

Program Director Perceived Factors for an Enhanced Advanced Education Program in Prosthodontics Recall System

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Abstract

Purpose: A survey study of program directors in Advanced Education Programs in Prosthodontics (AEPPs) was conducted to determine the barriers to and factors that can lead to an enhanced patient-centered recall system.

Material and Methods: Surveys were sent to AEPP directors across the United States to assess their program's recall protocol. This survey first identified whether an active recall program existed. Based on the existence of recall, the survey then delved into benefits of recall systems for patients and residents, barriers to the formation of a successful recall system, and factors that can be improved upon for an enhanced recall system.

Results: Thirty-two of the 45 programs responded; however, only 28 of the surveys were completed entirely, giving a response rate of 62%. Of these 32 programs, 19 (59.4%) reported having a recall system. A majority of the AEPPs with recall (87.5%) indicated that their system can be further improved. Almost all of the programs without recall (91.7%) indicated that if solutions to the most common barriers to recall were found, they would like to implement one within their program. Some hindrances faced by all programs included budget for initiating and maintaining a recall system, personnel to perform hygiene, a patient tracking system, patient education, and time allocation in the residents' curriculum. Mann-Whitney analyses indicated no statistically significant difference in each factor between programs with and without a recall system. Power analysis suggested that differences in perceived barriers between programs with and without recall systems may have been found if the response rate was 71% or greater. Necessary budget and facilities for initiating or maintaining a recall system may be the greatest difference in barrier importance between programs with and without recall.

Conclusions: Prosthodontic program directors perceived their program's recall system could be improved. If solutions to the most common hindrances were found, almost all program directors desired to establish a recall system within their AEPP. Therefore, a pilot recall system could be valuable in identifying these solutions in establishing an effective recall system for prosthodontic programs within the context of patient health promotion, program curriculum, and financial ramifications.

Placement of patients on a regular recall schedule following definitive rehabilitative treatment is a widely accepted practice in dentistry.¹ Insufficient evidence exists to support or refute the practice of encouraging patients to attend regular dental checkups according to a 2005 Cochrane Systematic Review.² However, the benefits of this practice in Advanced Education Programs in Prosthodontic (AEPPs) have been thoroughly de-

scribed in previous studies.^{3,4} Furthermore, a previous focus group study⁴ with advanced prosthodontic students suggested that a recall system often does not exist or students do not inform their patients of the need for recall. An ideal recall system would be financially self-supportive and managed by a team of hygienists, receptionists, and assistants with the students completing evaluations under attending faculty supervision.

This study was the second part of a series of studies aimed at identifying factors that describe an effective recall system for AEPPs within the context of patient health promotion, program curriculum, and financial ramifications. Students and their

for AEPPs within the context of patient health promotion, program curriculum, and financial ramifications. Students and their directors agreed that AEPPs' recall effectiveness could be improved.^{3,4} Current recall system diversity among AEPPs also highlighted the need for systematic preventive maintenance following prosthodontic patient rehabilitation. The purpose of the following survey study was to identify (1) existing practices that effectively promote ongoing patient health and student learning within the prosthodontic program learning environment, and (2) barriers that hinder programs from obtaining this ultimate goal. From the data, guidelines could be inferred to enhance future or existing AEPP recall systems.

Materials and methods

A survey was created and sent for approval by the University of Illinois at Chicago Office for the Protection of Research Subjects Institutional Review Board (IRB). Following IRB approval (2009–0774), the survey was uploaded to www.surveymonkey.com. Via this online survey service, e-mail invitations were sent to all 45 program directors at all United States university- and hospital-based AEPPs in December 2009. AEPPs were defined as those programs officially recognized by the Commission of Dental Accreditation (CODA). The list of director names and addresses was obtained through the American College of Prosthodontists (ACP). Directors were contacted to participate in the study three consecutive times using this online service. A follow-up packet containing a cover letter with thorough instructions, surveys, and prestamped envelopes with no form of labeling or identification was additionally sent on February 2010 to the directors. Directors were requested to complete the survey voluntarily and to disregard the survey if it had already been completed. To ensure a higher rate of participation, a final attempt was made on April 2010 by distributing the same packet at the ACP Invitational Joint Educators' Conference in Chicago, IL. A total of five attempts were made to obtain responses from program directors through an online survey service, written response, and verbal request. Data were collected until May 2010. Tables 1-3 and Appendices 1-3 show questions from the survey given to the program directors along with the tabulated responses.

