

Oral Health and Pediatricians: Results of a National Survey

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Objective.—Pediatricians have regular opportunities to perform screening dental examinations on young children and to educate families on preventive oral health. We sought to assess pediatricians' current attitudes and practices related to oral health of children 0–3 years old.

Methods.—A Periodic Survey of Fellows, focused on oral health in pediatricians' office settings, was sent to 1618 postresidency fellows of the American Academy of Pediatrics.

Results.—The response rate was 68%. More than 90% of pediatricians said that they should examine their patients' teeth for caries and educate families about preventive oral health. However, in practice, only 54% of pediatricians reported examining the teeth of more than half of their 0–3-year-old patients. Four percent of pediatricians regularly apply fluoride varnish. The most common barrier to participation in oral health-related activities in their practices was lack of training, which was cited

by 41%. Less than 25% of pediatricians had received oral health education in medical school, residency, or continuing education. Most pediatricians (74%) reported that availability of dentists who accept Medicaid posed a moderate to severe barrier for 0–3-year-old Medicaid-insured patients to obtain dental care.

Conclusions.—Pediatricians see it within their purview to educate families about preventive oral health and to assess for dental caries. However, many pediatricians reported barriers to fully implementing preventive oral health activities into their practices. Pediatricians and dentists need to work together to improve the quality of preventive oral health care available to all young children.

KEY WORDS: education; oral health; pediatrician; practice; medical practice

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Since publication of *Oral Health in America: A Report of the Surgeon General* in 2000,¹ there has been increasing emphasis on the integral nature of oral health to overall health. With that has come attention to medical providers' role in oral health. Pediatricians are well suited to incorporate oral health into their practice because they see young children regularly and often during the first 3 years of life. Oral health anticipatory guidance fits nicely with pediatricians' emphasis on prevention and early establishment of lifelong healthy habits. The pediatrician's role in oral health was formalized with the 2003

American Academy of Pediatrics (AAP) policy statement, *Oral Health Risk Assessment Timing and Establishment of the Dental Home*,² which recommended that pediatricians and other pediatric primary care providers incorporate preventive oral health education into their practices and that children undergo an oral health risk assessment by a pediatrician or pediatric primary care providers by 6 months of age. This role was further reinforced with the AAP Policy statement, *Preventive Oral Health Interventions for Pediatricians*, published in 2008.³

There are other reasons why pediatricians include oral health within their practice. As described in detail in this issue, children face obstacles to professional dental care, including a limited dental workforce to deliver preventive oral health services to young children, particularly those who are uninsured or publicly insured.^{4,5} National data indicate that few general dentists treat children under 4 years of age.⁶ This limitation in access to care is in part the result of inadequate dental school training in the care of infants and toddlers,⁷ poor Medicaid reimbursement, and maldistribution of workforce, with the majority of dental practices located in metropolitan areas. Access to pediatric medical care is not as fraught with these same challenges; even children who cannot find a dentist almost always have access to pediatric well-child care.⁸ Thus, pediatricians' involvement in oral health is also motivated by the possibility that young

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children may not have any other source of preventive dental attention.

We sought to better understand pediatricians' current attitudes and practices related to oral health of children 0–3 years old. With this in mind, the objectives of this study were to examine the extent of pediatricians' current oral health risk assessment and counseling, their perceived ability to perform these tasks, and their attitudes toward their role in oral health risk assessment and counseling. We also examined barriers to providing oral health care, including obstacles to young patients obtaining care from a dentist and the influence of receipt of oral health instruction.

METHODS

Data were collected via the AAP Periodic Survey of Fellows, which informs policy, developing initiatives, and modifying or evaluating existing projects.⁹ In 2008, Periodic Survey #70 focused on oral health within pediatric practices. Survey items were developed by the AAP Division of Health Services Research in conjunction with experts from the AAP Partnership to Reduce Oral Health Disparities in Early Childhood Project Advisory Committee. The survey addressed pediatricians' practices and barriers to oral health assessment as well as counseling and referrals among patients from birth to 3 years of age.

