

Metabolic Solutions Report

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Fluoride—What's Wrong With This Picture?

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In 1999 the US Center for Disease Control (CDC) released a glowing report on the fluoridation of public water supplies, citing the procedure as one of the century's great public health successes. (1)

Ironically, the same report hints that the alleged benefit from fluorides may not be due to ingestion:

“Fluoride's caries-preventive properties initially were attributed to changes in enamel during tooth development because of the association between fluoride and cosmetic changes in enamel and a belief that fluoride incorporated into enamel during tooth development would result in a more acid-resistant mineral.”

The CDC report then acknowledges new studies which indicate that the effects are “topical” rather than “systemic.”

“However, laboratory and epidemiologic research suggests that fluoride prevents dental caries predominately after eruption of the tooth into the mouth, and its actions primarily are topical for both adults and children.”

The obvious question is this: How can the CDC consider the addition of fluoride to public water supplies to be a public health success while admitting at the same time that fluoride's benefits are not “systemic,” in other words, are not obtained from drinking it?

The truth, now becoming increasingly evident, is that fluoridation and the proclaimed benefit of fluoride as a way of preventing dental decay is perhaps the greatest “scientific” fraud ever perpetrated upon an unsuspecting public.

Even worse, the relentless promotion of fluoride as a “dental benefit” is responsible for the huge neglect in proper assessment of its toxicity, an issue that has become a major concern for many nations. As there is no substance as biochemically active in the human organism as fluoride, excessive total intake of fluoride compounds might well be contributing to many diseases currently afflicting mankind, particularly those involving thyroid dysfunction. In the United States, most citizens are kept entirely ignorant of any adverse effect that might occur from exposure to fluorides. Dental fluorosis, the first visible sign that fluoride poisoning has occurred, is declared a mere “cosmetic effect” by the dental profession, although the “biochemical events which result in dental fluorosis are still unknown.” (2,3,4) The quantity of fluoride needed to prevent caries but avoid dental fluorosis is also unknown. (5)

WHAT IS FLUORIDE?

Fluoride is any combination of elements containing the fluoride ion. In its elemental form, fluorine is a pale yellow, highly toxic and corrosive gas. In nature, fluorine is found combined with minerals as fluorides. It is the most chemically active nonmetallic element of all the elements and also has the most reactive electro-negative ion. Because of this extreme reactivity, fluorine is never found in nature as an uncombined element.

Fluorine is a member of group VIIa of the periodic table. It readily displaces other halogens—such as chlorine, bromine and iodine—from their mineral salts. With hydrogen it forms hydrogen fluoride gas which, in a water solution, becomes hydrofluoric acid.

There was no US commercial production of fluorine before World War II. A requirement for fluorine in the processing of uranium ores, needed for the atomic bomb, prompted its manufacture. (6)

Fluorine compounds or fluorides are listed by the US Agency for Toxic Substances and Disease Registry (ATSDR) as among the top 20 of 275 substances that pose the most significant threat to human health. (7) In Australia, the National Pollutant Inventory (NPI) recently considered 400 substances for inclusion on the NPI reporting list. A risk ranking was given based on health and environmental hazard identification and human and environmental exposure to the substance. Some substances were grouped together at the same rank to give a total of 208 ranks. Fluoride compounds were ranked 27th out of the 208 ranks. (8)

Fluorides, hydrogen fluoride and fluorine have been found in at least 130, 19, and 28 sites, respectively, of 1,334 National Priorities List sites identified by the Environmental Protection Agency (EPA). 9 Consequently, under the provisions of the

Superfund Act (CRECLA, 1986), a compilation of information about fluorides, hydrogen fluoride and fluorine and their effects on health was required. This publication appeared in 1993. (9)

