

# An alternative technique for applying fluoride varnish

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**F**luoride varnish is a valuable tool in the prevention of tooth decay. Studies have demonstrated its effectiveness at arresting early cavitated lesions,<sup>1,2</sup> remineralizing interproximal incipient smooth surface lesions<sup>3-5</sup> and preventing caries.<sup>6-10</sup> Medical personnel in many public health clinics now are applying these varnishes in an attempt to minimize treatment needs and reduce access-to-care problems.<sup>11</sup> Several authors have reviewed the literature and recommended that fluoride varnishes be incorporated increasingly into preventive dentistry programs.<sup>12-15</sup>

One of the main advantages of fluoride varnish is that it releases fluoride over 24 hours<sup>16</sup> and appears to increase the calcium fluoride reservoirs that aid in long-term fluoride release.<sup>10</sup> In an *in vitro* model, fluoride was released over five to six months.<sup>17</sup> In addition, Skold-Larsson and colleagues<sup>18</sup> demonstrated that these varnishes are capable of maintaining elevated

fluoride levels in the plaque adjacent to fixed orthodontic appliances for up to one week. Fluoride varnish is well-tolerated by patients and is relatively easy to apply.<sup>19</sup>

The varnish can be purchased in bulk 10-milliliter tubes or in individual prepackaged applicators. The varnishes currently available in the United States are Duraphat (5 percent sodium fluoride/2.26 percent fluoride, Colgate Oral Pharmaceuticals, Canton, Mass.), Duraflor (5 percent sodium fluoride/2.26 percent fluoride, Medicom, Buffalo, N.Y.), Fluor Protector (1 percent difluorosilane/0.1 percent fluoride, Ivoclar Vivadent, Amherst, N.Y.) and CavityShield (5 percent sodium fluoride/2.26 percent fluoride, Omnii Oral Pharmaceuticals, West Palm Beach, Fla.).

The application technique recommended by manufacturers is as follows.

- Dispense approximately 0.5 mL of varnish into a small well. (Prepackaged individual-dose systems come with their

own well that is filled with varnish.)

- Lightly dry the teeth with air or gauze.
- Isolate the teeth to prevent moisture recontamination.
- Paint the varnish onto the teeth with a brush or another type of applicator. The varnish sets on contact with the slightly moist teeth.

From a clinical practice perspective, the major limitation of this technique is the need to frequently reload the brush with the varnish. Because the brush can hold only a limited quantity of varnish, much of the time needed to administer this treatment involves multiple reloadings of the brush and re-entry into the mouth to apply the varnish to the teeth. These time and motion inefficiencies are particularly problematic when treating an uncooperative child.

The following technique improves the efficiency of applying the varnish in an active pediatric practice, and this procedure can be performed easily in a public health clinic.

## APPLICATION TECHNIQUE

The clinician abuts a 10-mL tube of fluoride varnish to the end of a 5-mL plastic syringe with a Luer-lok end (Becton, Dickinson, Franklin Lakes, N.J.). He or she then slowly expresses the contents of the



**Figure. Fluoride varnish applied with the syringe technique.**

tube while simultaneously retracting the plunger on the syringe, filling the syringe with the product. If any air is incorporated during this process, it is important to remove it by uprighting the syringe, waiting for the air bubble to gather at the tip and compressing the syringe slowly until the air is fully expressed. If the air is left in the syringe, the air bubble will be compressed when the clinician depresses the plunger, and this will force more of the varnish out of the syringe when he or she stops pushing the plunger.

The practitioner then attaches an 18-gauge plastic disposable microbrush tip (Flowthru Microbrush-Style applicator, Microbrush, Grafton, Wis.) to the end of the syringe. He or she then dries and isolates the teeth as recommended by the varnish manufacturers. The clinician slowly expresses the fluoride varnish from the syringe through the brush tip. The foam pellet attached to the

end of this tip enables him or her to paint the varnish onto the teeth as the material is expressed (Figure).

Several authors have demonstrated that bulk supplies of fluoride varnish separate over time and result in a nonuniform distribution of fluoride content per milliliter of varnish.<sup>5,13,20</sup> Manufacturers recommend that clinicians knead the tubes of fluoride varnish before filling the syringes to homogenize the fluoride content. Once the syringes are filled, the practitioner can alternately pull back and push up on the plunger of the syringe to remix the contents and achieve a more uniform distribution of fluoride.

I have used this technique only with two of the sodium fluoride varnishes (Duraphat and Duraflo), not with the silane fluoride varnish (Fluor Protector). The sodium fluoride varnishes are much thicker (a honeylike consistency) than the silane varnish (which is similar to acetone). If a clinician were to

attempt to use this technique with the silane varnish, he or she would need to use a disposable tip with a smaller lumen gauge; however, even then, I do not know if the technique would be successful in applying the varnish adequately.

This technique enables the practitioner to apply the material in approximately one-half the time required when using a brush alone, and the amount of wasted material (the volume left in the syringe tip) is minimal. In the event that too much varnish is expressed from the syringe, the practitioner can distribute it easily to adjacent teeth using the brush tip, thereby ensuring that the appropriate amount of varnish is applied to all teeth.

## CONCLUSION

This modified technique is most useful when treating an uncooperative child. The increased efficiency with which the varnish is applied to the teeth reduces much of the time that would be needed to maintain an adequately dry field while repeatedly filling the brush, thus reducing the child's distress. ■

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