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Fluoride Varnish Use in Primary Care: What Do Providers Think?

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ABSTRACT. *Objective.* **A number of state Medicaid programs, including Washington, reimburse pediatricians and other pediatric health care providers to apply fluoride varnish, a caries preventive agent, to eligible patients' teeth. Little is known about the factors that encourage or impede diffusion of fluoride varnish into primary care physicians' (PCPs') offices. The objective of this study was to perform an in-depth case study of fluoride varnish diffusion in 12 pediatric, family medicine, and nurse practitioner offices that underwent fluoride varnish training.**

Methods. **We conducted focus groups with providers and staff in 12 community-based medical practices that had undergone fluoride varnish training within the previous 18 months. Topics of discussion included how the office staff learned about and sought fluoride varnish training, the perceived role of PCPs in oral health, oral health problems within the practice, specific details about the training, and organizational and logistic factors that promoted or impeded adoption. Focus groups were audiotaped and professionally transcribed; content analyses of the transcripts were conducted by the 3 authors.**

Results. **Three major themes emerged about the fluoride varnish diffusion process; these were preexisting factors, communication, and logistics. Within preexisting factors, PCPs learned about fluoride varnish through their involvement in public health–related activities and were influenced to participate in the training by their concerns for their patients' oral health and difficulty gaining access to professional dental care. Among communication factors identified as important were qualities of the training session and the communication that occurred within the practice about fluoride varnish. When staff were included in the fluoride varnish decision-making and planning process, the practice was more likely to be successful in implementing fluoride varnish. Logistic factors included systems used to identify and capture eligible patients for fluoride varnish application. Other important logistic factors that were considered included division of labor and timing of the fluoride varnish application during the visit. Access to dental care was a persistent theme throughout the focus group discussions that had an impact on the other 3 major themes.**

Conclusions. **Fluoride varnish can be adopted successfully into medical practice given PCP and staff commitment and openness, training that leaves participants motivated, appropriate systems, and resources for professional dental care referral. In addition, PCP involvement with fluoride varnish provided opportunities to discuss preventive oral health with families. Specific recommendations to encourage fluoride varnish diffusion in other settings are offered for program planners and PCP offices.** *Pediatrics* **2005;115:e69–e76. URL: www.pediatrics.org/cgi/doi/10.1542/peds.2004-1330;** ***oral health, primary care, diffusion of innovation.***

ABBREVIATIONS. MAA, Medical Assistance Administration; PCP, primary care physician; UW, University of Washington; ABCD, Access to Infant and Childhood Dentistry.

Dental decay is the most common chronic disease of childhood and affects a disproportionate number of low-income and minority children.[1] These vulnerable children have more dental caries than other pediatric patients and encounter greater difficulty accessing timely and appropriate dental care.[1] Although the American Academy of Pediatric Dentistry recommends the first dental visit occur no later than 12 months of age,[2] children who are at greatest risk for early childhood caries are those who are least likely to have access to this care. Pediatricians and other pediatric health care providers may be the only source of preventive oral health education and care for very young children and others who are unable to gain access to other sources of dental care. Acknowledging this, a number of state Medicaid programs reimburse pediatricians and other pediatric health care providers to apply fluoride varnish, a caries preventive agent, to eligible patients' teeth.

Fluoride varnish is a professionally applied, highly concentrated (22 600 ppm) fluoride product that has been widely used in Europe and Canada as a caries prevention agent for >20 years.[3] In the past decade, it has become more widely available in the United States. Fluoride varnish is an attractive option for the primary care setting because it can be applied by ancillary staff in <5 minutes, is generally acceptable to patients, and does not require special preparation of the teeth or expensive equipment.[3] Fluoride varnish can also reverse early caries lesions (white spot lesions).[4] Applications 2 to 4 times a year have been shown to decrease caries in the permanent dentition by 38%.[5]

In 1998, the Medical Assistance Administration (MAA) in Washington state began reimbursing primary care physicians (PCPs) $18.18 per visit to apply fluoride varnish up to 3 times per year in children younger than 19 years. With subsequent budget cuts, reimbursement was reduced to $13.39/visit. PCPs can bill Medicaid for fluoride varnish application on

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a fee-for-service basis even for Medicaid-managed care enrollees.