Fluorides are cumulative toxins. The fact that fluorides accumulate in the body is the reason that US law requires the Surgeon General to set a Maximum Contaminant Level (MCL) for fluoride content in public water supplies as determined by the EPA. This requirement is specifically aimed at avoiding a condition known as Crippling Skeletal Fluorosis (CSF), a disease thought to progress through three stages. The MCL, designed to prevent only the third and crippling stage of this disease, is set at 4ppm or 4mg per liter. It is assumed that people will retain half of this amount (2mg), and therefore 4mg per liter is deemed "safe." Yet a daily dose of 2-8mg is known to cause the third crippling stage of CSF. (10,11)

In 1998 EPA scientists, whose job and legal duty it is to set the Maximum Contaminant Level, declared that this 4ppm level was set fraudulently by outside forces in a decision that omitted 90 percent of the data showing the mutagenic properties of fluoride. (12)

The Clinical Toxicology of Commercial Products, 5th Edition (1984) gives lead a toxicity rating of 3 to 4 (3 = moderately toxic, 4 = very toxic) and the EPA has set 0.015 ppm as the MCL for lead in drinking water—with a goal of 0.0ppm. The toxicity rating for fluoride is 4, yet the MCL for fluoride is currently set at 4.0ppm, over 250 times the permissible level for lead.

WATER FLUORIDATION

In 1939 a dentist named H. Trendley Dean, working for the U.S. Public Health Service, examined water from 345 communities in Texas. Dean determined that high concentrations of fluoride in the water in these areas corresponded to a high incidence of mottled teeth. This explained why dentists in the area found mottled teeth in so many of their patients. Dean also claimed that there was a lower incidence of dental cavities in communities having about 1 ppm fluoride in the water supply. Among the native residents of these areas about 10 percent developed the very mildest forms of mottled enamel ("dental fluorosis"), which Dean and others described as "beautiful white teeth."

Dean's report led to the initiation of artificial fluoridation of drinking water at 1 part-per-million (ppm) in order to supply the "optimal dose" of 1mg fluoride per day—assuming that drinking four glasses of water every day would duplicate Dean's "optimal" intake for most people. Now, according to the American Dental Association, all people, rich or poor, could have "beautiful white teeth" and be free of caries at the same time. After all, the benefits of water fluoridation had been documented "beyond any doubt." (13)

When other scientists investigated Dean's data, they did not reach the same conclusions. In fact, Dean had engaged in "selective use of data," using findings from 21 cities that supported his case while completely disregarding data from 272 other locations that did not show a correlation. (14) In court cases Dean was forced to admit under oath that his data were invalid. (15) In 1957 he had to admit at AMA hearings that even waters containing a mere 0.1ppm (0.1 mg/l) could cause dental fluorosis, the first visible sign of fluoride overdose. (16) Moreover, there is not one single double-blind study to indicate that fluoridation is effective in reducing cavities. (17)

SO WHAT'S THE TRUTH ABOUT TOOTH DECAY?

The truth is that more and more evidence shows that fluorides and dental fluorosis are actually associated with increased tooth decay. The most comprehensive US review was carried out by the National Institute of Dental Research on 39,000 school children aged 5-17 years. (18) It showed no significant differences in terms of DMF (decayed, missing and filled teeth). What it did show was that high decay cities (66.5-87.5 percent) have 9.34 percent more decay in the children who drink fluoridated water. Furthermore, a 5.4 percent increase in students with decay was observed when 1 ppm fluoride was added to the water supply. Nine fluoridated cities with high decay had 10 percent more decay than nine equivalent non-fluoridated cities.

The world's largest study on dental caries, which looked at 400,000 students, revealed that decay increased 27 percent with a 1ppm fluoride increase in drinking water. (19) In Japan, fluoridation caused decay increases of 7 percent in 22,000 students, (20) while in the US a decay increase of 43 percent occurred in 29,000 students when 1ppm fluoride was added to drinking water. (21)

DENTAL FLUOROSIS: A "COSMETIC" DEFECT?

Dental fluorosis is a condition caused by an excessive intake of fluorides, characterized mainly by mottling of the enamel (which starts as "white spots"), although the bones and virtually every organ might also be affected due to fluoride's known anti-thyroid characteristics. Dental fluorosis can only occur during the stage of enamel formation and is therefore a sign that an overdose of fluoride has occurred in a child during that period.

