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The Periodontal Specialty: A Survey Regarding Our Future

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

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Abstract

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By John H. White, DDS

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Virginia Commonwealth University, 2018

Thesis Advisor: Sharon K. Lanning, DDS

Department of Periodontology

Purpose: To determine the characteristics influencing periodontal practices in Virginia and report on the anticipated changes in practice.

Methods: A REDCap survey was emailed to Virginia based American Academy of Periodontology (AAP) members assessing personal and practice demographics, trends in dental treatment and practice models, and how periodontists will adjust to account for these trends.

Results: The response rate was 31% (n=46). Respondents report greater referrals from more experienced general practitioners (GPs). Student debt was associated with age. Respondents ranked biologic advances, treatment of peri-implantitis, digital dentistry, development of corporate and group practice models, and GPs incorporating more periodontal services in their practices as most likely to impact periodontal practices. The most reported periodontal practice adjustments included expansion of existing services, increasing the number of periodontists in the practice, and joining with other specialists or GPs to create group practices.

Conclusions: Periodontists perceive the need to expand services, increase number of providers in their practices or create group practice models as future practice adjustments.

Introduction

According to an article by Albert Guay, dentistry is in the midst of radical changes that have increased in scope over the last several years. These changes are coming from both inside and outside the profession. The organization and administration of health care is currently in a mode of uncertainty, and dentistry, although apart from general health care in many ways, is not immune to challenges to the status quo.[1] Diringer and associates looked at critical trends affecting the future of dentistry and agree with Guay regarding the current changes impacting the profession. Diringer reports that the population is aging and becoming more diverse, the health care delivery system is changing rapidly with the implementation and revision of the Affordable Care Act, and consumer habits are shifting with Americans increasingly relying on technology and seeking greater value for their dollar. As a result, the nature of oral disease and the financing of dental care are in a state of flux.[2]

Paumier and colleagues argue that among several important structural changes that have occurred in the U.S. dental sector in recent years is the trend toward larger, consolidated, multi-establishment dental practices such as corporate practices or dental service organizations (DSOs).[3] Diringer and associates reported that multi-location practices are receiving an increasing percentage of dental receipts and new dentists are more receptive to working in these practices.[2] Wall et al. studied the growth of very large dental practices and found that from 2002 to 2012, market share for total receipts increased for dental firms with 20 employees or more (15.7% in 2002 versus 20.1% in 2012), while dental firms with fewer than five employees experienced a decline (19.9% in 2002 versus 16.0% in 2012). During the same period, very large dental firms, those with 500 employees or more, also saw increases in the number of

establishments (1,172 in 2002 versus 3,732 in 2012) and number of employees (14,269 in 2002 to 33,754 in 2012). This market penetration of very large firms varies by state, from a low of none in seven states to a high of 7% in the Florida market.[4]

For a number of reasons new dentists are three times more likely than older dentists to be employed in a multi-site practice.[4] Growing debt, changing demographics, and lifestyle choices of new dentists may influence practice choices. Mounting dental school debt makes it more difficult for new graduates to purchase solo practices. The debt load of new dental graduates has grown to an average of approximately $220,000. More than half (52%) of recent dental school graduates say that educational debt had a great influence on their professional choices after graduation.[5] They are more likely to forgo solo practices for joint, group, or corporate practices.[2] Dentists who have completed their dental education within the past ten years are three times more likely to be part of a larger company than those who completed their education more than ten years ago.[4]

Lifestyle choices and demographics of younger generations are also factors in choosing to work in a large practice. An increasing number of women are entering dentistry and attempting to balance family and professional lives.[2] Diringer and associates report that 60% of dentists ages 44 or below are women. Women are more likely to practice part-time, less than 30 hours a week (20% versus 12% for men). New female active private practitioners are also less likely to be owner dentists (36% of women; 53% of men) and are more likely to be associates or employees (41% of women; 28% of men). Female dentists are also more open to group practices versus owning a solo practice.[2]

Another major trend seen in dentistry is increasing digitization. The pressure to reduce costs and increase treatment accuracy is driving innovation, leading to a technological boom of

computer-aided design/computer-aided manufacturing (CAD/CAM) products, guided implant surgery, 3D Cone Beam Computed Tomography (CBCT) imaging, lasers, electronic records, and digital radiographs. Digital dentistry is thought to be advantageous because of improved efficiency in cost and time, improved accuracy in comparison to previous methods, and a higher level of predicable outcomes.[6] There are a number of areas where digitization is enhancing dentistry. Digital patient education is growing rapidly with technologies such as voice-activated and touch-screen computer and software instruction. Digital radiography has lower radiation, significant time reduction, convenient storage and organization, and image enhancements for quick and improved viewing.[6] One of its main advantages, as reported by Van der Stelt and colleagues, is the use of digital subtraction radiography which allows practitioners to distinguish small differences between subsequent radiographs that would otherwise remain unnoticed by overproduction of anatomic structures or too small to be recognized by the human eye.[7] CBCT is being quickly adopted by most specialties and becoming the proposed standard for many surgical procedures, including implant placement, third-molar removal, and endodontics.[6] The American Academy of Periodontology (AAP) recently published a best evidence consensus for oral applications for CBCT and concluded CBCT inherently offers increased diagnostic information and increased accuracy when compared to two-dimensional digital (periapical and panoramic exposures) diagnostic data. This information can be valuable when considering prognosis, treatment planning, and surgical management of complex cases that involve implant therapy or periodontal-orthodontic collaboration.[8] CAD/CAM for dental manufacturing and the dental laboratory profession is already well established. Manufactures report it is faster, more economical, predictable, consistent, and more accurate. Sannino and colleagues highlight the fact that this chairside system allows clinicians in private offices to independently design and also

machine dental ceramic restorations in matter of hours, enabling reconstruction during a single visit compared to conventional dentistry which has historically involved multiple visits.[9]

Laser use is on the rise in periodontics, endodontics, surgery, prosthodontics, and general practice and has drawn the growing attention of universities and specialists.[6] Cobb, in a review of lasers for periodontal applications, reports distinct surgical and non-surgical advantages including easy ablation of small volumes of tissue, hemostasis (which, in turn, offers better visualization of the surgical field), sterilization of the tissue and target surface area as well as less post-treatment tissue edema and swelling. Furthermore, Cobb reviews literature that states lasers may have biostimulatory effects that are reported to result in better wound healing compared to traditional approaches.[10] For these reasons, many in the dental field are increasing their use of lasers for various applications. Technological advances, whether it be CBCT imaging, CAD/CAM milled surgical guides and restorations, or lasers, are heavily impacting dental patient diagnosis, treatment planning, and treatment. This increasing digitization is a trend likely to continue.