The survey was an 8-page self-administered questionnaire sent to a random sample of 1618 nonretired, US post-training members of the AAP. The original survey and 6 follow-up mailings to nonrespondents were sent from October 2007 to March 2008. A \$2 bill was included in the first mailing. Subjects were asked how often and to what proportion of their patients they provided oral health screening. They were also asked to rate their ability to perform oral health screening and to counsel about preventive oral health. Finally, they were asked whether they believed physicians had a role in performing oral screening examinations and providing oral health anticipatory guidance. Barriers to their patients' receipt of dental care were assessed. Questions about pediatricians' practice characteristics included practice type and setting, and proportion of patients insured by Medicaid/State Children's Health Insurance Program (SCHIP) ($\geq 37\%$, high, vs $< 37\%$, low).

Data were analyzed by SPSS statistical software, version 14.0 (SPSS, Chicago, Ill). The χ^2 analysis was used to examine the association of pediatricians' personal and practice characteristics with providing oral health risk assessment and counseling, as well as barriers to providing oral health assessment and counseling, and referral to a dentist.

RESULTS

Characteristics of Respondents

After 7 mailings, 1103 completed questionnaires were returned, a response rate of 68.2%. Analyses were limited to the 698 postresidency pediatricians (63% of all respondents) who provide health supervision. The average respondent was in his or her 40s and worked full-time in

Table 1. Characteristics of Posttraining Respondents Who Provide Health Supervision (N = 698)

Variable*	Response (%)
Mean age, y	46.6
Gender, % female	55.6
Practice location	
Rural	14.6
Suburban	48.3
Urban (not inner city)	21.7
Inner city	15.4
Practice setting	
Solo/2 physician	21.1
Group/HMO	58.2
Hospital/clinic	20.7
Estimated percentage of patients who are Medicaid/SCHIP insured	37.5
Average number of hours per week in direct patient care	38.5
Received formal education in oral health	
Any	35.8
During medical school	13.1
During residency	15.8
Post-residency	21.7

*HMO = health maintenance organization; SCHIP = State Children's Health Insurance Program.

direct patient care (Table 1). Most practiced in suburban communities and in group practices.

Training in Oral Health Care

Approximately 36% of respondents reported previous oral health training: 13% had received at least some during medical school, 16% during residency and 22% after residency. The most common post-residency education took the form of journal articles (60%). About one-fourth of pediatricians said they were very interested in a continuing medical education course on pediatric oral health, while 41% were moderately interested, 29% were slightly interested, and 7% said they were not interested.

Perceptions of Oral Health Tasks in Primary Care

Most pediatricians (73%) reported that a quarter or less of their patients had experienced moderate to severe dental problems during the past year, while another 24% of pediatricians indicated that 25% to 50% of their patients had moderate to severe dental problems. About half of the pediatricians said that they examined the majority of their 0–3-year-old patients for dental caries, and a quarter assessed for plaque (Table 2). Nearly all pediatricians (91%) agreed that they should evaluate children for dental caries, and 65% agreed they should do so for visible plaque; however, only 41% and 23%, respectively, rated their ability to identify these conditions as very good or excellent. More than 80% of pediatricians were confident in their ability to deliver preventive oral health education about diet to parents, but only about half felt confident on instructing parents in toothbrushing. Only 4% of pediatricians indicated that they or their staff applied fluoride varnish to a majority of young patients; 19% said pediatricians should perform this task, but only 8% were confident in their ability to do so.

Table 2. Perceived Ability to Perform Oral Screening, Education, and Preventive Tasks in Children From Birth to 3 Years Old

Task	Perceptions and Experiences of Pediatricians Caring for 0–3-Year-Olds		
	Should Perform Task, %	Actually Perform Task on More Than Half of Patients, %	Good or Excellent Confidence in Ability, %
Identify teeth with dental caries	91.4	54.4	41.5
Identify plaque	64.7	25.0	22.9
Inform parents on the oral health effects of putting their child to bed with a bottle	99.3	82.1	89.0
Inform parents on the oral health effects of sugary food and drink.	97.3	77.1	83.3
Inform parents on how to brush their children's teeth correctly	84.9	51.7	52.5
Apply or have your staff apply fluoride varnish	19.2	3.8	7.7
Assess parents' oral health	32.5	22.1	18.4

Seventeen percent of pediatricians said the first dental visit should occur by 1 year and 29% by 2 years of age, while about half of respondents believed that the first dental visit should occur for healthy children at 3 years of age. During the past year, 7% of pediatricians recommended to *all* patients ≤ 12 months of age that they visit a dentist for an oral examination, although 42% recommended a dental visit to *some* parents of patients ≤ 12 months.

