

Fluoride Varnish in the Dental Practice

AMY REGEN, DMD

MICHELLE DALAL, MD, FAAP

Dr. Regen is a pediatric dentist in private practice at Chestnut Dental Associates (in Bedford, Franklin, and Needham, MA) and maintains a courtesy staff position at Boston Children's Hospital dental department. Dr. Dalal is a practicing pediatrician in Milford, MA, and chair of the Massachusetts Chapter of the American Academy of Pediatrics Oral Health Committee.



OVERVIEW

In 2013, the American Dental Association (ADA) updated its recommendations and guidelines for the use of topical fluoride for caries prevention. Fluoride varnish is now the only recommended form of professionally applied fluoride in children under 6 years of age. The goal of this article is to review the use and advantages of 2.26% fluoride varnish and encourage all dental practitioners to incorporate varnish in their practice.

The traditional modality of professionally applied topical fluoride has been foams and gels in trays. In recent years, a new way of delivering topical fluoride has been introduced to the field of dentistry: 2.26% fluoride varnish (5% sodium fluoride, NaF). Use of fluoride varnish is a great advancement in preventive dentistry. It serves to assist in caries prevention and to treat dentinal hypersensitivity. It has many advantages, including ease of application, ability to use less fluoride than gels/foams, adherence to tooth surface for hours after application, and no need to wait 30 minutes prior to eating/drinking.

BACKGROUND

Fluoride varnish was introduced in 1964 under the name Duraphat® and has been widely used in Europe since the 1980s.¹ In 1994, the U.S. Food and Drug Administration (FDA) approved fluoride varnish in the United States for use as a cavity liner and desensitizing agent. It has been used effectively off-label for many years as a caries prevention agent.^{2,3} The original varnishes were derived from a colophony rosin made from pine tree sap. Today, there are more than 30 fluoride varnish products on the market. The delivery method is quite simple and involves microbrush application of the varnish onto teeth. Varnish is used for decay prevention, remineralization of tooth structure, and treatment of dentinal hypersensitivity.

Fluoride varnish is advantageous because of its viscous, sticky nature, which allows the varnish to maintain contact with the tooth surface for a longer period of time—many hours after application.⁴ In addition, because of the small volume of varnish needed to coat

the teeth, the total exposure of fluoride ion to the patient is often 1/10th of what is provided in the tray with foams/gels.⁵ Varnish comes individually packaged for single-use application.

FLUORIDE VARNISH AND HYPERSENSITIVITY: USES FROM INFANTS TO GERIATRICS

Fluoride varnish can block dentinal tubules and prevent fluid flow within the dentinal tubules, making it ideal for treating dentinal hypersensitivity. As the population ages, root caries and gingival recession can lead to dentinal sensitivity. More patients have chronic medical conditions and take medications that can cause xerostomia, placing patients at an increased caries risk.^{2,6} Varnishes can also help with sensitivity post-bleaching, post-scaling, and root planing.⁶

NEW ADA RECOMMENDATIONS AND GUIDELINES FOR USE OF VARNISH IN THE PEDIATRIC POPULATION

In 2013, a panel of experts convened by the ADA Council on Scientific Affairs presented evidence-based clinical practice guidelines for the use of topical fluoride. This comprised a systematic review of professionally applied topical fluoride and addressed the use of prescription-strength, home-use topical fluoride agents for caries prevention.⁷ The previous ADA guidelines were from 2006. For patients at risk for caries, the panel found that for professionally applied topical fluoride for children under 6 years of age, only the 2.26% fluoride varnish is recommended. This is because of the risk of adverse outcomes for all fluoride applications except the varnish. The two main risks associated with topical fluoride application are nausea/vomiting and dental fluorosis. These adverse outcomes result from excessive ingestion of fluoride. Nausea and vomiting are an immediate reaction when excessive amounts of fluoride are swallowed. Dental fluorosis results from excessive daily ingestion of fluoride (e.g., toothpastes and prescription at-home gels) that occurs when the permanent teeth are developing.

