
The influence of practice type, region, and age on treatment recommendations for primary teeth

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Abstract

The purpose of this study was to investigate dentists' treatment recommendations for interproximal surfaces of primary molars based on the type of practitioner (general dentist or pediatric dentist), geographic location, and age of practitioner. Simulated cases, which included histories and pictures of bite-wing radiographs, were mailed to a random sample of 2000 general dentists and 1000 pediatric dentists. Dentists were asked to select their treatment recommendations for eight cases involving the interproximal surface of a specified primary molar. The return rate was 42% (1245) overall, with 36% (723) from general dentists and 52% (522) from pediatric dentists. An amalgam restoration was recommended most often for these eight cases. Dentists in the age 60+ category and pediatric dentists were more likely to recommend treatment for smaller interproximal lesions. Composite resins were recommended infrequently; however, dentists in the 60+ age category and dentists in the Northeast and Southwest were somewhat more likely to recommend composite resin than younger dentists, or dentists in other geographic locations. Dentists in the 40–49 age range, pediatric dentists, and dentists in the Southwest were the most likely to recommend stainless steel crowns. These simulated cases demonstrate differences and similarities in the treatment recommendations for interproximal lesions on primary molars based on age, practice type, and region. (Pediatr Dent 14:240–45, 1992)

Introduction

General dentists and pediatric dentists provide dental services for children. Treatment recommendations might vary based on the type of practitioner, the practitioner's experience, and the geographic location of the practice. Information about the differences in dental treatment recommended for children would be useful for structuring pre- and postdoctoral educational programs, developing continuing education courses, and providing additional insight into the dental care provided for children.

Using live patients to evaluate treatment recommendations presents considerable difficulty. However, simulated clinical situations have been employed by educational programs for teaching.^{1, 2} Simulations currently are used by dental specialty boards for administering examinations.³ The National Dental Board Examination will incorporate clinical simulations into the examination in 1992.

Simulated clinical situations have been used to assess dentists' clinical decision making regarding: radiographic recommendations for primary and transitional dentition-age patients,^{4, 5} treatment for occlusal surfaces,⁶ and treatment for carious lesions readily apparent on bite-wing radiographs.⁷ These studies show that there are differences in the radiographic examination practices and treatment of carious lesions in children recommended by general dentists and pediatric dentists.

The purpose of this study was to assess the treatment recommended for interproximal surfaces of primary

teeth in simulated clinical cases based upon type of practitioner (general dentist vs. pediatric dentist), geographic location, and practitioner age.

Materials and Methods

A survey which included a patient history and eight pictures of bite-wing radiographs displaying interproximal surfaces ranging from sound to moderately carious (Fig 1, next page) was mailed to 2000 general dentists and 1000 pediatric dentists. Names were selected randomly from the American Dental Association's national membership roster through the Association's Data Processing Service.

The history indicated the patient's age, the fact that there were no medical or behavioral contraindications to dental treatment, and that payment for services should not be considered a factor. The dentists were asked to evaluate a specific tooth in each radiograph and to recommend their optimal treatment from four choices: No Treatment (No Tx), Amalgam (Amal), Composite (Comp), and Stainless Steel Crown (SSC, Table 1, p. 242). Demographic questions included age, type of practitioner, and primary practice location.

For statistical analysis, the practitioner types were compared and the respondents' ages were grouped into the following categories; younger than 30, 30–39, 40–49, 50–59, 60+. The states were grouped according to the seven geographic regions used for the NIDR National Caries Prevalence Survey (Fig 2, next page).⁸ The seven

