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Barriers to the Adoption and Implementation of Preventive Dental Services in Primary Medical Care

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KEY WORDS

barriers to adoption, preventive dental services, early childhood caries, diffusion of innovation

ABBREVIATIONS

IMB—Into the Mouths of Babes

RCT—randomized, controlled trial

CME—continuing medical education

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WHAT'S KNOWN ON THIS SUBJECT: Few data are available regarding the barriers to adoption and implementation of oral health services in primary care medical practices. Only 1 other study, which included focus groups with a small number of practices, has been published thus far.



WHAT THIS STUDY ADDS: We identify some of the barriers to the adoption and implementation of preventive dental services in medical practices and provide recommendations as to how they might be overcome.

abstract

OBJECTIVE: To determine the barriers to adopting preventive oral health procedures in medical primary care.

METHODS: Medical providers who participated in a Medicaid demonstration in North Carolina completed questionnaires reporting their experiences with providing preventive dental services for children from birth to 3 years of age. Eleven factors were established as possible obstacles to the adoption of an oral health program. After 12 months of participation in the Into the Mouths of Babes training program, providers ($N = 231$) from 49 pediatric practices and 28 family physician practices reported if any of the 11 factors had been an obstacle to adoption and, if so, whether these obstacles were overcome. Program adoption and implementation, defined as providing all of the services on a regular basis, were predicted by using logistic regression to analyze the responses from providers who reported 1 or more barriers, the number of barriers identified (knowledge, attitudes, and external factors), and the number that were overcome.

RESULTS: Program-adoption rates were high, with 70.3% of the participants providing dental services on a routine basis. Attitude and external factors were positively associated with adoption, particularly with difficulty in applying the varnish, integration of the dental procedures into practice, resistance among staff and colleagues, and dentist referral difficulties. From 40.4% to 61.5% of providers overcame these 4 most common barriers. Those who reported external barriers and were unable to overcome them were less likely to provide the services, compared with those providers who reported no barriers (odds ratio: 0.08 [95% confidence interval: 0.01–0.44]).

CONCLUSIONS: The number of barriers to adopting preventive dental procedures in primary care medical practices is associated with implementation. A large proportion of these barriers can be overcome, leading to high adoption rates in a short amount of time. The barriers to adoption are similar to those identified in the literature on changing patient care, with the unique aspects of fluoride application to teeth. Interventions to promote preventive dental care in medical settings should rely heavily on empirical literature. Training physicians in preventive dentistry should identify and target potential barriers with information and options for introducing office-based systems to improve the chances of adoption. *Pediatrics* 2010;125:509–517

In response to growing concerns about the increased number of young children who have dental caries and poor access to dental care,¹⁻⁵ a number of organized efforts have been undertaken to encourage medical providers to become more involved in providing basic preventive dental care.⁶⁻¹² For example, many state Medicaid programs have started reimbursing physicians for providing preventive dental services, such as the application of topical fluoride to children's teeth, as part of well-child visits.¹³ The involvement of physicians in oral health has intuitive appeal, particularly for addressing the needs of young children, because most children receive primary medical care beginning very early in life, but not dental care.

To be effective, efforts to promote the provision of oral health services among physicians need to address the barriers to adoption and implementation. On the basis of studies of other types of preventive services, a number of barriers are likely to exist.¹⁴⁻¹⁸ To our knowledge, only Lewis et al¹⁹ have investigated factors that affect the provision of preventive dental services in medical practices. They conducted focus-group sessions with staff in 12 community-based, primary care practices that elected to implement a fluoride-varnish program after on-site training. A number of preexisting factors affected implementation, such as busyness and attitudes about the scope of the practice; communication among the office staff, parents, and the program planners; and organization and logistic factors within the practice. The qualitative study by Lewis et al¹⁹ did not provide any information about the perceived barriers among those who decided not to adopt fluoride varnish, the relative importance of the identified barriers, or which bar-

riers remained after experimenting with implementation.

