

A survey of pediatric dentists' management of dental caries in children three years of age or younger

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Abstract

Purpose: The purpose of this investigation was to obtain information from practicing pediatric dentists about how they manage caries in children three years of age and younger and the problems they are encountering.

Methods: A survey mailed to a randomly selected sample of 1,000 members of the American Academy of Pediatric Dentists (AAPD) in January of 1997 asked them to: identify the types and extent of caries in the young age group; define and quantify methods used to manage caries; determine the representation of caries among different payer source groups; identify sources of information used in managing caries; and determine the criteria they use for assessing the success of different methods in managing caries.

Results: The response rate was 43%. Definitions of techniques of managing caries varied among practitioners, and the use of the methods differed for the different degrees of severity of caries. There was a significant relationship between the percentage of Medicaid in a practice and the percentage of children with caries and pulpal involvement. Personal experience/philosophy was most frequently identified as an important source among factors influencing treatment decisions and sources of information about managing. Criteria most frequently cited to determine effectiveness of treatment were "caries free at recall" (45%) and "stop progress of lesion" (30%).

Conclusion: Practitioners use a variety of techniques to manage caries in the child ≤ 3 years of age. Disease level and payer source factored heavily in their treatment decisions. Practitioners reported interest in receiving information and help from AAPD on the subject. (*Pediatr Dent* 23:211-216, 2001)

Management of caries in the child three years of age and younger is a continuing dilemma for the busy practitioner. There are a number of caries management techniques available, but their indications for use are affected by many variables. Additionally, some of the newer, more conservative techniques have limited outcome data to support their effectiveness.

In order to gain more information from members of the American Academy of Pediatric Dentistry (AAPD) about how they are treating this group of young patients and the problems they are encountering, a survey was conducted in 1997 to obtain information from practicing pediatric dentists regarding their management of caries in children three years of age and younger. Specifically, the study sought to identify the types and extent of caries in the young age group, define and quan-

tify methods used to manage caries, determine the representation of caries among different payer source groups, identify sources of information used in managing caries, and determine the criteria they use for assessing the success of different methods in managing caries.

Methods

A randomly selected sample of 1,000 members of the AAPD representing all six regions of the United States was sent a three-page questionnaire in January of 1997 regarding their management of caries in children three years of age or younger. A postcard followup was sent in February. Practitioners were asked to describe, for children ≤ 3 years-of-age, the overall distribution of payer sources in their practices for these children, the incidence of caries, and how the caries was distributed among the payer sources.

The survey listed the following methods of caries management in the young child: preventive maintenance; risk assessment; definitive therapy; glass ionomer; and clean out and leave. The respondents were asked to identify from a list of descriptors following each method, those which best describe their definition and use of the method in the child ≤ 3 years-of-age in their practice. These descriptors are summarized in Table 1.

The next series of questions asked the practitioner how he/she typically used each of the methods to treat different degrees of severity of caries including: caries of enamel; caries of enamel and dentin; pulpal involvement and abscesses; or simultaneously demonstrating all three of the previous types. They were then asked to define effectiveness of treatment based on recall evaluations, to rate on a Likert scale¹ the effectiveness of the previously described techniques in managing the degrees of caries, and to describe any outcome data they had about how well the methods worked in their practices. A series of questions was used to identify sources of information for making treatment decisions as well as those for gaining additional information about managing caries in the young child.

A final series of questions inquired about the practitioners' greatest challenges in managing caries in the child ≤ 3 years-of-age, their comfort level in keeping current with new techniques, and how the AAPD could help them regarding managing caries in this young age group.

