Dental Hygiene Faculty Publications   Dental Hygiene

2011

2011 ADEA Annual Session: Poster Abstracts

Susan L. Tolle
Old Dominion University, ltolle@odu.edu

Leslie M. Congdon

Michele L. Darby
Old Dominion University

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**Presented on Monday, March 14, 2011
12:30–2:00 p.m.**

Educational Research

110. Baccalaureate Dental Hygienists' Perceived Barriers to Graduate Education

Linda D. Boyd, Massachusetts College of Pharmacy and Health Sciences; Angela Bailey, Idaho State University

Based on other professions like nursing, advancing the education of dental hygienists is necessary to the success of the profession, whether the individuals serve as clinicians, educators, researchers, or advocates. The American Dental Hygienists' Association (ADHA) has expressed this idea specifically in the report *Dental Hygiene: Focus on Advancing the Profession.* To expand the profession in the areas of research, education, administration, and mid-level practitioners, graduate education is necessary to build credibility in a climate in which most other health professions have entry-level master's and doctoral degree programs. A literature search revealed a limited number of studies addressing barriers to graduate education in general and no studies researching the barriers to pursuing a graduate degree for baccalaureate dental hygienists. An important step in moving the profession forward is understanding the barriers dental hygienists may face in pursuing graduate education. Using the literature and the American College Testing withdrawing and nonreturning student survey, we developed a survey on baccalaureate dental hygienists' perceived barriers to graduate education. Specific components of the survey included age, gender, education, income, race/ethnicity, professional practice setting, perceived barriers to graduate education, and future plans for graduate education. A small group of students in a graduate dental hygiene program (n=9) were asked to assess the survey content and provide input. Contact information for all program directors at U.S. dental hygiene bachelor's degree and degree completion programs was obtained from the ADHA. An e-mail was sent to these directors asking them to forward the survey link to their programs' baccalaureate graduates; twenty-four agreed to participate. The survey link was also sent to a list of dental hygienists (n=451) who had requested information about a master's of science in dental hygiene program. All participants were given approximately two weeks to complete the survey, and a reminder e-mail was sent one week prior to the survey completion date. The responding graduates contacted by the dental hygiene program directors (n=100) and a graduate program mailing list (n=60) totaled 160. Of these respondents, 50 percent graduated with a baccalaureate degree, while the rest graduated with an associate degree (47.5 percent) or certificate (2.5 percent) in dental hygiene. Sixty-four percent reported planning to pursue graduate education in one to two years, with another 21 percent planning to do so in three to four years. This convenience sample of dental hygienists with baccalaureate degrees revealed their top five barriers to pursuing a graduate degree were the following: 1) cost of graduate education, 2) family responsibilities and concerns about personal funding to pay for graduate education (two items tied), 4) finding time for graduate school while working, and 5) fear of thesis research. Many other professions have recognized the increasing complexity of providing health care to a medically compromised population and responded by increasing the entry-level degree from baccalaureate to master's and even doctoral levels. Dental hygiene is one of the few remaining health professions with entry-level degrees at the associate and baccalaureate levels; it therefore needs to make strides in moving the profession forward by advancing the education level. The challenge the profession faces is to address the barriers and encourage dental hygienists to continue their formal education to ensure an adequate supply of future leaders, educators, and researchers. This study provides some preliminary information about the barriers baccalaureate dental hygienists identify in regard to pursuing graduate education. Two out of the top three barriers are related to the cost associated with pursuing a graduate degree. The focus needs to be on identifying funding opportunities. Currently, loan forgiveness is available for some public health settings, but expansion is needed particularly for those interested in entering academia since salaries are often not competitive with private practice settings.

113. Faculty and Student Policies on the Use of Magnification Loupes in Dental Hygiene Programs

Susan L. Tolle, Leslie M. Congdon, and Michele L. Darby, Old Dominion University

Dental hygiene programs must teach the most effective techniques and interventions, advance best practices, and model the highest standards of professional practice to ensure graduates can provide quality care and have successful professional careers. Currently, use of magnification loupes is not a content area required by accreditation standards, nor is it reflected in nationally accepted dental hygiene curriculum guidelines as a best practice. However, the use of magnification glasses continues to increase in dental practice settings due to potential ergonomic benefits. The degree to which magnification loupes were used in accredited dental hygiene programs was the major aim of this study. After Institutional Review Board approval, the thirty-one item questionnaire was e-mailed via SurveyMonkey to 303 entry-level dental hygiene programs. An overall response rate of 75 percent was obtained. Results reveal the vast majority of programs do not require loupes for faculty or students with only 23 percent of responding schools requiring students to purchase loupes and only 8 percent requiring faculty to use loupes. Of those schools that require faculty members to wear loupes, 10 percent of the programs assume the cost. No statistically significant differences (p=0.5406) in dental hygiene educational program policies were found requiring the purchase of magnifying loupes by students, based on two-year and four-year programs. Odds ratio (1.25) gives the odds of students' purchasing loupes in a two-year program as 25 percent higher than a four-year program. Chi-square test also revealed no statistically significant differences (p=0.2684) in dental hygiene educational program policies for faculty use of magnifying loupes based on two-year and four-year program comparison. Odds ratio (1.87) gives the odds of faculty members wearing loupes in a two-year program as 87 percent higher than a four-year program. Most programs (90 percent) do not plan to require students to purchase loupes in the near future although the majority (73 percent) believe proper use of loupes should be integrated into the curriculum. A majority of respondents believe the ideal time a student should begin using loupes is in preclinical classes. Expense was the overwhelming disadvantage cited by respondents (97 percent) for not requiring loupes for students. Over 90 percent of respondents cited ergonomic benefits as the greatest advantage of use. Most respondents see advantages to loupes, but clinical policies on loupes do not appear to

correlate with beliefs. Educational programs in dental hygiene seem slow to adopt and require the use of loupes. More programs require students than faculty members to wear loupes although the vast majority of programs do not require students or faculty members to purchase or wear loupes. More two-year programs require loupes in the clinical setting than four-year programs. Current clinical policies on loupes should be reviewed to ensure graduates experience the potential ergonomic benefits of magnification.