Pediatricians, family physicians, nurses, and some physician extenders who were practicing in North Carolina became eligible to receive Medicaid reimbursement for providing preventive oral health services as part of a demonstration that was initiated in 2000.²⁰ The objectives of this program, known as Into the Mouths of Babies (IMB), are to improve medical providers' oral health knowledge, encourage the incorporation of preventive dental services (parental counseling and fluoride-varnish application) into their practices, and increase oral health screenings and dental referrals for children who are at an elevated risk of or already affected by oral disease. The program has grown rapidly and now includes all 100 counties in the state. The purpose of this article is to describe the obstacles encountered by medical providers in North Carolina when incorporating preventive dental services into their practices as part of the IMB program.

We examined the relationship between adoption and implementation of preventive dental services and (1) the number and type of barriers encountered and (2) whether providers were successful in overcoming these barriers. The basic premise underlying the study aims is that adopters who initially perceived fewer barriers would be more successful in overcoming those barriers. We also hypothesized that certain types of barriers would have a greater effect on adoption than others. Finally, informed by the results of this quantitative study and our experience in training >3000 providers and staff since the program began in 2000, we provide some recommendations to promote adoption and implementation in other states.

METHODS

We evaluated responses to a questionnaire in which primary care medical providers described potential barriers to adopting preventive dental services for their patients younger than 3 years of age. Questionnaires were self-completed by medical providers enrolled in a randomized, controlled trial (RCT) to compare the effectiveness of 3 types of continuing medical education (CME) of different intensity levels on the provision of preventive dental services in the IMB program.²¹ Results were to be used to determine the most effective and efficient approach to training providers statewide. Of the 1400 pediatric and family physician practices serving North Carolina children receiving Medicaid from birth to 3 years of age, 121 practices volunteered for the study and were randomly assigned to 1 of the 3 CME arms. The 107 practices that completed the trial were mostly group practices (72%) (solo: 13%; other: 15%) with a large volume of young Medicaid patients (43% of children <36 months old). At baseline, 467 providers in the 107 practices were eligible to complete questionnaires. This study was reviewed and approved by the University of North Carolina at Chapel Hill biomedical institutional review board for research involving human subjects.

CME Instruction

The IMB program includes a CME course on screening children for oral problems, guidelines for referral to a dentist, parental counseling on the care of the children's mouths, and procedures for applying fluoride varnish to children's teeth during a medical office visit. A single project coordinator (KC) conducted the CME courses during the trial. The instruction consisted of approximately 2 hours of didactic training for participants who were assigned to all 3 groups of the trial, learn-

ing collaboratives for 2 of the 3 groups, and in-office technical assistance for 1 group. The CME course was enhanced with several tools to assist in service delivery, including a risk-assessment checklist and protocol guidelines. The components of this instruction have been described in more detail in other publications^{20,21} and are available on the IMB Web site (www.oralhealth.ncdhhs.gov).

The project coordinator also provided CME for other practices in the state that wanted to participate in the demonstration but were not enrolled in the trial. In addition to participants in the practices that were enrolled in the RCT, at least 1 provider from >500 private medical practices and 90 local health departments has also been trained. The coordinator's observations of the implementation process during the training or technical assistance statewide supplemented those of the providers who participated in the trial.

Data Sources

Information from providers who participated in the trial was obtained by using a self-completed questionnaire before the CME course and 12 months after the course completion. We relied on the information provided in the follow-up surveys. The baseline survey and results were described in more detail elsewhere.²²

A 76-item follow-up survey was sent to all of the medical providers who were enrolled in the RCT to evaluate their experience in providing the preventive dental services within the first year. Those who were offering these services in their practices (adopters) were asked about the length of time between training and implementation. Those who reported that they had not yet implemented these services answered only 41 items on the questionnaire. All respondents, regardless of

adoption status, indicated whether each 1 of 11 potential barriers had ever been an obstacle to adoption and, if so, whether it was overcome or was still an obstacle.

Variable Definitions and Construction

The dependent variable in this analysis was defined as the adoption of the preventive dental services that were included in the IMB intervention. Respondents were classified as full adopters if they answered yes to each question in a sequence of 3 questions in which they were asked: (1) if they had ever provided preventive dental services (all 3 of the screening/referral, parent education, and fluoride-varnish application services) to patients younger than 3 years in the previous 12 months; (2) if they provided the services routinely; and (3) if they were still providing these services. The respondents who answered that they had provided services and continued to do so, but not routinely, were classified as partial adopters. The remainder of the sample was classified as nonadopters.

