

Applying Fluoride Varnish in Pediatric Primary Care

Lindsey K. Grossman, MD, Nicole Leistikow, Katherine Hartman, Joshua M. Sharfstein, MD

University of Maryland Department of Pediatrics and Hospital for Children and Baltimore City Health Department

Abstract

Early dental caries, a largely preventable condition, affects millions of US children, especially those of low socio-economic status. Fluoride varnish has been shown to decrease the incidence but children less than 5 rarely visit a dentist although they visit pediatricians frequently. To determine the feasibility of incorporating prophylactic applications of fluoride varnish into Medicaid well-child visits throughout Maryland, the Baltimore City Health Department undertook a new pilot program at different types of sites serving this population. After receiving training by dentists, staff at each pediatric center began applying fluoride varnish to children between ages 12 and 27 months during well-child visits and at sick visits when appropriate, using processes appropriate to each setting. Varnish treatments were entered into an online registry. Clinics were reimbursed \$30 per application.

The application of fluoride varnish was widely adopted across all sites. During the first six months, 809 children received varnish and 91 clinicians participated in applying varnish. Approximately two-thirds of eligible children at well-child visits received varnish during the first 10 weeks of data collection at each site. Each practice developed an effective system specific to their practice to identify potential candidates, obtain consent, and apply the varnish. On average, the entire process took about four minutes per application. Clinicians and parents reported strong support for applying fluoride varnish in primary care.

The experiences of our pilot project demonstrate that the incorporation of fluoride varnishing into EPSDT visits in Maryland is highly feasible.

Introduction

Chronic tooth decay affects millions of children across the United States, especially those at high-risk due to low socio-economic status. Yet tooth decay is largely preventable. Low-cost fluoride varnish applied regularly between the ages of 6 months to 5 years can reduce tooth decay by 46%. While preschoolers rarely are taken to the dentist, they are regularly seen at pediatric medical practices.

Methods

Baltimore city children between the ages of 12 and 27 months attending well-child visits at four partner clinics serving a high population of Medicaid children were targeted for this project. The Baltimore City Health Department, with funding from private foundations, partnered with the University of Maryland Dental and Medical Schools and four pediatric clinics in three different settings: an academic center, two community health centers, and one private practice. Clinicians and staff involved at each practice received training by dental experts on oral risk assessment and varnish application, early childhood caries, and dental emergencies. Staff at each pediatric center began applying fluoride varnish to children between ages 12 and 27 months during well-child visits and at sick visits when appropriate.

While following a universal protocol, each clinic developed its own system for completing the various aspects of varnish application with the goal of applying varnish during as many well-child visits as possible and with the option of applying at sick visits. Implementation involved: preparing the chart, gathering supplies, explaining the treatment and obtaining consent, applying the varnish, and documenting the treatment. Varnish treatments were entered into an online registry; clinics were reimbursed \$30 per application. Dental referrals were encouraged and recorded based on evidence of cavities or other serious problems. To evaluate feasibility, we recorded the number of treatments given divided by the number of opportunities for treatment. We also observed and timed a representative number of treatments at each practice and conducted staff and parent surveys.

Results

Figures: Application of Fluoride Varnish in Knee-to-Knee Position



These data reflect the first four months of the project. 91 clinicians have participated in fluoride application across all sites. 809 children received fluoride without a report of adverse reactions. 355/557 children (64%) of children presenting for well child care across all sites received fluoride varnish. Three of the four practices administer fluoride during sick as well as well visits.

Table 1: Fluoride Varnish Applications

Site	% of well visits with fluoride application	% of sick visits with fluoride application
Community health center #1	57% ⁴	10%
Community health center #2	53%	4%
Private practice	71%	0%
Academic health center	71%	31%

Each site was encouraged to develop a protocol for varnish administration that best suited their existing processes. Each site assigned the various tasks to identify eligible patients, prepare charts and supplies, administer the varnish and appropriately record data in the medical record and report the administration to the health department to various staff. Ultimately all fluoride applications are entered into a web-based tracking system at the Health Department, similar to that used in Baltimore for immunization tracking.

Table 2: Type of Staff Responsible for Each Step of Fluoride Varnish Process

	Academic Center	Community Health Center #1	Community Health Center #2	Private Practice
Preparing Chart	MA	EMR	EMR	MA
Gathering Supplies	MA	MA	MA	MA
Explaining Program, Consent	MD	MD or NP	MD or NP	MD or NP
Treatment	MD	MA	MD or MA	MA
Documentation	MA	MA	MA	MA

Abbreviations: MA=medical assistant; EMR=electronic medical record; MD=medical doctor (may be a resident in academic practice); NP=nurse practitioner

Results, cont'd

The total time required for all aspects of varnish application held relatively consistent across all three settings despite different methods of record keeping and the type of staff handling the varnish application. As the project progresses, additional time may be required to determine eligibility for second applications.