Another major trend is the increase in specialty procedures performed by general practitioners (GPs). Many general dentists have reported treating malocclusion with clear orthodontic aligners (Invisalign™) and performing complex endodontic procedures. Practice management seminars have been encouraging GPs to provide more soft tissue management, bone augmentation, and non-surgical therapy as important income generators.[11] Implant dentistry, in particular, has become a particularly expansive enterprise in dentistry. Lanning et al. in 2007 found that 16% of surveyed GPs reported placing dental implants.[12] A more recent survey by Yoon et al. in 2018 found that 32.8% of dentists surgically place dental implants, a dramatic increase from 2007.[13] Furthermore, prosthodontic residencies and some endodontic

residencies are now incorporating implant placement in their requirements, further diversifying the choices of surgical implant providers in the market.

When comparing the increase in implant placement by GPs to the amount of time spent teaching implant dentistry in dental school, several observations can be made. The Annual ADEA Survey of Dental School Seniors is a questionnaire that gathers information on senior's perceptions of their educational experiences while in dental school. This information can assist administrators and educators on the perceived educational needs of their students. As with previous surveys, most 2016 graduating seniors reported their time spent on the designated areas of education and training was appropriate. However, there were a few exceptions, one of which was the perception of inadequate time spent on implant dentistry (30.7%). Similarly, seniors reported they were generally prepared for private practice except in implant dentistry in which 16.5% reported they were underprepared and 28.7% were only somewhat prepared.[14] This survey also highlights that not only do senior dental students report a lack of preparation in implant dentistry, but they also had no desire or plan for postdoctoral training. Approximately half (50.5%) of responding seniors in 2016 planned to go into private practice dentistry immediately after graduation. The next largest share of seniors (33.8%) planned to pursue advanced dental education as a student, resident, or intern.[14] Results like this indicate there may be room for greater development of implant education in dental school. Furthermore, continued postdoctoral education in surgical and restorative implant dentistry might be advantageous, particularly for younger GPs recently out of dental school. It is plausible that over time older GPs see the limitations of providing specialty services and begin referring more to specialists as they become more established in their practices and see the long-term results of their work.

The increasing debt burden faced by graduating students, the rise in corporate dentistry, the increasing digitization of practices and periodontal procedures performed by GPs are just a few of the major dental trends currently impacting periodontal practices nationwide. There are few reports in the literature on the variables influencing periodontal practices or the perceptions of the periodontists in the field. Furthermore, there seems to be diverse opinion among periodontists regarding the current dental environment's impact on the specialty. The purpose of this survey is to determine the personal and practice demographic variables influencing periodontal practices and report periodontist's perceptions of the likely changes in treatment modalities and practice models required to account for the evolving changes in dentistry. It is hypothesized that periodontists sense their practices will need to adjust their treatment modalities and practice models to account for the broader changes seen in the dental industry.

Methods

The participants from this study were acquired from the AAP online membership directory in April 2017. Inclusion criteria included: 1) membership in the AAP; 2) primary practice location in the Commonwealth of Virginia; 3) full-time, part-time, or retired periodontists in a private practice or academic setting; 4) email address provided to online membership directory.

An original list of survey questions was created and organized into 5 categories: 1) personal demographics related to the periodontist; 2) demographics related to the periodontists' primary practice; 3) distribution of referring dentists and the reasons for referring and not referring; 4) perception of treatment and practice model trends likely to impact periodontal practices; 5) anticipated changes needed to adjust to the perceived dental industry trends.

A literature search was conducted to see if similar studies have been done and to develop content for potential use in the survey. The majority of the personal and practice demographic questions were modeled after a study by Zemanovich and colleagues where they assessed the demographic variables affecting patient referrals from GPs to periodontists.[11] In addition to the demographic variables like age, gender, years in practice, amount of continuing education (CE) per year, and advanced training studied by Zemanovich, this survey included questions on job status, approximate debt after residency, board certification, job satisfaction, and anticipated job status in 10 years. Like Zemanovich, the survey asked about the practice demographics including hours worked per week, number of patients seen per week, practice location, participation in insurance versus fee for service, and distance to nearest surgical specialists. In addition, this survey asked about the socioeconomic status of the practice's community, approximate annual periodontal production, the practice setting, and the average time spent on

procedures. It was believed these personal and practice demographic questions would provide an accurate and current representation of the responding periodontists and their practices.

Another set of questions were developed to assess the distribution of referring GPs and the perceptions of why GPs refer or do not refer. Content for these questions were obtained, in part, from McGuire's editorial, A Referral-Based Periodontal Practice – Yesterday, Today, and Tomorrow.[15] Finally, two other sets of questions assessed what periodontists perceive as the likely treatment and practice model trends occurring in dentistry that will most heavily impact periodontal practices as well as the changes to periodontal practice structures and business models needed to adjust to these trends. Input for these questions was largely based on experience from several members of the research committee, including one member who has been an active, full-time private practicing periodontist for the last 20 years, and another member who was in private practice for 15 years before transitioning into a full-time academic position.

After compiling all questions in a master list, the eight members of the research committee independently reviewed each question for clarity, consistency, and merit. Through multiple revisions, non-pertinent questions were discarded and confusing questions were reorganized for optimal clarity and to ensure all objectives were met. Once the final list of questions was approved, the survey was tested electronically by a small group of eight practicing periodontist to ensure clarity and evaluate the length of the survey.

Study data were collected and managed using REDCap (Research Electronic Data Capture) electronic data capture tools hosted at Virginia Commonwealth University. REDCap is a secure, web-based application designed to support data capture for research studies.[16] An email with the linked study survey was sent in May 2017 to 150 Virginia members of the AAP. Reminder emails were sent to non-respondents approximately every two weeks for two months.

Participants were informed that choosing to participate in the study was voluntary and yielded no compensation. Within the introductory email to members, it was clearly stated that all survey responses would be anonymous and no identifiers collected. By completing the survey, participants indicated their consent to participate in the study. This study was approved by Institutional Review Board at Virginia Commonwealth University (HM20010048). The complete survey is given in Appendix 1.

Results

Response Rate:

A total of 150 email addresses were obtained from the online AAP member directory in the Commonwealth of Virginia, and an email was sent with a unique link to complete the online survey. Two of the acquired addresses were undeliverable and one was incorrect. All three were removed from future emails and not counted in the response rate. The response rate of completed surveys was 31% (n=46) of the remaining 147 emailed.