Washington was 1 of the first states to reimburse physicians for fluoride varnish application. During the past 6 years, this strategy of involving pediatric medical providers in oral health care has expanded to at least 5 other states. Despite this, little is known about physicians' experience with fluoride varnish or about the factors associated with diffusion of fluoride varnish into PCPs offices. To address this, we performed a qualitative study of 12 pediatric, nurse practitioner, and family medicine practices in Washington that underwent fluoride varnish training.

METHODS

This research project was approved by the University of Washington Human Subjects' Division. In 1998, all providers with a Medicaid provider number were sent a letter informing them of this new fluoride varnish program. Those who were interested could request a 1-hour on-site training session that covered fluoride varnish application, chart documentation, and billing procedures. Additional information was provided on identification of caries, oral health anticipatory guidance for families, and the importance of professional dental care referrals. Two main groups provided training: the University of Washington School of Dentistry in conjunction with MAA (UW/MAA) and the Spokane Regional Health District. The UW/MAA training provided for hands-on practice applying fluoride varnish to children of various ages, whereas the Spokane Regional Health District had their instructor demonstrate fluoride varnish application using 1 child.

We contacted the 12 community-based medical practices, located throughout Washington, who underwent oral health and fluoride varnish training in 1 of the above capacities in the years 2000–2001. After the study was explained, all 12 offices agreed to participate and a site visit was arranged. Sites consisted of 8 pediatric practices; 2 Indian health clinics staffed by pediatricians, family physicians, and nurse practitioners; 1 nurse practitioner practice; and 1 combined pediatric and family medicine group. The proportion of Medicaid patients within the practice varied from 15% to 100%. Eight practices were located in small or medium urban/suburban areas, and 5 were located in rural communities. The various settings and experiences allowed comparison of factors that affected fluoride varnish adoption.

There was an Access to Infant and Childhood Dentistry (ABCD) program in counties where 8 of the practices were located. ABCD is a county-level program created as a partnership among the University of Washington School of Dentistry, the Washington Dental Service Foundation, the MAA, the county public health department, and a local dental society. The program provides training and expanded reimbursement to dentists to care for children who are younger than 6 years and on Medicaid and outreach, dental referral, and case management for families.

Within each office, all staff who had participated in the fluoride varnish application process, including physicians, nurse practitioners, nurses, medical assistants, and administrative personnel, were invited to participate in the focus group. These focus groups were usually held over lunch, and the staff were invited to attend for as long as their schedules permitted. Informed consent to audiotape the discussion was obtained from all attendees. Topics discussed in the focus groups included how the office staff learned about and sought oral health and fluoride varnish training, the perceived role of PCPs in oral health, oral health problems within the practice, specific details about the training, and organizational and logistic factors that promoted or impeded adoption. The focus groups interviews were conducted and recorded by 1 investigator (C.L.).

Practices had adopted fluoride varnish to varying degrees at the time of the focus group. During or shortly after the site visit, billing staff were queried about the proportion of eligible patients who were receiving fluoride varnish. Some reported applying fluoride varnish to almost every eligible patient seen, whereas others were still waiting for supplies to arrive and had not yet applied fluoride varnish to any patients. One practice elected not to offer fluoride varnish after the training.

Audiotapes were professionally transcribed. All 3 authors independently read the transcripts and identified relevant themes. Data analysis was based on extracting themes in the forms of patterns or categories that emerged from the interviews and observations made during the on-site visits. Themes were compared between readers to reduce bias and enrich the analysis, and conflicts were resolved through discussion.

RESULTS

Through analysis of the interviews and extraction of themes, we developed a conceptual model (Fig 1) of fluoride varnish diffusion within medical offices that we studied. This model incorporated relevant players both within and outside the practice setting (horizontal axis of model) and themes that arose during the time course of the practices' involvement with fluoride varnish (vertical axis). Three major themes emerged through the diffusion process: preexisting factors, communication, and logistics (vertical axis of Fig 1). Access to dental care was a fourth theme that emerged throughout the focus group discussions and had an impact on the other 3 major themes.

