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**DEMOGRAPHIC VARIABLES AFFECTING PATIENT REFERRALS FROM
GENERAL PRACTICE DENTISTS TO PERIODONTISTS**

By Mark Roy Zemanovich, D.D.S.

A thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science at Virginia Commonwealth University.

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Abstract

Background

Within dentistry, a limited body of literature exists regarding the referral relationships between general practitioners (GPs) and specialists. The purpose of this study was to investigate the referral relationship between GPs and periodontists within the state of Virginia.

Methods

A survey focused on the demographic variables in the referral relationship between GPs and periodontists was developed. The survey was mailed to 800 dentists throughout the state of Virginia. Descriptive statistics was completed along with multivariate logistic regression analysis comparing the responses with the number of patients referred per month to a periodontist.

Results

Female respondents were more likely to refer three or more patients per month to a periodontist than a male respondent ($p<0.02$). Those who practiced with one other dentist were twice as likely to refer more frequently when compared with solo practitioners or larger group practices ($p<0.03$). Dentists employing two hygienists were more likely to refer patients than those with fewer hygienists ($p<0.02$). Those whose practices were over five miles from the nearest periodontist were more likely to refer patients compared with

dentists geographically closer to a periodontist ($p<0.02$). No other variables had a significant effect on the referral of more patients per month to a periodontist.

Conclusion

This study indicates that four demographic variables have a statistical influence on the number of referrals per month from a GP to a periodontist. These variables are: female gender, practicing with one other dentist, employing two or more hygienists, and being greater than five miles away from the nearest periodontist.

Introduction

The referral process in dentistry involves the mutual care and treatment of the same patient shared between the referring doctor and the specialist to whom the patient has been referred. Many factors influence the decision to refer a patient for specialist care and support. Clinical, personal and economic factors of both the referring doctor and the specialist coupled with the patient's preferences and means make the referral process a complex entity in the everyday practice of dentistry.¹

Within dentistry, a limited body of literature exists with regard to referral relationships. Many of the studies conducted in the area of referrals have attempted to analyze the psychodynamic aspects of the relationship between the referring doctor and specialist. They have compiled the opinions and observations of both referring general practitioner's (GP's) and specialists regarding the referral process.²⁻⁶ Only a few studies have looked at the demographic predictors of the referral relationship between general dentists and specialists. Several studies have focused on the demographic variables in the referral process. These studies conducted in the United Kingdom looked at periodontal referrals from GPs. Linden, et al., concluded that considerable variation existed in the referral process. In many cases, non-disease factors have powerful effects on the decisions made by GPs in relation to periodontal referral.^{7,8}

The most recent comprehensive demographic study in the United States was authorized by the American Academy of Periodontology (AAP) in 1981. In this study, 1,202 randomly selected GPs in four metropolitan areas were questioned on numerous demographic descriptor variables such as practitioner age and hours worked per week. The study concluded that GPs, in the prime of their careers tended to be the best source of referrals for periodontists.⁹

However, since the 1981 study, numerous factors have influenced and advanced the overall perception and practice of dentistry. Practice management seminars have been encouraging GPs to provide more soft-tissue management and non-surgical treatments as important income generators.¹⁰ Esthetics now take a more prominent role in everyday dental practice. The knowledge base regarding the disease aspects of dentistry has greatly increased. Implant dentistry has grown significantly over the past twenty years offering patients more options for their reconstructive needs. The characteristics of patients being referred have also changed since 1980.¹¹ All of these changes could have altered the referral relationship between GPs and periodontists.

According to the most recent 2003 Practice Profile Survey by the AAP, though numerous referral sources exist, referrals from GPs account for the most frequent source of referrals for periodontists.¹² A problem lies in the ability of the periodontist to focus collaborative efforts within the large community of general dentists. According to the Virginia Board of Dentistry the state of Virginia had approximately 3,114 actively practicing general dentists in 2003.¹³ With so many GPs it becomes difficult for a periodontist to determine which dentists to seek out when attempting to establish a referral base. It is therefore important that a current understanding of the demographic referral

patterns be established to aid the specialist in developing a strong referral base of GPs in order to create and maintain a patient-oriented and successful practice. The purpose of this study was to investigate the referral relationship between GPs and periodontists within the state of Virginia.

