The Role of Insurance and Training in Dental Decision Making

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Abstract

Introduction: The purpose of this investigation was to evaluate (1) the differences in treatment planning decisions between dental general practitioners and specialists and (2) the role of patients' insurance and/or type of treatment in decision making. **Methods:** One hundred eighty subject charts were selected from 1,740 dental charts. Two specialists examined radiographs and reviewed the charts and then independently generated treatment plans. If there was disagreement between the 2 specialists, they discussed all aspects of the case until a consensus was reached. **Results:** Four subjects were excluded. Thus, 176 patients were evaluated. A statistically significant difference (χ^2 = 202.303, P = .0001) was found between treatment plans designed by GPs and those designed by specialists. Patients' insurance status did not influence the degree of agreement between specialists and GPs. The odds ratio for Medicaid was 0.431 (95% confidence interval [CI], 0.103–1.801; P = .249), and for self-pay, it was 0.801 (95% CI, 0.328–1.955; P = .627). However, logistic regression analysis showed that the type of treatment plan designed by GPs (ie, endodontic treatment, endodontic retreatment, and extraction followed by implant placement) was significantly related to the degree of disagreement with the specialists (odds ratio = 4.522; 95% CI, 1.378–14.84; P = .013). **Conclusions:** Insurance did not play a role in the decision-making portion of the treatment plan. However, the type of treatment was found to be significant. Implant cases had the highest disagreement between the specialists and the general dentists. *(J Endod 2014;40:1082–1086)*

Keywords

Decision making, endodontics, implants, insurance, treatment planning

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Clinical decision making is a complex process with much variation among dental clinicians (1, 2). Much of this variation might be attributed to the clinical background of an individual clinician (3, 4) and his or her ability to critically appraise evidence-based knowledge (5). For example, Bader and Shugars (1) evaluated the extent to which dentists agreed about the treatment of 1,187 teeth in 43 patients. Overall, agreement among the participating dentists in recommending treatment for individual teeth was 62%.

In an era of advanced technological progress, advances in the success of dental implants, newer restorative materials, and advanced regenerative procedures, opinions can vary widely among operators about what might be the best evidence-based treatment for an individual patient. Therefore, it is essential to incorporate an interdisciplinary approach that integrates the knowledge, skills, and experience of operators representing multiple disciplines of dentistry into a comprehensive treatment. Dechouniotis et al. (6) compared decision-making choices among dentists with different levels of education and training and reported that differences in specialty training and experience strongly influenced decision making regarding endodontic treatment. These authors and others (7) reported that endodontists showed the most consistent agreement among themselves compared with the other specialty groups in the study. The decision to retain or extract a compromised tooth presents the conscientious clinician with a dilemma because of many possible choices in treatment planning (4, 8, 9). Several clinical surveys have studied various dental treatment planning decisions (10–14) and how best to plan for the treatment of questionable teeth (15–19). However, there are only a few reports on representative samples of the trends among various dental specialties and/or general practitioners (GPs) toward treatment planning of cases (1, 4).

The purpose of this study was to investigate factors that influence treatment planning decisions related to endodontic treatment or extraction followed by implants. Patients' insurance status and the level of clinicians' postgraduate education were specifically addressed. It was hypothesized that (1) there are differences in treatment plan decisions between GPs and specialists and (2) the disagreement in treatment planning between GPs and specialists is influenced by patients' insurance status and type of treatment.

Methods

The protocol used in this investigation was approved by the Institutional Review Board, Case Western Reserve University, Cleveland, OH. A computerized retrieval system (Crystal Reports SAP America, Inc, Newtown Square, PA) was designed to select dental records of patients' treatment planned in the doctor of dental medicine students' comprehensive care adult clinic at Case Western Reserve University, School of Dental Medicine from January 1, 2011, to December 31, 2012. All treatment plans were supervised, approved, and signed by GPs who served as preceptors. Charts were selected based on the treatment planning information (ie, using the Code on Dental Procedures and Nomenclature codes for endodontic treatment [NSRCT], endodontic retreatment [RETX], or extraction followed by implant placement [EXT-Implant]). Treatment plans involving third molars were excluded. The query resulted in 1,740 charts that contained 1 of NSRCT, RETX, or EXT-Implant for at least 1 tooth.

Charts were sampled by matched randomized sampling based on treatment plans (NSRCT, RETX, or EXT-Implant), tooth regions (incisors, premolars, or molars), and insurance (Medicaid, self-pay, or private insurance). The patients who had private insurance were grouped together; Medicaid was another group, and patients with no

insurance at all were the last group. Therefore, if a Medicare patient had private insurance, he or she was included in the private insurance group. A sample size of 180 charts was determined based on the overall number of eligible charts, a margin of error of 10%, a confidence level of 99%, and a population proportion of 50%. Sixty charts were selected for each treatment plan, and within each treatment plan 20 charts were selected for each tooth region (anterior, premolar, or molar teeth). The primary investigators (PIs) (a board-certified endodontist [A.A.] and a prosthodontist [S.T.]) examined radiographs, reviewed the dental charts, and independently generated treatment plans following published guidelines (17, 19). The PIs had over 15 years (A.A.) and 23 years (S.T.) of experience in the clinical dentistry. They were blinded to patients' insurance status. Disagreement between the 2 specialists (PIs) was subsequently resolved by discussing all aspects of the case until both agreed on a final treatment plan. Statistical significance was assessed at the 0.05 level. Statistical software (SPSS version 21; IBM SPSS, Armonk, NY) was used for all analyses.