Preexisting Factors

Preexisting Factors refers to those characteristics and conditions present within and outside the practice that influenced a practice to pursue fluoride varnish. Among the office personnel, PCPs were the first to learn about fluoride varnish and to make the decision for the practice to undergo training. PCPs interviewed seemed to be on one end of the spectrum with regard to their interest in new technology and their involvement in public health–related activities. Unprompted, some of the PCPs described themselves as early adopters. In fact, a number of PCPs first learned about fluoride varnish through participation in public health efforts related specifically to oral health: "I was on the oral health coalition here in town, where there was a group that had been brought together through public health and through [a local pediatric dentist], so that's basically where I heard about it."

Some PCPs had personal or professional experience with oral health and expressed concerns about the burden of oral health problems in their patients as being an important motivation for providing fluoride varnish: "I was very well aware of the problem before. We have a high incidence [of caries]. I just get so sad when I see this. I personally think that this (fluoride varnish) is an easy thing for pediatricians to take on."

Inevitably, availability of dental resources in the community arose during discussions about the burden of oral health problems. Virtually all participants agreed that access to dental care for Medicaid and uninsured patients was difficult in their community. Within some practices, the lack of any nearby dental resources for low-income patients motivated participation in the fluoride varnish program as a means to offer at least some preventive dental care to these patients: "We have 2 dentists locally, and neither one of them takes Medicaid. . . . There is the Z clinic in O City (50 mile drive), but they have a waiting list for 6 months. . . . Considering that they can't get dental care, we really want to be sure that they get as much protection as possible."

