Effectiveness of water fluoridation in caries prevention.

Rugg-Gunn AJ, Do L.



Source  
Newcastle University, UK. andrew@rugg-gunn.net

<http://www.ncbi.nlm.nih.gov/pubmed/22998306>

7) 2012

**CONCLUSIONS:**

Data showed a significant decrease in dental caries across the entire country, with an average reduction of 25% occurring every 5 years. General trends indicated that a reduction in DMFT index values occurred over time, that a further reduction in DMFT index values occurred when a municipality fluoridated its water supply, and mean DMFT index values were lower in larger than in smaller municipalities.

----Int Dent J. 2012 Dec;62(6):308-14. doi: 10.1111/j.1875-595x.2012.00124.x.

Decline in dental caries among 12-year-old children in Brazil, 1980-2005.

Lauris JR, da Silva Bastos R, de Magalhaes Bastos JR.

Source

Department of Paediatric Dentistry, University of São Paulo, Bauru, São Paulo, Brazil. jrlauris@fob.usp.br

<http://www.ncbi.nlm.nih.gov/pubmed/23252588>

8). 2012

**Abstract**

The effectiveness of fluoridation has been documented by observational and interventional studies for over 50 years. Data are available from 113 studies in 23 countries. The modal reduction in DMFT values for primary teeth was 40-49% and 50-59% for permanent teeth. The pattern of caries now occurring in fluoride and low-fluoride areas in 15- to 16-year-old children illustrates the impact of water fluoridation on first and second molars.

----Caries Res. 1993;27 Suppl 1:2-8.

Efficacy of preventive agents for dental caries. Systemic fluorides: water fluoridation.

Murray JJ.

Source

Department of Child Dental Health, Dental School, University of Newcastle upon Tyne, UK.

<http://www.ncbi.nlm.nih.gov/pubmed/8500120>

9) 1993

**CONCLUSIONS:**

The survey provides further evidence of the effectiveness in reducing dental caries experience up to 16 years of age. The extra intricacies involved in using the Percentage Lifetime Exposure method did not provide much more information when compared to the simpler Estimated Fluoridation Status method.

----Community Dent Health. 2012 Dec;29(4):293-6.

Caries status in 16 year-olds with varying exposure to water fluoridation in Ireland.

Mullen J, McGaffin J, Farvardin N, Brightman S, Haire C, Freeman R.

Source

Health Service Executive, Sligo, Republic of Ireland. joej.mullen@hse.ie

<http://www.ncbi.nlm.nih.gov/pubmed/23488212>

10). 2012

**CONCLUSIONS:**

Children with severe dental caries had statistically significantly lower numbers of lesions if they lived in a fluoridated area. The lower treatment need in such high-risk children has important implications for publicly-funded dental care.

-----Community Dent Health. 2013 Mar;30(1):15-8.

Fluoridation and dental caries severity in young children treated under general anaesthesia: an analysis of treatment records in a 10-year case series.

Kamel MS, Thomson WM, Drummond BK.

Source

Department of Oral Sciences, Sir John Walsh Research Institute, School of Dentistry, The University of Otago, Dunedin, New Zealand.

Research Design: Consecutive clinical case series: clinical details (diagnoses and the treatments provided) were recorded for children who had received comprehensive dental care under GA between 2000 and 2009. Age, gender, ethnicity, socio-economic status and fluoridation status (determined from the residential address) were also recorded.

<http://www.ncbi.nlm.nih.gov/pubmed/23550501>

## Quotes From Fluoridation Proponents

"Numerous reputable studies over the years have consistently demonstrated that community water fluoridation is safe, effective, and practical. Fluoridation has made an enormous impact on improving the oral health of the American people. "

"Our country is fortunate to have over 204 million Americans living in fluoridated communities and having access to the health and economic benefits of this vital public health measure."

Sincerely,

Jeffrey S. Flier, MD  
Dean of the Faculty of Medicine  
Caroline Shields Walker Professor of Medicine  
Harvard Medical School

R. Bruce Donoff, DMD, MD  
Dean and Walter C. Guralnick Distinguished Professor of Oral and Maxillofacial Surgery  
Harvard School of Dental Medicine

Julio Frenk, MD, MPH, PhD  
Dean of the Faculty, Harvard School of Public Health  
T & G Angelopoulos Professor of Public Health and International Development,  
Harvard School of Public Health and Harvard Kennedy School

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"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

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"With the development of fluoridated drinking water and dental sealants, Americans are less likely to experience tooth loss and gingivitis by middle age ... Community water fluoridation continues to be a vital, cost-effective method of preventing dental [cavities]."

Dr. Regina Benjamin, Surgeon General (2009-current)

\* \* \* \* \*

"Water fluoridation has helped improve the quality of life in the United States by reducing pain and suffering related to tooth decay, time lost from school and work, and money spent to restore, remove or replace decayed teeth."

Dr. Richard Carmona, Surgeon General (2002-2006)

\* \* \* \* \*

"More than 50 years of scientific research has found that people living in communities with fluoridated water have healthier teeth and fewer cavities than those living where the water is not fluoridated. ... A

significant advantage of water fluoridation is that anyone, regardless of socioeconomic level, can enjoy these health benefits during their daily lives — at home, work, or at school or play — simply by drinking fluoridated water or beverages prepared with fluoridated water.”

