

FLUORIDE EXPOSURE AND HUMAN HEALTH RISKS

A Fact Sheet from the IAOMT

HIGHLIGHTS

- Sources of fluoride exposure have dramatically increased since water fluoridation began in the 1940s.
- Musculoskeletal effects, reproductive and developmental effects, neurotoxicity and neurobehavioral effects, genotoxicity and carcinogenicity, among others, are all related to fluoride exposure.
- Because fluoride is ubiquitous within our environment, there is no 'safe' water fluoridation dose.
- It is imperative that we eliminate all sources of fluoride exposure including water fluoridation, fluoride-containing dental materials, and other fluoridated products.

SOURCES OF EXPOSURE

Human exposure to fluoride has drastically increased since the 1940s. In addition to water fluoridation, an array of products containing fluoride and its compounds have been introduced to the average consumer. Some of these products were designed because of fluoride's alleged role in cavities prevention.

Products that may contain added fluoride include^{1,2}:

Municipal tap water	Beverages	Pesticides	Floss
Dental cement	Dental fillings	Food (from pesticides, fertilizers)	Toothpaste
Dental gel	Dental varnishes	Fluoride drugs ('supplements')	Mouthwash
Stain resistant and waterproof items containing perfluorinated compounds			
Pharmaceutical drugs with perfluorinated compounds			

Industrial pollution of fluoride and its compounds has also increased and contaminates the air, soil, water, and vegetation in both the immediate vicinity and distant areas. Fluoride in our environment comes from refineries, coal combustion and the manufacturing of multiple products (i.e., fertilizer, steel, utilities, etc.).³

HUMAN HEALTH RISKS FROM FLUORIDE

The collective impact of fluoride exposure from these and other sources can produce lifelong fluoride-related illnesses.⁴ Additionally, age (i.e., infants, elderly), sex, genetic factors, nutritional status (i.e., deficiencies of calcium, magnesium, iodine, and/or vitamin C), weight, health status (i.e., people with cardiovascular and kidney problems) and other factors influence each person's response.⁵

The National Research Council of the National Academy of Sciences evaluated the health risks of fluoride and raised concerns about potential associations between fluoride and osteosarcoma, bone fractures, musculoskeletal effects, reproductive and developmental effects, neurotoxicity and neurobehavioral effects, genotoxicity and carcinogenicity, and effects on other organ systems.⁶

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 IAOMT Position Paper on Fluoride



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 (including full list of references).



The following table includes some health conditions that have been associated with fluoride exposure⁵:

Bone weakness and risk of fractures ⁷	Diabetes ⁸	Insomnia ⁹	Neurotoxic effects ¹⁰
Bone Cancer, osteosarcoma ¹¹	Early puberty in girls ¹²	Iodine deficiency ¹³	Osteoarthritis ¹⁴
Cardiac ¹⁵	Harm to the fetal brain ¹⁶	Lower fertility rates ¹⁷	Skeletal fluorosis ¹⁸
Cognitive deficit ¹⁹	High blood pressure ²⁰	Lower IQ ²¹	TMJ ²²
Dental fluorosis ⁶	Immune system dysfunction ⁶	Liver ¹⁵	Thyroid dysfunction ²³

DENTAL FLUOROSIS



Dental Fluorosis Ranging from Very Mild to Severe from patients with dental fluorosis (consent provided for photos; Courtesy of Dr. David Kennedy)

Fluoride enters the bloodstream through the digestive tract. 50% is excreted via urine.²⁴ 99% of what remains is concentrated in the bone, where it is incorporated into the crystalline structure and accumulates over time.⁷ Since the 1940s we have known that the first outward manifestation of fluoride toxicity is dental fluorosis, a condition in which the teeth enamel is irreversibly damaged and discolored, forming brittle teeth that break and stain easily (see Image).⁶

According to the Centers for Disease Control and Prevention, 23% of Americans aged 6-49 and 41% of children aged 12-15 exhibit fluorosis to some degree.²⁵ These data were crucial in the Public Health Service’s decision to lower the water fluoridation level recommendation from 1.2mg/l to 0.07 g/l.²⁶

IN THE NEWS

Multiple studies have linked higher fluoride levels with reduced IQ. The U.S. Department of Health and Human Services National Toxicology Program draft of the State of the Science Monograph and Meta-Analysis Manuscript on Fluoride (April 2023) documents that 95% of the highest quality studies (19) show an inverse association between fluoride level and IQ (higher fluoride > lower IQ). This draft report, initially suppressed, is now publicly available (per court order).²¹ Most of these studies were conducted in children living in ‘optimally’ fluoridated (0.7mg/l) regions, suggesting that there is no ‘safe’ level of fluoridation. The findings of this report will likely play a significant role in the ongoing trial wherein the Fluoride Action Network (FAN) and others are suing the Environmental Protection Agency (EPA) for sanctioning the addition of fluoridation chemicals in public water supplies. In this case, attorney for the plaintiff, Michael Connett states, “It’s undisputed that fluoride will pass through the placenta into the brain of the fetus. It’s undisputed that babies who are bottle fed with fluoridated water receive the highest doses of fluoride in our population at the moment of greatest vulnerability. It’s undisputed that fluoride damages the brain.”²⁷ The latest trial date is currently set for January 2024.

IN CLOSING

Official recommendations on fluoride use, many of which are not enforced, are based on past limited research and have only been updated after irreversible harm has occurred. Given the plethora of new research, informed consumer consent is crucial for all uses of fluoride, including water fluoridation and dental-based products, whether administered at home or in the dental office. Providing education about fluoride risks and fluoride toxicity to medical and dental professionals, medical and dental students, consumers and policy makers is imperative to improving public health. Fluoride-free strategies to prevent dental caries exist. Given the current levels of exposure, it is necessary to reduce and work toward eliminating avoidable sources of fluoride exposure, including water fluoridation, fluoride containing dental materials, and other fluoridated products.

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