Scientific Article

Texas Dentists' Attitudes Toward the Dental Medicaid Program

Aaron Blackwelder, DDS, MBA[1] • Jay D. Shulman, DMD, MA, MSPH[2]

Abstract: *Purpose: The purpose of this study was to report the attitudes of Texas dentists toward the Dental Medicaid program. Methods: A self-administered survey was mailed to all pediatric dentists and a random sample of general dentists. Results: Surveys from 347 (69%) of 500 dentists (171 of 295 general dentists [58%] and 169 of 205 pediatric dentists [82%]) were returned. 57% of pediatric dentists and 29% of general dentists (P<.0001) treated at least 1 Medicaid patient in the past year. The major areas of dissatisfaction were: (1) broken appointments; (2) low reimbursement levels; and (3) patient noncompliance. This mirrors results from studies in Iowa, Louisiana, Ohio, Washington, and California. Both pediatric and general practitioners identified the following barriers to care for the Medicaid population: (1) low dental IQ; (2) few providers; and (3) no transportation. Conclusions: The major areas of dissatisfaction included both programmatic and patient-related factors. Attributes of the system (eg, lower reimbursement levels) are more modifiable than attributes of the patient population (eg, patient noncompliance and low dental IQ). Underfunding of dental Medicaid is endemic to all states studied in the literature. Providers, legislators, and government programs should target the programmatic problems with future efforts and funding. (Pediatr Dent 2007;29:40-46)*

KEYWORDS: DENTAL MEDICAID, PEDIATRIC DENTISTRY, ACCESS TO CARE

Medicaid is a combined federal-state program that provides both medical and dental health care to qualifying low-income individuals. Since its establishment as Title XIX of the Social Security Act in 1965, it has undergone many changes. In 1967, Congress enacted Public Law 20-248 that created the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) program. This was followed up by amendments that mandated its implementation and included specific guidelines for a dental component.[1] Specific operation of the Medicaid program takes place in each state. Other amendments including Public Law 101-239 (Omnibus Budget Reconciliation Act of 1989) enabled the provisions of services to be better supported and strengthened.[2] Within the broad federal guidelines, each state sets its own requirements for Medicaid eligibility, covered services,[3] and reimbursement levels. Since most of the control for Medicaid lies with the state, analysis is best done at the state level.

In 1990, The Office of Technology Assessment of the US Congress reviewed the dental portion of the Medicaid program in 7 states and found:

1. a lack of supervision at the state level;
2. inadequate availability of some federally mandated dental services; and
3. inadequate access to dental care for eligible children.[4]

The goal of the Medicaid program is to remove financial roadblocks to the receipt of dental care for qualifying children. A 1996 report by the Inspector General of the Department of Health and Human Services[5] concluded that only 1 in 5 (4.2 of 21.2 million) Medicaid-eligible children received EPSDT preventive dental services in 1993. Among the other roadblocks to dental treatment under Medicaid were: (1) lack of provider participation; (2) practitioner rationing of treatment time for Medicaid patients; and (3) patients' lack of awareness of the program.[5] Moreover, many areas with large numbers of children eligible for Medicaid have few or no participating dentists (actively enrolled).

In a 1998 survey of Dental Medicaid program managers in various states,[6] the average enrollment of dental providers in Medicaid programs was 60% over 41 states.[19] Texas was below this average at 54%. It should be noted that these numbers represented enrolled providers and not actively enrolled providers.[7] Low levels of provider participation in Texas are largely attributed to low levels of provider satisfaction but has not been quantified as of yet in Texas. Several studies of providers' attitudes towards the Dental Medicaid Program have been reported throughout the United States (North Carolina,[2] Iowa,[7] California,[8] Louisiana,[9] and Washington [10]).

[1]Dr. Blackwelder is first-year resident in dental public health and pediatric dentistry, University of Iowa, Iowa City, Iowa, and [2]Dr. Shulman is professor, Department of Public Health Sciences, and Graduate Dental Public Health Program Director, Baylor College of Dentistry, Dallas, Tex.
Correspond with Dr. Blackwelder at aaron-blackwelder@uiowa.edu

There are no published data on the attitudes of dental providers towards the Texas state Medicaid program. In light of the dentist's important role as a primary care provider and the number of qualified dental Medicaid recipients in Texas, this study was proposed to determine dentists' attitudes towards and participation in the Medicaid program.