Upon receipt of the surveys via the online survey system and mail, the raw data were entered into Microsoft Excel 2003 (Microsoft, Seattle, WA) for analysis. Number of responses (N), percentages, averages, and standard deviations (SD) were calculated and reported. All other statistical analyses were completed using SPSS version 17.0 for Windows. Cross tabulation and Fisher's exact testing were completed to test for significance between the existence of recall and the following variables: (1) public- versus private-based institution, (2) more professional referrals to the program versus self-referrals, (3) more comprehensive care provided by the program versus limited care. Mann-Whitney testing was used to test significant differences in each barrier factor between programs with and without a recall system. Wilcoxon signed rank test was used to evaluate significant differences between each factor hindering the effectiveness or establishment of a recall system for AEPPs with and without a recall system. For all analyses, $\alpha = 0.05$. Assuming a normal response distribution, a power analysis was also performed for *p*-values < 0.20 to identify the number of necessary director responses that would have resulted in a statistically significant difference in factors between programs with and without recall.

 Table 1
 Mean rating and ranking for factors hindering the initiation or the maintenance of a recall system in all AEPPs. Mann-Whitney test for significance within each factor between program with and without a recall system

	Wit	h recall		Without recall			
Factors	$Mean \pm SD$	Rank	NOR	$Mean \pm SD$	Rank	NOR	<i>p</i> -value
1. Personnel to perform evaluations	2.88 ± 0.96	7	16	3.25 ± 1.29	4	12	0.432
2. Personnel to perform hygiene	3.31 ± 1.30	3	16	3.50 ± 1.00	2	12	0.837
3. Budget for initiating and/or maintaining a recall system	3.00 ± 1.41	6	16	3.75 ± 1.54	1	12	0.133
4. Facility for recall patients to be seen in	2.50 ± 1.32	9	16	3.25 ± 1.22	4	12	0.133
5. Equipment	2.44 ± 1.26	10	16	2.25 ± 1.14	9	12	0.698
6. Patient appt tracking system (i.e., computerized, postcard)	3.44 ± 1.31	2	16	3.42 ± 1.38	3	12	0.945
7. Means of tracking treatment completion	3.06 ± 1.24	5	16	3.25 ± 0.87	4	12	0.664
8. Means of assessing patient use of recall system	2.81 ± 1.33	8	16	2.67 ± 1.30	8	12	0.802
 Standardized protocol of assessing fixed or removable prostheses, implant substructure, or adjunctive therapy 	3.19 ± 1.28	4	16	2.92 ± 1.08	7	12	0.397
10. Standardized protocol for services provided	3.06 ± 1.29	5	16	3.00 ± 0.95	6	12	0.732
11. Patient education on the importance of periodic recall	3.69 ± 1.14	1	16	3.17 ± 1.27	5	12	0.280
12. Time allocation in resident curriculum	2.88 ± 1.31	7	16	3.50 ± 1.45	2	12	0.302
13. Other	0 ± 0	11	16	0 ± 0	10	12	1.00

Question for AEPPs with a recall system was "For your program, rate the importance of these factors that can help your recall system become more effective." Question for AEPPs without a recall system was "For your program, rate barriers that make having a recall system difficult." NOR (number of respondents). Responses based on a Likert rating scale where 1 = not important, 2 = minimally important, 3 = important, 4 = very important, 5 = extremely important.