Table 3: Average Time in Minutes for Each Step in Fluoride Varnish Process

	Academic Center	Community Health Center #1	Community Health Center #2	Private Practice	Average
Preparing Chart	0.73	EMR	EMR	0.29	0.51
Gathering Supplies	0.13	1.07	0.14	0.10	0.11
Explaining Program, Consent	1.06	1.86	1.75	1.11	1.44
Treatment	2.08	1.06	0.73	2.13	1.50
Documentation	0.46	1.00	0.25	0.63	0.58
Total	4.46	3.98	2.87	4.25	3.89

Missed Opportunities. The practices reported very low rates of parental declination. At the academic center where this was specifically tracked, only 7 parents declined fluoride varnish over a period when there were 261 applications.

Similarly, few families reported having received fluoride treatment in dental practices, which would also make them ineligible for the pilot. At the academic center, only 7 children were considered ineligible for this reason. Clinicians cited two main causes of missed opportunities, including that in-clinic personnel missed the training, making them ineligible to apply the varnish, and not having enough time to apply the varnish, especially at the 12-month visit.

Staff and Parent Satisfaction. Staff members were strongly in favor of the program (see Table 4).

Table 4: Staff Satisfaction Survey

	Academic Center	Community Health Center #1	Community Health Center #2	Private Practice	Average
How difficult do you think it is to administer fluoride varnish? (1=Very Easy, 5=Very Difficult, N=24)	2.25	2.17	2.50	1.67	2.15
What is your impression of caregivers' attitudes towards varnish treatment? (1=Eager to Participate, 5=Refuse Participate, N=29)	1.13	2.00	1.94	1.25	1.58
What is your impression of the varnish program overall? (1=Great service to our patients, 5=should not be doing this, N=29)	1.13	1.94	1.72	1.00	1.45

Discussion

Early implementation of this fluoride varnish program in a variety of pediatric primary care sites serving a Medicaid population of toddlers was quite smooth. It was designed to be flexible, to best fit into the existing processes of the practices and this undoubtedly contributed to this early success. Our rate of 64% completed varnish applications among children presenting for well child visits compares well with the adoption rate often reported for the introduction of new immunizations. The entire process, including documentation in the medical record, added less than four minutes to the total staff time involved in a well child visit.

Some staff expressed concerns with the training format and materials used. As such a program is spread state-wide, improved materials are needed, most likely web-based video, possibly enhanced with live demonstrations at various local sites, may enhance staff confidence with initial start-up.

All varnish applications are entered into a searchable web-based registry modeled after the Baltimore Immunization Registry and populated by children within the target age range who are already in the registry. Users are assigned a personal login and password and can enter varnish treatments or view the most recent treatment or next possible treatment date (calculated by the registry to be at least four months after the last treatment date). Reports are available by practice. The successful implementation of a web-based registry allows convenient monitoring of fluoride applications by individual clinicians and by health departments. If used by both dental and medical practitioners, the registry could prevent duplication of varnish applications and alert medical practitioners to children who already have a dental home.

At least ten states reimburse physicians for applying fluoride varnish to children through Medicaid. Maryland's Dental Action Committee has recommended that physicians be trained to apply fluoride varnish. By covering the application of fluoride varnish in primary care, Maryland could quickly and significantly improve the health status of low-income children across the state.

Conclusions

Fluoride varnish has the potential to have a major public health impact in Maryland, and other states, by reducing the prevalence of cavities in primary teeth. Our pilot program finds that applying fluoride varnish in pediatric primary care can be:

- Relatively low-cost yet high impact
- Feasible among different types of practices
- Highly accepted by both patients and providers

The experiences of the pilot project suggest several recommendations for statewide adoption.

- Standard and convenient training modules should be made available to clinicians. Other states have allowed providers to obtain CME credit by training online.
- Establishment of a web-based varnish registry based on immunization registries that both medical and dental personnel can access will ensure that children receive regular varnish applications at the recommended time, without duplication. A registry could also allow a convenient way to notify parents when their child is next due for a varnish application or could be used to trigger reimbursement.
- Adequate financial reimbursement is critical. The reimbursement of \$30 per application, while less than many other states, was sufficient for the four sites.