This topic is also important because of the case of Frew v Hawkins.[11] In 1993, mothers of Medicaid-eligible children sued Texas Medicaid officials on the grounds that Texas violated the federal Medicaid Act. Specifically, they claimed that it failed to guarantee checkups and needed follow-up care, as mandated by Congress in 1989. In 1994, the United States Fifth Circuit Court of Appeals certified the case as a class action lawsuit.[12] Both parties agreed to a consent decree in which the state of Texas would implement specified changes to the Medicaid program targeted at increasing access to care. Texas signed the consent decree and later challenged it, claiming that the federal courts did not have the authority to enforce it. By 2005, the courts ruled that Texas had reneged on its portion of the consent decree and that changes must be made to provide better access to care for more than 2.7 million children.[13] Since the Supreme Court's ruling in Frew v Hawkins, there is a heightened interest in establishing a baseline for Texas. One of the requirements of the consent decree was for Texas to increase access to Medicaid. In light of this consent decree, it is important to examine the aspect of the access to care issue that includes the dentists' attitudes toward the Medicaid program.

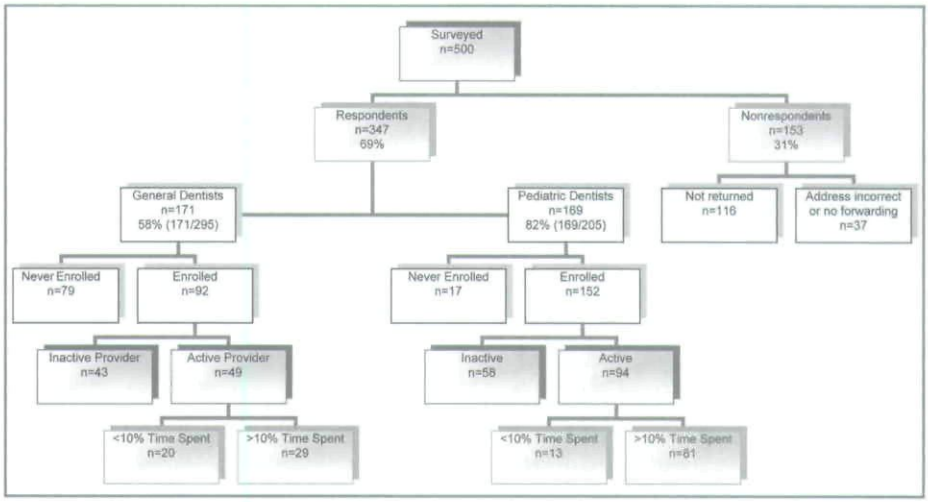

Figure 1. Flow chart of survey respondents.

The specific aims of this study were to:

1. determine the level of participation of the general practitioner and pediatric dentists in the Texas Medicaid program;
2. document the activity of enrolled providers to qualified Medicaid recipients;
3. evaluate the perceptions and attitudes of dentists towards the Texas Medicaid program; and
4. identify sources of provider dissatisfaction with the Texas Medicaid program.

Methods

A self-administered, 37-item survey was distributed to practitioners in the state of Texas. Sample size was limited to 500 by the availability of funds. Selected were pediatric providers who: (1) were full-time private practitioners in Texas; (2) listed their specialty as pediatric dentistry (N=205); (3) were less than 65 years of age; and (4) had no disciplinary actions pending against them. A sample of 295 (4%) was selected from 7,563 active, full-time general dentists in private practice. The authors chose this study's sample by sorting the 7,563 general dentists by first name and selected every 11th dentist from each letter of the alphabet until 295 names were selected. Provider information was obtained from the most recent database of providers published by the Texas State Board of Dental Examiners.[14]

The survey incorporated questions used in similar surveys in North Carolina,[2] Iowa,[7] California,[8] and Louisiana.[9] It was approved by the Institutional Review Board of the Baylor College of Dentistry, Dallas, Tex, and was tested on 10 licensed dentists. Survey instruments and a postage-paid envelope were mailed to the primary practice location of each active dentist selected, along with a cover letter requesting participation and stating the goals of the survey. Anonymity was maintained by assigning a unique identification number to each survey purely to identify nonrespondents for follow-up studies. The initial mailing was complete on March 22, 2004. There was no follow-up mailing to nonrespondents because of limited funds.