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11
Factor 2	0.143										
Factor 3	0.627	0.297									
Factor 4	0.244	0.036	0.163								
Factor 5	0.124	0.035	0.070	0.666							
Factor 6	0.091	0.778	0.257	0.011	0.034						
Factor 7	0.464	0.465	0.740	0.047	0.085	0.107					
Factor 8	0.876	0.130	0.614	0.319	0.199	0.031	0.194				
Factor 9	0.416	0.788	0.634	0.119	0.146	0.459	0.672	0.357			
Factor 10	0.589	0.549	0.795	0.230	0.177	0.394	0.829	0.595	0.480		
Factor 11	0.033	0.298	0.069	0.033	0.016	0.528	0.077	0.042	0.130	0.026	
Factor 12	1.000	0.359	0.829	0.150	0.435	0.150	0.589	0.856	0.272	0.490	0.015

Significance level of <5% in bold. Factor 1 (Personnel to perform evaluations), Factor 2 (Personnel to perform hygiene), Factor 3 (Budget for initiating and/or maintain a recall system), Factor 4 (Facility for recall patients to be seen in), Factor 5 (Equipment), Factor 6 (Patient appointment tracking system), Factor 7 (Means of tracking treatment completion), Factor 8 (Means of assessing patient utilization of recall system), Factor 9 (Standardized protocol of assessing fixed or removable prostheses, implant substructure, or adjunctive therapy), Factor 10 (Standardized protocol for services provided), Factor 11 (Patient education on the importance of periodic recall), Factor 12 (Time allocation on resident curriculum).

Results

Of the 45 programs invited to participate, 32 questionnaires were returned; however, of these 32 returned surveys, only 28 were completed in their entirety, giving a response rate of 62%. The data from all the surveys, including the partially completed ones, were included in the results. As such, each question on the survey may not have the same number of responses (N) as the total number of respondents. The responses for the majority of the survey questions are presented in Appendices 1-3.

All programs

The majority of programs participating in this study were based in public institutions (53.1%); 18.8% were in private institutions, 15.6% were in hospital-based institutions, and 12.5% were in military-based institutions. Among all programs, the mean proportion of professional referrals was 53.1% (self-referrals, 44.8%). Furthermore, a larger proportion of programs (42.3%) had more patients referred by professionals as opposed to more from self-referrals or of equal amount of both. Most programs (85.2%) provided more comprehensive care than limited, 11.1% equal amounts of both, and 3.7% more limited care than comprehensive. A majority of the programs (75.0%) indicated having a treatment-completion protocol, mainly conveyed to the patient through verbal instructions (83.3%).

Only about two-thirds of the programs (59.4%) reported having an active recall system; however, the majority (93.8%) had an emergency system in place to manage patients experiencing complications after treatment completion. No statistically significant relationship was found between the existence of an

Table 3 Wilxocon signed rank test for significance of factors hindering the establishment of a recall system for AEPPs lacking one

	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Factor 10	Factor 11
Factor 2	0.257										
Factor 3	0.083	0.426									
Factor 4	0.952	0.417	0.350								
Factor 5	0.093	0.032	0.019	0.041							
Factor 6	1.000	0.714	0.503	0.581	0.036						
Factor 7	0.952	0.584	0.403	1.000	0.016	0.527					
Factor 8	0.365	0.170	0.081	0.398	0.132	0.196	0.084				
Factor 9	0.519	0.203	0.119	0.482	0.062	0.098	0.102	0.453			
Factor 10	0.582	0.250	0.214	0.429	0.041	0.190	0.180	0.380	0.655		
Factor 11	0.666	0.458	0.203	0.891	0.024	0.732	0.783	0.262	0.618	0.608	
Factor 12	0.571	1.000	0.719	0.457	0.061	0.887	0.524	0.217	0.215	0.280	0.629

Significance level of <5% in bold. Factor 1 (Personnel to perform evaluations), Factor 2 (Personnel to perform hygiene), Factor 3 (Budget for initiating and/or maintain a recall system), Factor 4 (Facility for recall patients to be seen in), Factor 5 (Equipment), Factor 6 (Patient appointment tracking system), Factor 7 (Means of tracking treatment completion), Factor 8 (Means of assessing patient utilization of recall system), Factor 9 (Standardized protocol of assessing fixed or removable prostheses, implant substructure, or adjunctive therapy), Factor 10 (Standardized protocol for services provided), Factor 11 (Patient education on the importance of periodic recall), Factor 12 (Time allocation on resident curriculum).

active recall system within the program and the institutional setting the program was based in (p = 1.00), the percentage of self-referrals versus professional (p = 1.00), or whether a majority of patient care provided was comprehensive versus limited (p = 1.00).