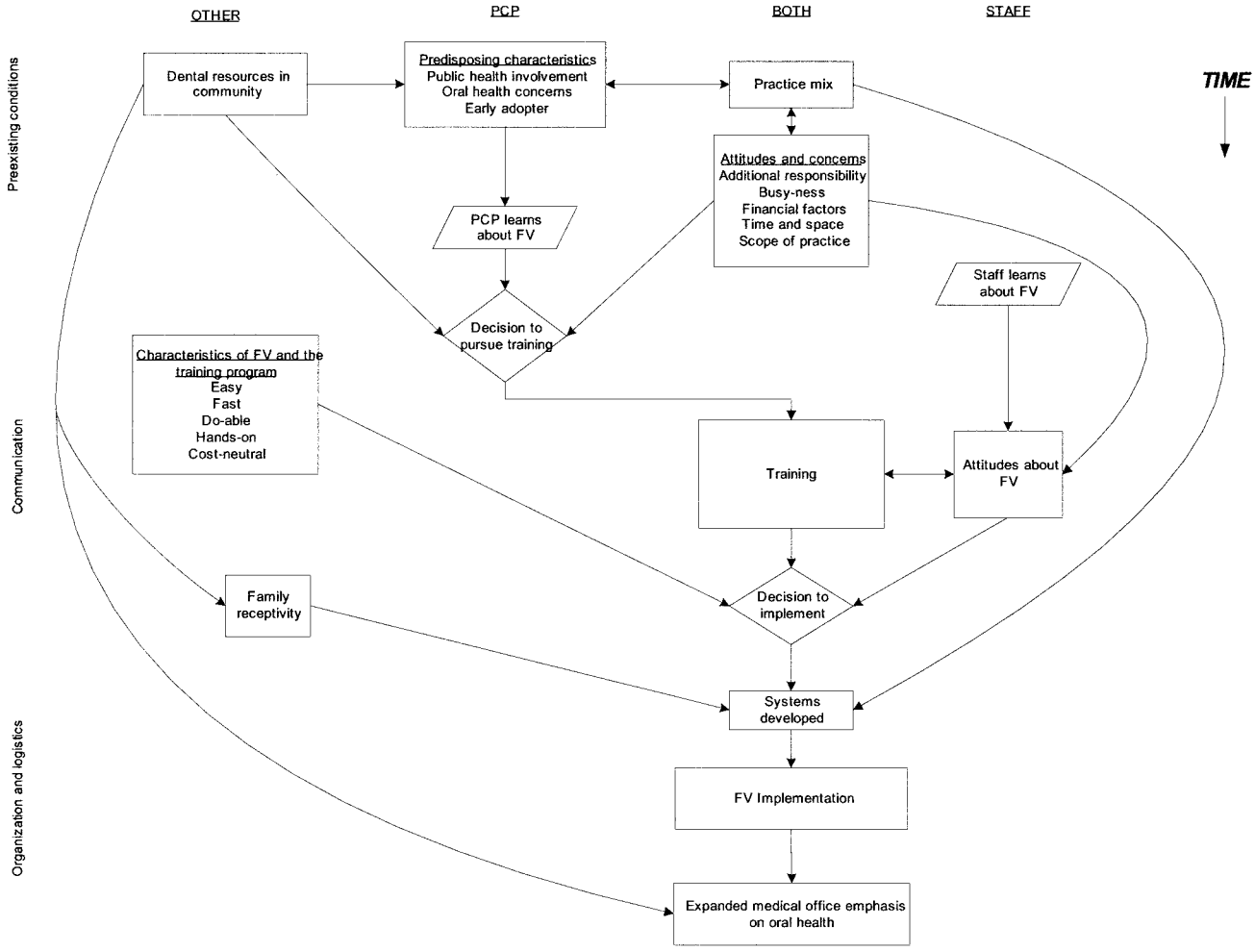

Fig 1. Conceptual model of fluoride varnish diffusion within medical practices.

Other PCPs wanted to know that they would have a referral source for dental care if they identified problems in their patients, through their increased involvement in oral health: "One of my concerns initially going into it is if I'm looking at dental stuff more, and I find kids with problems, and I don't have any place to send them, then why do it? "

Other concerns held by PCPs before their participation in the fluoride varnish program included that (1) fluoride varnish would take too much time and thus not generate adequate income to cover its costs; financial factors were not identified as the primary incentive for fluoride varnish involvement, and most offices just wanted to break even doing the procedure; (2) the program would not be sustained, thus disappointing families who had come to expect it; and (3) fluoride varnish was adding yet another task to the PCPs' responsibilities at the well-child care visit, as this comment reflects: "I think one of the hard parts in general about being a primary care doctor is that each group wants us to do some screening or preventive treatment for their kids. The latest statistic was that we each spent 9.4 minutes with each patient. And, yes, oral health is important, so is smoking, so are seat belts, so is assessing for maternal depression. . . . It's just hard to fit it all in."

In contrast to PCPs, nursing staff were less likely to cite public health–related concerns or interest and more likely to worry about the practical aspects of adding fluoride varnish to their already busy schedules: "We are so overwhelmed with paperwork and work, that to have 1 more thing added to what we do, it just seems astronomical."

A few participants questioned whether fluoride varnish should even be within the purview of the medical office, as this nurse's comment reflects: "It's not that we don't care about infants' teeth. We do. It just seems like you're asking an ice cream parlor to make pizzas."

Others questioned why medical offices, who perceive themselves as already overwhelmed with preventive care responsibilities, rather than dental offices were asked to assume responsibility for providing fluoride varnish to low-income patients, as this PCP's comment shows: "Why aren't the dentists doing it? Why are you asking the physicians to do yet 1 more thing?"

Communication

Within this overarching theme, the focus was on communication about fluoride varnish during the training sessions and on communication between the PCPs and staff and among PCPs, staff, and families about fluoride varnish. Overall, the training sessions

were perceived as being very helpful. The didactic components of the training sessions, covering the pathogenesis of caries, photographic images of the stages of tooth decay, and background on fluoride and fluoride varnish, were well received. In practices located in ABCD counties, the fluoride varnish trainings provided information about and encouraged use of the ABCD program for dental referral for Medicaid patients, thus providing an important resource for these practices and their patients.

Interviewees noted that observing an actual fluoride varnish application during the training dispelled the notion that fluoride varnish application and billing was difficult or time consuming: "We saw that it wasn't that hard to do, didn't take very long to do it, gave us the mechanics, showed us what to use and showed us the billing codes, so how we can bill for it, and that it costs us about a dollar in resources as far as the fluoride varnish."

The UW/MAA trainings had made arrangements for children of varying ages to be present so that participants could have hands-on practice. Being able to practice on a child furthered the sense that fluoride varnish application was fast, easy, and doable. In training sessions in which fluoride varnish application was only demonstrated, participants felt less comfortable with the procedure at the end of the session and were less likely to start using the fluoride varnish afterward.

Some training sessions provided extra supplies, a "starter package," for the practice to begin fluoride varnish use shortly after the training. Doing so encouraged adoption. Practices that had been trained without receiving a starter package seemed to lose momentum as they figured out how to order supplies and then waited for their arrival.