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Table 1. List of Descriptors to Define Methods of Managing Caries in the Young Child

Method: Preventive Maintenance <input type="checkbox"/> Knee to knee examination with parent <input type="checkbox"/> In-office brushing <input type="checkbox"/> In-office topical fluoride gel or foam <input type="checkbox"/> In-office fluoride varnish <input type="checkbox"/> Topical fluoride at home by caretaker <input type="checkbox"/> Recall every __ wks or __ mos <input type="checkbox"/> Hold lesion without progression <input type="checkbox"/> Other _____	Method: Glass Ionomer <input type="checkbox"/> No local anesthesia <input type="checkbox"/> Use local anesthesia <input type="checkbox"/> Clean out caries with bur <input type="checkbox"/> Clean out caries with spoon <input type="checkbox"/> Don't clean out caries <input type="checkbox"/> Wipe in glass ionomer <input type="checkbox"/> Etch before place ionomer <input type="checkbox"/> Use plain GI <input type="checkbox"/> Use resin/GI combination <input type="checkbox"/> Topical fluoride at home by caretaker <input type="checkbox"/> Recall every __wks or __mos <input type="checkbox"/> Other _____
Method: Definitive Therapy <input type="checkbox"/> Use Papoose Board™ or other restraints <input type="checkbox"/> Use conscious sedation <input type="checkbox"/> Use IV sedation <input type="checkbox"/> Use GA in hospital <input type="checkbox"/> Restore teeth aggressively with SSC/pulp <input type="checkbox"/> Extract carious anterior teeth <input type="checkbox"/> Use GA only if posterior teeth are involved <input type="checkbox"/> Use GA if only anterior teeth are involved <input type="checkbox"/> Recall every __wks or __mos <input type="checkbox"/> Other _____	Method: Clean Out and Leave <input type="checkbox"/> No local anesthesia <input type="checkbox"/> Use local anesthesia <input type="checkbox"/> Clean out and leave <input type="checkbox"/> Clean out caries with spoon <input type="checkbox"/> Clean out caries with bur <input type="checkbox"/> Paint with fluoride <input type="checkbox"/> Disking <input type="checkbox"/> Topical fluoride at home by caretaker <input type="checkbox"/> Recall every __wks or __mos <input type="checkbox"/> Other _____
Method: Risk Assessment <input type="checkbox"/> Salivary tests of patient <input type="checkbox"/> Salivary tests of mother <input type="checkbox"/> Knee to knee examination with parent <input type="checkbox"/> Diet history <input type="checkbox"/> Family caries history <input type="checkbox"/> Other _____	

Findings were described as frequencies, percentages and mean scores for scaled items. Statistical tests applied to the data included chi-square, t-tests and analysis of variance. All differences reported herein were at the level of $P \leq 0.05$.

Results

Responses numbered 430, which represented a 43% response rate. These responses were evenly distributed throughout all six AAPD regions of the United States. Demographics of respondents are summarized in Table 2.

Payer sources

Responses about overall distribution of payer sources in the practitioners' offices for the young child indicate that, on average, fewer than 20% are Medicaid patients in private practice, while nearly one-half have insurance and one-fourth are self-pay (Table 3).

Forty-five percent of practitioners have no Medicaid and 15% have 1-10% Medicaid in their patient base, indicating that nearly two-thirds have either no Medicaid or 10% or less. Only 16% of practitioners have 50% or greater Medicaid (Table 3). Practitioner age was found to be related to the proportion of young children on Medicaid. Older practitioners had lower percentages of Medicaid patients than did younger practitioners.

An analysis of payer source with caries level indicated a significant relationship between the percentage of Medicaid in a practice and the percentage of children with caries and pulpal

involvement. Additionally, the occurrence of caries, enamel, dentin, and with pulpal involvement was significantly related to increased Medicaid.

Methods and definitions of caries management

The frequency of use of methods of caries management are as follows: among the respondents, 100% of them applied definitive therapy, 99% used preventive maintenance, 94% used risk assessment, 71% applied glass ionomer and 66% clean out caries and leave. The most commonly used technique within definitive therapy (used by nine out of 10 dentists) was restoring teeth aggressively with SSC/pulp, followed by use of a papoose board, general anesthesia in hospital, conscious sedation, and extraction of carious anterior teeth (each used by between 60 and 70%).