A power analysis was performed for *p*-values <0.20 to identify the number of necessary director responses that would have found statically significant differences between programs with and without recall. The lowest *p*-values were identified for budget (p = 0.133) and facilities (p = 0.133). Power analysis indicated that a total of 42 directors and 32 directors, respectively, would have been necessary to identify differences between program groups for these two factors. Only 16 responses were obtained from directors with recall programs, and 12 responses were obtained from directors without recall.

Programs implementing a recall system

A majority of programs (81.3%) that reported having a recall system saw these patients within their own program. Most programs also transferred patients to the hygiene program (68.8%) for recall, 50.0% to the periodontic department, 18.8% to the faculty practice, and 6.3% to the predoctoral program. None of the programs transferred patients to the oral and maxillofacial surgery department. The majority of the programs' patients were seen for periodic recall in the prosthodontic department.

Responding programs indicated that the best attributes of their recall system included patient health promotion and disease prevention (81.3%), monitoring of the therapy rendered (75.0%), educational experience for the residents (62.5%), patient pool for new residents (50.0%), financial productivity (31.3%), reduced liability (12.5%), and data collection for future research (18.8%); however, a majority of programs (87.5%) indicated that they believed their recall system could be further improved. Directors were requested to rate the importance of factors that can lead to an even better recall system (Table 1). The greatest factors to be improved upon as indicated by directors are patient education on the importance of periodic recall, a patient appointment tracking system, and personnel to perform hygiene. The least important factor was equipment for the recall system. Mann-Whitney testing found no difference in factors between programs with and without a recall system. Wilxocon testing for significant differences between each factor in programs with a recall system is reported in Table 2. For programs with recall, directors perceived that patient education was significantly more important than personnel, facility, equipment, patient utilization, service protocol, or curriculum time.

All directors from programs with recall systems indicated that ongoing care and maintenance is important for prosthodontic practice, especially for patients with full-mouth rehabilitations (100%), implant-retained or -supported prostheses (100%), and removable prostheses (87.3%). More importantly, 93.3% of program directors agreed that all AEPPs should have a recall system for the benefit of their patients, students, and institution.

Programs lacking a recall system

Of the 11 programs that reported lacking a recall system, program directors indicated that the majority of patients are transferred either to private practices not associated with their institution (41.7%), other departments within the school (33.3%), faculty practice (8.33%), or the patients themselves find other alternatives (58.3%). Even though these programs lack a recall system, all directors agreed that patients should be informed of the need for recall and maintenance prior to the initiation of therapy and after prosthodontic treatment comes to a completion. These programs indicated that they mainly shared this information with the patient verbally (91.7%) followed by written instructions (33.3%). One director admitted that this information is never shared with the patient.

Directors indicated that in a majority of cases, over 75% of patients would like to continue care with the program after treatment completion (50.0%). Yet from the directors' perspective, (Table 1) programs face many barriers in initiating and maintaining a recall system. The greatest barriers, as indicated by the directors, include the budget needed for a recall system, time allocation in the residents' curriculum, finding personnel to perform the hygiene, and having an appointment tracking system. Mann-Whitney testing for significance found no difference in these factors between programs with and without a recall system. Wilcoxon testing for significant differences between each factor for programs without recall is reported in Table 3. For programs without recall, directors perceived that equipment was the least important barrier compared to personnel, budget, facility, patient tracking system, tracking treatment completion, service protocol, and patient education.