Dental fluorosis has been described as a subsurface enamel hypomineralization, with porosity of the tooth positively correlated with the degree of fluorosis. (22) It is characterized by diffuse opacities and under-mineralized enamel. Although identical enamel defects occur in cases of thyroid dysfunction, the dental profession describes the defect as merely "cosmetic" when it is caused by exposure to fluoride.

What is now becoming apparent is that this "cosmetic" defect actually predisposes to tooth decay. In 1988 Duncan (23) stated that hypoplastic defects have a strong potential to become carious. In 1989, Silberman, (24) evaluating the same data of Head Start children in fluoridated and non-fluoridated areas, wrote that "preliminary data indicate that the presence of primary canine hypoplasia [enamel defects] may result in an increased potential for the tooth becoming carious." In 1996 Li (25) wrote that children with enamel hypoplasia demonstrated a significantly higher caries experience than those who did not have such defects and, further, that the "presence of enamel hypoplasia may be a predisposing factor for initiation and progression of dental caries, and a predictor of high caries susceptibility in a community." In 1996 Ellwood & O'Mullane (26) stated that "developmental enamel defects may be useful markers of caries susceptibility, which should be considered in the risk-benefit assessment for use of fluoride."

Currently up to 80 percent of US children suffer from some degree of dental fluorosis, while in Canada the figure is up to 71 percent. A prevalence of 80.9 percent was reported in children 12-14 years old in Augusta, Georgia, the highest prevalence yet reported in an "optimally" fluoridated community in the United States. Moderate-to-severe fluorosis was found in 14 percent of the children. (27)

Before the push for fluoridation began, the dental profession recognized that fluorides were not beneficial but detrimental to dental health. In 1944, the Journal of the American Dental Association reported: "With 1.6 to 4 ppm fluoride in the water, 50 percent or more past age 24 have false teeth because of fluoride damage to their own." (28)

THE WONDER NUTRIENT?

On countless internet sites, fluoride is proclaimed as the "wonder nutrient," the "deficiency" symptom being increased dental caries. (29) It boggles the mind that a cumulative toxin and toxic waste product can be described a "nutrient." Nevertheless, such claims are repeatedly made by pro-fluoridationists. (30)

On March 16, 1979, the FDA deleted paragraphs 105.3 (c) and 105.85 (d)(4) of Federal Register documents which had classified fluorine, among other substances, as "essential" or "probably essential." Since that time, nowhere in the Federal Regulations is fluoride classified as "essential" or "probably essential." These deletions were the immediate result of 1978 Court deliberations. (31) No essential function for fluoride has ever been proven in humans. (32,33,34,35,36)

"NATURE THOUGHT OF IT FIRST"

A popular slogan employed by the ADA and other pro-fluoridation organizations is, "Nature thought of it first!" The slogan creates the impression that the fluoridation compounds used in water fluoridation are the same as those discovered many years ago in the water in some areas of the US. (37) The fluoride compound in "naturally" fluoridated waters is calcium fluoride. Sodium fluoride, a common fluoridation agent, dissolves easily in water, but calcium fluoride does not.

Animal studies performed by Kick and others in 1935 revealed that sodium fluoride was much more toxic than calcium fluoride. (38) Even worse toxicity was recorded for hydrofluorosilicic acid, the compound now used in over 90 percent of fluoridation programs. Hydrofluorosilicic acid is a direct byproduct of pollution scrubbers used in the phosphate fertilizer and aluminum industries. Our government adds it to water supplies even though it is also involved in getting rid of its own stockpile of fluoride compounds left over from years and years of stockpiling fluorides for use in the process of refining uranium for nuclear power and weapons. (39)

In the Kick study, less than 2 percent of calcium fluoride was absorbed and this was excreted quantitatively in the urine. But even calcium fluoride is not benign. As the animals given calcium fluoride also developed mottled teeth, it was clear that such compounds could produce changes on the teeth merely by passing through the body, and not by being "stored in a tooth" or anywhere else. No calcium fluoride was retained.