114. Factors Influencing Publication Rates of Poster Abstracts Presented at ADEA Annual Sessions

Maria Therese S. Galang, University of Illinois at Chicago

Factors related to the path of poster abstracts from presentation to full manuscript publication have been analyzed in the medical field. No similar studies have been performed in the field of dental education. This study investigated the rate of publication of posters presented at the 2002 and 2003 American Dental Education Association (ADEA) Annual Sessions and the time lag to publication. This study also aimed to characterize the posters and subsequent publications and determine if there were any significant factors related to publication into a full manuscript. A total of 370 poster abstracts met the inclusion criteria and were examined for this study. Subsequent publications were located using a standard PubMed search. Descriptive statistics and bivariate analyses were used to analyze the data collected. Results indicated that there was a low (19 percent) publication rate for posters presented at the two ADEA meetings and it took a median estimate of ten months from poster presentation until publication as a full manuscript. Factors that showed significant correlation to likelihood of publication included multiple affiliations, presence of analytical statistics, and, to a lesser extent, funding. It is generally suggested that poster presenters at ADEA Annual Sessions should seek to publish their research in peer-reviewed journals for the benefit of the dental profession. Based on the analysis of posters presented at these meetings, subsequent publication rates for dental education-related studies were lower than those in clinical fields. On a positive note, compared to clinical medical literature, if a dental education abstract gets published, it happens fairly soon after poster presentation. Multiple affiliation and use of analytical statistics were associated with increased likelihood of publication. Dental education research has room for growth in terms of scientific publication.

115. Assessing a Course Designed to Prepare Dental Students for the Clinical Operative Section of the Western Regional Examining Board (WREB) Examination

Brian J. Kenyon, Ken G. Louie, Jeffrey P. Miles, Karen A. Edwards, and Philip M. Buchanan, University of the Pacific Arthur A. Dugoni School of Dentistry

Preparing dental students for the clinical operative section of the Western Regional Examining Board (WREB) examination at the University of the Pacific Arthur A. Dugoni School of Dentistry has become an important component of the curriculum. Training starts with first-year preclinical operative practical examinations and is followed by second- and third-year clinical operative test cases. Senior dental students participate in a practice for state licensure course during their fourth quarter. Training for the operative section of the WREB exam is one of the course components. It consists of PowerPoint presentations, simulation laboratory exercises on extracted teeth, and three days of board rehearsal clinical examinations. Students complete Class II amalgam, Class II composite, and Class III composite preparations and restorations. Each student is given a grade and verbal and written feedback for each procedure. Credit is given towards their restorative competency standards upon successful

completion of certain procedures. To ascertain the usefulness of the training, a five-question survey was created and received IRB approval. The questions and responses were as follows: 1) overall, how helpful were the WREB operative lectures and simulation lab exercises? Responses: good to excellent 83 percent; 2) overall, how helpful were the operative board rehearsal clinical examinations? Responses: good to excellent 89 percent; 3) how helpful were the simulation laboratory operative practical examinations? Responses: good to excellent 63 percent; 4) what part of quarter four WREB operative training was most helpful? Responses: board rehearsal clinical examinations: 15, simulation laboratory exercises: 12, lectures: 1, review guidelines: 1; and 5) should anything be deleted from the quarter-four WREB operative training? Responses: delete nothing: 31, simulation laboratory: 1, similarity of lectures: 1. Students also requested tighter controls, more clinical feedback, and more clarification on placement of bases. Overall, a majority of the students surveyed said that Pacific's training for the clinical operative section of the WREB exam was helpful. Future practice sessions will utilize additional faculty members, which will promote tighter supervision and improved feedback.

116. Performance Assessment of Dental Hygiene Students in Identifying Angle's Classification of Occlusion

Darice K. Pacak and Mary Kaye Scaramucci

Students in the dental hygiene program at the University of Cincinnati's Raymond Walters College have typically been identified as visual learners. Because the occlusion topic is taught in a course with no corresponding clinical practice opportunity, it was necessary to provide students with additional visual experiences to practice and learn the principles of Angle's classification of occlusion for patient assessment. Thirty-six dental hygiene students agreed to participate in the study. Students were given a reading assignment and a lecture on the topic. Afterwards, students were instructed to practice categorizing occlusion on as many classmates as possible within a specific time period. Finally, students were asked to complete an anonymous survey of their impression of the exercise and its ability to reinforce the topic. Data collected included a composite score of accuracy of five final exam items about occlusion and Likert-scale items about the in-class activity from the survey. Additional testing of retention occurred in the two following quarters with data from two composite scores of accuracy of laboratory skills tests with study models. Descriptive statistics were used to analyze the data. Results indicated there was no significant difference in errors by year with the written and laboratory skills examinations. However, of all the stations the students were tested on in the spring quarter laboratory skills, the occlusion station had the highest average percentage score. Additionally, survey feedback provided the instructor with valuable information regarding the classroom activity and inspired faculty awareness and the need for calibration with this particular topic.