The criteria for the 3 categories are based on a conceptual framework that considers the use of preventive dental services in medical practice as an innovation and recognizes that its implementation may require a transition period in which providers become increasingly skillful, consistent, and committed to its use.^{23,24} Full adopters would be in what Rogers²⁴ refers to as the "routinizing" stage, in which the innovation has become embedded in the practice and the procedures lose their identity as an innovation. Partial adopters would be those who are in a stage of implementation in which the practice is trying to accommodate the innovation by making changes in the practice, to the innovation itself, or both.

Variables measuring potential barriers to the adoption and implementa-

tion of IMB services are based on the conceptual model proposed by Cabana et al,²⁵ which suggests that barriers to physician adherence to practice guidelines should be grouped into 3 major categories: provider knowledge, provider attitudes, and external forces outside of the provider's direct control. Respondents were asked to evaluate their experience with preventive dental services by indicating whether each of 11 questionnaire items "has never been an obstacle," "was an obstacle, but was overcome," or "was and still is an obstacle" (list of items in Table 2).

Because of the small sample of providers and the multiple items in the attitudes and external barriers categories, we created a summary variable for each of these categories by using a 2-step process. First, the proportion of the total nonmissing responses to the barrier items that were reported as being an obstacle "but was overcome" or "still is an obstacle" was calculated within each category for each responding provider. Second, on the basis of the distribution of the respective responses for attitude and external barriers, proportions were assigned to 1 of 3 categories: no barriers, a low number of barriers, and a moderate-to-high number of barriers. A set of relevant variables was also included in the analytic models as dichotomous covariates.

Data Analysis

The study participants' experiences in providing preventive dental services were descriptively reported. Our analyses included the distribution of the providers' status (was ever an obstacle or was an obstacle but was overcome) for each of the 11 items. For bivariate analyses, χ^2 tests were performed to determine the association between adoption and the categories established for the number of barriers

TABLE 1 Characteristics of the Practices and Providers Comprising the Study Population

Characteristic	Full Sample (N = 231) ^a	Included in Observations (N = 205)
Practitioner type, %		
Pediatrician	41.1	43.9
Family physician	12.1	12.2
Nurse practitioner	8.7	9.2
Physician's assistant	5.6	6.3
Nurse	28.6	24.3
Resident	0.9	0.9
Other	3.0	2.9
Provider gender, %		
Male	28.7	30.7
Female	71.3	69.2
Years in practice, %		
0–4 y	25.6	27.8
≥5 y	74.4	72.2
Busyness factor, mean	3.8	3.7
Frequency of decay seen in infants and toddlers, %		
≥1 child per mo	80.8	81.4
<1 child per mo	19.2	18.5

^a Minimum sample size equals 223 because of missing information.

(none, low, and moderate-to-high) for each of the barrier categories and overall.

We used multivariate logistic regression to test our hypotheses that adopters would have fewer obstacles and that they would be more successful in overcoming them. The distribution of the respondents according to adoption status (full adopters: 65.5%; partial adopters: 10.3%; and nonadopters: 24.1%) did not allow for modeling the adoption status according to these 3 distinct categories. Bivariate analyses determined that partial adopters were more similar to nonadopters than full adopters in terms of reported barriers; thus, partial adopters were grouped with the nonadopters in our models. We tested 2 regression models. First, we modeled the effects of the number of reported barriers in each of the knowledge, attitudes, and external-barrier categories on fully adopting the preventive dental services that comprised the IMB intervention. With the second regression model we examined the effects of overcoming the barriers to adoption in the subset of respondents who reported 1 or more

TABLE 2 Percentage of Providers Reporting Each Item as a Barrier and That the Barrier Was Overcome