In 1946 Samuel Chase, one of the authors of the Kick study, became president of the International Association for Dental Research (IADR). This organization promoted the idea that only the fluoride ion in the various fluoridation compounds was of importance. Yet he well knew that sodium fluoride did not behave like calcium fluoride. Unlike calcium fluoride, sodium fluoride was retained in great amounts in the body and was very toxic. Rock phosphate and hydro-fluorosilicic acid experiments yielded the same information.

New areas with "natural" fluoride are appearing all over the world, as now all areas not "artificially" fluoridated are considered "natural." The problem is that this "natural" fluoride is the result of direct water and soil contamination from petrochemical land treatment, uncontrolled fertilizer use, pesticide applications, ground water contamination from industrial waste sites, rocket fuel "burial grounds," and so forth. Suddenly we have "natural" fluorides showing up in areas previously deemed "fluoride deficient", such as in Sosnivka, Ukraine.

TOTAL INTAKE

It is well established that it is TOTAL fluoride intake from ALL sources which must be considered for any adverse health effect evaluation. (40,41,42) This includes intake by ingestion, inhalation and absorption through the skin. In 1971, the World Health Organization (WHO) stated: "In the assessment of the safety of a water supply with respect to the fluoride concentration, the total daily fluoride intake by the individual must be considered." (41) Exposure to airborne fluorides from many diverse manufacturing processes—pesticide applications, phosphate fertilizer production, aluminum smelting, uranium enrichment facilities, coal-burning and nuclear power plants, incinerators, glass etching, petroleum refining and vehicle emissions—can be considerable.

In addition, many people consume fluorine-based medications such as Prozac, which greatly adds to fluoride's anti-thyroid effects. ALL fluoride compounds—organic and inorganic—have been shown to exert anti-thyroid effects, often potentiating fluoride effects many fold. (43)

Household exposures to fluorides can occur with the use of Teflon pans, fluorine-based products, insecticides sprays and even residual airborne fluorides from fluoridated drinking water. Decision-makers at 3M Corporation recently announced a phase-out of Scotchgard products after discovering that the product's primary ingredient—a fluorinated compound called perfluorooctanyl sulfonate (PFOS)—was found in all tested blood bank examinations. (44) 3M's research showed that the substance had strong tendencies to persist and bioaccumulate in animal and human tissue.

In 1991 the US Public Health Service issued a report stating that the range in total daily fluoride intake from water, dental products, beverages and food items exceeded 6.5 milligrams daily. (42) Thus, the total intake from those sources alone already greatly exceeds the levels known to cause the third stage of skeletal fluorosis.

Besides fluoridated water and toothpaste, many foods contain high levels of fluoride compounds due to pesticide applications. One of the worse offenders is grapes. (45) Grape juice was found to contain more than 6.8 ppm fluoride. The EPA estimates total fluoride intake from pesticide residues on food and fluoridated drinking water alone to be 0.095 mg/kg/day, meaning a person weighing 70 kg takes in more than 6.65 mg per day. (45b) Soy infant formula is high in both fluoride and aluminum, far surpassing the "optimal" dose (46,47) and has been shown to be a significant risk factor in dental fluorosis. (48)

TEA

In their drive to fluoridate the public water supplies, dental health officials continue to pretend that no other sources of fluoride exist. This notion becomes absurd when one looks at the fluoride content in tea. Tea is very high in fluoride because tea leaves accumulate more fluoride (from pollution of soil and air) than any other edible plant. (49,50,51) It is well established that fluoride in tea gets absorbed by the body in a manner similar to the fluoride in drinking water. (49,52)