A majority (91.7%) of directors from programs lacking recall systems also indicated that ongoing care and maintenance is important for prosthodontic practice. This is especially important for patients with full-mouth rehabilitations (91.7%), implant-retained or -supported prostheses (83.3%), and removable prostheses (66.7%). More importantly, 91.7% of program directors agreed that all AEPPs should have a recall system for the benefit of their patients, students, and institution.

Discussion

AEPPs face myriad challenges when it comes to formulating a cohesive educational experience for their students while providing optimal care for their patients. A majority of program directors agreed that ongoing patient care is important for prosthodontic practice. This study indicated that directors of programs with recall systems obtained multiple benefits from recall for their patients, students, and institution as a whole, ranging from patient health promotion and disease prevention to monitoring of the therapy rendered and educational experience for the students; however, in agreement with a previous study,³ only two-thirds of responding programs had a recall system. The remaining schools lacking a comprehensive system for ongoing care indicated that they would prefer to establish one if solutions to the most common barriers to a recall system were found.

Even though statistical significance was not found between each factor in programs with or without a recall system, directors indicated that some hindrances are more important than others (Tables 2 and 3). Lack of statistical significance between programs may have been due to the limited number of respondents and variability in perceptions and expectations among program directors. If one assumes normality, power analysis of two independent samples led to realization that a response rate of 4 to 14 more directors could have identified statistical significance for budget and facilities, respectively.

Trends existed based upon whether the program had an existing recall program, and differences were found between factors within each program group. The top four reasons some AEPPs lacked a recall system included budget for initiation and/or maintenance of one, time allocation in the residents' curriculum, personnel to perform the hygiene, and a patient appointment tracking system (Tables 1 and 3). Of those programs that had a recall system and would like it further improved, the top three factors needed for improvement included more personnel to perform the hygiene, a patient appointment tracking system, and patient education on the importance of periodic care (Tables 1 and 2). These topics are addressed in the remainder of the discussion section, with examples and tips to assist in enhance existing and future recall systems.

Budget for equipment, personnel, and facilities

Although program directors perceived that financial support for a recall system is a limiting factor, a fully functional recall program could be productive. Analysis of barrier factors between programs suggested that budget and facilities were considered important factors for AEPPs without recall systems. It is true that an initial budget is indicated to not only offset equipment and facilities cost but also help support a team of hygienists, assistants, and receptionists; however, this may just be a one-time initial investment. As indicated by directors of programs with recall, in a majority of cases, over half the patients continue with recall within the program. In addition, programs without recall systems indicated that more than 75% of patients would be interested in continuing maintenance care at the program once treatment comes to a completion. Therefore, if a market exists for a product, the financial productivity should offset the initial financial investment. This financial productivity consists of fee collections for periodic evaluations, prophylaxes, and any needed radiographs. A study based on real-life data from general dentists in the Cincinnati area has shown that a dental hygienist can produce \$800 a day by providing these services.⁵ At a 100% capacity with a collection rate of 95%, this can amount to \$174,420 annually with a 5-day workweek. When an AEPP-based recall system is fully operational, based upon each program's individual goals and objectives, the capital collected for providing such periodic services could be more than sufficient to help the program become financially self-supportive.

Although sometimes overlooked, a recall system can also be financially productive by providing patient referrals to the prosthodontic clinic. Estimates indicate that about 70% of restorative dentistry is diagnosed in the dental hygiene setting.⁶ If any dental disease or abnormalities are discovered during the recall evaluation, the patient can be transferred back to the program for further care. More importantly, patient satisfaction with their care throughout the treatment phase as well as after translates to patient referrals of friends, family, and coworkers to the program.