117. Using Biomaterial Investigative Skills to Assist in the Clinical Decision Making Process

Eric D. Levine, Gary D. Hack, and Stuart D. Prymas, University of Maryland

Preclinical fixed prosthodontics involves the teaching of principles and concepts for single and multi-unit restorations. Students are given an opportunity to work with a variety of dental materials for both clinical and laboratory procedures. Many of these dental materials are chosen to meet the specific demands of the dental student working in an academic environment. An approach to combining the investigative skills taught in the dental materials curriculum was used to support decision making for materials used in the preclinical and predoctoral

student clinics. Methyl methacrylate has been the predominant temporary material in fixed prosthodontics. Newer materials have included bis-acrylics and polyurethanes. Each material has specific handling properties that may be appealing to dental students. This study sought to match materials-handling properties with clinical performance. Immersion studies were conducted to test for changes in flexural strength, elastic modulus, and porosity of three commercial temporary materials. To mimic the time necessary to complete treatment at the school's dental clinics, tests were conducted at one-day, two-week, and one-month intervals. Significant differences were found between different temporary materials under the same treatment and for the same temporary material after different immersion times (p<0.05). In general, the bis-acrylic material had higher strengths than the other tested materials. For example, Integrity (Dentsply, Milford, DE) Bis-Acryl had a flexural strength after one month of immersion that was significantly higher than the MPa of Jet (Lang, Wheeling, IL) (p<0.05). Integrity's elastic modulus of 25.2–3.2 GPa was also higher than those of the other temporary materials, which ranged from 12 to 14 GPa (p<0.05). The knowledge gained in the basic science curriculum can be enhanced during the clinical years. Incorporating principles of investigative skills taught in the dental materials curriculum should assist the clinician in treatment decisions.

118. A Survey to Identify Substance Use and Dependence Education in Predoctoral Dental Curricula

Gary H. Westerman, Creighton University; Eugene Barone; Kathryn N. Huggett; Amanda Lofgreen

Sixty-eight deans were sent a twenty-item survey requesting information as to when in the curriculum, what instructional method(s) were used, and whether behavior change instruction was included to address substance use and dependence. The topics of alcohol use and dependence, tobacco use and dependence, and prescription drug misuse and abuse were reported in over 90 percent (N=55) of the schools' predoctoral curricula. The topic of other substance use and dependence was reported in only forty (72.7 percent) of the schools. The primary instructional method reported is the use of lecture; to a lesser extent, methods included small-group instruction, instruction in school-based clinic, community-based extramural settings, and independent study. As future health professionals, dental students are an important audience for information about substance use, abuse, and treatment. Our investigation confirmed that alcohol, tobacco, and prescription drug abuse are addressed widely in predoctoral dental curricula, but other substance use and dependence receive less coverage. Our investigation found that lectures remain the primary mode of instruction and this suggests a need for curricular innovation. The continued call for education on substance use, abuse, and behavior change instruction also indicates there is a need for instructional materials and faculty development on teaching substance use issues to predoctoral dental students.

119. Assessing Dental Hygiene Students' Outlook on Language Barriers in a Growing Hispanic Population

Joanna L. Allaire, University of Texas Health Science Center at Houston; Brandi O. Barranco, Louisiana State University; Miriam J. DeLaRoi, University of Tennessee

Addressing cultural and linguistic competence has become an increasingly important issue for the dental professional. The U.S. Census Bureau has estimated that the nation's Hispanic population has grown from 21.9 million in 1990 to 46.9 million in 2008. Dental hygiene education has adopted an educational standard to ensure that graduates are competent in interpersonal and communication skills to effectively interact with diverse population groups. The purpose of this study was to determine if senior dental hygiene students have attained sufficient cultural and linguistic competencies necessary to effectively provide dental hygiene care to a growing Hispanic population with limited English proficiency (LEP). The research design of this study utilized an online survey administered to a convenience sample of senior dental hygiene students enrolled in programs throughout the United States. The electronic survey instrument was designed by the investigators, and response data were analyzed using correlations and cross-tabulated using chi-square with Yates correction. The findings were that 70.4 percent of the respondents felt they had obtained adequate experience through their dental hygiene program to independently and successfully treat patients of different cultures. However, 69.1 percent did not feel confident treating patients who only speak Spanish without the assistance of a translator. In order to better meet the needs of LEP patients, dental hygiene schools should provide a curriculum that enables their students to independently and successfully treat patients from different cultural, linguistic, and educational backgrounds. Graduate dental hygienists will be exposed to a wide assortment of patients, each having distinct cultural, linguistic, and educational backgrounds. This study revealed that students who question whether their dental hygiene program has offered them enough experience to successfully treat patients of different cultures also doubt their ability to provide adequate care to patients who may not fully understand them. Furthermore, the more confident students feel about their cultural competence, the more sure they are of their ability to provide dental hygiene services to patients who do not have English proficiency.

120. The Establishment of a Guiding Principle for Preliminary Impressions in Dental Education: The Cause of Impression Failure

Yutaka Ito, Marina Ozeki, Shigemitsu Sakuma, Takashi Mori, and Nobuaki Ozeki

The preliminary impression using alginate impression materials, which have been incorporated into the objective structured clinical examination (OSCE) in Japan, is indispensable in dental education. However, the concrete guidelines for training of taking preliminary impressions using alginate impression material leave a lot of matters to be discussed. Therefore, we investigated not only the types and frequency of defects on the preliminary impressions taken by dental students, but also the cause of defects for the purpose of creating a training manual on preliminary impressions. The study sample was comprised of 170 preliminary impressions (eighty-two upper jaw samples and eighty-eight lower jaw samples) made by fifth-year dental students at the Aichi Gakuin University School of Dentistry. We observed the defects on each preliminary impression using pictures taken from four directions by a single-lens reflex digital camera. Those defects on preliminary impressions were roughly divided into three kinds: local bubbles, exposure of impression tray, and lack of impression material. Also, in reference to anatomical landmarks, the impression surface may be divided further, categorizing the upper jaw into eight and the lower jaw into nine separate regions. Moreover, the observed percent agreement of impression failure was used to randomly sample twenty-four impressions (thirteen in the upper jaw, eleven in the lower jaw) out of 170 impressions. Eleven dentists who were educated at the Aichi Gakuin University School of Dentistry over ten years completed the questionnaire. The survey contained forty-four (twenty-one upper jaw, twenty-three lower jaw) multiple-choice questions in three main groups relating to prior preparation, operating or seating of tray, and muscle trimming. Respondents were asked to circle all correct responses. The observed percent agreement was used to summarize the agreement among evaluators. The examiner agreement was 100 percent for detecting local bubble defects on the