Data were entered into a Microsoft Access database (Microsoft Inc., Redmond Wash.) Statistical analysis was done using descriptive statistics, chi-square, and student *t* test with SPSS-PC 11.5 (SPSS Inc., Chicago, Ill.) Approximately 80% of the data were verified for coding accuracy, and the error rate was less than 1%.

The authors defined an enrolled provider as a dentist with a Medicaid provider number. Additionally, a dentist lacking one was not enrolled. An active provider is one who has treated at least 1 Medicaid-eligible child within 12 months. An inactive provider is one who has not treated at least 1 Medic-

aid-eligible child within 12 months, but who has a Medicaid provider number.

To explore the relationship between Medicaid activity level by provider type, the authors performed 1-way analysis of variance and pairwise student *t* tests using the Bonferroni-Holm correction. To see if there were statistically significant differences between the activity levels, the authors used Holm's sequential strategy with α=.05 as the level of significance to reduce the family-wise error rate. Briefly, the authors ranked the computed *P* values in increasing order, comparing the smallest value (αH_1) to .05/3, the next smallest significance level (αH_2) to .05/2, and the last (αH_3; ie, the largest) *P* value to .05/1, or α_H=.05. Comparisons were deemed statistically significant if $P<\alpha_H$.

Table 1. DENTIST MEDICAID ACTIVITY LEVEL BY AGE AND PRACTICE TYPE

STATISTICAL SIGNIFICANCE OF ACTIVITY OF PROVIDERS AND AGE AND TYPE OF PRACTICE

		ACTIVE PROVIDER	INACTIVE OR NONPROVIDER
YEARS SINCE GRADUATION *	<5 ys	54	43
	≥5 ys	92	158
MEDICAID PARTICIPATION †	Pediatric dentists	94	75
	General dentists	49	122
		0-10%	>10%
TIME SPENT (%) TREATING MEDICAID PATIENTS ‡	Pediatric Dentits	13	81
	General Pediatrics	20	29

* Chi-square=10.21; *P*=.001 † Chi-square=25.36; *P*<.001 ‡ Chi-square=13.21; *P*<.001

Results

Sample characteristics. Of 500 surveys mailed, 347 (69%) were returned: 169 (82%) from pediatric dentists and 171 (58%) from general dentists (Figure 1). Of the 153 surveys for which there was no response, 37 were returned with no forwarding address or no deliverable address. Of the 347 respondents, 169 were pediatric dentists, 171 were general dentists, and 7 responded as others. Of the others, 2 were faculty, 2 were periodontists, 1 worked in a community health clinic, 1 was in a group practice, and 1 was practicing pediatric dentistry in a general dentist's office. The respondents were not required to answer every question and, consequently, the total number of responses to each question varied. Dentists' years practiced ranged from 1 to 39 (mean=16.8±9.65 SD). Dentist's year of graduation ranged from 1963 to 2003, with a mean graduation year of 1984±5.5 SD. Of the providers who responded, 94 (57%) pediatric dentists and 49 (29%) general dentists were active Medicaid providers. Recent graduates were more likely to be active providers than others—a finding similar to that of other states (chi-square=10.21; *P*=.01)

Table 2. PROPORTION OF ACTIVE PROVIDER TIME SPENT WITH MEDICAID PATIENTS

% OF TIME SPENT	N	%
General dentists *	49	100
0-10%	20	41
>10-20%	11	23
>20-50%	9	18
>50%	9	18
Pediatric dentists †	94	75
0-10%	13	14
>10-20%	10	10
>20-50%	43	46
>50%	29	31