For preventive maintenance, in-office topical fluoride gel or foam, knee-to-knee exam with parent, and in-office brushing were used by approximately four out of

five respondents. With risk assessment, 85% of respondents reported to take diet history and use knee-to-knee exam with parent, and 74% said they investigated family caries history. For glass ionomer, 90% clean out caries with a bur and 79% use local anesthesia for this procedure. Two-thirds use resin/glass ionomer combinations and one-half prescribe topical fluoride by the caretaker, etch before placing the glass ionomer, and clean out caries with a spoon. One-third use plain glass ionomer. With clean out and leave, two-thirds prescribe topical fluoride by the caretaker and clean out caries with a bur or disk the tooth, and two-thirds of the time they perform this procedure without anesthesia. These findings are summarized in Table 4.

Table 2. Demographics of Respondents

Gender	Male	75%
	Female	25%
Age	≤34 yrs	16%
	35-49 yrs	55%
	≥50 yrs	29%
Practice	City	44%
	Suburban	48%
	Rural	8%
Occupation	Pvt Prac	90%
	Other	10%

Table 3. Payer Source of Respondents

A. Payer source as average percentage of patient base.	
Medicaid	19%
Insurance	48%
Self Pay	24%
Other	8%
B. Percentage that see Medicaid patients.	
% Respondents	% Medicaid
45%	0%
15%	1 – 10%
24%	11 – 49%
16%	≥ 50%

An analysis of responses to uses of risk assessment by the variables of age, gender, and Medicaid percentage patient base revealed that practitioners who have higher percentages of Medicaid base are significantly more likely to perform knee-to-knee exam with the parent. Females are more likely than males to use diet history.

Use of methods to treat different levels of caries

Responses to questions about which methods practitioners used for the different degrees of severity of caries revealed a number of differences, which are summarized in Table 5. As the caries becomes more severe, the more conservative techniques are used less often and the more aggressive approaches are used more often. Clean out and leave is used least frequently and mainly for caries of enamel.

Definition by practitioner of effectiveness of treatment

An open-ended question asked the practitioners to list the criteria they used for effectiveness of treatment or to define effectiveness at recall. “Caries free at recall” was most frequently cited (45%), followed by “stop progress of lesion” (30%). “Being asymptomatic” and “having restorations intact” were each cited by 25%.

Effectiveness of caries management techniques

Ratings of the effectiveness of treatment techniques for different degrees of severity of caries are summarized in Table 6. Definitive therapy was given the highest effectiveness scores by dentists for management of all types of caries. The percentage of Medicaid in the respondent’s practice significantly affected how he/she rated the effectiveness of three of the treatment techniques, all for caries of enamel. Preventive maintenance and risk assessment were ranked significantly less effective for managing caries of enamel in this age child by respondents with higher percentages of Medicaid patients in their practice. Glass ionomer was ranked significantly more effective for caries of enamel by respondents with higher percentages of Medicaid patients in their practice.

Factors influencing treatment decisions

Practitioners were asked to rank the importance of potential influences in their decisions about how to manage caries in the young child. Findings are summarized in Table 7. Personal philosophy was rated as most important, with post-doctoral training and CE and/or articles accorded the next highest levels of importance. The younger dentists rated their post-doctoral training as more important than did older dentists in how they decide to treat caries in this age child. Older

Table 4. Frequency of Practitioner’s Use of Techniques Defining Methods of Caries Management