Solutions exist to program directors' concern over the ability to provide personnel to perform hygiene. The ideal solution is to have multiple hygienists to meet the daily demands of recall. When this is not possible, an alternative plan to increase the number of patients seen daily without hiring more hygienists is to provide an assistant for the existing ones. With an assisted hygiene model as opposed to the solo model, the number of patients seen on a daily basis can be increased from 8 to 12. This model can increase hygienist productivity by as much as 33% to 50%. Another solution is for an AEPP to work closely with a hygiene program, if one exists within the community. A hygiene clinical rotation within the AEPP's recall program not only helps with the shortage of personnel, but also serves as a unique educational opportunity for hygiene students. Not only do they gain the experience of working in a clinical setting, but they also learn to treat patients who have undergone complex rehabilitative therapy, including implant-retained and -supported prostheses.

Patient appointment tracking system

For a recall system to be ultimately self-supportive within AEPPs, scheduling efficiency is imperative. Unfilled openings within the schedule are undesirable and require action. Rather than limiting a hygienist's clinical time, a receptionist who acts as a "scheduling coordinator" for the recall system is valuable.⁷ This can be further simplified with a computerized appointment tracking system. Since 45 dental schools in the US and Europe are using axiUm,⁸ an electronic health records software, patient tracking application within this software would seem feasible, axiUm incorporates some modules that are compatible for recall, especially tracking patients on a monthly basis to determine appointment status. Once patients are assigned to a certain recall schedule, a list of patient names can be compiled for specified months to determine whether patients have booked, confirmed, or set no appointments for their upcoming recall. The patient can be contacted to schedule appointments or be dropped out of the program after multiple unsuccessful attempts. The scheduling coordinator can be in charge of using this software to schedule appointments with patients in a timely fashion: however, a computerized tracking system and a scheduling coordinator are only two components of a multifaceted system for a successful AEPP recall. A third component that is of the utmost importance is patient initiative. The only way this can be fostered is through patient and resident education on the imperative nature of ongoing care.

Patient education on the importance of periodic recall

Patients should be actively involved in and accept responsibility for their own health and health care. Despite this recognition, studies indicate that a large number of patients still fail to follow recommendations offered by their healthcare providers.⁹⁻¹² This includes failure to keep regular dental appointments. More recent studies have shown patient noncompliance rates of at least 50%.¹³ This noncompliance has been attributed to multiple factors, including the patient, the disease or therapy, and the health professional.^{14,15} Of these three factors, the main one clinicians can control is the role they themselves play in influencing patient behavior. Poor communication has been found to be one of the most important factors in determining the extent to which patients comply with treatment.^{16,17} A positive correlation exists between compliance and a clinician's communication and explanation skills.¹⁸

Patient education is also a major factor in patient compliance. Without any knowledge or understanding why ongoing care is necessary, patients are less inclined to follow the provider's recommendations. Yet having knowledge of a disease or treatment has not been found to be a strong predictor of patient compliance.¹⁹ For patient education to be effective, it should be more than simply repeating instruction or handing out written material. It is a complex process consisting of identifying the needs of the individual patient, presenting information according to those needs, setting goals that are realistic and appropriate for that individual, and assessing the results.²⁰ Furthermore, the most important ingredients in patient education are communication and the formation of a trusting relationship between the provider and the patient. Teaching aids, no matter how elaborate or comprehensive, have a low chance of being effective if patient rapport does not exist.

AEPP students are in constant contact with patients throughout their therapy. These patients form a trusting relationship with their restorative dentist. Therefore, the students must realize the importance of the role they play in educating their patient about ongoing maintenance. But first, the students themselves need to be convinced of the imperative nature of recall. By having a recall system within a program, the students can see the results of their and their colleagues' work firsthand and therefore fully understand the importance of ongoing care and maintenance. Students would then be more inclined to educate their patients about recall and direct their patients into making conscious choices about continuing care at the school even when the student has graduated. In a focus group study with several AEPP students, most students are aware of the importance of recall for the patient and their own learning experience.⁴ Yet they also indicated that it is very important for the directors and faculty to reinforce the importance of recall to the students and present repercussions to those who do not appropriately assist patients with their future care. Otherwise, it is very easy for a patient to become "lost in the system" and never be seen again unless an emergency arises.

