Abstract: The Commission on Dental Accreditation (CODA)’s revised standard 2-23, which went into effect in July 2013, requires U.S. dental graduates to be competent in “evaluation of the outcomes of treatment, recall strategies, and prognosis.” To assess the way dental schools are implementing this revised recommendation, a survey was conducted to assess the existence of recall systems in the schools’ clinics and factors enhancing or hindering the formation of an effective recall system. Surveys were returned from thirty-five dental schools (54.7 percent response rate). Results showed that most institutions had active recall systems and the respondents believed that program effectiveness can be further improved. Suggested improvements included patient education and tracking patient recall appointments. The results indicate that recall systems exist in predoctoral dental education programs, have high student involvement, and vary among schools.

Keywords: dental education, dental clinics, recall system, patient care

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According to the 2010 Commission on Dental Accreditation (CODA) standards for predoctoral dental education programs, students must be competent in providing comprehensive oral health care. Prior to 2010, graduates were required only to be competent in “evaluation of the outcomes of treatment” but not patient recall. However, as the importance of recall and its integral role in comprehensive care and student education began to be realized, the standards were changed accordingly. Standard 2-23 of the revised CODA standards (which went into effect in July 2013) requires graduates to be competent in “evaluation of the outcomes of treatment, recall strategies, and prognosis.”

Patient recall is defined as “the planned, unprompted return of a patient who, when last seen, was in good oral health.” Even though insufficient evidence exists to support or refute the practice of encouraging patients to attend regular dental checkups, the ultimate goal is to detect oral cancer, decrease the incidence of dental caries and periodontal disease, and provide preventive and maintenance care. By providing an environment to support prevention and allow for early intervention, patient recall ultimately helps ensure long-term oral health. Traditionally, biannual recall has been the norm; now, more and more clinicians are undertaking an individualized risk-based recall strategy.

One of the major aspects of recall is patient education on preventive strategies. Dietary counseling, oral hygiene instructions, and encouragement to use fluoride toothpaste are important for caries control, while smoking cessation counseling can help prevent periodontal disease and oral cancer. With the practical benefits of attempting to alter the patient’s negative behavior and offering advice on a regular basis, regular recall has the potential to minimize the need for future complex rehabilitation and could improve the patient’s quality of life. Successful attempts to improve patient adherence depends highly on realistic assessment of patients’ knowledge and understanding of the recommendations, clear and effective communication, and nurturing a trusting partnership between patient and clinician.

Another less emphasized benefit of patient recall from the clinician’s perspective is outcomes...
assessment. Patient recall provides the opportunity for clinicians to re-evaluate and assess outcomes of treatment provided by them and their peers.\textsuperscript{30} This is especially important in an educational setting. In a focus group study of residents in advanced education programs in prosthodontics, the authors concluded that the didactic curriculum along with clinical experiences was solidified when students were given the opportunity to evaluate short- and long-term results of the treatments they rendered.\textsuperscript{30} Furthermore, in an institutional setting, a rigorous broad-based recall system can provide for collaborative learning and interdisciplinary communication among dental practitioners and those providing periodontal maintenance.

Research has been reported on the status of patient recall in advanced specialty programs.\textsuperscript{30-32} However, thus far, no study has reported on the current status of recall in predoctoral educational programs. The purposes of our survey study were to identify 1) existing practices that effectively promote ongoing patient health and student learning in predoctoral clinic recall systems and 2) factors enhancing or hindering the formation of an effective recall system in predoctoral clinics. From the data gathered, guidelines can be inferred to enhance future or existing recall systems in dental school clinics. However, the study does not focus on presenting any practical solutions to the most common barriers.

**Material and Methods**

A survey was created and sent for review to the University of Illinois at Chicago (UIC) Office for the Protection of Research Subjects (the survey is available from the corresponding author). Upon approval (2013-0426), the survey was mailed to deans of all dental schools across the United States. The list of deans and mailing addresses was obtained through the American Dental Association (ADA) website. A packet containing the survey, instructions, and stamped return envelope was mailed on June 1, 2013. The fourteen-question survey inquired as to the existence of a recall system and its functioning, such as services provided, student involvement, frequency of recall, and factors needing further improvement. Respondents were asked to complete the survey voluntarily and anonymously. If necessary, the dean was asked to forward the survey to an associate dean or clinical director who was more familiar with the details. After one month, the same packet was sent a second time with instructions to disregard it if the survey had already been completed. Data were collected until October 1, 2013.

Raw data from the survey were entered into Microsoft Excel 2007 for descriptive statistical analysis. The incidence for each category was calculated and reported as numbers and percentages. For questions based on a rating scale, frequency, mean, and standard deviations were calculated and reported.