Method: Definitive Therapy	100%	Method: Glass Ionomer	71%
Restore teeth aggressively with SSC/pulp	89%	Clean out caries with bur	90%
Use Papoose board or other restraints	73%	Use local anesthesia	79%
Use GA in hospital	70%	No local anesthesia	71%
Use conscious sedation	70%	Use resin/glass ionomer comb.	68%
Extract carious anterior teeth	67%	Topical fluoride by caretaker	56%
Use IV sedation	15%	Etch before place ionomer	56%
Other	7%	Clean out caries with spoon	51%
Use GA only if posterior teeth involved	6%	Use plain glass ionomer	33%
Use GA if only anterior teeth involved	6%	Wipe in glass ionomer	16%
		Other	2%
		Don’t clean out caries	4%
Method: Preventive Maintenance	99%	Method: Clean out and Leave	66%
In-office topical fluoride gel or foam	85%	Topical fluoride at home	68%
In-office brushing	85%	No local anesthesia	66%
Knee to knee exam with parent	84%	Clean out caries with bur	62%
Topical fluoride by caretaker	61%	Disking	61%
Hold lesion without progression	50%	Paint with fluoride	50%
In-office fluoride varnish	16%	Clean out caries with spoon	49%
Other	6%	Use other anesthesia	58%
		Other	9%
Method: Risk Assessment	94%		
Diet history	85%		
Knee to knee exam with parent	86%		
Family caries history	74%		
Other	6%		
Salivary tests of mother	1%		
Salivary tests of patient	2%		

Table 5. Methods Used to Treat Different Degrees of Caries

	Enamel Only	Enamel and Dentine	Pulpal Involvement	All Three Caries Patterns Simultaneously
Preventive Maintenance	87%	59%	40%	63%
Risk Assessment	60%	45%	37%	49%
Definitive Therapy	52%	95%	95%	96%
Glass Ionomer	35%	40%	5%	30%
Clean out and leave	22%	13%	2%	14%

dentists rely more on “continuing education and/or articles and the literature” in helping them decide how to treat caries in this age child than do younger dentists. Women ranked post-doctoral programs as more important than did men in helping them decide what approach to use. There was a relationship between percentage of Medicaid and the importance of different factors in the treatment decision-making process. The higher the Medicaid percentage in the practice, the more positive the respondent was about the importance of both their post-doctoral program teaching and the payer source in determining the method of managing caries.

Biggest challenge in managing caries

Dentists report that the biggest challenge in dealing with caries in the child ≤3 years of age is managing the child’s behavior (49%), followed by parental compliance (32%).

Assistance from the AAPD

When asked what the AAPD could do to help them with managing caries in this age group, one-third of the practitioners identified insurance not paying for general anesthesia, and 25% indicated that they wanted more information about alternative treatment options or new dental materials and more parental/public education by the Academy. Dentists said an AAPD public information campaign directed to parents of these children should stress first visit to the dentist (34%) and BBTD (28%). Fewer dentists favored prevention starting early (16%) and parent involvement in home care (10%) as a campaign focus.

Sources of information

Professional journals were the most often cited source of information used by practitioners in treating caries in the young child, and 25% indicated they were the most important. Personal experience was identified by two-thirds as an important source and listed as most important by one-fourth. Females were significantly more likely than males to cite the AAPD newsletter as most important. Overall females favored colleagues, continuing education, and the AAPD newsletter.

Males favored the journals and personal experience, and were twice as likely to choose journals as women (29% vs. 15%). These findings are summarized in Table 8.

Availability of information on managing caries

Several questions asked for the respondent’s “level of agreement” with statements concerning the availability of information on managing caries in the child ≤3 years of age, and these are summarized in Table 9. Associations between the age and gender of the respondents and their “comfort level” with these statements indicated that the respondents’ level of agreement that they have sufficient information on managing caries in the child ≤3 years of age becomes more positive as their age increases. Nearly one-half of the older (50+) respondents agree that they have sufficient information on managing caries in this age group, while only 20% of the youngest (under 30) age group agrees. The females were significantly less likely than men to feel they had sufficient information about managing caries in the young child.

Three-fourths of the younger dentists said they would welcome more AAPD-sponsored courses or programs on managing caries in this age child, compared with less than one-third of older practitioners. Women were significantly more likely than men to welcome more AAPD programs, though both men (mean of 3.9) and women (mean of 4.3) were generally favorable about AAPD programs. More than half of the youngest group would welcome journal articles on the subject of managing caries in this age child, while only one-third of the older group agreed.