Time allocation in resident curriculum

The results of this study indicate that more than half the programs with an active recall system believed one of the best attributes of their recall system is the educational experience for the students. Furthermore, a previous study showed that AEPP students agreed that a patient-centered recall system would have a positive impact on their learning experience.⁴ Both groups understood that outcomes assessment is key to better diagnosing, treatment planning, and managing patient expectations. More importantly, by assessing one's own success and failures, clinicians gain the ability to become lifelong learners. The question to consider is what exactly is the ultimate goal of AEPPs: to help students learn how to diagnose, treatment plan, and provide evidence-based therapy or along with that, become independent entities within society with the ability to change with science, technology, and societal expectations. If it is the latter, then finding time within the curriculum to allow for ongoing patient assessment should be an inherent part of the program's goals and objectives.

Conclusions

A survey of program directors was performed to identify existing practices and barriers to the initiation and maintenance of a comprehensive, patient-centered recall system in AEPPs. Results of the study are as follows:

- 1. Directors of programs with a recall system indicated a desire to improve their existing system.
- 2. Directors of programs lacking a recall system indicated a desire to implement one within their program for the benefit of their students and patients if solutions were found to the most common barriers.
- 3. Statistically significant differences in barriers between programs with and without recall were not identified due to the low response rate; however, the most commonly reported hindrances reported by all programs were budget for initiating and maintaining a recall system, personnel to perform hygiene, a patient tracking system, patient education, and time allocation in the residents' curriculum.
- 4. Budget and facilities as barriers were potentially significantly different between programs with and without recall (p = 0.133). Statistical significance may have been observed if 4 to 14 more responses were obtained.
- 5. For programs with recall, directors perceived that patient education was significantly more important than personnel, facility, equipment, patient utilization, service protocol, and curriculum time (p < 0.05).
- 6. For programs without recall, directors perceived that personnel, budget, facility, patient tracking system, tracking treatment completion, service protocol, and patient education were more important than necessary equipment (p < 0.05).

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Appendix 1

Program director survey: questions aimed toward all programs

Question	Response
1. What type of institutional setting is your	N = 32
program in?	
Public	17 (53.1%)
□ Private	6 (18.8%)
□ Hospital	5 (15.6%)
□ Military	4 (12.5%)
2. What percentage of patients in your	$N=32~Mean\pm SD$
program are professional referrals versus	
patient self-referrals?	
Professional referrals	53.1 ± 37.1
Patient Self-referrals	44.8 ± 36.4
3. What portion of care provided in your clinic	$N = 32 \text{ Mean} \pm \text{SD}$
is comprehensive versus limited to specific	
procedures (i.e., implant therapy)?	
Comprehensive care	81.2 ± 17.9
□ Limited care	18.8 ± 17.9
4. Does your program have an emergency	N = 32
system to manage patients after treatment	
completion?	
□ Yes	30 (93.8%)
□ No	2 (6.25%)
5. Does your program have a treatment	N = 32
completion protocol?	
	24 (75.0%)
□No	8 (25.0%)
6. If answer yes to 5: What is included in this	N = 24
treatment completion protocol?	
Verbal instructions for patient	20 (83.3%)
□ Written instructions for patient	10 (41.7%)
□ Guidelines for regular recall	19 (79.2%)
□ Other	1 (4.17%)
7. Does your program make mechanical aids	N = 32
available to patients for hygiene (i.e.,	
superfloss, proxybrush, threaders)?	
	31 (96.9%)
LI No	1 (3.13%)
8. Does your program have an active recall	N = 32
system?	10 (50 40()
	19 (59.4%)
LI NO	13 (40.6%)