Results

Four subjects were excluded for 1 of 3 reasons:

1. Their diagnosis was incorrect.
2. There was no treatment indicated.
3. Surgical endodontic treatment was indicated, as determined by the PIs.

"No treatment" meant that neither endodontic treatment nor extraction of the tooth was indicated. Thus, a total of 176 patients (91 females and 86 males) remained available for analysis. The mean patient age was 54.2 years (standard deviation = 16.75; range, 16–87 years). Table 1 details the distribution of selected charts among treatments and tooth regions. It displays a cross tabulation of the different treatments (NSRCT, RETX, and EXT-Implant) with the frequency distribution of the cases based on the teeth (incisors, premolars, and molars). The Pearson chi-square test was performed to determine whether the variables were statistically independent or if they were associated; it was not significant ($P = .994$). In other words, our random selection in the treatments and the different types of teeth was effective.

To test the first hypothesis, a Pearson chi-square test was conducted, and a statistically significant difference (Pearson $\chi^2_4 = 202.303$, $P = .0001$) was found between treatment plans designed by GPs and those designed by specialists (Table 2). The overall agreement for NSRCT, RETX, and EXT-Implant between the GPs and the specialist was 93%, 82.8%, and 72.9%, respectively. Table 2 is another cross tabulation using the Pearson chi-square test of the different treatments with the frequency of distribution of the cases based on the agreements between the GPs and specialists. This distribution was significant, and there was an association ($P = .0001$). In other words, the variables were not independent, and there was a difference in treatment planning by the GPs and specialists.

To test if the distribution of treatment plans was uniform among patients with different insurance coverage, a Pearson chi-square test was conducted (Table 3). A statistically significant difference (Pearson $\chi^2_4 = 17.406$, $P = .002$) in the distribution of treatment plans in each insurance category was found. Post hoc multiple comparisons among treatment plans using the Pearson chi-square test with Bonferroni correction revealed no differences between the distributions of NSRCT and RETX (Pearson $\chi^2_2 = 5.686$, $P = .174$), whereas the distributions of both of these treatments significantly differed from EXT-Implant (vs NSRCT: Pearson $\chi^2_2 = 13.124$, $P = .003$ and vs RETX: Pearson $\chi^2_2 = 11.777$, $P = .009$).

In other words, insurance might impose a bias. For this reason, Table 4 was performed to test the second hypothesis, and logistic regression analysis (LRA) was conducted to control for insurance. To perform a logistic regression, a reference group is needed: thus, NSRCT treatment plans designed by GPs, "private insurance" status, and molar

TABLE 1. Treatments and Tooth Regions Cross-tabulation

Treatment	Regions			
	Incisors	Premolars	Molars	Totals
NSRCT, *n* (%)	20 (33.9)	19 (32.2)	20 (33.9)	59 (100.0)
RETX, *n* (%)	19 (32.8)	20 (34.5)	19 (32.8)	58 (100.0)
EXT-Implant, *n* (%)	18 (30.5)	21 (35.6)	20 (33.9)	59 (100.0)
Totals, *n* (%)	57 (32.4)	60 (34.1)	59 (33.5)	176 (100.0)

	Value	*P* value
Pearson χ^2	0.227	.994

EXT-Implant, extraction followed by implant placement; NSRCT, endodontic treatment; RETX, endodontic retreatment.

TABLE 2. General Dentist/Specialist Treatment Planning Cross-tabulation

General dentist/ specialist treatment planning		Specialist			
		NSRCT	RETX	EXT-Implant	Totals
General dentist	NSRCT, *n* (%)	55 (93.2)	0 (0.0)	4 (6.8)	59 (100.0)
	RETX, *n* (%)	0 (0.0)	48 (82.8)	10 (17.2)	58 (100.0)
	EXT-Implant, *n* (%)	6 (10.2)	10 (16.9)	43 (72.9)	59 (100.0)
Totals, *n* (%)		61 (34.7)	58 (33.0)	57 (32.4)	176 (100.0)

	Value	*P* value
Pearson χ^2	202.303	.0001

EXT-Implant, extraction followed by implant placement; NSRCT, endodontic treatment; RETX, endodontic retreatment.

TABLE 3. Insurance Status Cross-tabulation with Treatment Plans Designed by General Dentists

Treatment	Insurance status			
	Medicaid	Self-pay	Private insurance	Totals
NSRCT, *n* (%)	16 (27.1)	34 (57.6)	9 (15.3)	59 (100.0)
RETX, *n* (%)	16 (27.6)	23 (39.7)	19 (32.8)	58 (100.0)
EXT-Implant, *n* (%)	3 (5.1)	36 (61.0)	20 (33.9)	59 (100.0)
Totals, *n* (%)	35 (19.9)	93 (52.8)	48 (27.3)	176 (100.0)

	Value	*P* value
Pearson χ^2	17.406	.002

EXT-Implant, extraction followed by implant placement; NSRCT, endodontic treatment; RETX, endodontic retreatment.

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