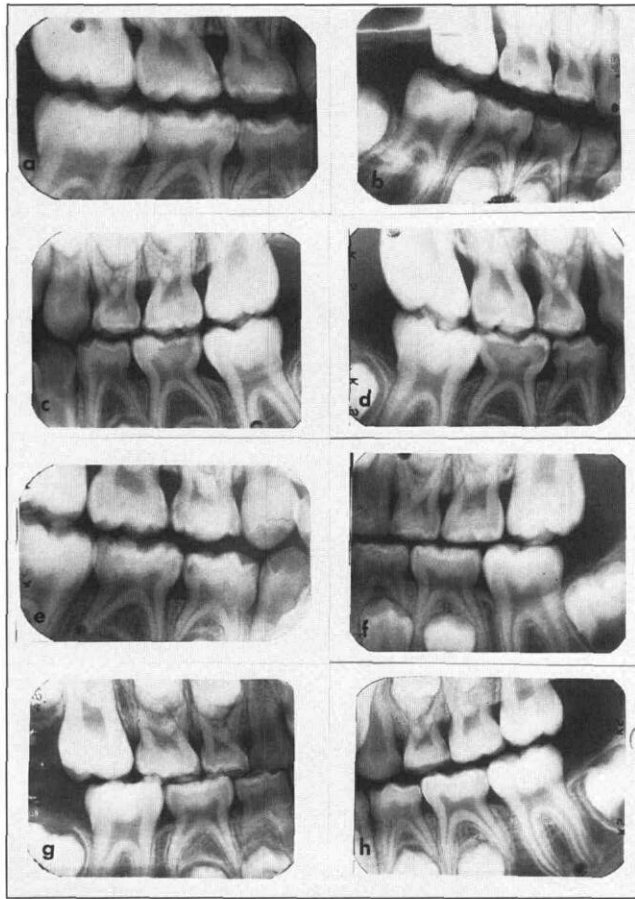


Fig 1. Composite photograph of bite-wing radiographs.

regions used were: I — Northeast (NE), II — East (E), III — North Central (NC), IV — Southeast (SE), V — Southwest (SW), VI — Northwest (NW) and VII — West (W). Treatment recommendations were evaluated using Chi-square analysis to determine the percentage distribution of respondents for each variable. Only those cases for which there was statistical significance at or greater than the 0.05 level will be described.

Results

The response rate for this survey, which was mailed once with no attempt at follow up, was 42% (1245) overall, with 36% (723) for the general dentists and 52% (522) for the pediatric dentists. This was similar to the overall response for previously published surveys.^{4,5,7} It has been reported that for a well-educated professional population, there is minimal likelihood of nonresponder bias with a response rate of this magnitude.⁹ The distribution of respondents by age is shown in Table 2 (next page), and by region is shown in Table 3 (next page).

Practice Type

In six cases, differences in the recommendations between the general dentists and pediatric dentists were

statistically significant. Case 2 requested treatment for a mandibular first primary molar with a moderate distal lesion (Fig 1b). Table 1 indicates the percentages of general dentists and pediatric dentists who recommended each treatment. The majority of both groups recommended an amalgam restoration for this tooth, with a small percentage of both groups recommending a composite resin restoration. Twenty-three per cent of pediatric dentists, but only 5% of the general dentists, recommended a stainless steel crown.

Case 3 requested treatment for the maxillary first primary molar with no radiographically evident carious lesion (Fig 1c). The majority of general dentists (85%) and pediatric dentists (81%) recommended no treatment (Table 1). However, 14% of pediatric dentists and 9% of general dentists recommended an amalgam restoration.

Case 4 (Fig 1d) requested a treatment recommendation for an interproximal lesion on a mandibular first primary molar. Seventy-six per cent of general dentists recommended an amalgam restoration, compared to only 38% of pediatric dentists (Table 1). Fifty-nine per cent of pediatric dentists recommended stainless steel crowns, compared to only 17% of general dentists.

The recommendations for case 5 (Fig 1e), a maxillary first primary molar with a small distal lesion, were similar (Table 1). Sixty-five per cent of the general dentists and 70% of the pediatric dentists recommended amalgam restoration. Composite resin restorations and stainless steel crowns were recommended infrequently. Twenty-nine per cent of general dentists and 20% of pediatric dentists recommended no treatment.

Case 6 requested treatment for a maxillary first primary molar with no radiographic evidence of caries (Fig 1f). Eighty-five per cent of general dentists and 90% of pediatric dentists recommended no treatment (Table 1). However 13% of general dentists and 7% of pediatric dentists recommended an amalgam restoration.

