

Different fluoride products

1. Fluoride is a mineral that is found in all natural water sources and is the ionic form of the trace element fluorine, which is commonly found in the environment; fluorine reaches water sources by leaching from soil and rocks into groundwater.
2. There are two different ways fluoride is delivered: topically and systemically.
 - a. Topically means the fluoride is helping the outside part of the tooth, by “washing” over the surface.
 - b. Systemically means the fluoride is absorbed in the body like other vitamins and minerals, bringing the fluoride to the inside part of the tooth and making it stronger from the inside.
3. Topical fluorides strengthen the teeth already present in the mouth, making them more decay resistant (toothpaste, mouth rinses, gels, foams, fluoride varnish applications and silver diamine fluoride).
4. Systemic fluorides are those that are ingested and become incorporated into the forming tooth structures (e.g. fluoride supplements and fluoridated water) and is also able to provide topical protection because fluoride is present in the saliva, which continually bathes the teeth.
5. Topical fluorides are at a much higher strength for a blast of fluoride to the teeth.
 - a. Toothpaste has fluoride levels of 1,100 ppm to 1,500 ppm.
 - b. Mouth rinse has fluoride levels of 230 ppm.
 - c. Fluoride varnish applications can have up to 22,600 ppm with only 2.3-5.0 ppm being applied directly to the tooth surface.
 - d. Each of these topical fluorides stick to the teeth but as you drink and eat, they are eroded away and ingested over time to be secreted back out of the body.
 - e. These fluorides are limited in what they do as they are there only as long as a person is not eating and drinking.
 - f. Not everyone is able to afford a toothbrush, toothpaste or to go to the dentist. Due to this it further increases health disparities and inequities.
6. Systemic fluorides are given at lower strength and continually bathe the teeth in fluoride from the secretion of saliva.
 - a. Fluoride supplements may be prescribed for children ages 6 months to 16 years who are at high risk of tooth decay **and whose primary drinking water has a low fluoride concentration.**
 - i. These supplements are usually given in the form of tablets or lozenges and are intended to be chewed or sucked on for 1-2 minutes before being swallowed to get the topical benefit.
 - ii. After swallowing, the supplements then act in a systemic method as they are absorbed by the body and secreted through the saliva.
 - iii. The downside is **all** fluoride supplements **must be prescribed by a medical doctor or a dentist.** These **cannot be obtained without a prescription** and can **be costly if not covered by insurance** (cost around \$25 or more for a 120 day supply).
 - iv. Only those who visit the dentist or doctor and have a health professional willing to write a prescription and have the funds to afford the prescription will benefit from the supplements.

- v. This causes an issue of health disparities and inequities.
- b. Community water fluoridation provides both a systemic and topical benefit to everyone.
 - i. Topically as someone drinks the water it bathes their teeth with the recommended amount (0.7 ppm) of fluoride. Additionally, if the water is used to cook food, make other drinks such as tea, Kool-Aid, coffee, etc. there is still a topical benefit received.
 - ii. Systemically the fluoridated water is ingested and is excreted through the “sweating process” of the body. This includes regular sweating, crying, urination and also by way of the saliva. When it is in the saliva it continues to provide a benefit to the teeth through a topical re-application.
 - iii. Children under the age of eight (8) get a double benefit. It is absorbed into their body and secreted through their saliva providing the topical re-application but it is also absorbed into their bones, which is what teeth are made of, and makes them stronger as they are forming under the gum line.
 - iv. Fluoridated water has a benefit for **all ages** and does not discriminate based on race, ethnicity, education level, age or socio-economic level. It is the one way to offer preventive services that does not cause further health disparities or inequities.
 - v. Bottled water that **has not been purified** has natural levels of fluoride in the water. Additionally, there are some bottled waters that **add** fluoride back into the water at the recommended level of 0.7 ppm.

7. Types of fluoride

- a. Fluoride additives of all kinds go through rigorous testing.
- b. Toothpaste, mouth rinse, foams, gels, fluoride varnish, silver diamine fluoride and fluoride supplements all fall under the Federal Food and Drug Administration. These products go through levels of testing and approvals before finally obtaining the seal of approval from the FDA.
- c. Fluoride additives used in water fluoridation also go through rigorous testing before being approved for use.
- d. This testing does not fall under the FDA because the FDA has **no say over community or public water systems and their requirements**. Water systems fall under the jurisdiction of the Environmental Protection Agency and the National Science Foundation International (NSF) and the American National Standards Institute (ANSI).
- e. NSF/ANSI Standards 60 and 61 are used to certify any products being added to public water supplies, including the three fluoride additives: Fluorosilicic Acid (FSA/HFS), Sodium Fluorosilicate and Sodium Fluoride.
- f. All three of these products completely dissolve in water to form sodium ions, fluoride ions, and in the case of the first two products, silicate ions.
- g. These two bodies (NSF and ANSI) complete the testing and offer the seal of approval on additives that meet their quality control checks and are in line with the regulatory body requirements of the EPA.