The final statement in this question asked respondents to agree or disagree with the statement “I find it difficult to keep

Table 6. Effectiveness of Caries Management Techniques

	Enamel Only	Enamel and Dentine	Pulpal Involvement	All Three Caries Patterns Simultaneously
Definitive Therapy	4.60	4.78	4.76	4.75
Preventive Maintenance	3.79*	3.09	2.61	3.24
Risk Assessment	3.45*	3.20	2.94	3.19
Glass Ionomer	3.67**	3.61	1.31	2.99
Clean out and Leave	2.89	2.22	1.82	2.14
Fluoride Varnish	3.19	2.43	1.67	2.42

Values shown are mean scores for items scored from 1 to 5 with 1 = not effective and 5 = very effective
 * Sig less effective with > Medicaid
 ** Sig more effective with > Medicaid

Table 7. Factors Influencing Treatment Decisions

Personal philosophy	4.72
Postdoctoral training	4.11
CE/Articles	4.05
Other (Experience)	3.60
Standard-of-care in my area	3.48
Parental preference	3.32
AAPD Reference Manual	3.32
Payer sources in my area	2.05

Values shown are mean scores for items scored from 1 to 5 with 1 = not important and 5 = very important

current on the subject of managing caries in the child ≤ 3 years of age.” Again, the younger respondents were twice as likely to voice discomfort with their level of information on this subject.

Discussion

Determination of whether or how payer source would influence treatment decisions for the young child was a major objective of this study. The distribution of payer sources in private practice with respect to the representation of Medicaid was somewhat surprising. More than half of the respondents had either no Medicaid or less than 10%. Insurance and self-pay were the most frequent (72%) payer sources in private practice.

Payer source distribution within the practices was believed to be important for potential associations with treatment philosophy or decisions. This concept was confirmed when analysis of payer sources with questions concerning treatment decisions and effectiveness of different treatments indicated significant relationships for those with higher percentages of Medicaid in their practices. The relationship between positiveness toward graduate program in helping to make treatment decisions by practitioners with higher percentages of Medicaid may indicate that they are treating patients more like those they treated during their educational programs.

The decreased effectiveness ratings given preventive maintenance and risk assessment by those with higher percentages

Table 8. Sources of Information and Rating of Importance

	Use	Most Important
Professional Journals	83%	25%
Colleagues	81%	17%
Component Newsletters	76%	4%
Personal Experience	63%	25%
AAPD Newsletter	53%	5%
Continuing Education	22%	20%
Local Study Clubs	15%	2%
Other	11%	1%

Table 9. Level of Agreement with Statements About Managing Caries in the Child < 3 yr-of-age

I feel I have sufficient information	4.01
Welcome more AAPD sponsored prog	4.01
Welcome more journal articles on subject	4.13
Find it difficult to keep current on subject	2.25

Values shown are mean scores for items scored from 1 to 5 with 1 = not important and 5 = very important

of Medicaid in their practices are consistent with the documented issues of low compliance and high no-show rates of Medicaid patients and may indicate a reluctance to use techniques which require a high degree of parent/caretaker cooperation. Higher effectiveness ratings given for glass ionomer may indicate increased use of atraumatic restorative technique (ART) in this patient population. An analysis of payer source with caries level for our respondents indicated a significantly higher level of caries of all degrees in practices of those who had more Medicaid. Caries management techniques appear related to both payer source and severity of disease in patients.

Overall, with the exception of those with higher percentages of Medicaid in their payer base, the private practitioners appear to indicate high expectations for techniques emphasizing home care and prevention such as risk assessment and conservative treatments for caries such as disking. Responses about effectiveness of the different techniques for treatment of varying degrees of severity of caries indicate that practitioners are significantly more positive about the effectiveness of the caries management techniques of preventive maintenance and risk assessment for all types of caries.

