Ohio dentists' awareness and incorporation of the dental home concept

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Dental caries is the most common chronic childhood disease in the United States,[1] and the dental home concept has been suggested as a possible strategy for the prevention and management of this disease.[2,3] The American Academy of Pediatric Dentistry (AAPD) initially adopted a policy in 2001[4] and further defined the dental home in 2006 as "the ongoing relationship between the dentist and the patient, inclusive of all aspects of oral health care delivered in a comprehensive, continuously accessible, coordinated and family-centered way. Establishment of a dental home begins no later than 12 months of age and includes referral to dental specialists when appropriate."[5] The dental home concept includes the need for dentists to identify and mitigate oral disease

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ABSTRACT

Background. The authors measured the awareness of the dental home concept among pediatric dentists (PDs) and general practice dentists (GPs) in Ohio and determined whether they included dental home characteristics for children 5 years and younger into their practices.

Methods. The authors sent a pretested 20-question survey to all Ohio PDs and to a random sample of approximately 20 percent of GPs in Ohio. The authors designed the survey to elicit information about dental home awareness and the extent to which dental home characteristics were incorporated into dental practices.

Results. More than 90 percent of both GPs and PDs incorporated or intended to incorporate into their dental practices the specific dental home characteristics mentioned in 20 of 41 items related to dental home characteristics. Of the respondents who did not already incorporate dental home characteristics into their practices, however, most did not intend to do so. Less than 50 percent of respondents in both groups responded positively to some items in the culturally effective group, and GPs were less likely than were PDs to provide a range of behavior management services and to provide treatment for patients with complex medical and dental treatment needs. PDs were more likely than were GPs to accept Ohio Medicaid (64 versus 33 percent). PDs were more likely than were GPs (78 versus 18 percent) to be familiar with the term "dental home." More recent dental school graduates were more familiar with the term.

Conclusions. Most Ohio PDs' and GPs' practices included characteristics found in the definition of dental home, despite a general lack of concept awareness on the part of GPs. Research is needed to provide an evidence base for the dental home.

Practical Implications. Once an evidence base is developed for the important aspects of the dental home and the definition is revised, efforts should be made to incorporate these aspects more broadly into dental practice.

Key Words. Dental home; dental care for children; patient care team.
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risk factors and provide appropriate and continuous, rather than episodic, care.

The dental home has considerable support from professional organizations as evidenced by the inclusion of the establishment of the dental home by age 1 year in the policies of the American Dental Association (ADA),[6] the AAPD,[4] the Academy of General Dentistry (AGD),[7] and the American Academy of Pediatrics (AAP).[8]

The dental home concept was modeled after the medical home concept,[9-11] which AAP originally developed for patients with special needs.[12] Primary care within a medical home is to be delivered or directed by well-educated physicians, and a medical home is used to facilitate and manage all other aspects of pediatric care.[11] The dental home, however, may not provide the same benefits as the medical home because there is less need for care coordination given that, unlike medicine, most dental care is provided by primary care dentists, both general practice and pediatric.[13] There are 25 times more general practice dentists (GPs) than pediatric dentists (PDs),[14] which translates to a large number of children who receive care from GPs. The ADA and AGD do not provide specific characteristics of the dental home, but AGD endorses AAP's dental home policy.[6,7] The dental home for children, therefore, is not a concept limited to pediatric dentistry, but it also is intended for GPs who treat children. A comparison of dental home policy descriptions, as well as their similarities to the medical home, is shown in Table 1.[4-8,10,11]

The benefits of the dental home may seem intuitive (reduced long-term costs, increased focus on prevention and individualized treatment plans),[2,15] but they have not been substantiated by research as have those of the medical home.[9] Children in lower–socioeconomic-status households may be the greatest beneficiaries of dental homes because they are more likely to experience dental caries and are less likely to have a regular source of dental care than are their counterparts in higher–socioeconomic-status households.[2,8] Nevertheless, no consensus exists regarding to whom the dental home should be targeted. AAPD and some experts in pediatric dentistry support the dental home for all infants, children, adolescents and people with special health care needs.[3,4] AAP policy acknowledges that dental practices are the ideal dental homes, but when no dentist will accept these young children as patients, physicians should prioritize referring the children at highest risk of experiencing dental disease to dentists and continue to act as a dental home for other children until a dental home can be established.[16]