This study tests the general hypotheses that demographic variables; such as age, gender, years in practice, participation in post-graduate advanced training, of GPs influence whether or not they refer patients to periodontists. The study tests the hypotheses that practice variables, such as solo vs. group, employment of a hygienist, proximity to a periodontist, urban, rural, suburban location, size of practice, of GPs influence whether or not they refer patients to a periodontist. This study also aims to answer three empirical questions: 1) What are the most frequently referred procedures from GPs to a periodontist? 2) Why do GPs refer to periodontists in the first place? 3) How does a GP select a periodontist to whom they refer?

Materials and Methods

Survey design

After obtaining Institutional Review Board (IRB) approval, a survey questionnaire focused on the potential demographic predictor variables in the referral relationship between GPs and periodontists was developed. The questionnaire addressed the following variables: a) demographics of the referring doctor; b) demographics of the referring doctor's practice; c) procedures referred; d) empirical reasons for a referral. A small focus group of local GPs in Richmond, VA evaluated the questionnaire for thoroughness and clarity.

Data collection

The survey, along with an introductory cover letter and postage paid return envelope, was mailed to 800 GPs throughout the state of Virginia in the summer of 2004. The sample was randomly drawn from a database (provided by the Virginia Board of Dentistry) containing all licensed dentists with a current address in Virginia who were self-classified as GPs. All those who completed the survey remained anonymous. All returned surveys were checked for completeness by the principle examiner (MRZ) and only those with two or fewer unanswered questions were included for analysis.

Statistical analysis

The statistical software package “STATA™” was utilized for subsequent analysis. The initial phase of the analysis involved the production of descriptive statistics of the data. Several response categories were combined to focus and ease data analysis. Tables were constructed and trends were examined. Chi squared analysis was used with a level of significance set at $p < 0.05$. Odds ratios and confidence intervals were calculated using standard methods. The final phase involved simple multivariate logistic regression analysis of the demographic data comparing all data with the number of patients referred per month to a periodontist, controlling for the number of patients seen per week in practice. Construction of this multivariate model was guided by the hypothesis that the more patients seen per week the greater the potential to refer more patients.

Results

Response rate

Of the 800 surveys circulated 37 (4.6%) were returned-to-sender due to the address no longer being that of the intended doctor. Thus, 763 surveys were actually mailed. In total 302 (39.6%) of those surveyed responded. However, 13 (4.3%) of those who replied stated that they were no longer working as dentists and 6 (2.0%) of the returned surveys had more than two questions unanswered rendering the survey incomplete. The corrected response of completed surveys was 283 (37.1%) of those circulated.

Demographic characteristics of dentists

The demographic characteristics of the responding dentists can be seen in Table 1. The average age of the respondents was 49.3 years (SD 10.3) with a range from 28 to 83. The largest percentage, 33.9%, was between 40-49 years old. A majority of the respondents were male (82.7%). The greatest percentage of respondents (32.9%) have been in practice 10-20 years. A majority of those responding (56.9%) worked between 33 and 40 hours per week. Nearly half (47.6%) of the dentists had not had any advanced training in dentistry. Of those who had received advanced training, the largest percentage (30.1%) had completed a general practice residency (GPR). With regards to the number of hours of continuing education (CE) taken per year, a nearly even split occurred between those who took less than 25 hours (49.7%) and those who took more than 25 hours (50.3%). A slight majority of dentists (53.7%) were active in a dental study club and a vast majority (81.3%) were members of the American Dental Association (ADA).

Demographic characteristics of dentist's practice

The demographic characteristics of the responding dentist's practices can be seen in Table 2. A majority of the respondents (50.9%) were solo practitioners. Nearly three quarters (74.4%) of the dentists employed at least one full time (FT) or full time equivalent (FTE) hygienist. A majority of the dentist's (58.2%) practiced in a suburban area in Virginia. Forty percent (40.1%) of respondents saw over 80 patients per week in their practice. Geographically, 42% of dentist's practices were located between one and five miles from the nearest periodontist with an even split of (28.8%) respondents less than one or greater than five miles away. A majority (57.6%) of the respondent's practices were not 100% fee for service. A vast majority of dentist's (82.6%) were providers for traditional insurance carriers whereas a smaller percentage (39.9%) participated with a Preferred Provider Organization (PPO) or Dental Maintenance Organization (DMO).