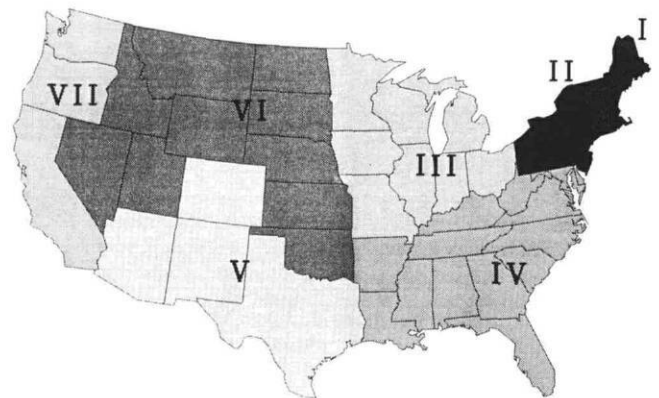


Fig 2. Map of the United States with the seven geographical regions

Table 1. Treatment options recommended by practice type

Case	Practice Type	No Tx	Treatment Option		SSC
			Amal	Comp	
2	General dentist	1	88	6	5
	Pediatric dentist	1	73	4	23
3	General dentist	85	9	2	4
	Pediatric dentist	81	14	1	4
4	General dentist	1	76	6	17
	Pediatric dentist	1	38	2	59
5	General dentist	29	65	4	2
	Pediatric dentist	20	70	4	6
6	General dentist	85	13	2	0
	Pediatric dentist	90	7	2	1
8	General dentist	12	80	6	2
	Pediatric dentist	4	80	4	12

Percentages of dentists recommending each treatment option.

In case 8, 80% of both general dentists and pediatric dentists recommended an amalgam restoration for the interproximal lesion on the distal of a maxillary first primary molar (Fig 1h, Table 1). The percentages of dentists recommending composite resin were similar between practice types. Twelve per cent of general dentists recommended no treatment for this tooth compared to only 4% of pediatric dentists. Twelve per cent of the pediatric dentists recommended a stainless steel crown, compared to only 2% of the general dentists.

Regions

Statistically significant regional differences were found in four cases. For case 2, the recommendations for an amalgam restoration ranged from a low of 64% in the Southwest to a high of 87% in the East (Fig 1b, Table 4, next page). The recommendations for a composite resin or stainless steel crown ranged from 3 to 11% across all regions, except in the Southeast and Southwest, where 17 and 27% of the dentists, respectively, recommended a stainless steel crown.

The regional treatment recommendations for amalgam in case 4 (Fig 1d) varied from 36% in the Southwest to 72% in the Northeast (Table 4, next page). Stainless steel crowns were recommended by 18% of the dentists in the Northeast, compared to 57% of the dentists in the Southwest.

For case 5 (Fig 1e), most dentists in each of the seven regions favored an amalgam restoration (Table 4). Dentists recommending an amalgam restoration ranged from 59% in the Southwest to 72% in the North Central region. The recommendation for no treatment ranged from 21% in the Southwest to 30% in the East. Region V,

the Southwest, had the highest percentages of dentists recommending a composite resin restoration (8%) and a stainless steel crown (11%).

For Case 8, (Fig 1h), most dentists in each region recommended an amalgam restoration. The range was from 69% in the Southwest to 84% in the East (Table 4). The only other recommendation made by more than 9% of the dentists was that 15% recommended a stainless steel crown in the Southwest.

Age

There were statistically significant differences in the treatment recommendations by age of the practitioner for cases 4, 5, and 6 (Table 5, next page). For case 4 (Fig 1d), the majority in each of the five age groups recommended an amalgam restoration. However, 43% of the practitioners between the ages of 40 and 49 recommended a stainless steel crown. Only 18% of the 60+ age group recommended a crown. Twenty-seven per cent of the younger-than-30 age group, 31% of the 30-39 age group, and 28% of the 50-59 age group recommended a stainless steel crown. Composite resins, were recommended infrequently, but were recommended most

Table 2. Distribution of respondents by age

Age Group	Number of Respondents
<30	88
30-39	338
40-49	483
50-59	249
60+	84

Table 3. Distribution of respondents by region

Region	Number of Respondents
I (NE)	89
II (E)	157
III (NC)	282
IV (SE)	315
V (SW)	119
VI (NW)	56
VII (W)	187