Demographic Characteristics of Periodontists:

The demographic characteristics of the periodontists responding can be seen in Table 1. The majority of respondents were male (87%), board-certified (78%), and practiced full-time (70%). Most were greater than 60 years old (41%), had been in practice more than 30 years (39%), and anticipated being retired or no longer practicing in 10 years (48%). Most had no other training other than periodontics (54%), but some had also completed an AEGD or GPR (33%) and some had GP experience prior to their periodontal residency (26%). Only 13% of respondents reported having greater than $250,000 in student debt after completing their residency. More than half were active in study clubs (63%) and most averaged more than 20 continuing education credits a year (80%). None of the respondents reported being unsatisfied with their job, but only 37% reported they were very satisfied.

Table 1: Personal Demographics

Demographics	n	%
Response Rate	46	29%
Job Status (n=46)		
Full-time practicing periodontist	32	70%
Full-time academic/teaching periodontist	7	15%
Part-time practicing Periodontist	8	17%
Part-time academic/teaching periodontist	4	9%
No longer practicing/retired	1	2%
AAP Member (n=44)	43	98%
Gender (n=46)		
Male	40	87%
Female	6	13%
Age (n=46)		
30-39	9	20%
40-49	12	26%
50-59	6	13%
60+	19	41%
Years in Practice (n=46)		
<10	9	20%
10-19	11	24%
20-29	8	17%
30+	18	39%
Approximate Student Debt after Finishing Residency (n=45)		
No student debt	19	42%
<$250,000	20	44%
$250,000-$500,000	5	11%
$501,000-$750,000	1	2%
Are you active in study club? (n=46)		
Yes	29	63%
No	17	37%
Average CE credits per year (n=46)		
15-20	9	20%
>20	37	80%
Board Certified (n=45)	35	78%
Job Satisfaction (n=46)		
Very Satisfied	17	37%
Satisfied	26	57%
Somewhat Satisfied	3	7%
Dissatisfied/Very Dissatisfied	0	0%
Anticipated Job Status in 10 Years (n=46)		
Full-time	19	41%
Part-time	5	11%
No longer practicing/retired	22	48%
Advanced training (n=46)		
AEGD/GPR	15	33%
Military- non-certified short course	4	9%
Military- Accredited Residency	4	9%
General Dentistry Experience Prior to Periodontal Residency	12	26%
No Advanced Training other than Periodontics	25	54%
Other (including Prosthodontics and Implantology)	2	4%

*Respondents could check all that apply

Characteristics of Periodontist's Practices:

The characteristics of the responding periodontists' practices is presented in Table 2. More respondents reported working in a group practice with other periodontal specialists (43%) than as a solo practitioner (23%). Forty-four percent of respondents indicated their practice employed 3 or more periodontists. Most practices were located in suburban areas (52%) with moderate income defined as median annual family income of roughly $50,000-$200,000. Most practices participated in conventional insurance plans (73%). Only 7% reported accepting Medicaid or Medicare, and 31% reported being fee-for-service. Age of the practice was roughly equally distributed from less than 10 years old (14%) to greater than 40 years (25%). Most periodontists worked between 35-44 hours per week (38%) and saw between 50 and 100 patients per week (39%). The annual periodontal production was between 1-2 million dollars for 29% of respondents. Sixteen percent of respondents reported greater than 3 million dollars in annual periodontal production and the same percentage reported less than $500,000. Most practices (59%) were within one mile of another surgical specialist (periodontist, OMFS).

Table 2: Practice Characteristics

Practice		n	%
Typical hours in given week (n=45)			
	<25	11	24%
	25-34	14	31%
	35-44	17	38%
	45+	3	7%
Patients per week (n=46)			
	<50	16	35%
	50-100	18	39%
	101-150	6	13%
	150+	6	13%
Practice Location (n=46)			
	Urban	19	41%
	Suburban	24	52%
	Rural	3	7%
SES of Practice Community (n=46)			
	Low income area (<$50,000 Median Income)	6	13%
	Moderate income area ($50,000-$200,000 Median Income)	36	78%
	High income area (>200,000 Median Income)	4	9%
Appox. Annual Production (n=45)			
	< $500,000	7	16%
	$500,00 - $1,000,000	9	20%
	$1,000,001 - $2,000,000	13	29%
	$2,000,001 - $3,000,000	9	20%
	> $3,000,000	7	16%
Practice Setting (n=44)			
	Solo practitioner	10	23%
	Group practice with other periodontal specialists	19	43%
	Group practice with other dental specialists	2	5%
	Group practice with general dentists and other periodontal specialists	2	5%
	Group practice with general dentists and other dental specialists	5	11%
	Traveling periodontist	1	2%
	Military	1	2%
	Academic	4	9%
100% Fee for Service (n=45)		14	31%
Num perios (n=36)			
	1	10	28%
	2	10	28%
	3+	16	44%
Medicare/Medicaid (n=46)		3	7%
Conventional insurance (n=44)		32	73%
Practice existence in years (n=36)			
	< 10	5	14%
	10-20	8	22%
	21-30	7	19%
	31-40	7	19%
	>40	9	25%
Distance to Nearest Surgical Specialist (periodontists, OMFS) (n=46)			
	< 1 mile	27	59%
	1-5 miles	17	37%
	>5 miles	2	4%

Average Time Spent on Procedures:

Respondents also reported their estimated time spent on common periodontal procedures. Results can be seen in Table 3. Respondents reported spending roughly 20% of their time on each of the following procedures: implant therapy (23%), non-surgical treatment of periodontal disease (19%), surgical treatment of periodontal disease (20%). The next most common procedures were periodontal plastic surgery (14%) and prescription surgeries (12%). Least common were laser therapy (3%) and "Other procedures" most commonly specified as biopsies (1%).

