

Making It Work For Your Practice



Smiles for Ohio Fluoride Varnish Program

Fluoride Fact Sheet

Background

Fluoride is a naturally occurring substance that is present in almost all sources of drinking water. Fluoride is necessary for the proper development of teeth and bones and it protects teeth once they have erupted into the mouth. Fluoride benefits children before their teeth have come in, and it also protects the teeth of children and adults after all of their teeth are present in the mouth. Fluoride can be ingested or swallowed (by means of fluoridated water or fluoride drops and tablets) and it can be applied topically (fluoride toothpaste, rinses, gels, foams and fluoride varnish applications in dental and medical offices). When a tooth is exposed to fluoride, it is more resistant to cavities.

Ingested or Swallowed Fluoride:

Drinking fluoridated water from birth significantly reduces tooth decay. It is important to know whether a child is served by a public water system with adequately fluoridated water.

When fluoridated water is not available, drops or tablets may be prescribed by the physician. Private wells must be tested to determine their natural levels of fluoride in order to adjust the proper prescription dosage. A child should receive only one source of ingested fluoride: fluoridated water, drops or tablets. Exposure to both sources may cause dental fluorosis which is characterized by white spots on the enamel. Some private wells have enough fluoride for good dental health, but most wells do not. If the child's drinking water comes from a private well and the physician wants to prescribe fluoride drops, vitamins or tablets, make sure he or she has the water tested first.

Topical Fluoride: In addition to one source of ingested fluoride, any combination of topical fluorides may be used. Topical fluoride, applied directly to the enamel surface, helps provide additional protection against decay after the teeth have come into the mouth. Fluoride enhances the replacement of minerals lost from enamel surfaces and stops decay before it spreads into the tooth.

There are three common methods for applying topical fluorides:

1. **Fluoride toothpastes** that have the seal of the American Dental Association's Council on Dental Therapeutics on the carton or tube have been proven effective in reducing decay. Only a small, pea-sized dab of toothpaste is necessary with each brushing to provide a sufficient amount of fluoride for children. Because toothpaste can contain high amounts of fluoride, young children should be carefully monitored so they do not swallow the toothpaste. For children under the age of 2, fluoridated toothpaste is not recommended. Ingestion of too much fluoride during tooth development may cause fluorosis.

2. A **fluoride mouthrinse** (not used in preschool-age children because they cannot control swallowing reflex). Daily, over-the counter (0.05%NaF) rinses and weekly, school-based (0.2%NaF) rinses are available for children and adults.
3. **Fluoride application** by a health professional. These compounds are liquids, gels, foams and varnishes.

Fluoride Varnish

Fluoride varnishes have been used in Europe for more than 30 years, and have been approved for use in the United States. They received approval in the United States as cavity varnishes and desensitizing agents; however, one of the most promising uses for fluoride varnishes is in the prevention of tooth decay. The use of fluoride varnish by dental and medical professionals for this purpose is referred to as off-label use.¹

Fluoride Content and Uptake into Enamel

Fluoride varnishes contain high concentrations of fluoride ion in a resin or polyurethane carrier. This forms a sticky layer on the tooth following application which hardens on contact with saliva. Fluoride is then absorbed into the enamel of the tooth. It is recommended that the varnish be allowed to remain on the teeth for up to four hours for optimal absorption.² A study by Koch and Petersson measured the levels of fluoride in extracted teeth following application of Duraflo, and found concentrations between 2,250 and 3,800 ppm in the enamel. It was also determined that increasing the time the varnish remained on the teeth from one to six hours more than doubled the fluoride level in the enamel.³

Caries Prevention

Most studies have shown 25-45 percent reductions in the decay rate with the use of fluoride varnish. Of special note is the reduction of decay in pits and fissures, as well as on smooth surfaces of teeth. A two-year study by Holm using 225 3-year-olds resulted in a 44 percent caries reduction rate following semi-annual varnish applications.⁴

Safety

The concentration of fluoride in varnishes is much higher than that of acidulated phosphate fluoride (APF) gels or other topical fluorides. However, due to the sticky form of the varnish and the small amount used per application, risk of ingestion and toxicity is very low. Less than 0.5 ml of varnish is usually required to coat the teeth of a young child.⁵

¹ Use of approved drugs for unlabeled indications. FDA Drug Bulletin, April, 1982

² Retief DH, Sorvas PG, Bradley EL, Taylor RE, Walker AR. In vitro fluoride uptake, distribution and retention by human enamel after 1- and 24- hour application of various topical fluoride agents. J Dent Res 59(3):573-82, 1980.