Perceived Barriers to Oral Health Care for Pediatricians and Patients

Pediatricians identified the following as moderate to significant barriers that interfere with their participation in oral health–related activities: lack of oral health training (41%), inadequate time during health supervision visits (35%), and inability to bill separately for oral health assessment or counseling (34%). As for their patients, pediatricians reported that their 0–3-year-old patients faced a variety of barriers to obtaining professional dental care (Table 3). The most common included a perceived lack of dentists who accept Medicaid/SCHIP for dental care, patients without dental insurance and/or unable to pay for dental care, parents not viewing dental visits as neces-

sary for children ≤ 3 years old, and difficulty finding dentists to care for young children. Pediatricians with more Medicaid/SCHIP patients were significantly more likely to report barriers that interfered with their patients' access to dental care.

Relationship Between Oral Health Training and Barriers to Providing Oral Health Care

Pediatricians who had received no training in oral health care, compared with those who had, were more likely to cite lack of oral health training as a barrier to their providing oral health care to patients ≤ 3 years of age. (44% no training vs. 35% any training, $P < .05$). There was no relationship between amount of prior oral health training and the following: propensity to provide oral health screening/counseling, attitude toward oral health assessment/counseling, or perceived ability to perform oral health tasks.

DISCUSSION

These results indicate that pediatricians see it within their purview to educate families about preventive oral health and to assess patients for dental caries. However, relatively fewer respondents reported actually performing oral health–related activities. This discrepancy highlights the complexity of adopting new practices and adhering to recommendations. Lack of confidence in one's abilities, particularly for performing a dental examination and applying fluoride varnish, seems to diminish the likelihood that a pediatrician will actually perform a task that he or she believes should be done. Relative to counseling about and assessing for caries, substantially fewer pediatricians participate in fluoride varnish application or referral of patients for dental care by 1 year of age. Consistent with previous surveys,¹⁰ pediatricians continue to view lack of dentist availability as a formidable barrier to their patients accessing recommended dental care. More than three-quarters of pediatricians surveyed in this project reported that availability of dentists who accept Medicaid posed a moderate to severe barrier for 0–3-year-old Medicaid-insured patients to obtain dental care. It is not surprising that pediatricians encounter difficulty for their Medicaid-insured patients to obtain dental care; young age and Medicaid insurance are 2 separate but related barriers to dental care access.²

Table 3. Perceived Barriers to Dental Care for Children 0–3 Years Old

Potential Barrier to Dental Care*	Pediatricians Reporting This to Be a Moderate to Significant Barrier for Their Patients (%)†
Dentists not accepting Medicaid/SCHIP patients	73.9%
Patients' lack of dental insurance/inability to pay	71.9
Dentists' nonparticipation in patients' dental insurance plan	60.6
Parents not perceiving dental visits as necessary	51.7
Lack of dentists who provide care for this young age group	39.9
Wait times for appointments	31.8
Transportation problems getting to dentist's office	22.0
Length of travel time to dentist's office	21.0

*SCHIP = State Children's Health Insurance Program.

†For all, this was found to be significantly more likely to be cited as a barrier by pediatricians with $\geq 37\%$ of their patients being Medicaid insured ($P \leq .01$).