Table 3: Average Time Spent on Procedures

Procedure	Average Percent of Time Spent	Std Dev	
Non-surgical treatment of periodontal disease (SRP, chemotherapeutics, occlusal therapy)	18.84	18.01	a, b
Surgical treatment of periodontal disease (open flap debridement, pocket elimination surgery, GTR)	19.63	13.08	a, b
Prescription surgeries (crown lengthening, orthodontic exposure, extraction, etc.)	12.16	7.27	b
Periodontal plastic surgery	14.36	9.44	b
Implant therapy with or without bone augmentation (sinus augmentation, ridge augmentation, ridge preservation)	22.61	17.16	a
Laser therapy	2.75	7.39	c
Other procedures (biopsies, etc.)	1.04	3.40	c

*Levels not connected by the same letter are significantly different; Tukey's HSD p-value<0.05; Std Dev = Standard deviation

Referrals:

Respondents were asked to rank GPs in terms of most referrals based on the GP's years in practice since graduating from dental school (Table 4), and then asked on a 5-point Likert scale (strongly disagree to strongly agree) to rate their agreement with two different sets of statements regarding reasons for referring and reasons for not referring (

Table 5). Respondents ranked GPs with greater than 15 years and 11-15 years of experience as generating a significantly higher proportion of referrals than GPs with 5-10 years or less than 5 years' experience. GPs with <5 years were also ranked significantly lower than those with 5-10 years' experience (p-value<0.0001). There was no significant difference between 11-15 and 15+ years' experience (p-value=0.2709). An overwhelming majority of periodontists agree that GPs do not refer to periodontal practices in order to keep revenue streams in-house and because they desire to do implant surgeries themselves, 83% and 72% respectively. Another 52% of respondents felt GPs preferred to do periodontal surgeries themselves. Most respondents also disagreed that GPs who do not refer are experienced in diagnosing and managing periodontal disease (29%) and can adequately address all periodontal problems (17%). On the contrary, respondents felt GPs who are more likely to refer do so because they value referring to the periodontist (76%), have not had the surgical experience to manage periodontal disease, or may have had poor surgical outcomes in the past (75%). There was consistent agreement on the remaining sentiments about why good referring GPs refer. This includes having knowledge, understanding, and familiarity with periodontal disease (67%), having experienced poor surgical outcomes in the past (66%), having a good understanding of the periodontal-restorative relationship (64%), and having the ability to adequately detect and diagnose periodontal disease (63%).

Table 4: Distribution of Referring GPs

Years Experience	Average Rank	SE	
< 5 Years Experience	3.5	0.13	a
5-10 Years Experience	2.6	0.14	b
11-15 Years Experience	2.0	0.13	c
> 15 Years Experience	1.7	0.13	c

*Levels not connected by same letter are statistically different, Tukey's HSD p-value<0.05;
*Ranks range from 1-4 with 1 indicating most referrals and 4 indicating least referrals; SE = Standard Error

Table 5: Perceived Reasons for Referring or Not Referring

	Mean Agreement*	SD
Reasons for Not Referring		
General practitioners are experienced in diagnosis and management of periodontal disease	28.6	22.1
General practitioners want to maintain periodontal patient revenue stream in-house.	83.0	15.9
General practitioners can adequately address all periodontal problems	17.4	24.3
General practitioners desire to do periodontal surgeries themselves	51.7	24.8
General practitioners desire to do implant surgeries themselves	72.0	19.0
Reasons for Referring		
General practitioners have knowledge, understanding, and familiarity with periodontal disease.	66.8	23.5
General practitioners value referring to periodontists	75.6	17.0
General practitioners can adequately detect and diagnose periodontal disease	62.8	21.6
General practitioners don't have surgical experience or have had poor surgical experiences	75.1	17.7
General practitioners may have had poor surgical outcomes	65.5	19.3
General practitioners have a good understanding of the periodontal-restorative relationship	63.9	26.3

0= Strongly Disagree 100= Strongly Agree

Debt:

Debt after residency was related to age, practice setting, and accepting Medicare/Medicaid (Table 6). Student debt after periodontal residency was significantly associated with age (p-value=0.0002). For respondents less than 40 years old, 56% reported greater than $250,000 in student debt after their residency compared to 3% of those 40 or older. Debt was not significantly associated with a group practice setting (p-value=0.2771), however all respondents who reported more than $250,000 in debt after residency reported working in a group setting compared to 73% for those with less debt. All the respondents accepting Medicare/Medicaid

patients (n=3) had less than $250,000 in debt after graduation. This association was not statistically significant (8% vs 0%, p-value=0.4819).

Table 6: Debt After Residency

	Debt after Residency		
	$250,000+	**<$250,000**	**p-value**
Age			<0.0001
<40	5, 56%	4, 44%	
40+	1, 3%	35, 97%	
Practice Setting			0.1461
Solo	0, 0%	10, 27%	
Group	6, 100%	27, 73%	

Future Variables Affecting Practices:

A section of the survey addressed various potential future trends and the impact they might have on elements of practice treatment, structure and business model. Results are given in Table 7. These were grouped by: treatment trends, practice model trends, changes to practice structure, changes to practice business model, and preferred practice if starting today.

Treatment Trends

When asked about the treatment trends most likely to have a large impact on changing periodontal practices over the next 20-30 years, respondents ranked highest biologic advances used in the treatment of periodontal defects, mucogingival deformities, and for bone augmentation procedures. They also ranked treatment of peri-implantitis, and digital dentistry (i.e. CAD/CAM, guided surgery, intraoral cameras, CBCT, digital patient education) as most likely to be influential. Lasers and genetic advances used for early screening and periodontal disease susceptibility were ranked significantly less likely to influence treatment trends.

Ratings for these new treatment trends were not related to provider age (p-value=0.2419), gender (p=value=0.1534), student debt upon finishing residency (0.1763), or anticipated job

status in 10 years (p-value=0.0857). Rankings were significantly associated with practice location (p-value=0.0155). After adjusting for multiple comparisons; however, none of the pairwise comparisons were statistically significant which could be due to the small sample size of rural respondents. There were marginal differences in rankings of biologics between rural and urban/suburban (3.5 vs 2.0, adjusted p-value=0.2928).

Practice Model Trends

When asked about practice model trends most likely to have a large impact on changing periodontal practices over the next 20-30 years, respondents ranked more corporate development, more group practice development, and GPs incorporating more periodontal services in their practices as having the biggest impact on periodontal practices. There was no statistical difference among the rankings. Respondents ranked periodontists incorporating more restorative services significantly lower.

Ratings for these practice model trends did not depend on age of the provider (p-value=0.1172), student debt upon finishing residency (p-value=0.4622), anticipated job status in 10 years (p-value=0.0653), or practice location (p-value=0.2584). There was evidence of a difference based on gender (p-value=0.0061), however, after adjusting for multiple comparisons, none of the comparisons of interest were significant. Most notable, females rated joining GPs more likely than males (1.5 vs 3.2, p-value=0.1113 -- Note: rankings ranged from 1-5 with 1 being the most likely). Based on the limited sample of females, this should be further studied. There were 36 females surveyed (17% of mailing list) and only 6 responded making the response rate among females 13%. Due to the small number of female respondents, this should be further studied.

