Fluoride and Water

Keeping kids' teeth healthy means more than just daily brushing. During a routine well-child exam, you may be surprised to find the doctor examining your child's teeth and asking you about your water supply. That's because fluoride, a substance found naturally in water, plays an important role in healthy tooth development and cavity prevention.

About Fluoride

Fluoride, which exists naturally in water sources, is derived from fluorine, a common element in the Earth's crust. It is well known that fluoride helps prevent and even reverse the early stages of tooth decay.

Tooth decay happens when plaque — that sticky film of bacteria that builds up on teeth — breaks down sugars in food. The bacteria produce damaging acids that dissolve the hard enamel surfaces of teeth.

If the damage is not stopped or treated, the bacteria can penetrate through the enamel and cause tooth decay (also called cavities or caries). Cavities weaken teeth and can lead to pain, tooth loss, or even widespread infection in the most severe cases.

Fluoride combats tooth decay in two ways:

1. It is incorporated into the structure of developing teeth when it is ingested.
2. It protects teeth when it comes in contact with the surface of the teeth.

Fluoride prevents the acid produced by the bacteria in plaque from dissolving, or demineralizing, tooth enamel, the hard and shiny substance that protects the teeth. Fluoride also allows teeth damaged by acid to repair, or remineralize, themselves. Fluoride cannot repair cavities, but it can reverse low levels of tooth decay and thus prevent new cavities from forming.

Despite the good news about dental health, tooth decay remains one of the most common diseases of childhood. According to the Centers for Disease Control and Prevention (CDC):

- more than 25% of 2- to 5-year-olds have one or more cavities
- half of kids 12 to 15 years old have one or more cavities
- tooth decay affects two thirds of 16- to 19-year-olds

Fluoride and the Water Supply

For more than 60 years, water fluoridation has proved to be a safe and cost-effective way to reduce dental caries. Today, water fluoridation is estimated to reduce tooth decay by 20%-40%.

As of 2012, CDC statistics show that more than 60% of the U.S. population receives fluoridated water through the taps in their homes. Some communities have naturally occurring fluoride in their water; others add it at water-processing plants.

Your doctor or dentist may know whether local water supplies contain optimal levels of fluoride, which is 0.7 milligrams per liter of water (previously it was a range of 0.7 to 1.2 milligrams). If your water comes from a public system, you also can call your local water authority or public health department, or check online at the Environmental Protection Agency's (EPA) database of local water safety reports.

If you use well water or water from a private source, fluoride levels should be checked by a laboratory or public health department.

Some parents buy bottled water for their kids to drink instead of tap water. Most bottled waters lack fluoride, but fluoridated bottled water is now available. If fluoride is added, the manufacturer is required to list the amount. If fluoride concentration is greater than 0.6 ppm (parts per million), you might see the health claim "Drinking fluoridated water may reduce the risk of tooth decay" on the label.

The Controversy Over Fluoride

Opponents of water fluoridation have questioned its safety and effectiveness; however, there has been little evidence to support these concerns.

Scientific research continues to show the benefits of fluoride when it comes to prevention of tooth decay and its safety. Dramatic reductions in tooth decay in the past 30 years is attributed to fluoridation of the water supply, and parents and health professionals should continue to ensure that kids receive enough fluoride to prevent cavities.

The American Dental Association (ADA), the United States Public Health Service (USPHS), the American Academy of Pediatric (AAP), and the World Health Organization (WHO), among many other national and international organizations, endorse community water fluoridation. In fact, the CDC recognized fluoridation of water as one of the 10 greatest public health achievements of the 20th century.

Kids' Fluoride Needs

So how much fluoride do kids need? In general, kids under the age of 6 months do not need fluoride supplements. Your child's 6-month checkup offers a great chance to discuss fluoride supplementation with your doctor.

If you live in a nonfluoridated area, your doctor or dentist may prescribe fluoride drops, tablets, or vitamins after your baby is 6 months old. The dosage depends on how much fluoride naturally occurs in the water and your child's age. Only kids living in nonfluoridated areas or those who drink only nonfluoridated bottled water should receive supplements.

Here are some other tips:

- Use a fluoride-containing toothpaste that carries the ADA's seal of acceptance.
- Brush babies' teeth as they come in with an infant toothbrush. Use water and a tiny bit of fluoride toothpaste (about the size of a grain of rice). If you are using baby toothpaste without the fluoride, keep it to the same amount because you still want to minimize any toothpaste that is swallowed.
- Kids ages 3 and up should use only a pea-sized amount of fluoride toothpaste.
- Kids younger than 6 may swallow too much toothpaste while brushing. Supervise them when brushing and teach them to spit, not swallow, the toothpaste.
- Kids under age 6 should never use fluoride-containing mouth rinses. But older kids at high risk for tooth decay may benefit from them. Your dentist can talk with you about risk factors such as a family history of dental disease, recent periodontal surgery or disease, or a physical impediment to brushing regularly and thoroughly.

Your family dentist or pediatric dentist (one who specializes in the care of children's teeth) is a great resource for information about dental care and fluoride needs. A dentist can help you understand more about how fluoride affects the teeth, and may even recommend applying a topical fluoride varnish during routine dental visits.

Overexposure to Fluoride

If some fluoride is good, why isn't more fluoride better? As with most medications, including vitamins and mineral supplements, too much can be harmful. Most kids get the right amount of fluoride through a combination of fluoridated toothpaste and fluoridated water or supplements.

Too much fluoride before 8 years of age, a time when teeth are developing, can cause enamel fluorosis, a discoloration or mottling of the permanent teeth. For most, the changes are subtle. In one study, 94% of identified fluorosis cases were very mild to mild. Most cases are due to accidental swallowing of fluoride-containing dental products, including toothpaste and mouth rinses. Sometimes kids take daily fluoride supplements but may be getting adequate fluoride from other sources, which also puts them at risk.

Recently, the National Research Council found that some naturally occurring fluoride levels exceeded the optimal levels used in community fluoridation programs, putting kids under 8 years old at risk for severe enamel fluorosis. The CDC recommends that in communities where natural fluoride levels are high, parents should give kids water from other sources.

The ADA also recognizes that infants need less fluoride than older kids and adults. Some infants may be getting too much fluoride in the water used to reconstitute infant formula. If you're concerned that your infant may be getting too much fluoride, talk with your doctor or dentist, who may recommend ready-to-feed formula or formula reconstituted with fluoride-free or low-fluoride water.

Very rarely, fluoride poisoning can happen if large amounts of fluoride are ingested during a short period of time. Kids under age 6 account for more than 80% of reports of suspected overingestion. Although this is generally not serious, fluoride poisoning sends several hundred children to emergency rooms each year.

Symptoms of fluoride poisoning may include nausea, diarrhea, vomiting, abdominal pain, increased salivation, or increased thirst. Symptoms begin 30 minutes after ingestion and can last up to 24 hours. If you suspect your child may have eaten a substantial amount of a fluoridated product or supplement, call the poison control center (1-800-222-1222) or 911.

Be sure to keep toothpaste, supplements, mouth rinses, and other fluoride-containing products out of kids' reach or in a locked cabinet. Also, supervise young kids when they brush their teeth to prevent swallowing of toothpaste or other fluoridated products.

If you have any questions about your water's fluoride content, the fluoridated products your child uses, or whether your child is receiving too much or too little fluoride, talk to your doctor or dentist.

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