Table 4. Treatment option recommended by region

	TX	Regions							P Value
		I (NE)	II (E)	III (NC)	IV (SE)	V (SW)	VI (NW)	VII (W)	
Case 2	No Tx	2	2	1	0	0	6	1	< 0.001
	Amal	83	87	87	79	64	80	86	
	Comp	9	4	3	4	9	5	6	
	SSC	6	7	11	17	27	10	8	
Case 4	No Tx	1	1	1	2	1	0	1	< 0.001
	Amal	72	69	63	55	36	67	69	
	Comp	9	5	3	3	6	3	5	
	SSC	18	26	33	40	57	30	25	
Case 5	No Tx	24	30	23	27	23	21	23	< 0.001
	Amal	71	66	72	64	59	70	70	
	Comp	4	3	4	4	8	6	6	
	SSC	1	1	1	5	11	3	2	
Case 8	No Tx	9	12	9	7	7	11	10	< 0.001
	Amal	80	84	81	79	69	79	83	
	Comp	8	3	4	5	9	4	6	
	SSC	3	1	6	9	15	6	1	

Percentages of dentists selecting each treatment option by regions.

frequently by the 60+ age group (7%).

Amalgam was the option most frequently selected by all age groups for case 5 (Table 5), with the highest percentage of amalgams recommended by the 60+ age group (74%). The no-treatment option was the most variable category. Forty per cent of the younger-than-30 age group recommended no treatment, compared to 5% of the 60+ age group. From 22 to 26% of the other

three age groups recommended no treatment. Composite resin was not recommended frequently by any age group; only 1% of the younger-than-30 age group recommended composite resin, compared to 7% of the 60+ age group.

The majority in all the age groups (81–89%) recognized the tooth in case 6 (Fig 1f) as radiographically caries-free, and recommended no treatment (Table 5).

The range of amalgam recommendations was from 9% of the 40–49 age group to 13% of the 60+ age group. Six per cent of the 60+ age group and less than 3% of the other age groups recommended composite resin.

Discussion

The goal of this study was not to determine an “optimal” treatment for each tooth, but to assess the influence of demographic variables on the recommendations the dentists would make for these simulated clinical situations. There is often more than one appropriate treatment in a clinical

Table 5. Treatment options recommended by age category

	TX	Age Groups					P Value
		<30	30–39	40–49	50–59	60+	
Case 4	No Tx	2	1	1	1	1	< 0.001
	Amal	66	64	53	67	74	
	Comp	5	4	4	4	7	
	SSC	27	31	43	28	18	
Case 5	No Tx	40	26	22	26	15	< 0.05
	Amal	57	68	68	67	74	
	Comp	1	3	6	5	7	
	SSC	2	4	4	2	4	
Case 6	No Tx	89	89	88	85	81	< 0.05
	Amal	11	10	9	12	13	
	Comp	0	1	1	3	6	
	SSC	0	0	1	0	0	

Percentages of dentists recommending each treatment option based on age.

situation, and a variety of factors may influence the treatment decision. Some factors were controlled in these simulations by indicating that the patient was healthy, cooperative, and financially able to accept any recommended treatment.

Clinical case simulations have limitations. Frequently, changes are made during actual treatment based on clinical conditions. Therefore, the results of the study should be considered within these limitations. However, dentists must present proposed treatment to parents, insurance companies, and Medicaid based on information similar to that provided in these cases.

These results show that there were differences in the treatment recommendations between general dentists and pediatric dentists. Both general dentists and pediatric dentists frequently recommended amalgam restorations. Class II composite resins rarely were recommended by either group. General dentists tended not to recommend treatment for small lesions while the pediatric dentists tended to recommend treatment of these lesions with an amalgam restoration. The general dentists typically recommended amalgam restorations for most interproximal lesions. Many of the pediatric dentists recommended amalgam for most of the carious lesions, but pediatric dentists recommended a higher percentage of stainless steel crowns than the general dentists in every case.