Barrier to Adoption of Services	Reported as a Barrier		Barrier Overcome	
	Sample Size, n	%	Sample Size, n	%
Knowledge				
I lack enough knowledge about these dental preventive services to use them effectively with patients.	226	14.6	33	84.8
Attitudes				
Applying fluoride varnish is difficult.	226	28.8	65	61.5
Infants and toddlers in my practice have too many problems other than tooth decay.	223	14.8	33	39.4
There is a lack of parental interest in these services.	225	13.0	29	34.5
I do not think these dental preventive services are effective for my patients.	223	1.6	3	33.3
External factors				
It has been difficult to integrate these dental procedures into my practice routine.	228	42.1	96	46.9
There has been resistance to implementing these procedures among colleagues and staff in my office.	225	25.8	58	51.7
Referral for dental problems is difficult; therefore, I prefer not to screen.	224	21.0	47	40.4
The reimbursement fee is insufficient.	223	6.3	14	50.0
There are few Medicaid children under the age of 3 y in my practice.	229	6.1	14	21.4
I do not see enough dental decay to warrant providing these services.	229	3.1	7	42.9

barriers in any category. Adoption status (full versus nonadopters or partial adopters) was predicted by the proportion of barriers that were reported as “overcome,” and was classified as “none,” “some but not all,” and “all.” The barriers in each of the 3 categories (knowledge, attitude, and external factors) were entered incrementally into the models as blocks to test for relative improvements in model fit by using the likelihood ratio test.

In both regressions we controlled for appropriate provider and practice characteristics, each of which was modeled as a dichotomous dummy variable. No statistical interactions were evaluated in the regression models because of the small sample sizes. Robust SEs were estimated to correct for the potential presence of heteroscedasticity that could arise if observations within practices were correlated with each other by using the Huber method.²⁶ All analyses were performed by using Stata statistical software (Stata Corp, College Station, TX).

RESULTS

The study sample comprised 231 providers in 28 family physician practices and 49 pediatric practices who completed follow-up surveys. The bivariate and multiple-regression analyses included 205 respondents (76 practices) who had nonmissing values for all of the variables included in the analysis. The samples used for the descriptive analysis ($n = 231$) and the bivariate or multivariate analyses ($n = 205$) differed little according to the characteristics that were used as control variables (Table 1).

Descriptive results for each of the 11 barriers are presented for the overall sample in Table 2. A lack of knowledge presented the least difficulty for providers and was the most frequently overcome barrier. The item that was reported most frequently as a barrier was difficulty in integrating the dental procedures into practice routines (42.1%), followed by difficulty in applying varnish (28.8%), resistance among

TABLE 3 Percentage of Providers Who Fully Adopted Preventive Dental Services, According to the Number of Barriers and Barrier Category

Barrier Category	Sample Size, <i>n</i>	Fully Adopting Providers, %	<i>P</i>
Knowledge			
None	175	73.7	
1	30	50.0	.008
Attitudes			
None	121	79.3	
Low number	53	62.2	
Moderate-to-high number	31	48.3	.001
External factors			
None	88	90.9	
Low number	44	61.3	
Moderate-to-high number	73	50.6	<.001
Overall			
None	69	92.7	
Low number	73	69.8	
Moderate-to-high number	63	46.0	<.001

N = 205 observations.

office personnel (25.8%), and difficulties in referring children in need of a dentist (21.0%). Of the 4 most common barriers, fluoride application was the most frequently overcome (61.5%). Only 40% to 52% of the respondents were able to overcome the other barriers.

Nearly 3 of every 4 providers (65.5% for full sample; 70.2% for analytical sample) were classified as full adopters. The full and partial adopters took an average of 4.48 and 7.04 weeks, respectively, after training to first try the procedures. The full adopters then began providing the services on a routine basis almost immediately at 4.87 weeks, or slightly more than 1 month after training. Barriers in each of the 3 categories and overall were associated at a statistically significant level with the percentage of adopting providers (Table 3). As the number of barriers increased for all 3 categories, the percentage of adopting providers decreased. The regression analysis (Table 4) confirmed the importance of the number of barriers that were classified as attitudinal or external factors in adoption, but knowledge was no longer associated with adoption. The

TABLE 4 Logistic Regression Results of the Effects of Different Levels of Attitude and External Barriers on the Odds of Being a Full Adopter (Versus a Partial or Nonadopter)