occlusal surface of anterior or posterior teeth in the upper jaw and 100 percent for detecting it in the lower jaw; 70.7 percent for detecting an exposure of impression tray defect on the occlusal surface of anterior teeth in the upper jaw and 50 percent for the lower jaw; and 76.8 percent for detecting lack of impression material defect on the labial side of soft tissue in the upper jaw and 92 percent for the lower jaw. The results of the survey show 54.5 percent were in agreement detecting operating or seating of tray and muscle trimming and 51.7 percent for detecting lack of impression material as well improper seating tray in the upper jaw. On the other hand, 53.7 percent agreed for detecting poor tray adjustment, 50.4 percent for detecting an improper seating tray, and 46.3 percent for detecting poorly instructions of tongue direction in lower jaws in the lower jaw. Our results identify, based on percent agreement, three critical defect groups in local bubbles, exposure of the impression tray, and lack of impression material or anatomical parts in fifth-year dental students. We also identify operator errors responsible for preliminary impression failure. These errors are as follows: operating or seating of tray, muscle trimming, lack of impression material, improper seating tray, poor tray adjustment, and poor instructions of the tongue. In summary, this study demonstrated that we need to better understand the cause of preliminary impression failure to establish a guiding principle for preliminary impressions in dental education.

121. Dental Student Performance in the Clinical Setting: A Qualitative Study Using Critical Incident Technique

Student Poster
Margaret J. Richards, Burlington County College

All clinical preceptors (n=18) who have major responsibility for the day-to-day direct supervision of third- and fourth-year dental students in the general dental clinic of a Midwestern dental school were invited to participate in the study. Thirteen clinical preceptors (six male, seven female) were interviewed by one researcher using a critical incident interview technique. Each clinical preceptor was asked to describe incidents that involved interactions between a high-performing student and a patient, instructor, clinic staff member, and/or peer and to describe incidents that involved interactions between an average or lower-performing student and a patient, instructor, clinic staff member, and/or peer. Each interview was audio-recorded. Participants were assured that only the interviewer and one other researcher would have access to the recordings. The study design was reviewed by the college's Institutional Review Board and deemed exempt. All audio-recordings were reviewed independently by two researchers. Data analysis resulted in the identification of key themes related to characteristics and behaviors that differentiate high-performing students from average or lower-performing students in the clinical setting. The following themes were identified: 1) taking personal responsibility, including consistent demonstration of a high level of advance preparation, conscientiousness, and attention to detail when performing procedures and communicating with others and accepting responsibility and taking corrective action when needed; 2) emotional self-control, including adaptability in changing circumstances and remaining calm and projecting confidence in difficult circumstances; 3) ability to manage relationships with patients and team members, including understanding the patient's perspective, needs, and fears, providing explanations in ways that the patient can relate to and understand, and working with team members effectively; and 4) motivation and a desire to learn, including going above and beyond what is expected, seeking out opportunities to gain knowledge and experience, and wanting to understand why. This qualitative study explored characteristics and behaviors that differentiate high-performing from average or lower-performing students in the

clinical setting. The results suggest that taking personal responsibility, demonstrating emotional self-control, managing relationships with others, and demonstrating strong motivation to learn may be related to superior clinical performance. This is consistent with work in the field of emotional and social intelligence that has demonstrated the importance of self-management and relationship management abilities in determining outstanding performance in professional settings. Qualitative methods have limitations. Additional empirical studies are needed to establish an association between the identified themes and student clinical performance.

122. Incidence of Student Clinician Injuries Occurring at Dalhousie University Dental Clinic

Peggy J. Maillet, Simone d'Entremont, Danielle Newell, and Marian Hynes, Dalhousie University

Contraction of bloodborne diseases represents a serious risk to the dental profession. It is especially of great concern in teaching institutions where the incidence rates of percutaneous injuries are of higher levels while experience, dexterity, and skills of the student clinician are being developed. It is important for teaching institutions to collect data on accidental injuries that occur to identify problems, enhance patient care, and prevent future occurrences. Following receiving ethics approval from the Dalhousie University Health Sciences Research Ethics Board, a quantitative retrospective study was conducted. The self-reported injury reports from 2000 to 2009 of the Dalhousie Faculty of Dentistry were analyzed. Injury data included only those of students who reported a percutaneous injury during clinical treatment of patients. Data on patient visits were obtained from axiUm, Dalhousie dental school's clinical software program. To ensure confidentiality, variables of interest from the injury reports were transcribed onto generic forms. A comprehensive literature search was conducted of PubMed, CINAHL, Embase, Web of Science, and the Cochrane Library. Opinio software was used to distribute an online survey to the nine other dental schools in Canada to determine comparable data for student clinician injuries. The data were analyzed to determine if there was a significant difference between the number of injuries occurring and day of the week and month of the year. The data were also analyzed to determine if there was a significant difference in injury rates occurring in the first half of the appointment compared to the second half. Finally, the investigators wanted to determine if there was a significant increase in the number of student clinician injuries per year. Secondary variables included the analysis of gender, student classification, instrument causing injury, and area of injury. To determine significant difference between each day of the week, each month of the year, and each year compared to another, a chi-square test was performed (independence assumed; CI 95 percent). A linear regression model was performed to predict the relationship between injury rate and year. A z-test for single proportion was performed to determine the probability rates (CL of 95 percent) of injuries occurring in the first half of the appointment as compared to the second half of the appointment. Analysis was performed using the Statistical Software R version 2.11.1. Results showed that needles and blades caused most injuries (25.81 percent, 19.35 percent respectively). Analysis showed that 45.97 percent of injuries occurred to a finger and 21.77 percent to a hand. The data also showed that 62.90 percent of injuries occurred during the second half of the appointment. There are on average 5.24 injuries per 10,000 patients. There was no significant difference found between the days of the week (p-value=0.355), and there was no significant difference found between the months of the year (p-value=0.0156). Injury rate per year was analyzed using a chi-square test, finding a significant difference between the years (p-value=0.00014). Linear regression analysis showed