* Mann-Whitney test: *P*=.004 † Mann-Whitney test: *P*=.0125

Active Medicaid providers. There was a strong association between years since graduation and active participation. (Table 1). The authors divided years of practice into: (1) ≥5 (since graduation); and (2) <5. The association between years practiced and active enrollment was statistically significant for all respondents (chi-square=10.21; *P*=.001)

Pediatric dentists had a higher participation proportion than general dentists (chi-square=25.36; *P*<.001). Pediatric dentists who saw Medicaid patients were more likely to devote larger amounts of time to providing care to Medicaid patients. Eighty-six percent of Medicaid-accepting pediatric dentists spent more than 10% of their time providing care to Medicaid patient compared to active general practitioners (59%; chi-square=13.21; *P*<.001).

Table 2 shows self-reported percent of time spent with Medicaid patients by provider type. The majority of the 94 active pediatric dentists (77%) spent more than 20% of their time with Medicaid patients. Of the 49 active general dentists, only 36% of them spent more than 20% of their time with Medicaid patients. Approximately 71% of all general dentists never enrolled as a provider or were enrolled but had not treated a Medicaid patient within the last year.

Table 3. RESPONDING PROVIDER SUMMARY BY PRACTITIONER TYPE

	General dentists	Pediatric dentists
Never enrolled in Medicaid (A)	46% (79/171)	10% (17/169)
Less active providers (B)	37% (63/171)	42% (71/169)
Highly active providers (spend >10% of tome with Medicaid patients (C)	17% (29/171)	48% (81/169)
	ANOVA: P=.09	ANOVA: P=.04
Pairwise *t* tests ($P<a_H$)	A vs B: P=.47 (a_H=.05)*	A vs B: P=.001 (a_H=.017)*
	A vs C: P=.01 (a_H=.017)*	A vs C: P=.01 (a_H=.025)*
	B vs C: P=.02 (a_H=.025)	B vs C: P=.28 (a_H=.05)

* $P<a_H$

Table 4. ACTIVE MEDICAID PROVIDER'S PERCEPTION OF ISSUES AS IMPORTANT OR VERY IMPORTANT *

	General dentists			Pediatric dentists		
	N=49	%	Rank	N=49	%	Rank
Broken appointments	46	94	1	90	96	1
Low reimbursements	40	82	2	85	90	2
Patient/parent noncompliance	37	76	3	72	76	3
Denial of payments	36	73	4	65	69	5
Slow payment	29	59	6	66	70	4
Complicated paperwork	24	49	7	44	47	7
Too few active Medicaid providers in area	20	41	8	44	47	7
Prior approval required	15	31	10	35	37	10
Frequently changing regulations	32	65	5	59	63	6
Intermittent patient eligibility	18	37	9	40	43	9

* Spearman rank correlation=.854; P=.01

Table 3 further describes the activity of enrolled Medicaid providers or dentists who have a provider number. Highly active providers reported spending more than 10% of their time treating Medicaid patients. Ninety percent of pediatric dentists and 54% of all general dentists reported being enrolled Medicaid providers.

Providers' perception of the Medicaid program. Respondents were asked a series of questions pertaining to barriers to care. Patient low dental IQ (81%), too few dental Medicaid providers (75%), and inability of patients to obtain transportation (48%) were the most consistent responses. Respondents reported receiving new Medicaid referrals from the following sources: (1) satisfied patients (29%); (2) other dentists (18%); (3) social workers (9%); and (4) physicians (5%). Active general dentist Medicaid providers reported limiting treatment by age of patient (78%). Of those, most limited patient age to over 10 years old (66%).

Medicaid billing in Texas is done by mail and electronically. Of the respondents, 10% use mail exclusively, 30% use a combination of both, and 60% used electronic filing exclusively. Compared with reimbursement levels of private insurance, 89% of providers reported the Medicaid reimbursement levels were "much less," with the paperwork required to file being more difficult (45%) or much more difficult (45%).

Providers were also asked to scale the importance of issues pertaining to the Medicaid program based on a 5-point (Likert-type) scale (Table 5). The most salient issues were: (1) broken appointments; (2) low reimbursement; and (3) patient/parent noncompliance, respectively. The rankings for general dentists and pediatric dentists were similar (Spearman rank correlation=0.854; P=.01).