**Results**

Of the sixty-four dental schools contacted, thirty-five responded. This resulted in a response rate of 54.7 percent.

**Schools with a Recall System**

Thirty-two (91.4 percent) out of thirty-five responding schools reported having an active recall system. Among those thirty-two, 28.1 percent (n=9) indicated the system is combined with advanced graduate programs in the institution. Twenty-five schools (78.1 percent) reported incorporating the system into their outcomes assessment and quality assurance program. The majority (n=30, 93.8 percent) of the schools also have an electronic patient record (EPR). Respondents reported keeping track of patient recall appointments mainly through computer software (n=29, 90.6 percent), while a small minority relied on dated ledgers (n=6, 18.8 percent), patient initiative (n=3, 9.4 percent), a patient care coordinator (n=1, 3.1 percent), and patient reminder calls (n=1, 3.1 percent). More than half of the schools (n=18, 56.3 percent) reported keeping track of the number of patients with completed therapy returning for recall. A third (n=7, 38.9 percent) of those schools reported patients' returning for recall 25 to 50 percent of the time, and about a third (n=6, 33.3 percent) had more than a 75 percent patient return rate. When asked if their school's recall system is “effective” at recalling patients for periodic dental evaluations, the majority of respondents reported “neutral” (3) on a five-point scale (n=17, 53.1 percent). Furthermore, when asked about the financial self-supportiveness of the program, only a third (n=10, 31.3 percent) responded positively. Factors rated as important in making the recall system more effective are shown in Figure 1.

More than half of the responding schools reported recalling patients biannually (n=19, 59.4 percent); however, a third (n=11, 34.4 percent) reported that their recall frequency varied on an
individual basis. The majority of services provided included extraoral exam (n=28, 87.5 percent), oral cancer screening (n=29, 90.6 percent), periodontal exam (n=29, 90.6 percent), hard tissue exam (n=30, 93.8 percent), radiographs (n=29, 90.6 percent), and prophylaxis (n=29, 90.6 percent). Few schools performed an occlusal evaluation (n=14, 43.8 percent) or a Caries Management by Risk Assessment (CAMBRA) (n=1, 3.1 percent). In a majority of these schools, the periodic assessment is completed by third-year (n=27, 84.4 percent) and fourth-year (n=28, 87.5 percent) dental students. Periodic prophylaxis is rendered mainly by second-year (n=17, 53.1 percent), third-year (n=24, 75 percent), and fourth-year (n=28, 87.5 percent) dental students. However, some schools reported working with dental hygiene students (n=15, 46.9 percent) and/or an in-house dental hygienist (n=9, 28.1 percent). When scaling and root planing are indicated, the majority were performed by third-year (n=29, 90.6 percent) and fourth-year (n=28, 87.5 percent) dental students, with some completed by dental hygiene students (n=14, 43.8 percent) and/or in-house dental hygienists (n=8, 25 percent).

Schools without a Recall System

Three schools (8.6 percent) reported lacking an active recall system. Two of the three indicated that their school was newly formed; therefore, the recall program was then under development. Of those two, one indicated the major barrier to development of a recall system was faculty coverage followed by time allocation in the curriculum. The third school indicated that major barriers to implementing a recall were lack of personnel to perform the clinical evaluation and periodontal care, faculty to supervise, a standardized protocol for assessing patients and providing services, and patient education on the importance of periodic recall. However, that school’s respondent indicated that if solutions were found to these barriers, the school would like to implement a recall system.

Discussion

This study suggests that active recall systems are in place at the majority of U.S. dental schools and, as required by CODA standards, feature high student involvement in patient assessment and recall procedures. The three schools that indicated lacking an active recall system may be newly formed schools in the process of implementing a clinical curriculum. However, the respondents from schools with recall systems believed that program effectiveness can be further improved. The most common barriers noted were patient education and tracking patient...
recall appointments. This is consistent with results from a previous study of advanced prosthodontic programs. In addition, the fact that only one-third of existing recall systems were reported to be financially productive may be another hindrance common among dental schools.

Patient education in regards to ongoing oral care is an important aspect of any recall program. In the medical field, studies have shown that lack of understanding and recollection can reduce patient satisfaction and commitment to a treatment. The greatest risk of patients’ forgetting instructions related to their health is when they are presented with three or four instructions. Patients should be given no more than one or two instructions in a consultation. When more is needed, it is recommended the follow-up should be within fourteen days and is more beneficial for more highly educated patients. Furthermore, the combination of oral and written advice appears to be the most effective, especially when the information is given in simple language. Therefore, pamphlets and videos may be possible practical solutions in educating patients on the importance of recall.