Some authors argue against the dental home beginning at age 1 year for practical reasons, including the crowding out of older children in need of treatment[17] and the lack of evidence to support universal application.[18,19] In addition, only 15 percent of surveyed GPs nationwide[20] and 8 percent in Ohio[21] identified age 1 year as the recommended time for a child's first dental visit. In 2008, investigators in a Virginia study found that 74 percent of PDs and 12 percent of GPs recommended that children have a dental visit by age 1 year.[22] In 2010, only 8 percent of patients 3 years and younger who were enrolled in Ohio Medicaid had had a dental visit.[23]

Despite its various meanings and lack of evidence base, the dental home concept has become enmeshed in pediatric oral health policy regarding the year-one dental visit, outreach to children enrolled in Head Start, Medicaid periodicity schedules and risk assessment recommendations.[2] Notwithstanding advocacy for the dental home as public policy, the extent to which dentists are aware of or have implemented the concept is not clear. A national survey of board-certified PDs on the presence of the dental home characteristics in their practices had a low response rate, and the investigators excluded GPs from their study population.[24] Although academicians, professional associations and public policy advocates have promoted the dental home, practicing dentists may not understand what the dental home is or want to change their practices to become one.

We conducted a study to assess Ohio GPs' and PDs' awareness of the dental home concept and their perceptions of the importance of dental home characteristics as measured in their current practices. This study is the first step in assessing the need for a more evidence-based approach to reconsidering the dental home as policy.

METHODS

The institutional review board at Nationwide Children's Hospital (Columbus, Ohio) approved our cross-sectional study. In 2010, we collected data for the study by administering a six-page, pretested, 20-question survey to Ohio GPs and PDs. Some of the questions had multiple parts, resulting in a total of 54 questions available for

ABBREVIATION KEY. AAP: American Academy of Pediatrics. **AAPD:** American Academy of Pediatric Dentistry. **ADA:** American Dental Association. **AGD:** Academy of General Dentistry. **GPs:** General practice dentists. **PDs:** Pediatric dentists.

TABLE 1

Dental home policy as described by professional organizations.

DESCRIPTION	AMERICAN ACADEMY OF PEDIATRIC DENTISTRY*	AMERICAN DENTAL ASSOCIATION†	ACADEMY OF GENERAL DENTISTRY‡	AMERICAN ACADEMY OF PEDIATRICS§	HAS ELEMENTS IN COMMON WITH THE MEDICAL HOME¶
Characteristic of the Dental Home					
Comprehensive assessment for oral diseases and conditions	✔		✔	✔	✔
Individualized preventive dental health program based on risk assessment	✔		✔	✔	
Anticipatory guidance about growth and development issues (that is, teething, digit or pacifier habits)	✔		✔	✔	
Plan for acute dental trauma	✔		✔	✔	✔
Information about proper care of the child's teeth and soft tissues, which includes the prevention, diagnosis and treatment of disease of the supporting and surrounding tissues and the maintenance of health, function and esthetics of those structures and tissues	✔		✔	✔	✔
Dietary counseling	✔		✔	✔	✔
Comprehensive oral health care, including acute care and preventive services in accordance with guidelines and periodicity schedules for pediatric oral health	✔		✔	✔	✔
Referrals to dental specialists when care cannot directly be provided within the dental home	✔		✔	✔	✔
Education regarding future referral to a dentist knowledgeable and comfortable with adult oral health issues for continuing oral health care; referral at an age determined by patient, parent and pediatric dentist	✔		✔		✔
Operational Characteristic of Care					
Accessible	✔		✔		✔
Compassionate					✔
Family centered	✔				✔
Comprehensive	✔	✔	✔		✔
Culturally effective					✔
Coordinated	✔		✔		✔
Continuous	✔	✔	✔		✔
Begins no later than age 1 year or within six months of the eruption of the first tooth	✔	✔	✔	✔	
Between the patient and dentist	✔	✔	✔	✔	

* Sources: American Academy of Pediatric Dentistry.[4,5]
† Source: American Dental Association.[6]
‡ Source: The Academy of General Dentistry.[7]
§ Source: Hale.[8]
¶ Sources: Patient-Centered Primary Care Collaborative[10] and American Academy of Pediatrics, Medical Home Initiatives for Children With Special Needs Project Advisory Committee.[11]

analysis. We adapted the questionnaire from a national survey of PDs[24] and distributed it through both electronic (online) and nonelectronic (paper) means. The first 10 items focused on basic information about the dentist and his or her practice. These items were followed by more detailed questions about each of the seven dental home characteristics described by Nowak and Casamassimo.[9] The final three items addressed the dentist's familiarity with the dental home concept.