Two previous US national surveys on oral health have included pediatricians. Lewis and colleagues¹¹ surveyed 1600 pediatricians in 1999 (62% response rate), and Ismail and colleagues¹² surveyed 1500 family physicians and 1000 pediatricians in 2000 (52% response rate for pediatricians). These 2 surveys and the one we describe here all identified similarly high proportions of pediatricians who believe that oral health prevention and assessment of teeth for cavities should be included in well-child care. With regards to the first dental visit, 15% of pediatricians in the survey of Lewis and colleagues and 14% of pediatricians in the survey of Ismail and colleagues supported referral of all children to the dentist by 1 year of age compared to 17% found in this survey. Ismail and colleagues found that 63% of pediatricians reported that sometime around the third birthday was the appropriate time for the first dental visit, whereas half of pediatricians in this current survey supported a first dental visit at 3 years of age. Ismail and colleagues specifically worded this question to pertain to children at low risk of caries, and this may be why more pediatricians in his survey favored 3 years of age for the first dental visit. Lewis and colleagues reported similar fluoride varnish participation levels in 1999 as were found in the present survey. In 1999, 21% of pediatrician respondents said that fluoride varnish application should be part of well-child, care compared to 19% currently.

Although pediatricians clearly support preventive oral health, their involvement in oral health activities continues to lag their commitment. The most cited barrier to these pediatricians' further involvement in oral health was lack of training. It is possible that many of the pediatricians who responded to this survey are too far removed from their formal training to have benefited from a more recent emphasis on oral health in and after pediatric residency. This was evident, for example, in that only 16% of respondents said they had received oral health training in residency. Meanwhile, in 2008, Caspary and colleagues¹³ reported that 65% of graduating pediatric residents reported at least some exposure to formal oral health education during their residency. A number of factors have facilitated increasing attention to oral health during residency training. For example, since 2007, the program requirements for pediatric residencies have stated that residents should be able to "implement age-appropriate screening, including oral health."¹⁴ Furthermore, oral health questions are now included in the pediatric board certification examination.

We had expected that more pediatricians would be referring children to the dentist at an earlier age and providing fluoride varnish, given increased attention to oral health in the last 10 years and current recommendations for the first dental visit by age 1 year. However, there has been little change from previous survey results in the proportion of pediatricians who refer children to the dentists by 1 year or who apply fluoride varnish to their patients. Underlying reasons for the lack of change involve more than just training or knowledge deficits. Rogers¹⁵ described 5 characteristics of an innovation that influenced its adoption: relative advantage, compatibility, complexity, observability,

and trialability. It is possible that pediatricians do not support referring patients to dentists by year 1 because it is not compatible with local availability of dentists to care for very young children or because doing so may not be consistent with pediatricians' beliefs about the benefit of an early dental visit for all children. Both of these factors have previously been documented to influence pediatricians' beliefs about the appropriate age for their first dental visit.¹¹

Practicing pediatricians who responded to this survey seemed to face particular challenges when it came to adopting fluoride varnish.¹⁶ There are numerous logistical steps that must take place within a pediatrician's office before fluoride varnish can be applied to a patient. However, pediatricians must first have opportunities to learn about (ie, observability) and practice (ie, trialability) fluoride varnish. In the absence of idea champions who successfully model fluoride varnish use in pediatric practice, other pediatricians may not be familiar or comfortable enough with this caries-prevention entity to successfully adopt it. Previous research has indicated that pediatricians worry about this taking too much time and decreasing their overall efficiency.¹⁵ In states where physician reimbursement is possible, Medicaid is typically the only provider that will pay for fluoride varnish. Pediatric offices must identify Medicaid-insured patients and flag them as candidates to receive fluoride varnish.¹⁶ This has proven complicated for many offices and is also incompatible with the way that most pediatricians practice; ie, pediatricians often do not know the insurance status of individual patients.^{16,17}

In Washington State, pediatricians and other pediatric primary care providers have recently been allowed to bill Medicaid for additional oral health services for their patients under 6 years. These billable activities include oral dental screening examination, provision of family oral health education, and fluoride varnish application. Medicaid reimbursement totals approximately \$70 if all of these are performed. This program has not been in place long enough to be evaluated, but it will be interesting to see whether some of the previous barriers to pediatric primary care providers involvement in oral health activities can be overcome through higher reimbursement.