In addition to the training, communication surrounding fluoride varnish occurred on different levels within the practice setting. This included communication about fluoride varnish between PCPs and their staff. In offices with the greatest success in adopting fluoride varnish, PCPs had considered their nurses' input and important role when deciding to pursue fluoride varnish training and to implement it in their practice: "We [the nursing staff and PCP] have an open discussion about it; it's not like I'm dictatorial about it. But they're usually pretty willing to try [new things]. I think that helps."

When communication about incorporating fluoride varnish into the practice setting and the division of labor surrounding its use were not addressed adequately, some ancillary staff expressed resentment. In these comments, the nurses are upset that the role of fluoride varnish application had been delegated to them, particularly when they thought that the PCP should do it:

R3 (respondent): "I would like to able to put some of those varnishes in each room, I would like to have the papers in each room, and I'd like to see the physician do the varnish right in the room at that time. I would like for them to take the responsibility. Do it all at the same time [when they are looking at the teeth]."

R2: "That was what the understanding was. They're already in the mouth looking at the teeth, so they should do it."

When communication between PCP and staff was not adequate, adoption of fluoride varnish was slower and implementation was less effective.

Communication between families and PCPs about fluoride varnish was also important. Most interview participants agreed that PCPs were best qualified to introduce the concept of fluoride varnish to families. There were a number of comments about families' agreeing to fluoride varnish because the PCP recommended it. Fluoride varnish required an initial explanation, sometimes perceived as time consuming for a busy well-child care visit. When parents did have questions about fluoride varnish, they were generally about safety and aftercare. PCPs also used the discussion about fluoride varnish as an opportunity to encourage oral hygiene and routine professional dental care to their patients.

Logistics

Within this theme, we considered the systems that were developed to provide fluoride varnish to patients and their effectiveness, as well as other implications of fluoride varnish involvement. Once training was completed, the actual incorporation of fluoride varnish application into regular, ongoing practice was the biggest challenge. When systems were not developed and instead reliance was made only on PCPs and staff to remember to use fluoride varnish, consistent use did not occur.

Identifying and capturing patients who were eligible fluoride varnish (ie, Medicaid beneficiaries) were substantial systems issues at most practices. When practices relied on nursing staff to identify eligibility, if it was not obvious at first glance of the medical chart, then fluoride varnish was often overlooked, as this comment demonstrates: "[The MDs] want [the fluoride varnish reminder] up when they go into the room . . . [but] we are not looking at every patient that we put down for well-child check to see whether or not they are [Medicaid] or if it's another insurance, so if we should put the fluoride varnish reminder up or not. That's how a lot of them are falling through the cracks."

Relying on PCPs to determine that a patient had Medicaid and then to request fluoride varnish without any reminders in place was not an effective method either. Most practices discovered that front office staff were best equipped to determine eligibility and to flag the chart for fluoride varnish. Different types of reminder flags were developed in the various offices and included a tooth sticker on the intake sheet and even the individual fluoride varnish dose pack clipped to the front of the patient's chart. The flag then indicated to the PCP that he or she should discuss fluoride varnish with the family and subsequently order it, preferably using an order sheet on which fluoride varnish was a preprinted option. Office staff usually documented fluoride varnish application on their record of preventive care, along with immunizations and other well-child care activities. Because MAA provides for 3 medical office claims per child per year for fluoride varnish, this

allowed front office staff to ensure that a child had not already received all of his or her fluoride varnish treatments for the year.

Clinics that serve only Medicaid patients had an easier time implementing fluoride varnish because they were able to offer it to all of their patients without having to determine eligibility. However, in most practices that saw both Medicaid and non-Medicaid patients, there was interest in offering fluoride varnish to all patients. In addition to the time issues involved in identifying Medicaid beneficiaries, equity was an important consideration. Particularly in areas without community water fluoridation, interview participants expressed the belief that all of their patients, not just those on Medicaid, could potentially benefit from fluoride varnish. Practice staff were mindful that non-Medicaid patients would have to pay out of pocket, because neither private medical nor dental insurance will reimburse medical offices for fluoride varnish application. One practice advertised the availability of fluoride varnish for cash payment. "Fluoride varnish at the doctor's office" was popular in this particular community, where no dentists accepted Medicaid.