Demographic characteristics of dentist's referrals

The demographic characteristics of the responding dentist's referrals to a periodontist can be seen in Table 3. Nearly all (97.8%) of the responding dentists did refer to a periodontist. With regard to frequency and quantity of referrals, a majority of dentists who referred (62.2%) sent three or more patients per month to the periodontist. Those who referred tended to most often (52.7%) utilize two different periodontists.

Factors affecting periodontal referral

The effects of the demographic variables on the number of referrals made per month to a periodontist are shown in Table 4. The analysis controlled for the number of patients seen per week in the GPs practice. Those respondents who were female were over two and a half times more likely to refer three or more patients per month to a periodontist

than a male respondent ($p<0.02$). Those dentists who practiced with one other dentist were twice as likely to refer three or more patients per month when compared with solo practitioners or larger group practices ($p<0.03$). Those dentists who employed two or more FT or FTE hygienists were more than two times as likely to refer more patients than those dentists with one or no hygienist ($p<0.02$). Those dentist's whose practices were greater than five miles from the nearest periodontist were nearly two and a half times more likely to refer more patients compared to dentists geographically closer to a periodontist ($p<0.02$). No other demographic variables had any statistically significant effect on the likelihood that a dentist would refer three or more patients a month to a periodontist.

Procedures referred

The dentists were asked to circle the top five procedures they most frequently referred to a periodontist the results of which are listed in Table 5. The most commonly referred procedure indicated by the dentists was treatment of generalized periodontal disease (78.1%), followed closely by treatment of localized periodontal disease (69.3%). Just over half of the respondents (56.1%) indicated they referred soft tissue grafting and (51.9%) indicated they referred for implant placement procedures. Crown lengthening (49.5%) procedures accounted for the fifth most common referral. The remaining procedures, treatment plan consultations, comprehensive exam, initial therapy, cosmetic periodontal plastic surgery, bone grafting and second opinion individually accounted for far fewer responses than the top five above.

Influence on decision to refer

The following factors influenced the GP's decision to refer a patient: 1) disliked performing periodontal procedures (56.2%) 2) support of a treatment plan (54.1%) 3)

desire to consult (45.6%) 4) desire to restrict own services (33.9%) and 5) difficult patient (25.4%) (Table 6).

Influence on choice of periodontist

The following factors influenced the GP's selection of a periodontist to whom they refer: 1) the ability and skill of the periodontist plays a major role (84.8%), 2) good communication from the periodontist (75.6%), 3) previous patient satisfaction with the periodontist (71.7%) 4) previous treatment success with the periodontist (70.7%) and 5) the personality of the periodontist (62.2%) (Table 7).

Discussion

Little data exists regarding the demographic predictors of referral within dentistry as a whole, let alone the specialty of periodontics. This study increases that body of knowledge by anonymously surveying, via mailed questionnaire, a random sample of GP's within the state of Virginia. The dentists were asked a short list of questions about various personal demographics, demographics of their practice, demographics of their referrals to periodontists and several questions attempting to elicit some empirical data about their views on the referral procedure and relationships. A total of 283 surveys (37.1% of those originally circulated) provided a database upon which descriptor and simple multivariate regression analysis was applied to describe trends within the referral process between GP and periodontist.

The goal of the survey design was to produce a survey tool which was concise enough to encourage a high response rate, yet thorough enough to touch on a wide array of potential demographic influences on referral rates. The initial questionnaire was developed by the principle examiner using previously published literature as a starting point and reference for questioning.^{1,2,4-10} The final survey questions and answer choices were determined after a small focus group had discussed thoroughness and clarity. Some bias may have inherently existed in the focus panel since they were derived, for convenience sake, from a larger study club located in Richmond, VA. However, care was taken to include a diverse group by age and years in practice. In hindsight, especially in light of

this study's results, a possible enhancement to the focus group's development of the final survey might have been to include a female dentist in the focus group.

The response rate for the survey of 37.1% was slightly lower than anticipated yet was within the range of that encountered in similar studies.⁷⁻⁹ All attempts were made to encourage a high response rate. The survey was kept to twenty-three (23) multiple-choice questions. A cover letter was included describing the reason for the survey and ensuring the respondent of anonymity and security of all responses. The survey mailing also included a pre-addressed, stamped, return envelope. Due to the anonymity of responses, no follow-up letter could be sent to those doctors who failed to respond, thus potentially contributing to a lower response rate.