We selected a sample of 956 dentists from a list of actively licensed dentists obtained from the Ohio State Dental Board. The sample included all PDs (156) and approximately 20 percent of GPs (800) chosen via a stratified random sample with oversampling of those in rural counties, according to federal definitions.[25] We obtained the mailing addresses of actively licensed GPs and PDs from the Ohio State Dental Board's database. We procured the dentists' e-mail addresses from the Ohio Dental Association.

First, we invited dentists with known e-mail addresses to participate in the online version of the survey that we administered by means of an online survey tool. After one week, we sent reminder e-mails to nonresponders. We sent the third and final invitation via postal mail to those who did not respond to the first two invitations and to dentists without known e-mail addresses. Those with known e-mail addresses received up to three invitations to participate and those without known e-mail addresses received one. All respondents who completed the online survey received a $2 bill. In addition, we included a $2 bill in each of the invitations sent via postal mail.

We excluded from our analysis respondents who indicated that they were not practicing clinical dentistry, practiced a specialty other than pediatric dentistry or did not treat children 5 years and younger, as well as those whose surveys were grossly incomplete.

Most of the survey addressed current practices regarding children 5 years and younger. We grouped the multiple-part questions according to the seven dental home characteristics: accessible (nine questions), compassionate (five questions), family centered (four questions), comprehensive (11 questions), culturally effective (five questions), coordinated (four questions) and continuous (three questions). We structured the questions by using a four-point Likert scale, with 1 indicating "I offer this now," 2 indicating "I plan to offer this within a year," 3 indicating "It would take significant incentive (financial, etc.) to offer this," and 4 indicating "I do not wish to offer this." Because 96 percent of responses were either 1 or 4, we redistributed the relatively few 2 responses to the 1 responses group and the few 3 responses to the 4 responses group. We considered the combined 1 and 2 responses to be positive. Finally, we introduced the term "dental home" and assessed dentists' knowledge of it.

We analyzed data by using Excel 2007 (Microsoft, Redmond, Wash.). We did not adjust GP data to account for the oversampling because the respondents returned the surveys anonymously, and they self-reported the setting (urban, suburban or rural) of their practices. Self-reports of urban or rural status by health care professionals are significantly inaccurate compared with census-derived data.[26] We validated the sample response about serving patients enrolled in Medicaid against the underlying population of dentists who had made one or more Medicaid claims (33 percent for primary care dentists responding to the survey and 31 percent for all dentists in Ohio) (Amber Detty, researcher, Oral Health Section, Ohio Department of Health, Columbus, written communication, July 2012), which suggested that bias was not introduced by oversampling without adjustment of the resulting data.

RESULTS

We discarded completed surveys from two of the 118 Ohio PDs owing to their not practicing clinical dentistry, which left us with 116 usable surveys (75 percent adjusted response rate); of these, 47 were online surveys and 69 were paper surveys. Of the 561 completed surveys from Ohio GPs, we discarded 112 because they had incomplete data (n = 18), the dentist had retired or was not practicing clinical dentistry (n = 21), the dentist was not a GP or PD (n = 10) or the dentist did not treat children 5 years and younger (n = 63). We included 449 GP surveys (65 percent adjusted response rate) in our data analysis; of these, 104 were online surveys and 345 were paper surveys.

We compared demographic information and awareness of the dental home concept between respondents who completed paper surveys versus all respondents (those who completed paper and online surveys) in each group. We found that both groups were similar with regard to sex, year of graduation from dental school, board-certification status (for PDs), percentage of patients enrolled in Medicaid, awareness of the dental home concept and the proper identification of the components of the dental home definition.

Table 2 shows that for both PDs and GPs, 1984 was the average year of graduation. Although all PDs have at least two years of postdoctoral specialty education, only 17 percent of GPs completed advanced education programs.

