



## Facts on Fluoridation

### The Fact:and Fiction of Water Fluoridation

The fluoridation of water supplies has been described as one of the great advances in modern public health. It is simply a process of adding a naturally occurring element, fluorine, to drinking water for the purpose of preventing tooth decay, using guidelines developed by scientific and medical research. Fluoridation is safe, economical, and effective. Fluorine ranks thirteenth in abundance among elements in the earth's crust, twelfth in the oceans, and thirteenth in the human body. Fluoridation of drinking water is not something new; it is actually a naturally occurring process. Although concentrations vary widely, fluorine can be found in virtually every water supply used by man for drinking purposes.

Although community water fluoridation has been proven to be the safest and the most cost-effective method to help prevent dental caries, a small percentage of the population continues to oppose its introduction into community water systems. Persons opposed to fluoridation often introduce allegations that attempt to disprove the benefits, safety, and effectiveness of fluoridation. A summary of many of these allegations follow, along with a factual explanation of each:

***Allegation 1: Natural fluoridation is different from adjusted fluoridation.***

***Fact:*** No matter where the fluoride ion comes from, the fluoride ion in drinking water is the same. The element fluorine is comprised of atoms with a definite structure. When fluorine combines with another element, each fluorine atom gains one electron and the new substance is called fluoride. In a water solution, these fluoride particles tend to separate into allegationond particles called ions. Fluoride ions have unique properties that are different from fluorine and are consistent regardless of the origin of the fluoride ion.

***Allegation 2: Fluoridation is wasteful. Less than one tenth of one percent of the water is drunk by children. The remaining 99.9 percent is used for sanitary and industrial purposes, fighting fires, washing streets, sprinkling lawns, etc.***

***Fact:*** There is some truth here. As Fluoridation can be considered wasteful based on this argument. But in a similar manner, chlorination and all other water treatment processes are therefore also wasteful. Fluoridation of water consumed only by children is not possible, so fluorides must be added to the entire water supply. Even with this admitted waste, the cost of this proven method of preventing tooth decay in children is small compared to the benefits received.

***Allegation 3: There is a danger that, either by accident or design, a whole town will be over-fluoridated resulting in a mass poisoning of the community.***

***Fact:*** The minimum fatal dose for a human is approximately 2g of fluoride (as F<sup>-</sup>). In order to provide the recommended 1 mg/L of fluoridation to say 10 million gallons of water it would require 190 lb of sodium fluoride or 140 lb of sodium silicofluoride. To raise the fluoride concentration to the minimum fatal dose (2g) that could be consumed in a 10 oz (300mL) glass of water, it would be necessary to increase that dose to approximately 700 tons (635,000 kg) of sodium fluoride or 500 tons (450,000 kg) of sodium silicofluoride at one time. It is impossible for 700 tons (635,000 kg) of fluoride chemical to be put into the water at one time.

The idea of mass poisoning of a community with fluoride is therefore unrealistic. Note on an average day the City of Hollywood produces 26 million gallons of potable water.

***Allegation 4: Fluoridation causes corrosion in the water lines.***

***Fact:*** Corrosion by potable water is related primarily to dissolved oxygen concentration, pH, water temperature, alkalinity, hardness, salt concentration, hydrogen sulfide content, and the presence of certain bacteria. The fluoride ion itself is unrelated to corrosion at the concentrations found in our potable water.

***Allegation 5: Fluoride adds taste, color, or odor to the water supply.***

***Fact:*** Taste, color, and odor are not affected by the addition of fluoride at a concentration of 0.7 to 1 mg/L. Water supplies normally vary in their taste, color, and odor. Materials other than fluoride, such as total dissolved solids and organic contaminants, are primarily responsible for causing the tastes, colors, or odors in a water supply.

***Allegation 6: Although fluoride may be added at a uniform rate at the source of the water supply, there is a likelihood of the fluoride tending to form pockets in water pipes that would give rise to uneven concentrations.***

***Fact:*** At the concentration of 1 mg/L F<sup>-</sup>, fluoride is completely soluble and will not be precipitated out of solution, even in hard water. The concentration of fluoride at the plant tap is carried throughout the distribution system. "Pockets of fluoride" do not occur in the distribution system.