Even though the benefit of professional fluoride application in kids under 6 years of age is well known, only the 2.26% varnish (5% NaF) is believed to have the lowest risk of adverse outcomes. Fluoride varnish minimizes the risk because the amount of fluoride that is placed in the mouth is about 1/10th that of the other professionally applied fluoride products.⁵ In addition, the varnish sets upon contact with teeth—leaving less available to swallow—and stays in contact with the enamel for hours after application.⁸ Varnish can be applied every 3–6 months, with 3-month intervals recommended for high-risk patients, to aid in caries prevention.⁷

The 2.26% fluoride varnish is very easy to apply and has many additional benefits compared to the traditional 1.23% fluoride APF gel. The gel needs to be applied for a minimum of 1 minute, with 4 minutes being the recommended application time for maximum benefit. Although some manufacturers claim gels and foams can be applied for 1 minute, only the 4-minute application is endorsed.⁹ Having to leave foams and gels in the mouth for 4 minutes increases the risk of accidental swallowing of fluoride. Alternatively, the varnish application takes just seconds, as it simply involves a thin application with a microbrush on all teeth. The varnish sets upon contact with saliva and requires neither rinsing nor wiping after application. Manufacturers have made varnish in child-friendly flavors, making it acceptable to patients of all ages. In addition, the patient does not have to wait 30 minutes to resume eating and drinking; he or she can drink and eat right away with some modified food restrictions. Most varnish manufacturers recommend a soft diet and avoiding hot liquids for the first 4–6 hours after application. This allows the varnish to remain on the teeth to gain maximum benefit. Also, patients should not brush or floss their teeth, nor should they use mouthrinses during this 4–6-hour period.

USE OF FLUORIDE VARNISH BY THE MEDICAL COMMUNITY

Fluoride varnish application is not only being utilized in the dental office; our medical colleagues are helping to combat early childhood caries by performing caries risk assessment, educating/counseling families, and applying fluoride varnish. The ADA, American Academy of Pediatric Dentistry (AAPD), and American Academy of Pediatrics (AAP) recommend that every child establish a dental home by no later than age 1.^{10,11} This consistent message to parents and caregivers emphasizes the importance of oral health and caries prevention.

Throughout the state of Massachusetts, pediatric and family medicine practices are being trained in the application of fluoride varnish in the medical setting. Numerous resources are available for online training for our medical colleagues to learn how to perform a caries risk assessment, counsel parents, and apply varnish. The U.S. Preventive Services Task Force recommends primary care physicians apply fluoride varnish to all infants and children at least once every six months starting when the first tooth erupts and at least until establishment of a dental home.¹² High-risk children can have varnish applied every 3–6 months.⁷ Pediatricians bill fluoride through medical insurance, and this does not affect the dentist billing for fluoride through dental insurance. For high-risk patients, having fluoride applied at both the dental and the medical office will help fight early childhood caries.

HOW TO APPLY VARNISH

Note: This is a general overview. You should follow specific manufacturer's instructions for the product being used.

1. For infants and toddlers: Place patient in the “lap-to-lap” position with the parent and practitioner. This allows for better head control and visibility. (See Figure 1.)
2. Wipe teeth with gauze; excessive drying is not necessary. (See Figure 2.)
3. Using a microbrush, paint a thin film on all tooth surfaces.
4. Varnish sticks to the teeth once it contacts saliva.
5. Tell patients they may see a “coating” or mild “yellow” color on the teeth—this is the varnish adhering to the teeth and it comes off with brushing.
6. Advise patients that they:
 - ▲ Can eat and drink immediately following application but should maintain a soft diet and avoid hot liquids for 4–6 hours post-application
 - ▲ Should avoid brushing and flossing for 4–6 hours

Figure 1. Lap-to-lap position