Variable	Effect	
	Odds Ratio (SE) ^a	95% CI
Knowledge barriers	0.71 (0.33)	0.28–1.79
Attitude barriers		
Low number (>0.00, ≤0.33) vs none	0.74 (0.32)	0.32–1.74
High number (>0.33–1.00) vs none	0.40 (0.20) ^b	0.15–1.07
External barriers		
Low number (>0.00, ≤0.25) vs none	0.15 (0.08) ^c	0.05–0.44
High number (>0.25–1.00) vs none	0.12 (0.06) ^c	0.04–0.34
Control variables		
Busyness factor (medium or high vs low)	0.69 (0.31)	0.28–1.67
Practitioner type (physician vs other)	1.25 (0.54)	0.54–2.91
Frequency with which decay was seen (≥1 vs <1 child per mo)	3.44 (1.50) ^c	1.46–8.08
Gender (male vs female)	0.92 (0.40)	0.39–2.14
Years in practice (≥5 vs <5 y)	0.71 (0.30)	0.30–1.71

N = 205 observations. CI indicates confidence interval.

^a Robust SEs are shown in parentheses.

^b Statistically significant at the 10% level.

^c Statistically significant at the 1% level.

regression analysis also confirmed that external factors had a more important influence compared with other barriers.

The bivariate analysis showed that ordinal categories for the number of attitudinal and external barriers that were overcome were strongly associated with adoption of the program (Table 5). The logistic regression (Table 6), in which we incrementally added the barriers in 3 blocks while adjusting for the control variables, confirmed that overcoming a lack of knowledge was not important in adoption at a statistically significant level, but that overcoming attitudes and external factors was important. The effect (odds ratio: 0.08; [95% confidence interval: 0.01–0.44]) of not overcoming any external barriers, as displayed in model 3 in Table 6, was particularly detrimental to adoption.

DISCUSSION

This study has 2 primary limitations. The providers who enrolled in this trial can be considered to be early adopters, because they were among the initial practices choosing to participate in the new preventive dentistry pro-

TABLE 5 Percentage of Providers Who Fully Adopted Preventive Dental Services, According to the Number of Barriers Overcome Among Those Providers Who Reported 1 or More Barriers in the Category

Barriers Overcome	Sample Size, <i>n</i>	Fully Adopting Providers, %	<i>P</i>
Knowledge			
None	5	40.0	
All	25	52.0	.624
Attitudes			
None	35	40.0	
Some but not all	8	50.0	
All	41	73.1	.013
External factors			
None	50	30.0	
Some but not all	23	65.2	
All	45	77.2	<.001
Overall			
None	44	36.3	
Some but not all	38	57.8	
All	54	77.7	<.001

N = 136 observations.

gram. They were also enrolled in a trial that targeted practices with a large volume of Medicaid patients. Providers reported seeing much more decay than is generally reported in national surveys, likely because of this enrollment criterion.²¹ For these reasons,

TABLE 6 Logistic Regression Results of the Effect of Overcoming Barriers on the Odds of Being a Full Adopter (Versus a Partial or Nonadopter) Among Those Providers With 1 or More Barriers

Variable	Model 1, OR (95% CI) ^a	Model 2, OR (95% CI)	Model 3, OR (95% CI)
Knowledge			
None overcome vs no barriers	0.47 (0.08–2.48)	0.62 (0.10–3.81)	1.24 (0.20–7.57)
All overcome vs no barriers	0.59 (0.23–1.49)	0.56 (0.20–1.56)	0.52 (0.15–1.85)
Attitude barriers			
None overcome vs no barriers	^b	0.37 (0.14–0.97) ^c	0.60 (0.20–1.77)
Some overcome vs no barriers	^b	0.54 (0.10–2.88)	0.42 (0.07–2.51)
All overcome vs no barriers	^b	1.78 (0.22–4.53)	0.96 (0.30–3.09)
External barriers			
None overcome vs no barriers	^b	^b	0.08 (0.01–0.44) ^d
Some overcome vs no barriers	^b	^b	0.34 (0.06–1.77)
All overcome vs no barriers	^b	^b	0.53 (0.10–2.88)
Control variables			
Busyness factor (medium or high vs low)	0.60 (0.25–1.43)	0.49 (0.20–1.20)	0.68 (0.25–1.83)
Practitioner type (physician vs other)	1.14 (0.47–2.72)	1.44 (0.57–3.59)	1.37 (0.51–3.63)
Frequency with which decay seen (≥ 1 vs < 1 child per mo)	2.26 (0.91–5.63)	2.01 (0.76–5.29)	1.87 (0.66–5.27)
Gender (male vs female)	1.10 (0.46–2.62)	1.01 (0.42–2.42)	1.30 (0.52–3.23)
Years in practice (≥ 5 y vs < 5 y)	0.60 (0.24–1.49)	0.59 (0.23–1.48)	0.64 (0.22–1.81)
Log likelihood, degrees of freedom	–88.49, 8	–83.63, 11	–74.19, 14
Likelihood ratio χ^2 statistic, P^e	1.57, .456	9.72, .021	18.87, $< .001$
McFadden's R^2	0.03	0.09	0.19