Another important factor relating to the optimal treatment recommended by a dentist is the experience of the dentist with a particular restorative material or technique. In an increasing number of dental schools, predoctoral students have limited opportunities to place stainless steel crowns on primary teeth.¹⁰⁻¹² Therefore, it is reasonable to expect that many general dentists have little experience with stainless steel crowns, and as a result, are more likely to recommend amalgam restorations in most situations. Conversely, pediatric dentists have had greater experience with stainless steel crowns than most general dentists, and may be more likely to recommend crowns. It is interesting that there were differences not only between the recommendations of the general dentists and the pediatric dentists, but also differences among treatments recommended within each group of practitioners.

For the four cases with statistically significant regional differences, a higher percentage of dentists in Region V, the Southwest, recommended stainless steel crowns than in any of the other regions (Table 4). In contrast, a lower percentage of dentists in Regions I (Northeast) and II (North) recommended crowns. However, for these four cases, amalgam was still recommended by most dentists. Only in case 4, in the Southwest (Region V), did dentists recommend stainless steel crowns more frequently than amalgam (57% vs. 36%).

Table 6. Regional distribution by practice type

<i>Region</i>	<i>General Dentists</i>	<i>Pediatric Dentists</i>
I (NE)	41	36
II (E)	97	39
III (NC)	155	89
IV (SE)	153	120
V (SW)	52	51
VI (NW)	38	23
VII (W)	103	75

In Region V, approximately 50% of the respondents were pediatric dentists (Table 6), which may explain the higher frequency of stainless steel crowns recommended.

Dentists in the Northeast and Southwest, regions geographically far apart, recommended the most composite resins. Possible factors contributing to the regional variations include differences in educational philosophies of dental schools, lack of experience with stainless steel crowns or composite resin, reimbursement policies, influence of sales representatives, and continuing education courses available in the region. Some regions may have dental schools where composite resin materials are used frequently for primary molars; dental supply representatives or continuing education courses also might influence the choice of restorative material used by dentists in the region.

For the three cases in which age was a significant factor in smaller interproximal treatment recommendations, there were some notable trends. Most of the dentists recommended an amalgam restoration as the treatment for cases 4 and 5. However, for case 4, 43% of those in the 40-49 age range recommended a stainless steel crown.

Dentists younger than 40 and those age 50 and older recommended crowns less frequently. Explanations for these recommendations may include the practice experience of those age 40-49, compared to that of those dentists younger than age 40. In the last 10 years, predoctoral students have had fewer opportunities to perform stainless steel crown procedures while in dental school.¹⁰⁻¹² Prefabricated primary molar crowns first were available commercially in the late 1950s. Therefore, dentists in practice or dental school before that time might be less likely to use or recommend crowns routinely. For case 5, the largest variation in treatment recommendations was between the dentists who were younger than 30 and those older than 60. Forty per cent of those younger than 30 recommended no treatment, compared to only 15% of those in the 60+ category. The

greater years of clinical experience of the dentists older than 60 may have resulted in a decision to treat earlier.

The dentists in the 60+ age group recommended composite resin restorations more frequently than dentists in the other age groups. Again, the 60+ group might rely more on dental supply representatives or continuing education courses, which encourage the use of posterior composite resins in primary teeth more than the traditional dental school curriculum.

In summary, an amalgam restoration was the treatment most often recommended for these eight cases. Pediatric dentists were more likely to treat smaller interproximal carious lesions and recommend stainless steel crowns than were general dentists. Dentists 60+ were more likely to recommend treatment for small interproximal lesions than were younger dentists. Composite resins were recommended infrequently; however, dentists in the 60+ age group and dentists in the Northeast and Southwest were somewhat more likely to recommend composite resin than younger dentists or dentists in other parts of the country. Pediatric dentists, dentists in the Southwest, and dentists in the 40-49 age range were most likely to recommend stainless steel crowns.

These simulated cases suggest that there are differences and similarities among the treatments recommended by dentists for the interproximal surfaces of primary teeth based on practice type, geographical location, and age. Further study should be conducted to identify the reasons for the differences, and to determine the impact these differences may have on the quality of care provided for children.

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