Fluoride content in tea has risen dramatically over the last 20 years due to industry contamination. Recent analyses have revealed a fluoride content of 22.2 mg per teabag or cup in Chinese green tea, and 17.25 mg of soluble fluoride ions per teabag or cup in black tea. Aluminum content was also high—over 8 mg. Normal steeping time is five minutes. The longer a tea bag steeped, the more fluoride and aluminum were released. After ten minutes, the measurable amounts of fluoride and aluminum almost doubled. (53)

A website by a pro-fluoridation infant medical group states that a cup of black tea contains 7.8 mgs of fluoride (54) which is the equivalent amount of fluoride from 7.8 litres of water in an area fluoridated at the "optimal" concentration of 1ppm. Some British and African studies from the 1990s showed a daily fluoride intake of between 5.8 mgs and 9 mgs a day from tea alone. (55, 56, 57) Tea has been found to be a primary cause of dental fluorosis in many international studies. (58-70)

In Britain, over three-quarters of the population over the age of ten years consumes three cups of tea per day. (71) Yet the UK government and the British Dental Association are currently contemplating fluoridation of public water supplies! In Ireland, average tea consumption is four cups per day and the drinking water is heavily fluoridated.

Next to water, tea is the most widely consumed beverage in the world. Tea can be found in almost 80 percent of all US households and on any given day, nearly 127 million people—half of all Americans—drink tea. (71)

The high content of both aluminum and fluoride in tea is cause for great concern as aluminum greatly potentiates fluoride's effects on G protein activation, (72) the on/off switches involved in cell communication and of absolute necessity in thyroid hormone function and regulation.

FLUORIDE AND THE THYROID

The recent re-discovery of hundreds of papers dealing with the use of fluorides in effective anti-thyroid medication poses many questions demanding answers. (73,74) The enamel defects observed in hypothyroidism are identical to "dental fluorosis."

Endemic fluorosis areas have been shown to be the same as those affected with iodine deficiency, considered to be the world's

single most important and preventable cause of mental retardation, (75) affecting 740 million people a year, according to the WHO. Iodine deficiency causes brain disorders, cretinism, miscarriages and goiter, among many other diseases. Synthroid, the drug most commonly prescribed for hypothyroidism, became the top selling drug in the US in 1999, according to Scott-Levin's Source Prescription Audit, clearly indicating that hypothyroidism is a major health problem. Many more millions are thought to have undiagnosed thyroid problems.

ENVIRONMENT

Every year hundreds and thousands of tons of fluorides are emitted by industry. Industrial emissions of fluoride compounds produce elevated concentrations in the atmosphere. Hydrogen fluoride can exist as a particle, dissolving in clouds, fog, rain, dew, or snow. In clouds and moist air it will travel along the air currents until it is deposited as wet acid deposition (acid rain, acid fog, etc.) In waterways it readily mixes with water.

Sulfur hexafluoride (SF₆), emitted by the electric power industry, is now among six greenhouse gases specifically targeted by the international community, through the Kyoto protocol, for emission reductions to control global warming. The others are carbon dioxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), methane and nitrous oxide (N₂O).

SF₆ is about 23,900 times more destructive, pound for pound, than carbon dioxide over the course of 100 years. EPA estimates that some seven-million metric tons of carbon equivalent (MMTCE) escaped from electric power systems in 1996 alone. The concentration of SF₆ in the atmosphere has reportedly increased by two orders of magnitude since 1970. Atmospheric models have indicated that the lifetime of an SF₆ molecule in the atmosphere may be over 3000 years. (76)

The ever-increasing fluoride levels in food, water and air pose a great threat to human health and to the environment as evidenced by the endemic of fluorosis worldwide. It is of utmost urgency that public health officials cease promoting fluoride as beneficial to our health and address instead the issue of its toxicity.

Andreas Schuld is head of Parents of Fluoride Poisoned Children (PFPC), an organization of parents whose children have been poisoned by excessive fluoride intake. The group includes educators, artists, scientists, journalists and authors, lawyers, researchers and nutritionists. It is active in worldwide efforts to have the toxicity of fluoride properly assessed. For further information, visit their website at www.bruha.com/fluoride.

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