N = 136 observations. CI indicates confidence interval.

^a The 95% confidence intervals were adjusted for clustering of observations within practices.

^b Variable not included in the model.

^c Statistically significant at the 5% level.

^d Statistically significant at the 1% level.

^e Restricted models that were used for comparison included the control variables and constant for model 1, with the addition of knowledge variables for model 2 and knowledge and attitude variables for model 3.

providers may have been more motivated to overcome barriers to adoption and implementation, thereby limiting the external validity of the findings. A second limitation is that all of the information used in this study was self-reported and, thus, was subject to recall biases.

We found a high level of adoption and implementation among providers who responded to the follow-up survey. Approximately 70% of the respondents reported providing services on a regular basis only 12 months after being introduced to the innovation through training. Not only were provider adoption and implementation rates high, but providers were also able to adopt the innovation and start providing it on a regular basis in a short amount of time. Only a little more than 1 month elapsed before adoption occurred at the practice and provider levels, and

institutionalization, defined for our purposes as providing the service on a regular basis, occurred almost simultaneously with adoption.

According to existing frameworks and empirical evidence, successful primary care practice change efforts must address a number of factors both within and beyond the practice.^{27–30} We found that some types of barriers were more important than others. Two of the most commonly reported barriers (difficulty in integrating procedures into practice routines and resistance from colleagues and staff) require practice-level changes. One of the other more common barriers was related to attitudes about the process of care, such as difficulty in applying fluoride to the teeth. We discuss each of these barriers below and provide recommendations to help overcome them, which are in-

formed by our experiences with this innovation.

Integrating the Preventive Dental Procedures Into Practice Routines

Difficulty integrating the oral health preventive procedures into practice routines was the primary obstacle that providers reported. During interactions with the study participants and others, we observed that major contributing factors in this area were insufficient time to plan for change or provide services, practice procedures, and practice turmoil.

The most common concern expressed by staff was an insufficient amount of time to integrate the oral health services into the practice. Lewis et al¹⁹ also found this factor to be a major concern among the 12 practices included in their qualitative study of fluoride varnish, and it is a commonly expressed constraint for practice change in primary care in general.¹⁶ Most of the providers we observed did not believe that they had the option, and others did not seem to have the desire to alter patient scheduling to allow more time for providing oral health services. One reason for this belief is that providers often overestimated the amount of time required to provide these services, particularly fluoride application. Adequate training, including demonstration of the clinical procedures during courses and in-office visits, is invaluable in addressing this concern. The reimbursement rates provided by state Medicaid programs also need to adequately cover the cost of supplies and an average visit of approximately 5 minutes, which are necessary to deliver comprehensive oral health services.

The providers who were the most successful in introducing these services into their practices made several important changes in their office procedures. Table 7 lists some of the impor-

TABLE 7 Recommendations for In-Office Systems for Implementing an Oral Screening and Fluoride Varnish Program

1. Train everyone in the practice. Implementation will be smoother if everyone is on the same page.
2. Choose a coordinator who is responsible for monitoring and ordering supplies, replenishing parent educational materials, and updating information on dental referral sources.
3. Designate the staff person responsible for each of the clinical services (screening and referral, counseling, and fluoride therapy).
4. Package supplies in a kit, such as a plastic container, for easy transport.
5. Keep supplies in a central location where they can be easily picked up and taken to the examination room with the patient. If you choose to keep supplies in the examination room, make sure they are stored properly.
6. Identify eligible patients on the daily schedule or by flagging the chart, which will set the process in motion as soon as the patient arrives.
7. Check patient eligibility at every encounter to prevent missed opportunities.

tant steps that helped to ensure that eligible patients received services at most visits.