Changes to Practice Structure

When asked about how they might change the structure of their practice to account for future dental, industry, and practice variables the respondents ranked expansion of services they provide (digital dentistry, lasers, restoring own implants) and increasing the number of periodontists in the practice as most likely. Respondents ranked opening additional offices and no anticipated practice changes significantly lower than expansion of services.

Changes to Practice Business Model

Respondents were also asked how they might change their business model to account for future dental, industry, and practice variable. Respondents were least likely to sell their practice to an investor group or corporate entity. They were significantly more likely to join with other specialists to create a multi-specialty model or join with general dentists to create a group model.

Table 7: Future Variables Affecting Practices

Future Variables Affecting Practice	Mean Rank (1=Most)	SD	
Model Treatment Trends			
Digital dentistry (i.e. CAD/CAM, guided surgery, intraoral cameras, CBCT, digital patient education)	2.4	1.34	a
Biologic advances used to treat periodontal defects, mucogingival deformities, or for bone augmentation procedures	2.2	1.14	a
Genetic advances (i.e. genotyping) used for early screening of periodontal disease susceptibility	3.8	1.37	b
Lasers	4.2	1.04	b
Treatment of peri-implantitis	2.4	1.20	a
Practice Model Trends			
More group practice development	2.1	0.99	a
More corporate practice development	2.0	2.00	a
General practitioners will incorporate more periodontal services in their practices, leading to less referrals	2.0	0.93	a
Periodontists will incorporate more restorative services in their practices	3.8	0.88	b
Other practice trend	4.9	0.25	c
Practice Structure Trends: Services			
Expansion of services you provide (digital dentistry, lasers, restoring own implants)	2.1	1.21	a
Opening additional offices	2.7	0.93	b
Increasing the number of periodontists in your practice	2.4	0.87	a, b
I don't see my practice changing	2.8	1.28	b
Practice Structure Trends: Model			
Joining with other general practitioners to create a group model Joining	2.9	0.20	a
with other periodontal practices to create a group model Joining with	3.0	0.19	a, b
other specialists to create a multi-specialty practice model Selling your	2.2	0.20	a
practice to an investor group or corporate entity	3.7	0.20	b
I don't see my practice changing	2.9	0.21	a, b

*Levels not connected by the same letter are significantly different; Tukey's HSD p-value<0.05; Std. Dev = Standard deviation

Practice Preference if Starting Practice Today

Additionally, respondents were asked if they were to start practicing today, what type of practice would they choose, regardless of their current practice (Table 8). The most common response was group practice with other periodontal specialists (41%) followed by group practice with general dentists and other dental specialists (24%). These responses were not dependent on the age of the provider (p-value=0.5254), anticipated job status in 10 years (p-value=0.5606), current practice type (p-value=0.3727), or student debt at the end of residency (p-value=0.1986).

Table 8: Practice Preference if Starting Practice Today

Practice Type	**n**	**%**
Solo practitioner	5	11%
Group practice with other periodontal specialists	19	41%
Group practice with other dental specialists	8	17%
Group practice with general dentists and other dental specialists	11	24%
Traveling periodontist	1	2%
Other (Please specify)	2	4%

Discussion

It is evident from the results of this survey that most periodontists sense treatment and practice model changes occurring in the field of dentistry. The perceived treatment changes most notably impacting periodontal practices are digital dentistry, biologic advances, and the treatment of peri-implantitis. The most notable practice model change is the growing presence of corporate dentistry, group development, and GPs incorporating more periodontal services into their practices. This survey also shows that periodontists perceive the need for change and adaptation in the field of periodontology either by expanding the services the practice provides, hiring additional periodontists, or joining with other specialists or GPs to create a group model.

A progressive change seen in the dental industry has been the rise of educational debt and advancement of corporate dentistry. Inflation adjusted dental school debt increased from approximately $144,000 in 2001 to $245,000 in 2014, a 70% increase.[17] Because educational debt levels have increased substantially over the last 15 years, new dentists may believe entering a corporate DSO group practice may offer more predictable earnings stability early in their career.[18] An association between increased debt and dental career choices has been demonstrated by several authors. Nasseh and colleagues showed that for every $10,000 increase in educational debt, dentists were 0.9% more likely to join a DSO and 0.6% less likely to join a non-DSO group practice over a solo practice.[18] They also concluded that increased debt levels may make specialization less attractive for new dentists, considering the additional time and investment it requires.[18] Nicholson and colleagues concluded that dentists with high educational debt were more likely to enter private practice and work longer hours.[19] However, the authors did not find a relationship between education debt and practice ownership, setting of practice, or decision to participate in Medicaid.[19] Wanchek and colleagues found that increased debt makes dental

graduates more likely to choose private practice employment over government service, advanced education, and teaching.[20] Even stronger evidence of debt's influence on career choices can be found in the Annual ADEA Student Survey of Dental School Seniors. Among the 2016 seniors planning to enter private practice immediately after graduation, more than half (55%) said their debt moderately or very much influenced their decisions, while only a quarter (23.6%) said debt did not affect their decisions.[14] It is clear the debt faced by current graduates is affecting their career choices, possibly encouraging them to work with group or corporate practices.

According to the Health Policy Institute, 8.3% of U.S. dentists were affiliated with DSOs in 2016, which was up from 7.4% in 2015.[21,22] This included 6.6% of periodontists and 7.5% of dentists in Virginia.[21] One would expect DSO affiliation to be inversely correlated with age, with less DSO affiliation in older dentists who have less debt and higher earning potential. The Health Policy Institute confirmed this relationship between DSO affiliation and age with 17.4% of dentists aged 21-34 affiliated with DSOs, 11% aged 35-49, 4.2% aged 50-64, and 3.2% greater than 65 years old. More females (11%) than males (7%) are affiliated with DSOs.[21] Findings from the 2016 senior survey confirmed that the traditional sole proprietor, single location model of dentistry, in which new dentists enter small practices as associates, is seeing more competition from other business models. While 42% of these seniors going immediately into private practice planned to become associates at a sole proprietor-owned practice, 17% planned to join a group practice that has multiple locations, and 15% were going to a corporate-owned practice, which is up from 10.4% in 2015, a roughly 5% increase in one year. Women were more likely to enter these three group arrangements, while men were more likely to purchase existing practices as partners (7.2%), become sole proprietors (6.5%), or establish new private practices (5.9%).[14]

The results from this survey seem to align with much of the aforementioned research. Most notably, there was a significant association between student debt after residency and age. For respondents less than 40 years old, 56% reported greater than $250,000 in student debt after their residency compared to 17% of those 40 or older. Additionally, none of the respondents who had more than $250,000 in debt at graduation reported practicing in a solo practice and none reported accepting federal programs (Medicare/Medicaid). Debt was not significantly associated with a group practice setting, however all respondents who reported more than $250,000 in debt after residency reported working in a multi-doctor group setting compared to 73% for those with less debt. The survey also shows that younger periodontal practitioners are more likely to enter a group practice with other periodontists or GPs rather than start a solo practice. This is likely due in part to the heavier debt load facing young periodontists. More group practice and corporate practice development were also rated highest when asked what practice model trend will have the biggest impact over the next 20 years.