that there was significance in injury rate per year (2000–09) with an expected 0.0001 increase in chance of injury. A z-test for single proportions showed that there was a 0.672 probability of a student being injured in the second half of an appointment as opposed to the first half (p-value=4e-04). A primary variable that was analyzed was at what stage of the appointment most injuries were occurring. The probability of injury occurring in the second half of the appointment was 0.672 (p-value=4e-04, 95 percent CI). This may be due to stress as the time to complete the procedure is ending and many students are also having their skills evaluated. Secondary variables analyzed showed that needles and blades most commonly caused injury. The finger and thumb were found to be the most commonly injured area of the body. It is not surprising, as all dental professionals work with a variety of sharp instruments in the oral cavity. The results of the online survey were poor due to the response rate. Of the two dental schools that replied, the investigators can report anecdotally that they support the finding that most injuries occur at the end of the day and the most common sources are needle stick and blade injuries. It was evident from this study that many students are involved in clinical injuries at the Dalhousie Dental Clinic each year. The results of this study provide important information regarding patterns that contribute to an increase in the occurrence of percutaneous injuries and advance the understanding of the factors associated with these injuries. Analyzing these patterns and disseminating the results can generate suggestions on how to update and improve the safety protocols currently in place. Increased student and faculty education regarding time and type of injury should also occur.

123. Developing an Oral-Systemic Patient Education Module

Student Poster

Jennifer L. Ciske; Amit Acharya, Marshfield Clinic

Due to the lack of sufficient patient education resources focusing on the oral-systemic health interrelationship, we wanted to provide a useful and appealing educational tool for dental hygienists to use as they educate patients. To begin, it was determined necessary to learn how dental hygienists currently educate patients and what educational tools (if any) they wanted developed to help educate patients. The study protocol was submitted to the Institutional Review Board, which classified the study as exempt under section 45 CFR 46.101(b) (Marshfield Clinic Research Foundation IRB number FWA00000873). To gather the needed information for the study, sixteen dental hygienists working in the Marshfield Clinic Dental Centers in Chippewa Falls, Ladysmith, Medford, Neillsville, and Park Falls were interviewed in person. The participants were asked what materials they currently use and preferred to use while educating patients, what health issues were important to be included in the educational tool, and the optimum format and length of the educational tool. Results from this eight-question survey revealed that 56.2 percent of dental hygienists spend on average five to fifteen minutes educating patients. Currently, 43.8 percent of dental hygienists use videos, 75 percent use brochures, 62.5 percent use charts and posters, 68.8 percent lecture, and 56.3 percent use other educational tools (such as models and hand mirrors) while educating patients. However, 68.8 percent indicated they would prefer to use videos while educating patients, 37.5 percent would prefer more brochures, and 43.8 percent would prefer more charts and posters. Based on these results, it was decided an audiovisual education module would best meet dental hygienists' needs. To create the module, a PubMed search was first conducted to gather current information regarding the correlation between oral and systemic health. Other online sources used to research this topic included the Centers for Disease Control and Prevention, Department of Health and Human Services, National Institute of Dental and

Craniofacial Research, American Dental Association, Wisconsin Dental Association, and MedlinePlus websites. To help direct this research, dental hygienists were asked in the survey what health topics besides those already included in the module (cardiovascular disease, diabetes, osteoporosis, and pregnancy) they wanted covered in the module. Of those who responded, 62.5 percent also wanted respiratory disease, 75 percent wanted xerostomia, and 100 percent wanted a general overview of periodontal disease included in the module. Once the appropriate information was gathered, it was transferred into a PowerPoint document, and open-source pictures were added. Since 80 percent of the surveyed dental hygienists wanted real-life pictures in the educational tool, 53.3 percent desired flow charts, and 46.7 percent desired animation, the images added included a mixture of these three. Scripts were then written for each slide, and a digital voice recorder was used to record the narration. The sound files were uploaded to each slide, and basic animation was incorporated so the images and text were in sync with the narration. The completed document was then made into an audiofile using QuickTime software. Ideally, this will allow the Marshfield Clinic Dental Centers to display the audiovisual modules in the waiting room and the patient hygiene rooms. The modules will also be uploaded to the health portal My Marshfield Clinic, making it accessible to patients through the Internet. As all the study participants desired a handout to give to their patients about the correlation between oral and systemic health in addition to the video education module, PowerPoint was further considered the desired format for developing the educational tool since individual slides can be printed and used in this manner. A PowerPoint format also allows a dental hygienist to display just one or more relevant slides and use them in a chart-like manner to help explain a concept to a patient. Both the PowerPoint document and audiovisual file were sent to the Marshfield Clinic Dental Centers to be used by the dental hygienists in the manner that best suited their teaching style. As part of future work, it would be interesting to evaluate the effectiveness and usefulness of these educational modules that were implemented.

125. Trends in Teaching Biochemistry to Dental Students: Survey Results from North American Basic Science Course Directors

Alan E. Levine, University of Texas Health Science Center at Houston; H. Wayne Lambert, West Virginia University; Allen Otsuka, Southern Illinois University; Larry D. Crouch, University of Nebraska Medical Center