In retrospect, the survey tool contained some design limitations. For example, some of the survey question's multiple-choice categories were too limiting, resulting in the need to condense some responses for statistical analysis and comparison. To allow for regression analysis comparing demographic predictors with procedures referred and empirical reasons behind the referral process, questions asking for a specific ranking of each response should have been included. Any future survey will benefit from these enhancements.

After computing the simple descriptor statistics of the raw data and comparing it with recent data from the ADA, it appears that the respondents to this survey were similar to a representative sample of dentists throughout the United States.¹³ Nationally, 83.5% of dentists are male. In this study, 82.7% were male. Nationally, 77.1% of GPs employ at least one hygienist. In this study, 74.4% had a hygienist. Nationally, 66.5% of GPs are

solo practitioners and 19.7% are in two-dentist practices. In this study, the frequencies were 50.9% and 30.4% respectively.

The main goal of this study was to determine which demographic predictor variables affect the referral relationship. As such, simple multivariate regression analysis was utilized comparing each surveyed variable to the number of patients referred per month to a periodontist by the respondent GP. An initial univariate regression analysis between the number of patients seen per week and the number of patients referred per month revealed no significant association. However, it was decided that the number of patients seen per week should be controlled for in the multivariate analysis under the hypotheses that the more patients seen per week in practice the more chance for periodontal referral.

After controlling for patients seen per week, the multivariate analysis revealed several statistically significant demographic predictors for GPs who refer three or more patients per month to a periodontist. The first of these predictors and, incidentally, a variable never previously shown to be related to referral frequency, was the gender of the dentist. Female GPs were shown to be more than two and half times more likely to refer three or more patients per month than their male counterparts. However, this study was unable to determine whether female GP's referred more frequently to both male and female periodontists; a potential bias requiring future investigation. Previous studies in the United Kingdom, which looked at gender and its relationship, found no such statistical significance.^{7,8} To our knowledge, no study conducted within the US has looked at gender's effect on referral rates in dentistry. The reason for the gender difference (purely speculative) may lie in the potentially more macho, "never ask for directions", attitude of

some males who subsequently refer less out of stubborn pride. This study did not attempt to determine if there exists any gender bias in the referral relationship. Future studies may look to determine if female GP's refer more frequently to female specialists. Regardless of the reason, the fact this study showed that females tend to refer more frequently may have a substantial impact on periodontal referrals in the future. Currently only 16.5% of GPs are female in the US. Looking at current dental school enrollment statistics, 44% of first-year dental students are female.¹³ With the potential for so many more female dentists in the future, the possibility exists for increased periodontal referrals and more collaborative comprehensive patient care.

A second significant demographic predictor of frequent referral was the two-doctor practice. Dentists who practice with one other dentist were twice as likely to refer three or more patients a month when compared with solo practitioners or those in larger group practices. Two doctors in practice together may allow increased flexibility to limit treatments offered versus solo practitioners. They may also share treatment ideas and discuss treatment philosophies resulting in a deeper appreciation of periodontal therapies available to their patients. Larger group practices may have a dentist internally who enjoys performing periodontal procedures, thus negating the need to frequently refer beyond the practice itself.

Having two or more FT or FTE hygienists in the practice was the third significant predictor of more frequent monthly referral to a periodontist. Those dentists who employed two or more hygienists were more than twice as likely to refer more patients than those dentists with one or no hygienists. The hygienist in a general practice functions as a second pair of periodontally focused eyes for the dentist. They are able to observe and

bring attention to more specific periodontal needs of patients that may otherwise go unnoticed by a busy practitioner without a hygienist. The hygienist is also invaluable in regards to the level of patient education they provide. As a patient's understanding of overall periodontal health increases, their desire for periodontal therapy grows. Thus, reason stands that the more hygienists employed by a dentist, the more periodontal needs noticed by that dentist, the more periodontally educated the patient base and the more referrals made by that dentist to address patient's needs per month.