Another important evolution in dentistry is the increased use of digitization. Guided surgery, full-arch implant dentistry, digital work-flow treatment planning, and CBCT are increasingly popular in periodontal practices. The AAP reported, in a best evidence consensus, that current evidence supports the use of CBCT in the surgical management of patients. This includes assessment of such things as root morphology, location of anatomic structures, sinus morphology, dynamic implant navigation, bone augmentation associated with implant planning, and management of implant complications.[8] CBCT is perhaps the most impactful technological advance for periodontal practices since it has such a dramatic effect on the decision making with regard to bone augmentation and implant treatment planning.

The Struamann Group in their 2016 annual report suggested an increased use of CAD/CAM technology as found through company sponsored surveys.[23] It was shown an estimated 15-20% of dental practices in developed markets like the US, Germany, or Switzerland have made CAD/CAM investments. More surprising, 60% of labs surveyed have an in-lab scanner and 40% have also invested in a milling system. Of the larger labs, 85% have a scanner, milling system, sintering furnace, and a significant proportion intend to invest in additional CAD/CAM equipment.[23] Digital scanning and CAD/CAM equipment is being used to fabricate guides used in surgical procedures. This is further evidence of the increasing digital trend occurring in dentistry.

Results from this survey show that many periodontists agree that technological advances will have a large impact on the future of periodontal practices. This opinion was shared by both young and old practitioners and was not associated with gender or anticipated job status in 10 years. Respondents rated technological advances like CAD/CAM, guided surgery, and CBCTs as most likely to drastically shape dentistry and periodontics. In general, respondents suggested increasing the digitization of periodontal practices to keep up with current trends.

The rise in student debt and ability to share technology expenses are likely reasons young graduates are more prone to practice in DSOs, but they also may be likely reasons young GPs are less likely to refer periodontal procedures to non-DSO periodontal specialists. Results from the survey indicated that providers report they receive the least referrals from GPs with less than 5 years of experience. The most agreed upon reasons cited for GPs not referring was the desire to maintain revenue in-house and to do implant surgeries themselves. GPs incorporating more periodontal services in their practices was also one of the highest rated items when respondents

were asked what practice model trends would have the greatest impact on periodontal practices in the future.

In an editorial, McGuire and colleagues argue that practice management seminars have been encouraging general practitioners to partake in soft tissue management protocols.[15] In addition, non-surgical treatment is looked upon as a much more important income center in the business model of today's general practice than it was 20 years ago. Many of today's referring doctors can be strongly influenced to delay their referrals and maintain their revenue stream with soft tissue and implant management programs that do not have guidelines for outcome assessment and have not delivered definitive periodontal therapy.[15]

This is interesting when compared to the amount of time spent on implant and surgical training. Nearly one third (30.7%) of dental school seniors surveyed in 2016 responded they spent inadequate educational time on implant dentistry. Furthermore, 16.5% of graduates perceived they were underprepared and 28.7% perceived they were only somewhat prepared to handle implant cases upon graduating. Yet, nearly half (48.6%) of 2016 dental school graduates did not think any postdoctoral education should be required, while 29.5% reported thinking one year should be required. Only half (48.4%) said they had applied to a postdoctoral or advanced education programs.[14] It is possible the lack of preparation and training results in inferior results. Da Silva conducted a 5-year retrospective study assessing the outcomes and risk factors associated with dental implants placed in GP practices. He found that 172 of 920 implants failed leading to a success rate of 81.3%.[24] This is in stark comparison to a number of systematic reviews and meta-analyses, including one by Iqbal and Kim, where implant surgeries conducted by surgical specialists reported on average a 95-97% success rate at 5 years. According to Rakic and colleagues, the prevalence of peri-implantitis is 18.5% at the patient level and 12.8% at the

implant level.[25] Derks and colleagues in a systematic review and meta-analysis showed a higher odds ratio (4.27x) for moderate to severe peri-implantitis for implants restored by GPs rather than specialists.[26] This indicates a possible need to spend more time on training GPs to properly place and restore implants.

Aside from implant dentistry, other authors have reported on the periodontal services rendered by GPs. Lanning et al. surveyed Virginia GPs to determine the specific nature of periodontal services they rendered and to investigate whether certain variables affect GP's practice patterns. They found that 95% of GPs performed generalized (four or more teeth) scaling and root planing, with 30% treating >25 patients in a 3-month period. A majority (86%) of GPs reported providing periodontal maintenance in their practices. The most common surgical services performed included crown lengthening and pocket reduction surgery, which were done by 48% and 24% of GPs respectively.[12] Interestingly, variables found to influence specific services rendered by GPs included year of dental school graduation and recent hours of CE related to periodontics. Year of dental school graduation correlated positively with pocket reduction surgery, bone and/or guided tissue regeneration, and implant placement with more recent graduates performing more of these services. Formal advanced training correlated positively with soft tissue grafting, pocket reduction surgery, and bone and/ or guided tissue regeneration. Hours of periodontal CE credits earned correlated positively with crown lengthening and implant placement.[12] This is in agreement with Betof et al., who found younger dentists, presumably more recent graduates, treated more patients with periodontal disease than did less recent graduates.[27] This could be related to the fact that periodontal education has increased over the years, but it may also be related to the debt burden faced by younger practitioners and the increase in surgical CE available as compared to older generations.