The respondents’ concern regarding tracking patient recall appointments is not unfounded. In previous clinical studies, only 50 percent of patients were reported to participate in recall programs in a school setting following prosthodontic therapy, with motivation to attend recall programs decreasing over time. If no recall program is offered to the patient, the rate of patient recall drops substantially. Factors such as gender, income, having a usual place for care, and level of dental care anxiety have been found to be associated with regularity of dental check-ups. Other studies have found self-perceived oral health status, private dental insurance, and dental anxiety to be strong determinants for regular dental visits among dentate adults. Since anxiety is an overriding factor, even among those with dental insurance, Woolfolk et al. recommended practitioners be educated about the cause of dental anxiety and receive formal training on how to treat the problem. Our study does not investigate the level of student involvement in tracking recall appointments or motivation of the patient. However, a study in a predental dental program indicates that computer-aided organization of follow-up visits, repeated contact and motivation of patients by students, follow-up appointments every six months, and an intensive examination can ensure a high recall attendance. As patient attendance and adherence to recommendations increase, the financial productivity of well-organized, school-based recall systems most likely will also increase.

The majority of the respondents in our study indicated that the most common procedures completed at the recall visit were extraoral and intraoral examination, oral cancer screening, radiographs, and prophylaxis. Predental student involvement with these procedures was reported to be high. Recall frequency was indicated to be biannual or patient-dependent. Although our survey did not ask the question directly, other studies have reported that many schools follow societal norms and provide standardized procedures for caries and periodontal disease, rather than focusing on a risk-based assessment. Even with the recommendation for a more risk-based approach, clinicians still seem to apply standardized procedures and the six-month recall interval. Possible explanations for this include time management and practice organization, patient preferences, peer-accepted practice routines, or financial incentives related to insurance reimbursement. Furthermore, the complex and time-consuming process of identifying relevant risk factors and predicting oral disease has been reported as a potential barrier for change.

Identifying relevant risk factors can be easy if dentists are educated on how to approach it. One well-known example is CAMBRA. This risk assessment protocol is important not only as a part of the strategy for proper diagnosis and treatment planning, but also assists in determining proper recall frequency and regimens for patients. In an educational setting, Teich reported on a comprehensive approach to dental patient recall called Risk Assessment-Based Individualized Treatment (RABIT). At Case Western Reserve University School of Dental Medicine, this electronic health record (EHR) recall module addresses a patient’s risk for caries and periodontal disease and the need to perform periodic oral cancer screenings. Since almost all of the schools in our study indicated that they utilized an EHR in their institution, a software-based risk assessment recall strategy may be a possibility.

Risk assessment and evaluation of treatment outcomes can occur concurrently in a well-organized recall system. This is evident by the fact that 78.1 percent of the schools in our study indicated using their recall program as part of their outcomes assessment and quality assurance program. CODA standards also state that “Dental education programs
should create and maintain databases for monitoring and improving patient care and serving as a resource for research and evidence-based practice.”

A highly organized recall system with standardized protocols and evidence-based assessment criteria can foster more comprehensive outcome data collection. Analyses of these outcomes and relating them to previous diagnoses would allow for clinical associations that could improve patient care and foster future research in addition to preparing students as part of the educational program.

The educational experience of working with a dental hygienist as a collaborator in providing ongoing care is also valuable. Annual surveys of dental practitioners by the ADA indicate that the majority employ dental hygienists. Therefore, it is very likely that a graduating student will work in an office that employs one or more dental hygienists since they can add greatly to the productivity of a practice. In our survey, 46.9 percent and 28.1 percent of school-based clinics employed either a dental hygiene student or an in-house dental hygienist, respectively. As such, some schools already provide for a collaborative environment for their students.

Due to the limited response rate among dental schools, the findings of our study may not be representative of all U.S. programs. However, the response rate was similar to that of a similar study in predoctoral education. As with any study involving a self-administered questionnaire, the participants are prone to report socially desirable answers. Therefore, the results gathered from the schools may tend to be positively biased as those who responded may have a well-established recall system. However, every effort was made to avoid this, as participation was voluntary and anonymous and all schools across the nation were contacted twice and given ample time to respond. Future directions for this research include investigation of student and alumni perceptions as to the importance of recall in predoctoral education and private practice. In addition, barriers to recall can be further investigated, and practical solutions provided relevant to the most common challenges.

**Conclusion**

A survey of U.S. dental schools was performed to identify existing practices and barriers to the initiation and maintenance of a comprehensive, patient-centered recall system in their predoctoral clinics. Results of the study indicated that current active recall systems exist at the educational level with high student involvement; however, the respondents believed that current systems can be improved. In addition, patient education, tracking of patient appointments, and financial productivity were considered to be barriers to establishing an enhanced recall system. Future studies should focus on providing practical solutions to optimize patient recall as a means of enhancing patients’ oral health, students’ education, and research.

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**REFERENCES**