The last significant factor, and the most difficult to explain from this study is the fact that those dentists who were greater than five miles from the nearest periodontist were nearly two and half times more likely to refer more patients a month compared to those in closer geographic proximity. Linden found the opposite to be true with those further from a periodontist referring less patients.⁸ However, in that study the distance was a much greater 25 miles. Betof et al. noted that urban dentists tended to refer more frequently than suburban dentists.⁹ Our study showed no statistical significance for location descriptor and referral frequency. Why then would this distance relationship be the case in this study? Walden noted that the distribution of periodontists had decreased in overall number per 100,000 persons in the State of Virginia.¹⁴ Virginia is also undergoing rapid population growth throughout the state. With the significant amount of explosive sprawl underway in Virginia, coupled with a decreasing overall population of periodontists, the potential exists that far more GPs find themselves further away from a periodontist regardless of their descriptor location. These GPs located in the rapid growth areas may be busier than their counterparts in other areas and thus may be more inclined to refer more patients. Bias may have existed in this study with regard to GP's not knowing exactly how

far away they are from the nearest periodontist who might not be the periodontist they most often utilize. We can only hypothesize about this matter and encourage that future research attempt to elicit a more specific cause behind this puzzling trend.

It was interesting that no other demographic predictors showed any statistical significance to referral frequency. Betof et al. concluded that the best sources of patient referrals were from GPs in urban areas in the prime of their practice careers (31-45) with large patient populations.⁹ In our study, age and location had no effect on referral rate and size of practice was not researched. Years in practice, hours worked per week, previous advanced training, yearly hours of CE, participation in a study club and membership in the ADA also had no effect on referral frequency. In addition, testing for the taking of traditional insurance, providing for a PPO/DMA and being 100% fee for service showed no statistical relationship with referral frequency.

Compiling the procedures most commonly referred, a clear top five list emerged. Most GPs still refer for treatment of generalized (78.1%) and localized (69.2%) periodontal disease, though the degree of disease may be more severe than that which was referred in the past according to Cobb, et al.¹¹ Soft tissue grafting (56.1%), implants (51.9%) and crown lengthening (49.5%) procedures complete the top five and are similar to the ranking indicated by the most recent periodontal practice survey.¹² An interesting area of future study could relate the specific referred procedures indicated above with potential demographic predictors in an attempt to determine which dentists refer which procedures.

Lastly, this study gathered empirical data regarding the GP's reasons behind the referral and the reason behind their choice of periodontist. The referral relationship

involves the mutual treatment of the same patient with the specialist providing additional care and support to aid the GP in total patient care. Not surprisingly then the most commonly cited factors behind the decision to refer a patient were the dislike of periodontal procedures (56.2%) and a desire to restrict one's own services (33.9%) along with support of a treatment plan (54.1%) and the desire to consult (45.6%). Few other factors aside from the referral of a difficult patient (25.4%) seem to contribute to the decision to refer.

Several factors emerged as major influences on the decision by GPs to which periodontist they refer. The ability/skill of the periodontist (84.8%) combined with previous treatment success with a periodontist (70.7%) ranked highest among the reasons for choice of a periodontist. This finding mirrors that of Betof who showed that "technical competence" was the only criteria that consistently demonstrated to be an effective one for the GP in choosing a specific periodontist for referral.⁹ How the periodontist's ability is judged by the GP is not understood and further study into this area may elicit interesting insight. Communication of the periodontist (75.6%) back to the referring GP ranked second among the influences. Continuous knowledge about their patient's treatment status and the understanding that the referral relationship is a "team" effort can greatly enhance the trust and confidence of the GP in their choice of periodontist. Communication through consult and treatment letters, phone calls and/or e-mails by the periodontist to the GP ensures the basic tenant of the referral relationship; shared treatment. Finally, previous patient satisfaction with the periodontist (71.7%) and the personality of the periodontist (62.2%) ranked third among the reasons for referral. It makes sense that if patients return to the GP with ill feelings toward the periodontist to whom they were referred, the referral

frequency may diminish or stop entirely. Superior patient care, communication and satisfaction should thus be a paramount goal of any periodontist.

Conclusion

This study aimed to contribute to the limited body of research regarding the demographic variables which affect the referral relationship between GPs and periodontists. Based on the responses of 283 GPs throughout Virginia, four demographic variables showed statistical significance in their ability to predict greater periodontal referral frequency after controlling for the number of patients seen per week by the dentist. These predictors are: female gender of GP, GP practicing with one other dentist, GP employing two or more FT or FTE hygienists, and GP greater than 5 miles away from the nearest periodontist. No other demographic variables tested showed any statistical influence on periodontal referral frequency.