"We have some patients that aren't our patients that are coming asking about it. The word's out. And we do them on all the well-child [visits]. And sometimes you do the whole family. . . . Everybody I've talked to has asked for it. They say, 'We have a hard time getting dental care and it's wonderful that you can do that here.'. . . [Even people who are not on Medicaid have] asked about fluoride treatment. I've said, 'You know, you have to pay with cash for the visit, but it will only be $18.' And they say, 'Oh, we want to do it.' $18 three times a year, that's nothing."

Other key organizational/logistic themes that emerged included division of labor, timing of fluoride varnish application during the visit, location of supplies, adequacy of time and space, and financial impact. Application of fluoride varnish was usually done by nursing and/or ancillary staff. Although in the nurse practitioner practice, the PCP assumed responsibility for the actual fluoride varnish application, in most other practices, PCPs reported performing an oral examination, including the teeth and gums, and discussing fluoride varnish with families, but most did not apply the varnish themselves. One physician explained why he did not personally apply fluoride varnish: "The thing about the fluoride is that you have to bring [the fluoride varnish into the examination room] and you have to . . . know that this is a patient [who needs it], so it'd take a little bit of logistic work, and you have to glove, and [the nurses] glove anyway, because they're doing the shots. So it made more sense to me to have them do it as part of their immunizations. I mean, I think that physicians certainly could do it, but I doubt many will."

Delegating the responsibility of the fluoride varnish program to certain staff members seemed to promote more successful fluoride varnish adoption. When 1 or 2 nursing staff had "ownership" of fluoride varnish, they seemed more invested in making the program succeed in their practice. However, when it was the delegated staff person's day off, fluoride varnish could fall by the wayside.

Most offices used well-child care visits when immunizations were planned also to offer fluoride varnish. The allied staff who were responsible for vaccines usually also applied fluoride varnish because vaccinations and fluoride varnish were perceived as similar sorts of procedures that could be performed in the same physical space and time. Offices generally kept fluoride varnish in the same general location as vaccines were stored so that it was readily available. When done in conjunction with vaccination, most staff members agreed that application of fluoride varnish was best done immediately before immunizations because children were often upset and crying after their shots. Most staff avoided fluoride varnish application before the PCP had seen the child because they perceived that it would interfere with the PCP's examination, either because the child would be too upset or because the varnish on the teeth would not allow an adequate oral examination.

Although adequate time and space for fluoride varnish application were common concerns before implementing fluoride varnish, once adopted into practice, most participants reported that fluoride varnish application required minimal extra time and space, particularly when considered relative to the demands of giving immunizations: "I don't think it really adds much more time to the nurses, generally we're doing shots all the time anyway, so it's in the room doing some type of procedure. A fluoride varnish I would say doesn't even add—maybe adds 2 minutes to explain it to the parents and to put it on the child's teeth—so it's not really too time-consuming for us."

In a setting of overall declining reimbursement for increasingly involved well-child care visits, that fluoride varnish could be reimbursed was a positive motivating factor for practices. Although financial factors were not the primary reason for a practice's involvement in fluoride varnish, interview participants perceived that reimbursement allowed them to "break even" on the extra time required to explain and apply the fluoride varnish.

Implementing fluoride varnish had implications for the practices' involvement in oral health overall and their patients' access to dental care. PCPs and staff placed greater emphasis on oral health in both their clinical care and their interactions with families after undergoing training and incorporating fluoride varnish into their practice, as this PCP's comment reflects: "As I see patients, I am much more aware of their teeth [since the fluoride varnish program began]. I talk to everybody now that I see, about if they've been to the dentist and how long it's been and what kinds of concerns they might have. "

Because the trainings covered general oral health topics, including the importance of professional dental care, and provided referral resources, involvement with fluoride varnish in the medical setting was often coupled with using ABCD resources for dental referrals. ABCD was perceived as making a big difference in improving access to dental care for

TABLE 1. Everett Roger's Attributes[6] and Their Relevance to Fluoride Varnish Adoption