This referral pattern was confirmed by respondents of this survey who perceived younger GPs refer less than older, more established GPs. Respondents do believe; however, that referrals increase as GPs gain experience. The main reasons for perceived GP referral was limited surgical experience, poor surgical outcomes, or because the GP has a true understanding of the value periodontists bring to patient care. McGuire argues that many of today's young dentists do not understand what periodontists do and what value they bring to patient care and that most of the young periodontists' referrals do not come from young GP colleagues but instead from established practitioners who have mature practices, and possibly a more periodontally aware philosophy.[15] In their opinion, the reason for this is not so much the difference in financial security between the young and established practitioner, but the fact that the established practitioner has the periodontal educational experience and understands the need to maintain optimal periodontal health in their long-term patient population.[15]

With these observations in mind, the survey directly asked how periodontists might adjust their own practice to account for the landscape changes they are seeing in dentistry. The most common response was to form group models with other periodontists, GPs, or multi-specialty groups, but to not sell their practices to investor groups or corporate entities. It can be assumed these structural changes would provide for a better flow of referrals, a stronger base from which to educate the referral base, and optimization of overhead costs by sharing expenses like technological advances as compared to being a solo practitioner.

This survey highlights some of the important changes occurring in dentistry and reports how strongly periodontists believe these changes will impact their practices. Increased debt, the rise of corporate dentistry, technological advances, and GPs performing periodontal services are just a few of the areas periodontal practitioners will need to consider as they adjust the structure

of their practices and services they provide over time. As stated by McGuire, "if the Specialty of periodontics is to remain the premier caregiver for the diagnosis and treatment of periodontal diseases and replacement of the lost dentition, we must face and successfully overcome many new challenges."[15]

This study is not without limitations. First, the cross-sectional nature of the study does not allow for causal interpretations. The respondents were also restricted to Virginia, so these results may not be representative of the entire field of periodontology. The sample size and response rate were also limited. As a result of the small sample size, there were also limited responses for various demographics, especially gender (female) and practice location (rural). Testing for associations with these variables may lack sufficient statistical power and should be further studied. Another limitation is that respondents were asked to answer questions based on their perceived opinion of referring GPs. This study addresses training of GPs (i.e. implant) in dental school, yet many dentists receive additional training (i.e. residencies, CE) following dental school. Due to the large number and diversity of training programs (i.e. implant, soft tissue grafting, regeneration) available, there was difficulty in finding research to reference. Therefore, a comparison of the respondent's opinions regarding referring GPs and the actual education level of referring GPs was not feasible. Furthermore, the survey was developed based on existing literature and by practicing periodontists and is not an established, validated instrument. As a result, the survey might overlook additional factors. The survey did include the option to select "Other" in various places, but this option was not often selected and therefore no additional factors or additional areas to explore were immediately apparent.

Conclusion

Virginia periodontists foresee significant changes for their specialty in the years to come. Student debt after residency was significantly associated with age which may impact career choices for both young periodontists and GPs due to rising debt levels. The heavier the debt burden, the more likely the practitioner is to be associated with a group model. Periodontists perceive biologic advances, treatment of peri-implantitis, and digital advances as being the most influential treatment trends affecting periodontal practices in the future. They also perceive that corporate and group development, as well as GPs incorporating more periodontal services in their practices, will be the most influential practice model trends impacting the future of periodontal practices. To account for these changes, periodontists acknowledge the need to expand the services they provide, increase the number of periodontists in their practices, or join with other specialists or GPs to create multi-specialty or group practice models. Doing so could lead to increased referrals and the ability to share expenses. Because of the debt, corporate dentistry, technology, and GP service trends seen in the current dental industry, periodontists should consider increasing the services they provide, adding additional doctors to their practice, and changing their business models to adapt to the changing dental environment.

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Appendix

The Periodontal Specialty: A Survey For Our Future

Survey Purpose

The purpose of this survey is twofold:

(1) To determine the personal and demographic variables influencing a periodontal practice

(2) To determine what periodontist's believe will influence the future of their specialty

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Demographic Variables: Periodontists

Please answer the following questions based on your personal demographics.

Which of the following reflects your age bracket?

◯ < 30
◯ 30-39
◯ 40-49
◯ 50-59
◯ 60+

What is your gender?

◯ Male
◯ Female

Which of the following accurately reflects your primary job status?

◯ Full-time practicing periodontist
◯ Full-time academic/teaching periodontist
◯ Part-time practicing periodontist
◯ Part-time academic/teaching periodontist
◯ No longer practicing/retired

Are you board certified?

◯ Yes
◯ No

How many years have you been in practice?

◯ < 10
◯ 10-19
◯ 20-29
◯ 30+

How many hours do you work in a typical week at your primary location?

◯ < 25
◯ 25-34
◯ 34-44
◯ 45+

Do you have any advanced training outside of periodontics (please select all that apply)?
(Select all that apply.)

☐ AEGD/GPR
☐ Military - non-certified short course
☐ Military - accredited residency
☐ General dentistry experience prior to periodontal residency
☐ No advanced training other than periodontics
☐ Other (please explain)

Please describe any other advanced training you have obtained:

_____

In the last 5 years, what is the average number of CE credits you obtained each year?

◯ 15-20
◯ > 20

Are you active in a study club?

◯ Yes
◯ No

Are you a member of AAP (American Academy of Periodontology)?

◯ Yes
◯ No

What was your approximate level of student debt after finishing your periodontal residency?

◯ No student debt
◯ < $250,000
◯ $250,000 - $500,000
◯ $500,000 - $750,000
◯ > $750,000

Which of the following is the best way to describe your current job satisfaction?

◯ Unsatisfied
◯ Somewhat satisfied
◯ Satisfied
◯ Very satisfied

Which of the following best describes your anticipated job status in 10 years?

◯ Full-time
◯ Part-time
◯ No longer practicing/retired

Demographic Variables: Practice

Please complete the following items based on your PRIMARY practice and its location. For example, if you work as both a traveling periodontists and a solo practitioner, you should respond to items based on where the most practice time is spent. If you have multiple offices, please respond based on your primary location.

Which of the following best describes the type of periodontal practice you work in?

◯ Solo practitioner
◯ Group practice with other periodontal specialists
◯ Group practice with other dental specialists
◯ Group practice with general dentists and other periodontal specialists
◯ Group practice with general dentists and other dental specialists
◯ Traveling periodontist
◯ Military
◯ Academic
◯ Other (Please specify)

Please describe your practice:

_____

How long has this practice been in existence?

◯ < 10
◯ 10-20
◯ 21-30
◯ 31-40
◯ >40
◯ N/A or Unknown

What is the total number of periodontists in the practice?

◯ 1
◯ 2
◯ 3+

Which of the following best describes the location of your practice?

◯ Urban
◯ Suburban
◯ Rural

Which of the following best describes the socio-economic status of the community your primary practice is based?

◯ Low income area (<$50,000 median income)

◯ Low income area ($50,000- $200,000 median income)

◯ Low income area (>$200,000 median income)

What is the number of periodontal patients seen per week in practice?