³ Koch G, Petersson LG. Fluoride content of enamel surface treated with a varnish containing sodium fluoride. Odont Revy 23:437-46, 1972.

⁴ Holm GB, Holst K, Mejare I: The caries-preventive effect of a fluoride varnish in the fissures of the first permanent molar. Acta Odont Scand 42(4):193-7, 1984.

⁵ Ekstrand J, Koch G, Petersson LG: Plasma fluoride concentration and urinary fluoride excretion in children following application of the fluoride containing varnish Duraphat. Caries Res 14:185-9, 1980.

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Fluoride Varnish Protocol

Introduction

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Indications

Infants and children with a moderate or high risk of developing caries. A child is considered at risk if he/she:

- Has had caries in the past or has caregivers and/or siblings who have caries
- Has visible dental caries, white spots or plaque
- Continues to use the bottle past 1 year of age
- Sleeps with a bottle containing liquids other than water
- Breastfeeds on demand at night
- Has special health care needs
- Chronically uses high-sugar oral medications
- Engages in prolonged or ad lib use throughout the day of a bottle or sippy cup containing liquids other than water

Children with a low risk of caries who consume optimally fluoridated water or children who receive routine fluoride treatments through a dental office may not need fluoride varnish or derive as much benefit as children determined to be at high risk of developing caries.

Varnish Application

You will need:

- 2 x 2-inch gauze sponges
- Fluoride varnish
- Small disposable brush
- Latex/vinyl gloves
- Mouth mirror, tongue blade, flashlight (optional)
- Paper towels or disposable bibs to place under the child's head (optional).

Position the Child

- For an infant, use the knee-to-knee position and have the caretaker lower the child's head onto the provider's lap. Treat the child from above.
- Or, place an infant or young child on an exam table and work from above and behind the head.
- Or, adapt a method that works for you.

Apply Fluoride Varnish

- Using gentle finger pressure, open the child's mouth.
- Remove excess saliva and plaque from the teeth with a gauze sponge. *The teeth should be as dry as possible.*
- Use your fingers and sponges to isolate the dry teeth and keep them dry. Work on one quadrant of teeth at a time, but with younger children (age 6 – 18 months) you will have fewer teeth to work with.
- Apply a thin layer of varnish to all surfaces of the teeth. The varnish will set upon contact with saliva.
- Repeat the varnish application every six months.

Post-application Instructions

- Eat a soft, non-abrasive diet for the rest of the day.
- Do not brush or floss until the next morning.
- Tell the parent or caregiver the teeth may not be white and shiny until the next day.
- Give the parent the age-appropriate information on oral health.

Remember: Even though the child may fuss, the varnish application *is not* unpleasant.



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Helpful Hints as you Introduce Fluoride Varnish in your Practice

These helpful hints were provided by North Carolina primary care providers who have successfully instituted the FV procedure in their practices.

- Devise a system to identify who gets FV: tag the chart in some way.
- Get everyone in the office trained by those who attended the training course.
- Have a meeting to get organized for the procedure. Listen to suggestions from everyone regarding how it might best work in your office.
- Have one person coordinate the FV system to ensure it happens when it should.
- Most often the physician will do the exam, varnish and counseling, but other personnel are often involved in all three components.
- Most do the procedure at well baby checks, but others apply FV at most any appointment when it is time to do so and the child is not too ill—especially between ages 2 and 3 years.
- Have materials handy in the exam rooms and be sure the supplies are included in your re-supply system.
- Integrate into the examination of the tonsils and pharynx.
- For infants and very small children, try the knee-to-knee position for the exam—it provides good visibility and the parent can help with restraint.
- Try to minimize contamination of the fluoride varnish with saliva as this will cause premature setting of the varnish in the unit dose well. Use gauze squares to dry the applicator brush as you move back and forth from the mouth to the varnish.
- Many practices implemented the procedure as routine in three to seven days, most all in a month.