There are certain limitations to this research. As with any survey, there is the potential for responder bias. Although the response rate of 68% is higher than average for physician surveys, it is possible that the nonrespondents had different experiences and opinions regarding oral health in pediatric practice. Second, in an effort to provide a more desirable response, some pediatricians may have overestimated the frequency with which they participate in oral health preventive activities in their practices. In addition, some questions asked for providers' perceptions, and their responses may not represent patients' actual experiences.

Optimally, focus on primary and secondary preventive oral health should occur for all children at both the pediatricians' and dentists' offices. Each specialty has an advantage that enables them to provide specific attention to certain aspects of oral health for young children. Pediatricians establish early relationships with patients and their

parents, and they are trusted sources of preventive advice starting from birth, while dentists are uniquely able to provide definitive treatment for dental disease. The 2 specialties need to work collaboratively to ensure that the oral health needs of all of their patients are met. Such an ideal oral health care system requires further integration of oral health into medical school, pediatric residency and continuing medical education curriculums, appropriate resources, better communication between dentists and pediatricians, and changes to our health care financing and insurance structure so all children have equity in accessing dental care.

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REFERENCES

1. US Department of Health and Human Services. *Oral Health in America: A Report of the Surgeon General*. Rockville, Md: US Department of Health and Human Services, National Institute of Dental and Craniofacial Research, National Institutes of Health; 2000.
2. Hale KJ. Oral health risk assessment timing and establishment of the dental home. *Pediatrics*. 2003;111(5 pt 1):1113–1116.
3. Crall JJ, Krol DM, Lee JY, et al. Policy Statement. Preventive oral health intervention for pediatricians. *Pediatrics*. 2008;122:1387–1394.
4. Smith RG, Lewis CW. Availability of dental appointments for young children in King County, Washington: implications for access to care. *Pediatr Dent*. 2005;27:207–211.
5. DHHS Office of Inspector General. Children's Dental Services Under Medicaid: Access and Utilization. San Francisco, Calif: Office of Evaluation and Inspections; April 1996. Document OEI-09-93-00240.
6. Seale NS, Casamassimo PS. US predoctoral education in pediatric dentistry: its impact on access to dental care. *J Dent Educ*. 2003;67:23–30.
7. McWhorter AG, Seale NS, King SA. Infant oral health education in US dental school curricula. *Pediatr Dent*. 2001;23:407–409.
8. Lewis CW, Johnston BD, Linsenmeyer KA, et al. Preventive dental care for children in the United States: a national perspective. *Pediatrics*. 2007;119:e544–e553.
9. American Academy of Pediatrics. Periodic Survey of Fellows. Available at: <http://www.aap.org/research/periodicsurvey/>. Accessed June 11, 2009.
10. dela Cruz GG, Rozier RG, Slade G. Dental screening and referral of young children by pediatric primary care providers. *Pediatrics*. 2004;114:e642–e652.
11. Lewis CW, Grossman DC, Domoto PK, Deyo RA. The role of the pediatrician in the oral health of children: A national survey. *Pediatrics*. 2000;106:E84.
12. Ismail AI, Nainar SM, Sohn W. Children's first dental visit: attitudes and practices of US pediatricians and family physicians. *Pediatr Dent*. 2003;25:425–430.
13. Caspary G, Krol DM, Boulter S, et al. Perceptions of oral health training and attitudes toward performing oral health screenings among graduating pediatric residents. *Pediatrics*. 2008;122:e465–e471.
14. Accreditation Council for Graduate Medical Education (ACGME) program requirements for graduate medical education in pediatrics. June 17, 2007. Available at: http://www.acgme.org/acWebsite/downloads/RRC_progReq/320_pediatrics_07012007.pdf. Accessed September 15, 2009.
15. Rogers EM. *Diffusion of Innovations*. 5th ed. New York, NY: The Free Press; 2003.
16. Lewis C, Lynch H, Richardson L. Fluoride varnish use in primary care: what do providers think? *Pediatrics*. 2005;115:e69–e76.
17. Tinanoff N, Kanellis MJ, Vargas CM. Current understanding of the epidemiology mechanisms, and prevention of dental caries in preschool children. *Pediatr Dent*. 2002;24:543–551.