Practice turmoil was also a factor in the lack of adoption or in adoption delays. Physician and staff turnover resulted in the loss of some providers who were trained and committed to providing the oral health services. Office relocation was reported by several practices as the reason for a lack of or a delay in adoption. Ten of the 118 practices in the RCT delayed adoption for >12 months after training because of practice disruptions. This type of practice turmoil has been identified by other investigators as a major barrier to practice change efforts.³¹ This observation suggests that the intervention must be carefully timed to be successful and that follow-up is often necessary.

Resistance by Staff and Colleagues

Resistance by staff and colleagues to adopt these procedures was reported as a barrier by 25.8% of the sample and only slightly more than

one half were able to overcome this obstacle. As mentioned before, time constraints and the possibility of an increase in workload were the most common reasons for this resistance. An incentive system was 1 strategy that was used to overcome staff resistance. Physicians performed the oral screenings but delegated the fluoride-varnish application to a nurse, who received a specified dollar amount for each fluoride treatment. Under this system, nurses checked charts for eligibility more often, which resulted in fewer missed opportunities. Another strategy was to identify and cultivate an oral health “champion” in each practice. This person often took the initiative of introducing the services to the practice, scheduling training, allocating time to planning the incorporation of the intervention into the practice routine, and overseeing the implementation of the changes needed to provide these services.

Applying Fluoride Varnish

The third most commonly reported barrier was difficulty in applying the fluoride varnish, which was second only to knowledge in the percentage of respondents who were able to overcome this barrier. Because fluoride application is an integral but less-flexible aspect of the recommended procedures in a comprehensive preventive dentistry program for medical providers, it is important to anticipate the difficulties that might arise with this procedure and include possible solutions in training sessions.

Establishing access to the oral cavity is a key element to the fluoride-varnish application. This access is usually approached from behind the patient’s head, rather than face-on approaches to which physicians are

usually accustomed. A provider should sit knee-to-knee with the parent, with the child’s head in the provider’s lap. In this position, the provider can view the oral cavity similar to the way a dentist does and is able to perform the oral screening and apply varnish with the parent restraining the child’s arms and legs. A number of training materials demonstrating this procedure are available.^{8,32}

Research has suggested that interactive workshops and small-group discussions can be effective in changing primary care providers’ behaviors.³³ For in-office training, we requested that a child patient be present for demonstration purposes. When it is not possible to have a child present at the training, a dentiform is used to demonstrate the fluoride-varnish procedure and allow providers to practice applying the fluoride. We also give each practice a starter kit of supplies so that they can immediately start trying out the procedure while their enthusiasm is the greatest.

CONCLUSIONS

This study revealed a number of barriers in primary care medical practices that are associated with the adoption and implementation of preventive dental procedures. We also found that a substantial proportion of these barriers can be overcome, leading to high adoption rates in a relatively short amount of time. The barriers to adoption are similar to those identified in the general adoption and implementation and quality-improvement literature, with unique aspects of this study relating to the clinical procedure of topical fluoride application. Those who plan preventive dental programs for primary

health care settings should rely heavily on strategies discussed in the theoretical and empirical literature to improve patient care, particularly preventive services.

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Sometimes Records Should Not Be Broken: The Wall Street Journal recently reported (December 29, 2009) that the record for consecutive hours of television watching was set in 2009 by Jessica Mosley, a 26-year-old education coordinator from Baltimore. Mosley watched 70 straight hours of TV without sleeping to set this national record last New Year's day. This year on January 1, she competed with others to break the record and win the annual Ultimate Couch Potato award from the ESPN Zone eating establishment. As it turned out, her fellow competitors tired out quickly, making her a winner in just under 33 hours. When television viewing becomes a spectator sport unto itself, it is only a matter of time until major networks jockey to cover this event from the opening program to the last viewer still blinking. We can only hope that among the prizes given to future winners there is a copy of the AAP's policy on television viewing with the recommendation that watching TV be limited to an hour a day. And, we can hope that children and adults strive to do what the policy says, and not what Mosley does, as she strives to beat her record next year.

Noted by JFL, MD

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