Dr. David Satcher, Surgeon General (1998-2002)

\* \* \* \* \*

“Data consistently have indicated that water fluoridation is the most cost-effective, practical, and safe means for reducing the occurrence of tooth decay in a community.”

Dr. Audrey Manley, Surgeon General (1995-1997)

\* \* \* \* \*

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

Dr. C. Everett Koop, Surgeon General (1982-1989)

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The American Dental Association

“Studies conducted throughout the past 65 years have consistently shown that fluoridation of community water supplies is safe and effective in preventing dental decay in both children and adults.”

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The American Academy of Pediatrics

“Fluoride plays a very important role in the prevention of dental [decay]. Although the primary mechanism of action of fluoride in preventing dental [decay] is topical, systemic mechanisms are also important.”

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The Centers for Disease Control and Prevention

“For many years, panels of experts from different health and scientific fields have provided strong evidence that water fluoridation is safe and effective.”

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The American Academy of Family Physicians

“Fluoridation of public water supplies is a safe, economical and effective measure to prevent dental [decay].”

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The Institute of Medicine

“Evidence continues to reaffirm that community water fluoridation is effective, safe, inexpensive, and is associated with significant cost savings.”

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The American Public Health Association

“Much of the credit for the nation’s better oral health can be attributed to the decision in the 1940s to begin adding fluoride to public drinking

**Organizations Which Recognize the Importance of Water Fluoridation  
(from the American Dental Association)**

Acad Dentistry InterNatl  
Acad General Dentistry  
Acad for Sports Dentistry  
Alzheimer's Assoc  
America's Health Insurance Plans  
Am Acad Family Physicians  
Am Acad Nurse Practitioners  
Am Acad Oral and Maxillofacial Pathology  
Am Acad Orthopaedic Surgeons  
Am Acad Pediatrics  
Am Acad Pediatric Dentistry  
Am Acad Periodontology  
Am Acad Physician Assistants  
Am Assoc for Community Dental Programs  
Am Assoc for Dental Research  
Am Assoc for Health Education  
Am Assoc for the Advancement Science  
Am Assoc Endodontists  
Am Assoc Oral and Maxillofacial Surgeons  
Am Assoc Orthodontists  
Am Assoc Public Health Dentistry  
Am Assoc Women Dentists  
Am Cancer Society  
Am College Dentists  
Am College Physicians / Am Society Internal Medicine  
Am College Preventive Medicine  
Am College Prosthodontists  
Am Council on Science and Health  
Am Dental Assistants Assoc  
Am Dental Assoc  
Am Dental Education Assoc  
Am Dental Hygienists' Assoc  
Am Dietetic Assoc  
Am Federation Labor and Congress of Industrial Orgs  
Am Hospital Assoc  
Am Legislative Exchange Council  
Am Medical Assoc  
Am Nurses Assoc  
Am Osteopathic Assoc  
Am Pharmacists Assoc  
Am Public Health Assoc  
Am School Health Assoc  
Am Society for Clinical Nutrition  
Am Society for Nutritional Sciences  
Am Student Dental Assoc  
Am Water Works Assoc  
Assoc for Academic Health Centers  
Assoc Am Medical Colleges  
Assoc Clinicians for the Underserved

Assoc Maternal & Child Health Programs  
Assoc State & Territorial Dental Directors  
Assoc State & Territorial Health Officials  
Assoc State & Territorial Public Health  
Nutrition Directors  
British Fluoridation Society  
Canadian Dental Assoc  
Canadian Dental Hygienists Assoc  
Canadian Medical Assoc  
Canadian Nurses Assoc  
Canadian Paediatric Society  
Canadian Public Health Assoc  
Child Welfare League America  
Children's Dental Health Project  
Chocolate Manufacturers Assoc  
Consumer Federation America  
Council State & Territorial Epidemiologists  
Delta Dental Plans Assoc  
FDI World Dental Federation  
Federation Am Hospitals  
Hispanic Dental Assoc  
Indian Dental Assoc (USA.)  
Institute of Medicine  
Institute for Science in Medicine  
InterNatl Assoc for Dental Research  
InterNatl Assoc for Orthodontics  
InterNatl College Dentists  
March Dimes Birth Defects Found  
Natl Assoc Community Health Centers  
Natl Assoc County & City Health Officials  
Natl Assoc Dental Assistants  
Natl Assoc Local Boards Health  
Natl Assoc Social Workers  
Natl Confectioners Assoc  
Natl Council Against Health Fraud  
Natl Dental Assistants Assoc  
Natl Dental Assoc  
Natl Dental Hygienists' Assoc  
Natl Down Syndrome Congress  
Natl Down Syndrome Society  
Natl Found Dentistry for the Handicapped  
Natl Head Start Assoc  
Natl Health Law Program  
Natl Healthy Mothers, Healthy Babies Coalition  
Oral Health America  
Robert Wood Johnson Found  
Society for Public Health Education  
Society Am Indian Dentists  
Special Care Dentistry  
Acad Dentistry for Persons with Disabilities  
Am Assoc Hospital Dentists  
Am Society for Geriatric Dentistry  
The Children's Health Fund  
The Dental Health Found (of California)

US Department Defense  
US Department Veterans Affairs  
US Public Health Service  
Health Resources & Services Administration (HRSA)  
Centers for Disease Control & Prevention (CDC)  
Natl Institute Dental & Craniofacial Research (NIDCR)  
World Federation Orthodontists  
World Health Org