

Talking with Patients

Featured Topic: Fluoride

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WHAT IS IT?

Fluoride has long been recognized as a mineral ion that, in the right concentration, can be helpful in the prevention of dental caries (cavities in teeth). Dental caries occurs when acidic conditions cause tooth mineral to dissolve. It was observed that people living in areas with fluoride naturally present in the sources of drinking water had very low rates of dental caries. Children are less prone to dental caries if fluoride has been incorporated into the structure of their developing teeth. Topical application of fluoride on the surfaces of erupted teeth in children and adults increases resistance to loss of tooth mineral caused by acidic foods and conditions. Dental researchers have identified optimum amounts of fluoride that can be safely included in drinking water, toothpastes, mouth rinses, and children's vitamin supplements. Your dentist may apply fluoride to your teeth in the form of gels or varnishes and/or may prescribe mouth rinses, gels, and toothpastes to use at home. These professional products contain higher concentrations of fluoride. Alternatively, your dentist may recommend use of over-the-counter

rinses and toothpastes that contain lower amounts of fluoride.

WHAT CONCENTRATION OF FLUORIDE IS BEST?

Dentists recommend a therapeutic fluoride concentration based on individual patient risk of developing dental caries. Caries risk assessment requires evaluation of multiple factors. These factors include the types and numbers of bacteria on teeth, diet, quantity/quality of saliva, effectiveness of homecare, frequency of caries development and exposure/utilization of professional dental care, and sources of fluoride.

Mutans streptococci and *Lactobacilli* are bacteria that infect teeth and utilize cooked starches, natural sugars (like those found in fruit), and sugars that are added to foods for energy. As these bacteria grow, they make acid byproducts that dissolve tooth mineral. Greater amounts of these bacteria and food stuffs increase the acid produced and the risk of developing caries.

Saliva contains multiple protective agents, buffer systems to counter acidic conditions, and mineral ions to replace mineral lost to early

caries processes. Your dentist or physician is able to identify if you are taking any medications or have medical conditions that cause your body to produce less saliva. Inadequate quantity and quality of saliva will increase the risk of developing dental caries. Sugar substitutes that increase the amount of saliva and encourage the growth of non-acid-producing bacteria may be recommended.

Adequate at-home removal of bacteria that collect on tooth surfaces requires motivation and skill in the use of cleaning aids such as floss, interdental brushes, and toothbrushes. Physical limitations may result in inadequate removal of bacteria. Your dentist may need to modify inaccessible areas where bacteria accumulate in order to improve at-home cleaning and lower the risk of caries development. The presence of difficult-to-clean orthodontic or removable dental appliances increases the amount of bacterial accumulation and subsequent risk of caries development.

Routine professional care will allow your dentist to assess various risk factors in light of how often

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you develop caries. This assessment will include your current exposure to sources of fluoride and your implementation of methods that lower the risk of developing dental caries. After considering these factors and your unique experience, it is possible to identify caries risk as High, Medium, or Low.¹ All of the factors previously mentioned increase caries risk through exposure of teeth to acidic conditions that result in loss of mineral.

Your dentist will design a strategic plan that includes recommendations for the concentration of fluoride, the frequency of use, and the best means of its delivery. This plan will depend greatly on the identified level of caries risk and which unique risk factors are primarily involved. Higher caries risk may involve use of higher concentrations of fluoride (e.g., 1.1% sodium fluoride), and these are available by prescription only or for application on your teeth by your dentist or dental hygienist. Medium caries risk may use a

combination of professionally applied fluoride and at-home use of nonprescription strength toothpaste and rinses. Low caries risk may use nonprescription strength sources of fluoride. Use of fluoride is one of many interventions your dentist may recommend to lower your risk of developing dental caries. Careful attention to appropriate use of fluoride products has the potential to safely reduce caries risk. Regular dental appointments allow modification of recommended means of fluoride application based on your current caries risk. Caries risk may vary throughout life.

CONCLUSIONS

Multiple factors can result in the formation of acidic conditions with subsequent tooth mineral loss (dental caries). The incorporation of appropriate amounts of fluoride into teeth safely increases resistance to dental caries. The fluoride concentration and means of application will vary based on whether a patient's risk of dental caries is

high, medium, or low. Dentists develop individualized strategic plans that address the factors contributing to caries risk and make recommendations that include the therapeutic use of fluoride. These plans may include professional application and prescription of higher concentration fluoride products; combination of professional strength and over-the-counter, lower strength fluoride products; or limit use to only over-the-counter fluoride products. Fluoride application is one component of overall dental health care that may foster low caries risk for a lifetime.

DISCLOSURE

The author does not have any financial interest in the manufacturers whose materials are discussed in this article.

REFERENCE

1. American Dental Association Council on Scientific Affairs. Professionally applied topical fluoride. Evidence-based clinical recommendations. *J Amer Dent Assoc* 2006;137:1151-9.

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