Attribute	Definition	Fluoride Varnish Relevance
Relative advantage	The degree to which an innovation is seen as better than the idea that it replaces	PCP involvement provides access to preventive oral health care for children who may otherwise not receive care. Reimbursement provides financial incentive.
Compatibility	How consistent innovation is with values, habits, experience, and needs of potential adopters	PCPs have well-established roles in preventive activities such as injury prevention counseling and immunizations. Fluoride varnish can be applied right before vaccines using same space and staff. Overtaxed staff did not want to add 1 more thing to their responsibilities
Complexity	How difficult the innovation is to understand or use	After training, fluoride varnish was perceived as simple and not requiring excessive space or staff time.
Trialability	Extent to which the innovation can be experimented with before committing to adopt	Successful training sessions allowed sufficient opportunity to practice fluoride varnish application. A starter package of supplies maintained momentum after the training.
Observability	Extent to which innovation provides tangible or visible results	Word of mouth about fluoride varnish was good public relations for 1 practice. Involvement with ABCD has improved access to dental care.

many of these practices' patients and provided a resource if the PCP identified dental problems through their increased involvement in oral health: "With the ABCD program . . . I've been able to get my patients in [to dental care], so I have a resource and that really had to be there first, before this piece [fluoride varnish in the medical office]. "

In addition, PCPs with professional or other relationships with dentists in the community believed that it was easier to make dental referrals. "Give and take" in patient care, such as doing preoperative history and physical examinations for dentists before they undertook operative dental care on a child, was considered important.

DISCUSSION

Using qualitative methods, we have described 12 Washington state PCP practices' experience with fluoride varnish. We have identified preexisting factors that influenced fluoride varnish diffusion within a practice, how communication promoted or impeded success with fluoride varnish, and the logistic consideration for fluoride varnish implementation in these practices. In addition, access to dental care was an important recurrent theme interwoven with the other 3 major themes.

Although fluoride varnish is just 1 aspect of an oral health preventive program, it provides a useful model to study diffusion of innovation and behavior change related to oral health within a medical practice. Theories on health promotion and behavior change provide frameworks to consider factors that influence this process. We have relied primarily on Everett Roger's Diffusion of Innovation[6] model to understand fluoride varnish diffusion within these practices. Diffusion research was traditionally modeled on the concept of an individual's learning about new technology and making a decision for or against adoption. In these practices, a PCP or group of PCPs learned about fluoride varnish and decided to pursue it for the rest of the office staff. In general, the PCPs heard about fluoride varnish through special channels and obtained training in a relatively early stage of fluoride varnish diffusion into the medical setting. Characteristics of the PCPs interviewed are consistent with other descriptions of early adopters, which have included greater empathy, a more favorable attitude toward change, greater social interconnectedness, more change agent contact, greater exposure to mass media channels, and a greater likelihood to actively seek information.[6] Our participants seemed to be on 1 end of the spectrum with regard to PCPs' involvement in public health activities and concerns about their patients' oral health and difficulties gaining access to dental care. However, diffusion research has demonstrated that successful innovations are ultimately adopted, sometimes after substantial time has passed, by those with more typical characteristics.[6]

After a decision has been made to adopt an innovation, the emphasis of organizations, such as these medical offices, is primarily that of implementation. As we have seen through analysis of these practices' experiences with fluoride varnish, behavior change within health care settings involves multiple players and is dependent on many factors.[7] Characteristics of the PCPs and staff and their communication and logistic capabilities of the organization in which they worked determined the extent and rate of fluoride varnish implementation. Nurses who perceived themselves as already overtaxed and who did not feel included in the fluoride varnish decision-making or planning process often expressed frustration with having to do "1 more thing." Under these conditions,

fluoride varnish was less widely implemented. This points to the important role of the support staff in determining a practice's success with fluoride varnish. In practices in which support staff were included in the planning and implementation process, problem solving around issues such as identifying eligible patients seemed to be more successful.

For practical reasons, most medical offices applied fluoride varnish in conjunction with immunizations. However, connecting fluoride varnish with vaccines limits opportunities for fluoride varnish application after 18 months of age, when the primary immunization series usually has been completed. We would encourage medical offices to use other visits, such as acute care visits and sports physicals, as opportunities for oral health anticipatory guidance and assessment and fluoride varnish application.