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<u>TABLE 1</u>		
<u>Distribution of All Dentist Demographic Variables</u>		
	Frequency	Percentage (%)
<u>Age (n=283)</u>		
< 29	6	2.1
30-39	45	15.9
40-49	96	33.9
50-59	87	30.7
> 59	49	17.4
<u>Gender (n=283)</u>		
Male	234	82.7
Female	49	17.3
<u>Years in Practice (n=283)</u>		
< 10	48	16.9
10-20	93	32.9
21-30	84	29.7
> 31	58	20.5
<u>Hours worked per week (n=281)</u>		
< 25	24	8.6
25-32	70	24.9
33-40	160	56.9
> 40	27	9.6
<u>Advanced training (n=279)</u>		
AEGD	13	4.7
GPR	44	15.8
Dental specialty	27	9.7
Military	30	10.7
Other	32	11.5
No advanced training	133	47.6
<u>Yearly Hours of CE (n=282)</u>		
0-25	140	49.7
> 25	142	50.3
<u>Active in a study club (n=283)</u>		
Yes	152	53.7
No	131	46.3
<u>Member of the ADA (n=283)</u>		
Yes	230	81.3
No	53	18.7

<u>TABLE 2</u>		
<u>Distribution of All Dentist's Practice Demographic Variables</u>		
	Frequency	Percentage (%)
<u>Number of dentists in the practice (n=283)</u>		
One	144	50.9
Two	86	30.4
Three or more	53	18.7
<u>Number of full time (FT) or full time equivalent (FTE) hygienists in the practice (n=281)</u>		
One	112	39.9
Two or more	97	34.5
None	72	25.6
<u>Location of the practice (n=282)</u>		
Urban	64	22.7
Suburban	164	58.2
Rural	54	19.1
<u>Number of patients seen per week in practice (n=282)</u>		
< 40	40	14.2
41-60	70	24.8
61-80	59	20.9
> 80	113	40.1
<u>Distance between the practice and nearest periodontist (n=281)</u>		
< 1 mile	81	28.8
1-5 miles	118	42.0
> 5 miles	81	28.8
Don't know	1	0.4
<u>100 % fee for service (n=281)</u>		
Yes	119	42.4
No	162	57.6
<u>Provider for traditional insurance carrier (n=282)</u>		
Yes	233	82.6
No	49	17.4
<u>Provider for PPO/DMO (n=281)</u>		
Yes	112	39.9
No	169	60.1

<u>TABLE 3</u>		
<u>Distribution of All Dentist's Referral Demographic Variables</u>		
	Frequency	Percentage (%)
<u>Refer to a periodontist (n=282)</u>		
Yes	276	97.8
No	6	2.2
<u>How many patients per month are referred (n=275)</u>		
0-2	104	37.8
≥ 3	171	62.2
<u>How many practices are referred to (n=277)</u>		
One	70	25.3
Two	146	52.7
Three or more	61	22.0

TABLE 4

<u>Simple Multivariate Relationship Between Number of Periodontal Referrals Per Month and Demographic Predictor Variables</u>			
† Controlled for Number of Patients Seen Per Week in Practice * Statistically significant difference Overall Model P-value <0.05			
	% Referring ≥ 3 patients per month	Odds Ratio	95% CI
<u>Age (n=171)</u>			
< 29	2.3	1.0	
30-39	16.9	0.8	0.1-5.2
40-49	35.1	0.6	0.1-3.8
50-59	31.0	0.6	0.1-3.7
> 59	14.6	0.4	0.1-2.2
<u>Gender (n=171)</u>			
Male	78.9	1.0	
Female	21.1	2.6*	1.2-5.5*
<u>Years in practice (n=171)</u>			
< 10	18.7	1.0	
10-20	31.6	0.6	0.3-1.4
21-30	29.8	0.7	0.3-1.5
> 31	19.9	0.5	0.2-1.2
<u>Hours worked per week (n=169)</u>			
< 25	8.3	1.0	
25-32	21.9	0.8	0.3-2.2
33-40	60.9	1.4	0.5-3.7
> 40	8.9	1.0	0.3-3.4
<u>Advanced training (n=169)</u>			
AEGD	4.7	1.0	
GPR	15.4	0.7	0.2-3.1
Dental specialty	6.5	0.3	0.1-1.2
Military	13.0	1.4	0.3-6.2
Other	11.2	0.7	0.2-3.1
No advanced training	49.2	0.8	0.2-3.0
<u>Yearly hours of CE (n=170)</u>			
0-25	50	1.0	
> 25	50	1.0	0.6-1.6