A survey was designed and pilot tested with a limited number of biochemistry course directors and the final version administered through SurveyMonkey. In addition to basic demographic information, the survey consisted of twelve detailed questions seeking information about the students taught, topics taught, techniques used in teaching, and unique aspects of individual biochemistry courses. IRB approval was obtained for this study. E-mail invitations were sent to the academic deans of all North American dental schools asking them to forward the survey link to the appropriate faculty member at their school. Follow-up e-mail reminders to individual course directors were also sent. Thirty-one responses (46 percent response rate) were obtained. The survey respondents have been teaching biochemistry to dental students for an average of seventeen years (range=0 to 42 years). While 47 percent of the responding schools have an admissions requirement of biochemistry, all of the schools teach biochemistry to their dental students. The results indicated that 83 percent of the schools responding have a stand-alone biochemistry course and 73 percent of classes have only dental students in them. Half of the schools stated that they have changed how biochemistry was taught in some manner due to changes in the overall dental curriculum at

their school. These changes range from revising the specific topics taught within the course to combining biochemistry with other basic science courses to create an integrated curriculum. The average contact hours for the biochemistry course were seventy-seven with a range of fifteen to 306 hours. Only 3 percent of the schools have a laboratory component within their biochemistry course. The use of computer-assisted instruction (CAI) is increasing with 50 percent of the schools using some form of CAI. A large majority of schools include examples of the scientific method (87 percent), dental (87 percent) or medical (77 percent) clinical correlations, and evidence-based dentistry (37 percent) in their course. The distribution of time allocated to specific topics in the biochemistry course varied greatly; however, some consensus exists on topics considered to be essential to a dental biochemistry course. These essential topics included the central dogma of molecular biology, amino acid and protein structure, enzymes and their mechanisms, signal transduction, collagen and extracellular matrix structure and function, carbohydrate metabolism, oxidative phosphorylation, and integration of metabolic pathways. Nutrition was included in 60 percent of the biochemistry courses. Half of the respondents indicated that their biochemistry course had some unique aspects to it including clinical correlates, small groups that included problem-based learning, and integration with other courses. Data will be presented to reflect additional survey responses and input. These survey results document the great variability that exists between institutions in the teaching of biochemistry to dental students. This information should provide the framework by which course directors and administrators can make more informed decisions about the appropriateness of content and provide guidance in evaluation of their programs.

126. Predicting Use of Online Instruction Among Dental Hygiene Faculty Members in the United States

Leslie Koberna, Texas Woman's University

Dental hygiene education could benefit from the use of online instruction. Creative use of online instruction in the field could help reduce the projected shortage of dental hygienists in the United States, reach students in rural areas, and alleviate the need for classroom space. Online instruction may also be a solution for individuals and universities trying to progress during the economic recession. An essential component for a successful online education program is faculty support. Faculty perceptions, attitudes, self-efficacy, and knowledge impact faculty acceptance and adoption of online instruction. Factors faculty members view as incentives and/or barriers to online instruction have a positive or negative influence, respectively, on faculty perceptions of online instruction. This poster will present research results on factors predictive of online instruction among dental hygiene faculty members in the United States. Full-time, part-time, and adjunct dental hygiene faculty members were surveyed, first, to determine whether knowledge, attitudes, and self-efficacy are significant predictors of use of online instruction among dental hygiene faculty and, second, to determine factors that are incentives and/or barriers to use of online instruction. Faculty members who had experience with online education, confidence in their ability to teach online, and the belief that online instruction was a sound teaching method were more likely to teach online. Faculty members confident in their ability to teach online perceived fewer barriers, and those who believed in online instruction perceived more incentives to teaching online. Faculty members teaching in bachelor's degree programs, programs affiliated with dental schools, and/or members of the American Dental Education Association (ADEA) had higher incentive scores than those from associate degree programs, non-affiliated programs, or who were not members of ADEA.

127. Evidence-Based Dentistry Influences Student Interest in an Academic Career

Student Poster

Niyati Mehta and Ann L. McCann, Baylor College of Dentistry; Robert J. Hinton, University of Texas Health Science Center at San Antonio; Robert D. Spears, Baylor College of Dentistry

The standard of care in the dental profession revolves around incorporating results of cutting-edge research to treat patients. Across dental schools in the United States, a movement to include evidence-based dentistry (EBD) courses in the curriculum has increased student exposure to analysis and application of current research into their dental careers. At Baylor College of Dentistry the PEAK survey was designed as an assessment tool to measure student knowledge and perceptions towards four components of EBD: practices of critical appraisal, experience in evidence-based topics and research, attitudes about evidence-based dentistry, and knowledge of critical appraisal skills. In particular, the objective of this study was to determine the interest of students in pursuing an academic career and determine if EBD training had any influence on this decision. The study was conducted using two groups of dental students: those who had not received EBD courses as part of their dental education (NT) and those who received EBD training (T) as part of their first-year curriculum. Each group completed the PEAK survey, and the resulting data were analyzed using chi-square, Mann-Whitney U, and Student's t-tests in SPSS. The results demonstrated that the T group was more interested than the NT group in learning about dental research (p<0.05). Our conclusions from this preliminary data are that students with increased exposure to EBD see a benefit and a value to incorporating research into their dental careers. The research also suggests that EBD courses may provide an impetus for later involvement of students in research and academia.

128. Does ART Have a Place in U.S. Dental School Curricula? A Survey of Predoctoral Pediatric Dentistry Programs

Student Poster

Elham T. Kateeb, John J. Warren, Elizabeth Momany, Timothy Ansley, and Michael J. Kanellis, University of Iowa

Dental caries is still considered one of the most prevalent chronic diseases that affect children in the United States. Access to oral care problems could be due to the limited availability of services or unwillingness of people to seek services. As a proposed solution to those challenges, atraumatic restorative technique (ART) was developed in the 1980s as an affordable, patient-friendly caries management procedure that does not need extensive operator training or special skills. ART was originally developed to be conducted in field settings; however, after initial evidence of effectiveness, the World Health Organization and the International Dental Federation promoted the use of ART in modern clinical settings worldwide. In the United States, the practice of ART is not believed to be widely used. This may be a result of little attention given to ART training in predoctoral pediatric dentistry curricula in U.S. dental schools. This study investigated the extent of clinical training in ART provided in U.S. dental schools by surveying the chairs of pediatric dentistry programs. Program chairs were asked about their attitude towards ART and how much training they provide to their predoctoral students about the use of ART with pediatric patients. To address the aim of this study, predoctoral pediatric dentistry program chairs were asked to complete an online survey in May 2010. Of the fifty-eight chairs asked to complete the survey, fifty complied for a response rate of 86 percent. We found no significant response bias for the survey. Of the fifty programs represented in the survey, 70 percent provide