Inactive Medicaid providers (78%) who responded were not inclined to resume treating Medicaid patients. The salient issues for inactive providers were: (1) low reimbursement levels (87%); (2) Medicaid audits (38%); (3) "hassle factor"9 (37%); and (4) lack of funding for sedation/operating room procedures (27%).

Table 5 compares provider's sources of dissatisfaction toward EPSDT from previous statewide studies as well as Texas. Although differences in questions and study designs limit

comparison, 3 sources continue to be issues: (1) low reimbursement; (2) broken appointments; and (3) patient noncompliance. Rankings of Medicaid issues were strongly correlated among the 7 studies (Spearman correlation = .869; $P = .01$).

Discussion

The data are consistent with findings from studies done in other states (North Carolina,[2] Iowa,[7] California,[8] Louisiana,[10] Washington,[10] Texas,[16] Ohio,[17] and South Carolina[18]). Some sources of dissatisfaction are patient-related (broken appointments, noncompliance), while others are programmatic in nature (denial of payment, slow payment, professional audits, complicated paperwork). Although this study did not resolve these issues, it does shed light on how future efforts and changes in the EPSDT program can help alleviate problems and make the Dental Medicaid program more appealing to Texas Dentists.

Funding for Medicaid programs comes from federal and state sources. The percentage of Texas' overall annual Medicaid budget allotted to dental care is less than 2%.[19] According to survey participants, Texas reimbursement levels were 40% to 50% below insurance reimbursements. Based on a North Carolina study,[2] small rate increases did not increase access to care for Medicaid recipients. In addition, a South Carolina study[18] showed that increasing reimbursements to 75% of the customary private practice rates improved access to care through an increase in providers and services rendered. The 75th percentile is in the threshold for keeping

Table 5. RANK-ORDERED DENTISTS' SOURCES OF DISSATISFACTION WITH DENTAL MEDICAID PROGRAMS: A COMPARISON OF 6 STATEWIDE STUDIES

SOURCES OF DISSATISFACTION	CALIFORNIA[8] 1990	IOWA[7] 1996	OHIO[17] 1993	WASHINGTON[10] 1998	LOUISIANA[9] 1997	TEXAS[16] 1994*	TEXAS[16] 2004
Low Reimbursements	1	1	1	2	2	2	2
Broken Appointments	3	2	3	7	1	1	1
Patient Noncompliance		3			3		3
Complicated Paperwork	5	5	2	1	6	4	7
Slow Payments	7	7	3		5	3	5
Denial of Payments	2	4				5	4
Need for Prior Approval	6	9		5	8		10
Hard to Get Questions Answered				3			
Dealing with Third Party Coverage				4			
Too Few Services Covered	4	10					
Changing Regulations		6			9		6
Intermittent Reliability		11			10		9
Copayments							
Slow Appeals Process						6	
Payment errors				6			
Language Barrier							11
Low Provider Number							8

* 1994 Texas Survey was not published.

† North Carolina study (1993)[2] cited low reimbursement, broken appointments, and patient noncompliance as the top 3 most frequent sources of dissatisfaction, but no ranking was given for them.

providers actively seeing Medicaid patients.[18]

Five factors that determine dentist Medicaid activity level are suggested by Edelstein[20]: (1) sufficient reimbursement levels; (2) inflation-adjusted reimbursement levels; (3) previous provider experience and satisfaction with Medicaid; (4) ease of claims processing and associated administrative issues; and (4) practitioner's current economic situation and patient load.

Inactive providers were concerned about low levels of reimbursement and their lack of change over the years. They were also hesitant to resume treating Medicaid patients because of the type of practice they had developed over the years. Others maintained that segmenting days of the week or hours in the day to see patients that had Medicaid as a payer source alleviated many of these concerns.