Respondents were asked to rate the importance of specified sources in how they decided on the method of caries management for children ≤ 3 years of age. Practitioners ranked personal philosophy as most important among factors in how they decide to manage caries for their patients. Another similar question asked respondents to identify sources of information upon which they rely for information and updates in managing caries in the young child, and professional journals were identified most frequently (83%) and ranked as most important. However, colleagues and personal experience were second and fourth in frequency, and personal experience was only slightly behind journals as most important.

Practitioner's personal experience and/or philosophy factored more importantly than expected in influencing treatment decisions. This may indicate that there is insufficient evidence-based scientific data from which they can draw to support their treatment decisions. Increased numbers of well-designed research studies assessing treatment outcomes for pediatric dentistry are needed.

Additionally, it is interesting to note that continuing education was mentioned by only one in five, yet received the third highest rating of importance. This could be indicative of the lack of availability of continuing education on the subject and the expression of need for more. Significant differences in responses between males and females were identified and may signal different needs based on different practice patterns.

Younger practitioners are expressing the need for more AAPD-sponsored programs or courses and journal articles on the subject of managing caries in the young child. It is interesting that the younger respondents agreed twice as often that they found it difficult to keep current. Intuitively, one could have predicted just the opposite association with age for this series of questions. The younger ones are closest to their educational programs and more recently current with the literature in the area. The older practitioners have been out longer and are further away from formal reviews of the literature. However, the fact that older practitioners appear more comfortable with their level of information about managing caries in this age group is consistent with their high ratings given to personal philosophy as the most important influence in their decisions about managing caries in the young patient. Experience is a powerful teacher. Older dentists appear satisfied with their own knowledge base and experiences in the area of managing caries for this age group.

Responses to a request for a topic for an AAPD-sponsored public information campaign directed toward parents of children ≤ 3 years-of-age unanimously identified early prevention as the main emphasis. The top three topics—first visit early, baby bottle tooth decay, and prevention starting early—all have prevention as a central theme. Clearly, practitioners would like more efforts from the AAPD to educate parents of young children.

When this survey was initiated, only a few states had been successful at passing legislation mandating insurance companies to pay for general anesthesia, which probably explains the topic's placement as first in the list of issues about which practitioners would like help from AAPD. Improvement in this area has been rapid and widespread, but the AAPD must remain vigilant on the issue, as it appears to be of great importance to private practitioners. Treatment options and dental materials, along with parental and public education, were identified in almost identical numbers as the second most important issues and should send a clear message to those responsible for AAPD sponsored continuing education and public awareness.

Conclusions

Practitioners use a variety of techniques to manage caries in the child ≤ 3 years of age. Disease level and payer source factored heavily in their treatment decisions. Practitioners reported interest in receiving information and help from AAPD on the subject

References

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ABSTRACT OF THE SCIENTIFIC LITERATURE



ORAL HEALTH PROGRAM BY CAREGIVERS OF CHILDREN WITH DISABILITIES

The purpose of this prospective study was to evaluate the impact of an oral health education program on the caregivers of adults and children with intellectual disabilities. The authors chose three centers for patients with special needs and presented an oral health program to the caregivers. This program was repeated every three months for one year and attempted to educate the caregivers about dental disease, to motivate them with regard to prevention, and to improve both the oral hygiene and oral health of the residents. The impact of the program on the caregiver was evaluated based on self-reported questionnaires completed by the caregivers both before and after the intervention program. Results indicated that both the numbers of residents who had their teeth cleaned more than once per day and the percentage of caregivers able to clean both posterior and anterior teeth of the residents increased significantly. In addition, there was a non-significant increase in the percentage of caregivers who found tooth cleaning easy to perform. The authors concluded that the oral health program was moderately successful and emphasized the need for both initial and ongoing oral health training of caregivers.

Comments: Although this study demonstrated considerable effort leading to positive results, two concerns must be remembered. First, since all outcomes are self-reported, caution must be used when interpreting the results. Second, even though 69 caregivers were involved with the intervention program, only 24 remained with the program for the entire year and therefore all conclusions are based on a sample size of only 24 individuals. MM

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