Table 3 (pages 650-651) shows PDs' and GPs' willingness to incorporate dental home characteristics into their practices. More than 90 percent of respondents in each group incorporated or intended to incorporate into their practices specific dental home characteristics mentioned in 20 of 41 items related to dental home characteristics. In the culturally effective grouping, less than one-half of both PDs and GPs responded that they arranged for language interpreters or provided oral health information in English and other languages.

Probably the most salient difference between the groups was that PDs were more likely to accept Medicaid than were GPs (64 percent and 33 percent, respectively). For other payment-related items, more than one-half of all respond-

ents accepted reduced payment for emergency care provided to uninsured low-income patients and more than 80 percent reported that they would arrange payment plans and offer less expensive treatment alternatives.

PDs were more likely than were GPs were to provide more advanced pediatric dental care, as reflected by their responses to items in the comprehensive and coordinated dental home characteristics groupings (that is, treat children aged 0-2 years; provide age-appropriate anticipatory guidance, caries risk assessment, appliance therapy, a range of behavior management services, complex dental treatment, treatment under general anesthesia and care for children with complex medical treatment needs). A minority of GPs and PDs made interpreters available or offered print materials in languages other than English.

Table 4 (page 651) shows that essentially all PDs (90 percent or more) incorporated or intended to incorporate into their practices 28 of the 41 dental home characteristics and that a similarly high percentage of GPs incorporated or intended to incorporate into their practices 21 of the characteristics. The majority (more than 50 percent) of PDs incorporated or planned to incorporate into their practices 39 of the characteristics, and the majority of GPs incorporated or planned to incorporate into their practices 35 of the characteristics.

TABLE 2

Demographic information for survey respondents.

DEMOGRAPHIC	PEDIATRIC DENTISTS (n = 116)	GENERAL PRACTICE DENTISTS (n = 449)
Sex, No. (%)		
Male	82 (71)	381 (85)
Female	34 (29)	67 (15)
Year of Dental School Graduation		
Range	1958-2007	1955-2009
Mean	1984	1984
Board Certified in Pediatric Dentistry, No. (%)		
Yes	53 (46)	NA*
No	59 (54)	NA
General Dentistry Education,† No. (%)		
Advanced education (General Practice Residency, Advance Education in General Dentistry)	NA	77 (17)
Fellow of the Academy of General Dentistry	NA	28 (6)
None of the above	NA	340 (76)
Other	NA	17 (4)‡
Current Practice, No. (%)		
Private practice	100 (86)	437 (97)
Not-for-profit, safety-net clinic, community health center	4 (3)	7 (2)
Academic	8 (7)	1 (< 1)
Hospital	4 (3)	3 (1)
Patients Enrolled in Ohio Medicaid in the Practice, Mean %	29	11
Dentists With No Patients Enrolled in Ohio Medicaid, %	29	62
Percentage of Practice Made Up of Children Aged 0-5 Years, Mean	38	7
Dentists Who Treat Children Aged 0-5 Years, %	100	87§

* NA: Not applicable.
† Percentages may add to more than 100 percent because multiple answers were allowed.
‡ Common answers included Las Vegas Institute, Pankey Institute, implant and orthodontics education.
§ Includes data from surveys that were excluded from analysis because respondents did not treat children 5 years and younger.

Regardless of the extent to which their practices reflected the dental home model, we found that Ohio PDs were much more familiar with the term dental home than were Ohio GPs (78 versus 18 percent). However, only 59 percent of PDs correctly identified both aspects of the dental home definition (that is, a relationship between a dentist and a patient, and that it should begin no later than age 1 year) compared with only 7 percent of GPs.

Within each group of dentists, we measured awareness of the dental home concept against all other demographic factors and responses. We found that graduating from dental school more recently and providing more advanced pediatric dentistry services were common themes among those who were aware of the concept.

DISCUSSION

Although the dental home is promoted by experts and some professional health care organizations,[2-9] there is a paucity of information regarding it in the dental literature. We conducted our study to initiate an understanding

TABLE 3

Extent to which responding dentists indicated dental home characteristics in their practices.