◯ < 50
◯ 50-100
◯ 100-150
◯ > 150

What is the approximate distance between your practice and the nearest surgical specialist (periodontists, OMFS)?

◯ < 1 mile
◯ 1-5 miles
◯ >5 miles
◯ Unsure

Is the practice 100% fee for service?

◯ Yes
◯ No

Is the practice a participant in federal Medicaid, Medicare?

◯ Yes
◯ No

Is the practice a participant in conventional insurance plans (Cigna, Delta Dental, MetLife, etc.)

◯ Yes
◯ No

What is the approximate annual production for the periodontal practice or periodontal portion of a group or multidisciplinary practice?

◯ < $500,000
◯ $500,00 - $1,000,000
◯ $1,000,000 - $2,000,000
◯ $2,000,000 - $3,000,000
◯ > $3,000,000

Practice Model

The following questions apply to your current practice model.

Please indicate on the sliding scale what PERCENT of your practice time is spent on each of the following procedures.

Non-surgical
treatment of periodontal disease
(SRP,
chemotherapeutics, occlusal therapy)

Least time — Most time

(Place a mark on the scale above)

Surgical treatment of periodontal disease (open flap debridement, pocket elimination surgery, GTR)

Least time — Most time

(Place a mark on the scale above)

Prescription
surgeries (crown
lengthening,
orthodontic exposure,
extraction, etc.)

Least time — Most time

(Place a mark on the scale above)

Periodontal plastic surgery

Least time — Most time

(Place a mark on the scale above)

Implant therapy with or without bone augmentation (sinus augmentation, ridge augmentation, ridge preservation)

Least time — Most time

(Place a mark on the scale above)

Laser therapy

Least time — Most time

(Place a mark on the scale above)

Other procedures (please specify)

Least time — Most time

(Place a mark on the scale above)

Please describe any other procedures you considered in your ranking of the above question:

_____

Considering your current referral base, what is the approximate distribution in terms of years of experience since dental school of your referring dentists (please answer with "1" indicating the years of experience for your most frequent referring dentists and "4" indicating the least)

	1 (Most Referrals)	2	3	4 (Least Referrals)
< 5 Years Experience	◯	◯	◯	◯
5-10 Years Experience	◯	◯	◯	◯
10-15 Years Experience	◯	◯	◯	◯
>15 Years Experience	◯	◯	◯	◯

Regarding general practitioners who refer the LEAST, please indicate your agreement with the following statements regarding the reasons why they DO NOT REFER.

General practitioners are inexperienced in diagnosis and management of periodontal disease

Strongly Disagree — Neutral — Strongly Agree

(Place a mark on the scale above)

General practitioners want to maintain periodontal patient revenue stream in-house.

Strongly Disagree — Neutral — Strongly Agree

(Place a mark on the scale above)

General practitioners can adequately address all periodontal problems

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners desire to do periodontal surgeries themselves

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners desire to do implant surgeries themselves

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

Please list any other reasons you feel general practitioners don't refer:

_____

Regarding general practitioners who refer the MOST, please indicate your agreement with the following statements regarding the reasons why they DO REFER.

General practitioners have knowledge, understanding, and familiarity with periodontal disease.

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners value referring to periodontists

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners can adequately detect and diagnose periodontal disease

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners may have had poor surgical outcomes

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners don't have surgical experience or have had poor surgical experiences

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners don't want to do periodontal surgeries

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

General practitioners have a good understanding of the periodontal-restorative relationship

Strongly Disagree Neutral Strongly Agree

(Place a mark on the scale above)

Please list any other reasons you feel general practitioners might refer to periodontists

_____

Future Variables: Affecting Practice Model

Please answer the following questions based on what you believe will have an impact on the future of periodontal practices.

Which of the following treatment trends do you think will have the biggest impact or implement the most change in periodontal practices over the next 20-30 years (please rank in order of impact with "1" being the most impact)?

	1 (Most Impact)	2	3	4	5	6 (Least Impact)
Digital dentistry (CAD/CAM, guided surgery, intraoral cameras, CBCT, digital patient education)	○	○	○	○	○	○
Biologic advances used to treat periodontal disease and defects	○	○	○	○	○	○
Genetic advances (i.e. genotyping) used for early screening of periodontal disease susceptibility	○	○	○	○	○	○
Bone grafting advances (techniques, biologics in conjunction with bone grafting)	○	○	○	○	○	○
Lasers	○	○	○	○	○	○
Other (Please explain)	○	○	○	○	○	○

Please describe any other factors you considered in your ranking of the above question: _____

Which of the following practice model trends do you think will have the biggest impact or implement the most change in periodontal practices over the next 20-30 years (please rank in order of impact with "1" being the most impact)?

	1 (Most Impact)	2	3	4	5 (Least Impact)
More group practice development	○	○	○	○	○
More corporate practice development	○	○	○	○	○
General practitioners will incorporate more periodontal services in their practices, leading to less referrals	○	○	○	○	○

Periodontists will incorporate more restorative services in their practices	○	○	○	○	○
Other (please explain)	○	○	○	○	○

Please describe any other trends you considered in your ranking of the above question: _____

Which of the following best describes how you might change your PRACTICE STRUCTURE to account for future dental, industry, and practice variables (please rank in order of likelihood with "1" being the most likely)?

	1 Most Likely	2	3	4 Least Likely
Expansion of services you provide (digital dentistry, lasers, restoring own implants)	○	○	○	○
Opening additional offices	○	○	○	○
Increasing the number of periodontists in your practice	○	○	○	○
I don't see my practice changing	○	○	○	○

Which of the following best describes how you might change your PRACTICE MODEL to account for future dental, industry, and practice variables (please rank in order of likelihood with "1" being the most likely)?

	1 Most Likely	2	3	4	5 Least Likely
Joining with other periodontal practices to create a group model	○	○	○	○	○
Joining with other General Practitioners to create a group model	○	○	○	○	○
Joining with other specialists to create a multi-specialty practice model	○	○	○	○	○
Selling your practice to an investor group	○	○	○	○	○
I don't see my practice changing	○	○	○	○	○

Irrespective of your current practice, and considering your thoughts on the future of Periodontics, if you started a practice today, which best describes the type of model you would adopt?

◯ Solo practitioner
◯ Group practice with other periodontal specialists
◯ Group practice with other dental specialists
◯ Group practice with general dentists and other periodontal specialists
◯ Group practice with general dentists and other dental specialists
◯ Traveling periodontist
◯ Academic
◯ Other (Please specify)

Since you selected other to the previous question, please specify:

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