<u>Active in a study club (n=171)</u>			
Yes	58.5	1.5	0.9-2.5
No	41.5	1.0	
<u>Member of the ADA (n=171)</u>			
Yes	83.0	1.1	0.6-2.0
No	17.0	1.0	
<u>Number of dentists in the practice (n=171)</u>			
One	45.6	1.0	
Two	35.1	2.0*	1.1-3.7*
Three or more	19.3	1.4	0.7-2.8
<u>Number of full time (FT) or full time equivalent (FTE) hygienists in the practice (n=170)</u>			
One	37.7	1.0	
Two or more	43.5	2.2*	1.1-4.1*
None	18.8	0.7	0.4-1.3
<u>Location of the practice (n=171)</u>			
Urban	19.3	1.0	
Suburban	60.8	1.5	0.8-2.8
Rural	19.9	1.5	0.7-3.3
<u>Number of patients seen per week in the practice (n=171)</u>			
< 40	14.6	1.0	
41-60	19.9	0.6	0.3-1.4
61-80	19.3	0.9	0.4-2.0
> 80	46.2	1.5	0.7-3.2
<u>Distance between the practice and nearest periodontist (n=170)</u>			
< 1 mile	24.1	1.0	
1-5 miles	42.3	1.7	0.9-3.2
> 5 miles	33.5	2.4*	1.2-4.6*
Don't know	0		
<u>100 % fee for service (n=171)</u>			
Yes	39.2	0.8	0.5-1.3
No	60.8	1.0	
<u>Provider for traditional insurance carrier (n=170)</u>			
Yes	84.1	1.1	0.6-2.2
No	15.9	1.0	
<u>Provider for PPO/DMO (n=171)</u>			
Yes	40.6	1.1	0.7-1.9
No	59.4	1.0	
<u>How many practices are referred to (n=171)</u>			
One	22.8	1.0	
Two	53.8	1.4	0.8-2.5
Three or more	23.4	1.6	0.8-3.3

<u>TABLE 5</u>		
<u>Distribution of Referred Procedures</u>		
	Frequency (n = 283)	Percentage of Responders (%)
<u>Procedure</u>		
Consultation for treatment planning	83	29.3
Comprehensive exam	54	19.1
Initial therapy	70	24.7
Treatment of generalized disease	221	78.1
Treatment of localized disease	196	69.3
Crown lengthening	140	49.5
Cosmetic periodontal plastic surgery	72	25.4
Implants	147	51.9
Bone grafting	60	21.2
Second opinion	43	15.2
Soft tissue grafting	159	56.1
Other	6	2.1

<u>TABLE 6</u>		
<u>Distribution of Influences on Decision to Refer</u>		
	Frequency (n = 283)	Percentage of Responders (%)
<u>Influence</u>		
Periodontist needs patients	12	4.2
Desire to consult	129	45.6
Desire to restrict own services	96	33.9
Dislike performing periodontal procedures	159	56.2
Support of a treatment plan	153	54.1
Difficult patient	72	25.4
Other	43	15.2

<u>TABLE 7</u>		
<u>Distribution of Factors Influencing Selection of a Periodontist</u>		
	Frequency (n = 283)	Percentage of Responders (%)
<u>Factors</u>		
Personality of periodontist	176	62.2
Availability of periodontist	125	44.1
Ability/skill of periodontist	240	84.8
Previous treatment success with periodontist	200	70.7
Previous patient satisfaction with periodontist	203	71.7
Friend with periodontist	61	21.6
Good communication of periodontist	214	75.6
Similar treatment philosophy as periodontist's	163	57.6
Periodontist accepts same insurance	35	12.4
Periodontist is board certified	61	21.6
Other	14	5.0