Appendix 2

Program director survey: questions aimed toward programs with a recall system

Question	Response
9. Under which department are prosthodontic patients	N = 16
seen for periodic recall?	
Prosthodontics	13 (81.3%)
Periodontics	8 (50.0%)
Oral and Maxillofacial Surgery	0 (0%)
Predoctoral Program	1 (6.3%)
🗆 Hygiene Program	11 (68.8%)
□ Faculty Practice	3 (18.8%)
□ Other	2 (12.5%)
10. Which department is the primary location that your	N = 16
program's patients obtain periodic recall?	
	10 (62.5%)
	0 (0%)
Oral and Maxillotacial Surgery	0 (0%)
	0 (0%)
□ Hygiene Program	3 (18.8%)
	1 (6.3%)
U Other	2 (12.5%)
11. What portion of all patients with therapy in progress	N = 16
or completed maintain periodic recail visits in the	
	4 (25.0%)
\square Botwoon 51 and 75%	4 (23.0 %) 6 (37.5%)
\square Between 31 and 75%	4 (25.0%)
	4 (25.0 %) 2 (12.5%)
12 What are the best attributes of your program's recall	N - 16
system?	11 = 10
\square Patient health promotion and disease prevention	13 (81 3%)
\Box Monitoring of therapy rendered	12 (75 0%)
Educational experience for the residents	10 (62.5%)
□ Financial productivity	5 (31.3%)
□ Reduced liability	2 (12.5%)
Patient pool for new residents	8 (50.0%)
□ Data collection for future research	3 (18.8%)
□ Other	0 (0%)
13. Would you like your program's recall system to be	N = 16
better?	
□ Yes	14 (87.5%)
□ No	2 (12.5%)
15. Do you believe that ongoing care and maintenance	N = 16
following treatment is important for prosthodontic	
practice?	
□ Yes	16 (100%)
□ No	0 (0%)
16. Which kind of patients in your program is periodic	N = 16
recall particularly important for?	
Full-mouth rehabilitation	16 (100%)
Implant-retained/-supported prosthesis	16 (100%)
Removable prosthesis	14 (87.5%)
□ Anterior crowns/veneers	7 (43.8%)
	5 (31.3%)
21. Should all programs have a recall program for the	N = 15
benefit of their patients, students, and the institution?	4.4.100.000
	14 (93.3%)
	1 (6.7%)

Appendix 3

Program director survey: questions aimed toward programs without a recall system

Question	Response
22. If patients receive ongoing recall evaluation	N = 12
elsewhere, where do they receive it?	
Other departments associated with your institution	4 (33.3%)
□ Faculty practice associated with your institution	1 (8.33%)
Private practice not associated with your institution	5 (41.7%)
	6 (50.0%)
□ Other	1 (8.33%)
23. Should the patient be informed of the need for	N = 12
recall and maintenance prior to initiation of	
therapy?	
□ Yes	12 (100%)
□ No	0 (0%)
24. Should the patient be informed of the need for ongoing recall and maintenance after prosthodontic treatment is completed?	N = 12
	12 (100%)
	0 (0%)
25. If yes to 23 or 24: How is this need for recall	N = 12
and maintenance shared with the patient in your	
program?	
□ Verbal	11 (91.7%)
□ Written	4 (33.3%)
Patient not informed	1 (8.33%)
	0 (0%)
26. What portion of prosthodontic patients would	N = 12
treatment completion if a recall system existed?	
\Box Over 75%	6 (50 0%)
□ Between 51 and 75%	3 (25.0%)
□ Between 26 and 50%	0 (0%)
\Box Less than 25%	0 (0%)
Do not know	3 (25.0%)
27. Do you believe that ongoing care and	N = 12
maintenance following treatment is important	
for prosthodontic practice?	
	11 (91.7%)
	1 (8.33%)
28. For which kind of patients in your program is	N = 12
	11 (01 7%)
□ Implant-retained/-supported prosthesis	10 (83 3%)
\Box Removable prosthesis	8 (66 7%)
Anterior crowns/veneers	5 (41.7%)
□ Single crown	4 (33.3%)
33. If solutions were found to these common	N = 12
barriers, would you like to have a recall system	
for the benefit of patients, students, and	
institution?	
	11 (91.7%)
	0 (0%)
⊔ Uther	1 (8.33%)

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