CHARACTERISTIC	DENTISTS INCORPORATING OR INTENDING TO INCORPORATE DENTAL HOME CHARACTERISTICS INTO THEIR PRACTICES* %	
	Pediatric Dentists	General Practice Dentists
Accessible		
New patients are scheduled for examination within four weeks	95	99
Established patients are scheduled for treatment within four weeks	95	99
Patients are seated in the operatory within a reasonable amount of time (on average 15 minutes) of their scheduled appointment time	98	100
Emergency care is available during office hours for patients of record	100	100
Emergency care is available after hours for patients of record	94	88
Office makes it easy for patients to schedule appointments (for example, by means of telephone or Internet)	97	99
Office accepts private insurance plans	96	95
Office accepts Ohio Medicaid	64	33
Care is provided for children and adults with special health care needs (for example, Down syndrome, cerebral palsy, mental retardation or developmental delay)	96	83
Compassionate		
Compassionate providers and staff who recognize socioeconomic issues	97	100
Office attempts to communicate effectively with patients with low literacy	98	99
Office offers less expensive, clinically acceptable alternative treatment plans for patients who cannot afford optimal care (for example, extraction versus pulp therapy and restoration)	81	95
Office will accept reduced payment for emergency care provided to uninsured patients who cannot afford to pay full fees	55	57
Office will arrange payment plans	81	89
Family Centered		
Office provides oral health recommendations specific and individualized to each family	99	99
Dentist and staff members involve parents in making treatment decisions and when providing oral hygiene instructions	100	100
Dentist and staff consult parents about different behavior management techniques that can be used	98	91
Office encourages and evaluates parental compliance for home care	99	96
Comprehensive		
Provides care for children aged 0 to 2 years, including examinations, prophylaxis, restorative treatment and extractions	99	43
Provides care for children aged 3 to 5 years, including examinations, prophylaxis, restorative treatment and extractions	100	97
Provides dietary counseling and anticipatory guidance (age-appropriate counseling) for children	98	83
Provides formal caries risk assessment for children	83	73
Office encourages emergency patients to return for comprehensive care	100	99
Dentist makes referrals to physicians, as necessary	100	99
Dentist makes referrals to dental specialists, as necessary	100	100
Dentist writes prescriptions, as necessary	100	99
Office provides special equipment and appliance therapy (for example, space maintainers and habit appliances)	98	68
Dentist provides range of pharmacological (including intravenous sedation, oral sedation or nitrous oxide) and nonpharmacological services for behavior management	85	37
Dentist can provide treatment under general anesthesia	83	8

* On a four-point Likert scale, the dentist responded either 1 (I offer this now) or 2 (I plan to offer this within the next year).

of the dental home in the way the medical home has begun to be characterized in the medical literature. Our results can help guide future in-depth studies of the dental home. One objective was to test Ohio dentists' awareness of the dental home. The results of our study showed that PDs were largely aware of the concept. The dental home is a policy of AAPD, an organization to which 94 percent of PDs belong (Suzanne Wester, membership and marketing director, AAPD, written communication, January 2011). However, the practical consideration is the ex-

TABLE 3 (CONTINUED)

CHARACTERISTIC	DENTISTS INCORPORATING OR INTENDING TO INCORPORATE DENTAL HOME CHARACTERISTICS INTO THEIR PRACTICES* %	
	Pediatric Dentists	General Practice Dentists
Culturally Effective		
Office arranges for licensed and appropriate language interpreters, as necessary	46	16
Office treats patients with sensory impairments (for example, visual or hearing)	98	84
Office has staff, decor, procedures and policies to respect cultural differences	79	68
Recognize culturally specific treatment needs and priorities of major cultural groups	77	63
Office provides oral health information printed in English and other languages	41	15
Coordinated		
Office provides care for patients with complex dental treatment needs (for example, pulpotomies, crowns and space maintenance)	99	73
Office provides care for patients with complex medical treatment needs (for example, cystic fibrosis, sickle cell disease, congenital heart defect, leukemia and transplants)	97	51
Office coordinates care with physicians	99	92
Office coordinates care with social services, schools and care facilities	84	71
Continuous		
Office provides recall visits and continuing care over the long term	100	99
Dentist and staff schedule patients for recall (for example, three months, six months and one year) on the basis of caries risk and other individual factors	96	96
Office participates in community programs (for example, oral disease prevention, screening and referral)	75	71

tent to which dentists actually carry out this concept in their practices. GPs, who are the majority of dentists, largely reported that they were not aware of the concept but many of their offices' practices were consistent with dental home characteristics.