clinical training in ART, though only 20 percent provide this training often or very often. The types of ART training provided include interim treatment in primary teeth (83 percent), definitive treatment in primary teeth (40 percent), and multisurface cavities in primary teeth (48 percent). However, ART was rarely taught for multisurface cavities for permanent teeth (20 percent) or for definitive treatment in permanent teeth (6 percent). A majority of chairs of programs that did not teach ART indicated that they felt students should learn conventional methods before being taught ART. Pearson correlation coefficients (r) were used to determine relationships between the use of ART in clinical training and various characteristics of program chairs, programs, and their dental patients. Caries management techniques, attitudes toward minimal invasive dentistry and ART, and behavior management techniques were also assessed and related to ART. Preliminary results indicate chairs who spend more time per week on research oversee programs that are more likely to include ART in clinical training. Early evidence from this study indicates that ART is being taught in a majority of predoctoral pediatric dentistry programs but on a limited basis. ART is primarily taught for use with primary teeth and rarely taught as a definitive treatment in permanent teeth. Certain characteristics are indicative of the inclusion of ART in the clinical training program. Perhaps most importantly, those programs that do not rely on traditional methods are more likely to teach ART.

129. Gender Disparity in Orthodontic Literature and Leadership

Student Poster
Kristina G. Dragstrem, Maria Therese S. Galang, Judy Chia-Chun Yuan, Damian J. Lee, and Cortino Sukotjo, University of Illinois at Chicago

Professional advancement in an academic environment depends on scholarly activity, including outstanding performance in teaching, research, and service. Academic productivity may be objectively measured by the number of publications in peer-reviewed journals. While there has been an increase of females in dentistry as a whole, the participation of females in orthodontic education, literature, and leadership has not been widely investigated. Three journals representing orthodontics were selected to analyze the first and last author demographics for the years 1986, 1990, 1995, 2000, 2005, and 2008. Inclusion criteria for articles reviewed were at least one first or last author with a minimum degree of D.D.S./D.M.D./B.D.S. and whose primary affiliation was located in the United States. Female authors who met inclusion criteria were analyzed for degree, primary affiliation, academic rank, type of article authored, and source of funding provided. The history of past and present presidents in three orthodontic organizations (American Association of Orthodontists, Edward H. Angle Society of Orthodontists, and American Board of Orthodontics) and their genders were identified. A linear regression analysis was performed to investigate the trend of female authorship in orthodontic literature. Kruskal-Wallis test was performed to evaluate the relationships between academic ranks and female first and last authors. A significance level of 0.05 was used for all tests. Overall, the percentage of female first authors increased significantly from 0 to 29 percent in the years studied (p=0.004). The change of the percentage of female last authors was not statistically significant as a linear trend (p=0.719). With respect to each individual journal, a significant trend of linear increase in female first authorship was evident in a linear way in only one journal (p=0.007). The majority of female first and last authors held only a dental degree (47 percent and 58 percent respectively), followed by combined D.D.S. and M.S. degrees (36 percent and 24 percent respectively). There was a higher percentage

of female last authors with an additional Ph.D. degree (16 percent) compared to female first authors (9 percent). Eighty-one percent of female first and last authors were affiliated with a university, with the remaining authors in private practice (19 percent). For the first authors, nearly equal distribution was shown among student/resident (25 percent), junior faculty (24 percent), senior faculty (24 percent), and other/private practitioner (25 percent). Conversely, more than half of female last authors were among senior faculty (58 percent), followed by junior faculty (21 percent). Within the limitations of this study, it was concluded that female first authorship in orthodontic publications has increased significantly over time. Female last authorship did not show a significant increase. Most female authors had solely a dental degree, were affiliated with an academic environment, published original research articles, and did not identify a source of funding. Participation in orthodontic leadership and administration by females has been minimal since the profession's inception. Female mentorship and encouragement to participate in scientific research and apply for leadership positions is called for to alleviate the existing gender disparity.

132. An Investigation into the Reasons Patients Discontinue Dental Treatment

Student Poster
Sarmad M. Alyas and Linda M. Wells, University of Detroit Mercy

The objective of this study was to determine the primary reasons why a subset of patients discontinued dental treatment at the University of Detroit Mercy School of Dentistry. Using an axiUm-generated report, we identified thirty patients who discontinued treatment at each of three specific points. The first group was patients who discontinued treatment after their screening appointment; the second group was patients who discontinued treatment after their oral diagnosis and treatment planning appointments; and the third group was patients who had a minimum of five appointments after the treatment planning appointment. A review of each record was done to determine if the reason for discontinuing treatment was noted in the patient's appointment history. Next, for each of the groups, patients were contacted via phone to administer a brief, follow-up survey. In the majority of cases examined, the axiUm records did not indicate the reason why the patients discontinued treatment. The patients who were interviewed were given a choice of ten reasons why they discontinued treatment at the School of Dentistry. The most commonly cited reason was financial limitations or instability, and the second most cited reason was insurance problems. Using a Likert scale of 1 to 5 (5 is highly satisfied), the respondents were then asked to rate their satisfaction with the service provided by the school. Ninety-six percent ranked their satisfaction with faculty as a 5. In addition, 91 percent ranked their satisfaction with the staff and with the school as a whole as a 5. Lastly, 73 percent of the respondents ranked their satisfaction with the dental student operator as a 5. At the beginning of the study, we expected that there would be several reasons mentioned by the patients, including amount of time and cost of treatment, as to why they discontinue treatment. However, we discovered that financial concerns were the main reason for patients' discontinuing treatment. Future studies are planned to include a survey of students, faculty, and administration to determine their perceptions of why patients are not returning.

