

# FLUORIDE

## PART III

### Fluoride Varnishes

Developed around 1970, they have been used extensively in Europe since the '80's but have not been available in the U.S. until 1994. In fact, the varnishes manufactured in this country are approved only as cavity liners and desensitizers since anticaries products require FDA trials.

There are three varnishes:

Duraphat (5% NaFl or 2.26% Fl ion)

Duraflor (5% NaFl or 2.26% Fl ion)

FluorProtector (1% difluorsilane or 0.1% Fl ion)

### Objective

The purpose is to apply the fluoride in the dental office two to four times a year for maximal uptake of calcium fluoride into enamel, particularly demineralized enamel. The varnish is very sticky which increases adherence to tooth surface, up to several hours.

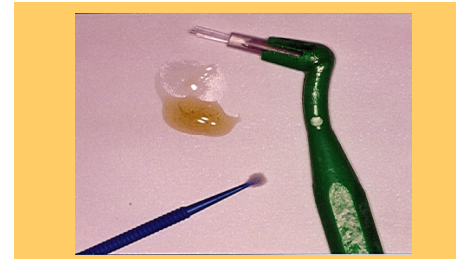
Duraphat (Colgate Oral Pharmaceuticals) and Duraflor (Pharmascience) are viscous lacquers. They come in 10 ml tubes and are dispensed in dappen dishes in 0.3, 0.5 and 1.0 ml amounts. It is recommended that 0.3 ml be used in the primary dentition and 0.5 ml for the mixed dentition.

Fluor-Protector (Ivoclar-Vivadent) is a polyurethane based lacquer with a lower pH and fluoride content and is transparent.

### Application

The varnishes are applied to a clean, dry surface with a small disposable brush, cotton applicator or bendable foam applicator. A gloved finger can be used if only the maxillary incisors are to be coated, in the case of an infant. For a full mouth application, apply to one isolated quadrant at a time, flossing it between the teeth. Upon contact with saliva, it sets immediately.

Post application, instruct the patient to eat soft foods and refrain from brushing for 12 hours.



### Advantages

The one distinct advantage of varnishes over conventional topical fluorides is their adhesiveness. This has been shown to result in superior uptake. In spite of the different fluoride and percentage of fluoride ion between Duraphat, Duraflor and Fluoro Protector, Fluoro Protector has been shown to be as effective, because silicon acts as a conduit to enhance fluoride retention.

The anticaries effect of the varnishes can be primarily related to a remineralization process. Therefore, the best results are realized on incipient smooth surface caries/decalcified areas seen in the beginning stages of "bottle caries" in infants and in beginning proximal caries.

### Disadvantages

**Toxicity:** In applying a varnish to the entire mouth, there is a potential for fluoride levels to be high, resulting in systemic uptake and toxicity. Whole saliva concentrations have been  $\pm 5$  ppm within 30 minutes after a 0.5 ml application. However, when Duraphat was applied according to manufacturer's instructions, peak fluoride levels were 60-120 ngF/ml within 2 hours, far below toxic levels.

**Time :** Full mouth application requires more operator time and better cooperation than a conventional tray of APF gel or foam.

**Cost:** 0.5 ml of Duraflor is \$0.65 compared to \$0.55 for foam or gel APF.

**Appearance:** After application of Duraflor or Duraphat, the teeth appear to be covered by a yellow "scum". This is easily removed by tooth brushing. However, the recommendation is not to brush for the remainder of the day, or for 12 hours, so the untoward appearance of the teeth will persist until then.

### Precautions

The varnishes are contraindicated in patients with ulcerative gingivitis and stomatitis.

### Research

We can expect to see more studies on the effectiveness and safety of varnishes, especially in children. We are particularly interested in its use in preventing Early Childhood Caries. Several state health departments are applying varnishes to toddlers' teeth during well baby visits with medical personnel. Medical auxiliaries are taught to recognize incipient demineralized areas on incisors and to apply the varnish. Colorado is currently considering such a program in rural areas.

Another area of research is the use of varnishes to prevent root caries.

### Recommendations

We are using Duraflor in two situations:

- Infants identified at high risk of developing cavitations on incisors and molars. We apply a thin layer of varnish to the buccal and lingual surfaces of the incisors and to the occlusal, buccal and lingual surfaces of the first primary molars. We schedule the infants every 3 months for a reapplication.
- Mixed and permanent dentitions in high caries individuals. We floss the varnish between the teeth or apply it directly to the adjacent tooth when preparing a CI II preparation. We also apply it to labial decalcified surfaces in teens.

When faced with a teenager or toddler with decalcified surfaces, we take advantage of every opportunity to remineralize these areas by applying a fluoride varnish.



### Final Word on Fluorides

**High caries:** We are using a combination of in-office application of varnish and at home prescriptions of 0.4% stannous fluoride gels for young children. For older, cooperative, children and teens, we use in-office varnish and prescription 5000 ppm fluoride dentifrices.

We do not use glass ionomer or compomer restorations because we have not been pleased with their long term durability. The fluoride release from these products has not been shown to be consistent over time and the amount necessary for cariostasis has not been proven.

Fluoride containing sealants are very popular among pediatric dentists. However, their cariostatic properties have not been proven in clinical trials.

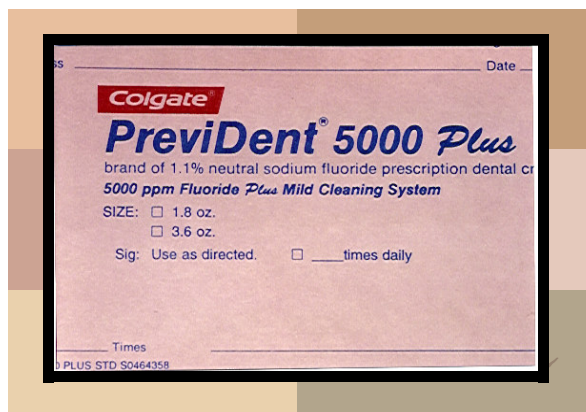
### Prescription Dentifrices

In addition to varnishes, we prescribe a dentifrice for children 6 years of age or older, who can expectorate. There are three products with 5000 ppm fluoride:

- Control Rx by Omni Products  
\$6.75/ 2oz. tube
- Prevident 5000 Plus by Colgate  
\$6.80/ 1.8oz. tube
- ProDentx 1.1% Plus by Pro-DenTech  
\$5.95/ 2oz. pump

These products are not only good for caries prevention but also for hypersensitivity.

We prescribe them for our orthodontic patients, teens with sensitivity from bleaching as well as high caries risk patients.



### Literature

As with all of our newsletters, we are happy to provide you with copies of any of our cited references.

### Bibliography

Primosch RE. A report on the efficacy of fluoridated varnishes in dental caries prevention. ClinPreventive Dent (7): 12-21, Nov-Dec 1985.

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