Another objective of our study was to test the presence of dental home characteristics in pediatric and general dental practices in Ohio. Almost all respondents (96 percent) answered either "I offer this now" or "I do not wish to offer this," implying that they were satisfied with how they ran their practices and were not planning to make any changes. Overall, GPs and PDs reported their practices had many dental home characteristics. Although the results of our study confirmed that PDs fulfill the dental home requirements for children aged 0 to 5 years more consistently than do GPs, there are too few PDs to treat all young children. It is not clear if PDs provide aspects of the dental home because they know about the concept or if these aspects were already part of their practices before the concept was introduced.

TABLE 4

Dental home characteristics, according to percentage of dentists answering positively.

DENTIST	DENTISTS ANSWERING POSITIVELY, %					TOTAL NO. OF DENTAL HOME CHARACTERISTICS
	0-24	25-50	51-74	75-89	90-100	
Pediatric	0	2	2	9	28	41
General Practice	3	3	9	5	21	41

* Positive responses on a four-point Likert scale were either 1 (I offer this now) or 2 (I plan to offer this within the next year).

As we expected, PDs answered more positively regarding the provision of comprehensive and coordinated care than did GPs, because many of the aspects of these two characteristics are specific to pediatric dentistry and part of the didactic and clinical curricula within pediatric dental residency education. The data from our study suggested that although most GPs are prepared to provide basic dental care for children older than 2 years, PDs must be available to focus on comprehensive care for children aged 0 to 2 years and for children older than 2 years

whose care requires more advanced pediatric dentistry skills.

It is not known which dental home practice characteristics are essential; this topic has not been studied. Accessibility, for example, is the essential element of entry into the oral health care system, whereas the other characteristics relate more to the nature of the care received once entry has been gained. GPs and PDs reported that their practices had characteristics that made their services accessible to their patient populations. However, a much higher percentage of PDs than GPs accepted patients enrolled in Medicaid who were 5 years and younger and patients with special health care needs. For these two groups, for whom a dental home is thought to be beneficial,[2] accessibility would seem to be an important dental home characteristic.

Our study has several limitations. All data were self-reported by dentists and may not represent patients' actual experiences. Although the high response rate should mitigate this risk, it is possible that nonresponders had different practice characteristics than did responders. Considering the high overall response rates from both PDs and GPs, however, it is likely that the final results are representative of the underlying populations. The effect of the lack of adjustment of oversampled rural GPs is not known, although validation for one survey item suggests that it was not a problem.

The results of our study indicate how little is known about the dental home concept, which has made its way into the policy statements of several professional associations and has been the subject of at least one national conference.[27] The medical home concept was generated by means of expert opinion, but it subsequently has been tested as to its relevance for pediatric care.[9] It seems prudent for dentistry to articulate clearly the outcome objectives of the dental home as medicine did with the patient-centered medical home[28] and to refine the dental home concept to adhere closely to those objectives. Dentistry must circle back to generating high-quality evidence as the basis for establishing policy rather than relying on expert opinion. Conducting more dental home research, therefore, is imperative. Once there is a larger evidence base, a meaningful tool to measure "dental homeness" should be developed, as has been done for the medical home. Although the proposed construct has not been supported with data, Slonkosky and colleagues[24] offered one for a dental home index. Research should focus on which elements add value to dental care in a manner that improves oral health, especially since the results of our study revealed that both pediatric and general dental practices embodied many of AAPD's dental home characteristics even though there was a lack of awareness of the concept. Once a revised, evidence-based and operational dental home definition emerges, research regarding its use and effective approaches for disseminating information to primary dental care providers should be undertaken.

CONCLUSIONS

The findings from our study add to the scant literature on the dental home. However, our knowledge about the effectiveness of implementing the current dental home concept—as defined by AAPD—to improve the oral health of at-risk children and people with special health care needs remains inadequate. In our study, Ohio GPs and PDs reported that their practices reflected many of the characteristics of the current dental home definition for children 5 years and younger. Ohio PDs largely were familiar with the dental home concept and GPs were not; thus, knowledge and practice may not always go together. Dentists who did not generally incorporate dental home characteristics into their practices may be unlikely to do so in the future. An evidence base for the dental home definition should be developed before professional associations' policies are updated, consolidated and promoted. ■

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