Patients and their families, as recipients of the preventive effort, and their environment could also influence this program's success. In these practices, when systems were in place such that families were offered fluoride varnish by the PCP, they seldom refused. The environment in which patients and their families live, particularly with regard to the availability of professional dental care in the community, also affected the fluoride varnish program. In 1 practice, fluoride varnish was seen as the only source of dental care in a setting where no local professional dental resources were available for low-income patients. Other PCPs wanted to know that dental resources were available if they identified dental problems in their patients.

Offices that implemented fluoride varnish in the context of promoting oral health and encouraging professional dental referral were most successful when they did so in partnership with dentists either through ABCD or informally. For example, in Spokane County, a respected pediatric dentist worked in conjunction with the Spokane Regional Health District to provide the fluoride varnish and oral health trainings to the medical offices. In doing so, he also identified himself and his colleagues as available for consultation and dental referrals and promoted the ABCD referral telephone line that connected Medicaid beneficiaries with local dentists for care. Where medical offices in this county had previously struggled to identify dental care options for their lower income patients and children with acute dental needs, they now had a confirmation of actual dental resources available to them and their patients.

Finally, characteristics of the training session and of fluoride varnish, considered collectively as "the innovation," also affected the diffusion process. Rogers[6] identified 5 attributes of innovations that influence the extent and speed of their diffusion. These attributes—relative advantage, compatibility, complexity, trialability, and observability—help us to understand which factors promoted success with fluoride varnish (Table 1) and can inform certain recommendations for both program planners and PCP offices for how these results may be applied in other settings (Tables 2 and 3).

It is important to acknowledge the limitations of qualitative research. What occurred in these 12 practices in Washington may or may not be applicable in other locales. Moreover, these data were collected retrospectively and thus considered only practices that elected to pursue fluoride varnish training. Nevertheless, we believe that findings from this study can provide useful information to guide oral health programs in primary care practice.

TABLE 2. Recommendations for Fluoride Varnish Program Planning

1. The initial message to the PCP should address benefits of fluoride varnish and its cost relative to reimbursement and concerns about time and space.
2. Reimbursement for fluoride varnish application can be an important motivator. Advocate for this from Medicaid and private insurance in your state.
3. Ancillary staff must have buy-in and be involved in planning and implementing fluoride varnish. Their important role should be acknowledged in the training and subsequently encouraged.
4. Training should be hands-on, leave participants positive and enthusiastic, and allow participants to start using fluoride varnish right away. After training is completed, provide ongoing support.
5. Help practice staff to think through systems needed for fluoride varnish applications and billing. Determine how eligible patients will be identified and approached for fluoride varnish.
6. Facilitate formal and informal affiliations between MDs and dentists within a community to enhance partnerships, learning opportunities, and dental care referrals.

TABLE 3. Recommendations for Medical Offices That Are Considering Fluoride Varnish

1. Get ancillary staff's support and buy-in. Elicit input on how fluoride varnish can work in your office setting.
2. Use your front office staff to identify potential fluoride varnish recipients. Mark the chart in an obvious way to designate fluoride varnish eligibility, and incorporate fluoride varnish as an option on preprinted order sheets.
3. Identify designated time, space, and staff for fluoride varnish application. In younger children, fluoride varnish is usually best done after the PCP's visit but before vaccines. Make use of other types of visits, such as acute care and sports physicals, for fluoride varnish application to older children.
4. During your oral examination, assess the child's teeth and oral hygiene. Use discussion about fluoride varnish as an opportunity to address the importance of preventive oral health and professional dental care. A brief written description of fluoride varnish including its safety, its benefits, how it is applied, and aftercare could be given to families when they arrive for their appointment to save in-depth explanations during the PCP's visit.
5. Depending on needs in your community, consider offering fluoride varnish to non-Medicaid families for a small fee.
6. Explore, develop, and use dental resources in your community to improve access to care for your patients.

In conclusion, diffusion of fluoride varnish into medical settings occurs over time and is dependent on a number of players and factors. Within medical practices, consideration of preexisting factors, communication, and logistics all were important as a practice attempted to adopt and implement fluoride varnish. When fluoride varnish is adopted successfully by medical offices, it offers an effective and straightforward caries prevention strategy for children who have traditionally had difficulty gaining access to professional dental care. Besides allowing PCPs and their staff to expand their clinical focus to include oral health, it provides an opportunity to

emphasize further to patients and families the importance of good oral health and professional dental care.

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