According to the annual EPSDT Participation Report for the 2004 fiscal year, there are more than 2.7 million Medicaid-eligible children in Texas with a participation ratio of 0.62.[13] Currently, there are more than 7,700 full-time general dentists and 250 pediatric dentists in private practice in Texas.[14]

Often, patient care barriers do not make it feasible to receive care regularly. As seen in Table 2, 77% of pediatric dentists spend more than 20% of their time with Medicaid patients. Only 36% of the general dentists reported spending more than 20% of their time with the same patients. Recent graduates were more likely to be active providers than dentists with 10 or more years experience after graduation—a result similar to what has been found in other states. Every provider helps alleviate the problem of access to care, but more help is needed.

There were differences in opinions between active providers and inactive providers. More inactive providers cited complicated paperwork and patient noncompliance as larger issues and barriers to providing care compared to their active provider counterparts. Although both groups cited these 2 areas as negative issues, active providers seemed to have navigated the convoluted road of paperwork and learned to educate or resolve the issue of patient noncompliance better than inactive providers.

Study limitations include: (1) a relatively small sample size; (2) no follow-up of nonrespondents; (3) applicability to Texas dentists only; and (4) its external validity remains to be established. Since the Texas licensure database included year of graduation from dental school, the authors calculated the mean years since graduation for respondents (16.8±1.98 SD), nonrespondents (16.4±1.87 SD), and the population (17.92±1.82 SD). The authors compared the mean of the respondents to those of the sampling frame (those eligible for selection) and the population using the student *t* test and found that the means were not significantly different (t=0.065, 1.405, and 1.521, respectively). While one cannot know the extent to which respondents and nonrespondents had different attitudes toward Medicaid, this study's finding that they were not statistically different regarding years of practice (found to be associated with dentists' attitudes toward Medicaid[9]) is reassuring. This study appears to have external validity, since practitioner attitudes towards dental Medicaid programs have been fairly consistent in studies done in other states (Table 5).

Conclusions

Based on this study's results, the following conclusions can be made:

1. Provider attitudes and sources of dissatisfaction with the dental Medicaid program in Texas were similar to those in other states.
2. Sources of dissatisfaction included both programmatic (lower reimbursement levels, complicated paperwork) and patient-related factors (patient non compliance, broken appointments).
3. The top 3 sources of dissatisfaction were:
   a. broken appointments;
   b. lower reimbursement levels; and
   c. patient noncompliance.
4. Active pediatric dental providers spent more time treating Medicaid patients than active general dentists.

References

1. US Department of Health, Education, and Welfare. Health Care Financing Administration: A Guide to Dental Care for the Early and Periodic Screening, Diagnosis, and Treatment Program (EPSDT) Under Medicaid. Washington DC: USDH; 1980.
2. Venezie RD, Vann WF, Jr. Pediatric dentists' participation in the North Carolina Medicaid program. Pediatr Dent 1993;15:175-80.
3. Rymer MP, Adler GS. Children and Medicaid: The experience in four states. Health Care Financ Rev 1987;9:1-20.
4. US Congress, Office of Technology Assessment. *Children's Dental Services Under the Medicaid Program—Background Paper.* Washington, DC: US Government Printing Office; 1990.
5. US Department of Health & Human Services, Office of the Inspector General. *Children's Dental Services Under Medicaid: Access and Utilization.* Washington DC: United States Government Printing Office;[OEI-09-93-00240], April 1996.
6. Epstein CA. *States' Approaches to Increasing Medicaid Beneficiaries' Access to Dental Services.* Princeton, NJ: Center for Health Care Strategies, Inc; 2000.
7. Damiano PC, Kanellis MJ, Willard JC, Momany ET. *A Report on the Iowa Title XIX Dental Program: Dentist's Participation in and Attitudes Toward the Iowa Title XIX Program.* Iowa City, Iowa: Public Policy Center and College of Dentistry, University of Iowa; 1996:25-37.