***Allegation 7: There are alternative, inexpensive methods, such as home fluoridation units, that can be used by families who believe in the value of fluoridation.***

***Fact:*** There is no reasonable alternative to community fluoridation. It is impractical and expensive to attempt to equip each home with its own fluoridation system. The operation and maintenance problems are also difficult for the average homeowner to handle.

***Allegation 8: Fluoridation is promoted by the big chemical companies that make huge profits out of it.***

***Fact:*** Production and sale of fluoride chemicals for water fluoridation represents only a very small fraction of the business of the fluoride chemical industry. There are many other industrial uses of fluoride chemicals, such as in the aluminum industry.

***Allegation 9: Fluoridation causes cancer.***

***Fact:*** Early in 1975, the National Health Federation issued information alleging a relationship between fluoridation and cancer. Their allegations have been repeatedly disproved, both by separate reviews of their work and by independent studies, not only in the United States but in several other countries. Reviews have been conducted by the National Cancer Institute of the National Institutes of Health. In addition, independent studies conducted in the United States by the National Cancer Institute; the National Heart, Lung, and Blood Institute; and the Centers for Disease Control found no relationship between fluoridation and cancer death rates. After evaluation of the available studies on the oncogenicity of fluoride, USEPA concluded that adequate information does not exist to conclude that fluoride presents a cancer risk to humans. 14 A recent study in Great Britain found nothing in any of the major classes of epidemiological evidence that could lead to the conclusion

that either fluoride occurring naturally in water or fluoride added to water supplies is capable of inducing cancer or of increasing the mortality from cancer.

***Allegation 10. Fluoridation causes heart diseases, diabetes, and liver and kidney***

***Fact:*** Studies made in 64 cities (32 of which have used naturally fluoridated water for generations and 32 of which used no fluoridation) show no significant difference in the mortality rates from these diseases. These findings have also been confirmed by studies in Illinois, New England, Texas, and New York.

***Allegation 11: Fluoridation is mass medication.***

***Fact:*** Fluoride is not a medicine. It does not treat or cure anything. It is a nutrient that prevents dental decay. Like other minerals in the diet, fluoride helps the body to resist disease, namely, dental decay.

***Allegation 12: Fluoridation is an unconstitutional and illegal invasion of individual rights.***

***Fact:*** Over the years the legality of fluoridation has been tested repeatedly. Courts in more than 25 states have heard fluoridation cases, and the constitutionality of fluoridation has been upheld by state Supreme Courts in more than a dozen states. In addition, at least eight times, the US Supreme Court has declined to hear these cases because no substantial federal constitutional question was involved.

***Allegation 13: Fluorides in drinking water can produce allergic reactions.***

***Fact:*** Fluoride, in the concentration recommended for dental health, does not cause such reactions. The American Academy of Allergy conducted a review of clinical reports of possible allergic responses to fluoride. The academy found no evidence of allergy or intolerance. Following completion of the study, the executive committee of the academy unanimously adopted the following statement: "There is no evidence of allergy or intolerance to fluorides as used in the fluoridation of community water supplies."

***Allegation 14: The cumulative effect of a fluoridated water supply will permanently damage the tissues and bones of the body.***

***Fact:*** A minute part of the fluoride ingested is deposited in the bones and teeth; the remainder is rapidly excreted through the kidneys. Bones and teeth will accumulate fluoride over long periods of time. This is not a health problem, but rather a benefit when an optimal concentration is consumed. As discussed previously, adverse health effects may occur when a high concentration is consumed over an extended period of time.

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As of 1983, fluoridation is utilized in approximately 7000 communities in the United States serving more than 112 million people. Residents of almost 2600 additional communities, serving more than 10 million people, consume water that contains at least 0.7 mg/L fluoride from natural sources. As of 1985, an estimated 131 million people have access to water with a dentally significant concentration of fluoride.

**It has been estimated that fluoridated water systems, if available throughout the country, could in time reduce the national dental bill by one half. In these terms, the benefits expected from fluoridation are considerable.**