8. Damiano PC, Brown ER, Johnson JD, Scheetz JP. Factors affecting dentist participation in a state Medicaid program. J Dent Educ 1990;54:638-43.
9. Shulman JD, Ezemobi EO, Sutherland JN, Barsley R. Louisiana dentists' attitudes toward the dental Medicaid program. Pediatr Dent 2001;23:395-400.
10. Milgrom P, Riedy C. Survey of Medicaid child dental services in Washington State: Preparation for a marketing program. J Am Dent Assoc 1998;129:753-63.
11. *Frew v Hawkins*, 540 U.S. 431; 124 State. Court 899; 157 L. Ed. 2d 855; 2004.
12. *Frazar v Hawkins*, 00-41112, 01-40667, 376 F3d 444 (5th Cir 2004) US App LEXIS 13762, July 2, 2004, Filed, Motion denied by, On remand at *Frew v Hawkins*, 2005 US Dist. LEXIS 36210, E.D. Tex., Aug. 19, 2005.
13. Report for the State of Texas: 2004 EPSDT. Available at: "www.dshs.tx.us/reports/EPSDT/2004/CMS-416. Accessed January 17, 2006.
14. Texas State Board of Dental Examiners: Database of licensed Dentists in Texas. Available at: "http://www.tsbde.state.tx.us/lists.htm". Accessed January 17, 2006.
15. Glantz S. *Primer of Biostatistics*. 5th ed. New York, NY: McGraw-Hill; 2002:92.
16. Porteous NB. Provider input for improvement of the EPSDT in Texas (unpublished case report). University of Texas Health Science Center at San Antonio, 1994.
17. Bouchard JM. Ohio's oral health needs assessment: Findings from community surveys-primary care dentist's surveys. Unpublished Masters Thesis. Ohio State University Department of Preventive Medicine, January 1993.
18. Nietert PJ, Bradford WD, Kaste LM. The impact of innovative reform to the South Carolina Dental Medicaid System. Health Serv Res 2005;40:1078-91.
19. Tolbert L. State Children's Health Insurance Program: Dental Care for Kids. National Conference of State Legislatures. Available at: "www.ncslorg/programs/health/CHIPDENT/htm". Accessed January 18, 2006.
20. Edelstein, Burton L. *Public Financing of Dental Coverage for Children: Medicaid, Medicaid Managed Care, and State Programs*. Washington, DC: The Children's Dental Health Project and the Milbank Memorial Fund; 1997.

Abstract of the Scientific Literature

Postorthodontic Demineralization Management with Microabrasion

The purpose of this study was to measure reductions in orthodontically induced decalcification size after treatment with 18% hydrochloric acid and pumice microabrasion. The study sample comprised 8 orthodontic patients (7 females and 1 male and a mean age of 17.3 years) with multiple decalcifications after fixed orthodontic therapy. Two demineralized areas were randomly selected for interventive treatment in each patient. The 18% hydrochloric acid and pumice microabrasion technique was completed on these lesions. Standardized images were taken before and immediately after microabrasion. Visible areas of the demineralized lesions were quantified (mm^2) utilizing image-processing software before and after microabrasion. The total labial surface area of each tooth was also determined and the area affected by demineralization was expressed as a percentage of total tooth surfaces. Significant reductions in visible enamel demineralization ($P < .001$) were seen after microabrasion. Mean reduction in lesion size after treatment was 83%. The quantification methodology was found to be highly repeatable with an intraclass correlation coefficient of 0.98. Authors concluded that microabrasion is an effective approach for the cosmetic improvement of long-standing orthodontically induced white spot lesions.

Comments: *Microabrasion has many applications and has been widely used for the removal of decalcifications. Although the initial sample size was small, hydrochloric acid and pumice microabrasion seems to be an effective technique for cosmetic treatment of these postorthodontic demineralized lesions. Prevention of demineralized lesions through oral hygiene instruction, dietary recommendations, and routine oral hygiene maintenance visits, nevertheless, remain our primary goal. RKY*

Address correspondence to Dr. Tania C. Murphy, Orthodontic Department, Montagu Hospital, Mexborough S64 OA2, United Kingdom; e-mail: tania murphy@btopenworld.com.

Murphy TC, Willmot DR, Rodd HD. Management of postorthodontic demineralized white lesions with microabrasion: A quantitative assessment. Am J Orthod and Dentofacial Orthop 2007;131:27-33.

33 references