133. The Emerging Role of Women in Oral and Maxillofacial Pathology

Student Poster
Junu Ojha, Jonathan E. Blatt, and Michelle Wheater, University of Detroit Mercy

We evaluated the number and proportion of female to male oral and maxillofacial pathology (OMP) residency program applicants from 1996 to 2008 using data obtained from the American Dental Association (ADA). We chose the time interval 1996 to 2008 because, prior to this, the ADA did not publish data on residency applicants separated by gender. In addition, we collected data on primary and corresponding authorship by women oral pathologists in leading OMP publications from 1996 to 2008 using PubMed searches. We also evaluated the role and number of females in key OMP leadership organizations—namely, the American Academy of Oral and Maxillofacial Pathology (AAOMP) and American Board of Oral and Maxillofacial Pathology (ABOMP). The proportion of female to male residency applicants and authors was analyzed for significant changes between 1996 and 2008 using the Fisher exact test. The Cochran-Armitage trend test was used to check for linear trends in such proportions over the course of the twelve years examined. A non-significant increase occurred from 1996 to 2008 in the proportion of female to male residents enrolled in OMP (p=0.657), with no significant linear trend observed (p=0.241). Non-significant increases also occurred from 1996 to 2008 in female first authorship (p=.413), last authorship (p=.143), and total (of first and last) authorship (p=.177), with no significant linear trends observed (p=.955, p=.661, and p=.770 respectively). Since its establishment in 1947, the AAOMP has elected only two female presidents. Similarly, the ABOMP established its first board of directors in 1948; since then, only two female oral pathologists have held this position. Within the time frame of our research analysis, we did not detect a significant increase in the impact of female participation in OMP. Future studies are planned to identify the factors that may be impeding the impact of female participation in OMP.

135. Fourth-Year Dental Students' Attitudes and Opinions Pertaining to the Presentation of Treatment Plans

Student Poster
Monica R. Popowski, Michelle R. McQuistan, and Cheryl L. Straub-Morarend, University of Iowa

The purpose of this study was to assess fourth-year dental students' self-perceived comfort and competence in presenting treatment plans to dental patients. A survey was developed and administered to all fourth-year dental students at the University of Iowa College of Dentistry (N=77; July 2010). The survey assessed dental students' methods of presenting treatment plans, their attitudes regarding the presentation of treatment plans, and their perceptions of their patients' oral health literacy. Prior to commencing the study, IRB approval was obtained. Data were entered into an Excel database, and frequencies were calculated using SAS 9.1. Seventy-four dental students completed the survey for an adjusted response rate of 96 percent. Ninety-one percent of respondents reported having presented thirty-five or fewer comprehensive treatment plans thus far in their dental education. Students reported that the greatest challenges they experience with patients who have difficulty understanding them are 1) the patients do not speak English (31 percent) and 2) the students do not think they can provide information more simply than they already do (30 percent). The majority of students felt very comfortable (36 percent) or somewhat comfortable (63 percent) presenting treatment plans. Similarly, 90 percent felt very competent or competent (25 percent and 65 percent respectively) presenting treatment plans. Seventy percent of students indicated that they enjoy presenting treatment plans. Forty-eight percent of students anticipate that after graduation they and their staff will present treatment plans to their patients, while 52 percent anticipate that they will present treatment plans to their patients without the assistance of their staff. Nine

percent of students reported having taken a health communication course outside of the college. The resources that students cited most frequently as being helpful in developing case presentation skills were observing faculty (91 percent), observing peers (88 percent), and lectures on case presentation skills (74 percent). Seventy percent of the students reported that textbooks were not helpful in developing case presentation skills. Students stated that the following would help them present treatment plans more effectively: better access to available resources (88 percent), greater variety of available resources (78 percent), more experience presenting treatment plans to patients (74 percent), more clinic time for presenting treatment plans (55 percent), and more training or lectures (43 percent). Overall, the majority of fourth-year dental students feel competent and somewhat comfortable presenting treatment plans. Lectures and observing faculty and peers were the most helpful resources in developing case presentation skills. The greatest challenges for students are patients who do not speak English and not being able to provide information more simply than they already do. Greater variety of available resources and better access to available resources would be the most helpful in assisting students to present treatment plans more effectively.

138. Dental Hygiene Students' Service-Learning Experiences in the Inner City

Alexandra D.E. Sheppard, University of Alberta

The purpose of this poster presentation is to explore how compassion and caring are evident towards patients in service-learning environments by dental hygiene students. Third-year dental hygiene students attend rotations in a variety of service-learning environments ranging from hospitals with seniors with degenerative diseases to a health care facility in which patients are afflicted by poverty, substance abuse, and sexually transmitted diseases. Do service-learning experiences enhance a student's level of cultural sensitivity and compassion for people with various personal and physical needs? A literature search has been completed to determine the frequency of literature involving caring and compassion in health sciences professions. There were four phases to the research project. In Phase I, students wrote reflective papers on their experiences. The papers were assessed for particular themes in regards to the depth of their compassion and recognition of cultural sensitivity. In Phase II, a modified version of the Coates caring efficacy scale was administered as a Likert-type style survey to dental hygiene students before and after the service-learning experiences. Second-year dental hygiene students were also included in this survey. In Phase III, the Coates caring efficacy scale and level of comfort scale were administered to the part-time clinical instructors. In Phase IV, focus group sessions were held to discuss the external service-learning experiences with three groups: current dental hygiene students, recent graduates, and full- and part-time clinical instructors. The literature search does reveal literature involving caring and compassion within the health professions of nursing students and medical students. There is little research involving dental students and none involving dental hygiene students. Third-year dental hygiene students scored higher on the Coates caring efficacy scale following their final rotations at the end of third year. Focus group discussions revealed that students felt anxiety during their rotations. Students initially feel anxious about service-learning experiences involving patients with compromised general health, psychiatric disorders, and a lower socioeconomic status as well as those patients afflicted with substance abuse. Following the service-learning experiences, the students' level of caring towards all patients was higher than before the service-learning experience. Service-learning experiences help to improve a student's level of comfort with patients.

139. Oral Health Promotion from Chairside to Bedside: A Study on the Attitudes to Interprofessional Learning in a Pediatric Ward Setting

Barry F. Quinn, King's College London; Richard Johnson

Poor oral hygiene in critical care settings has been associated with increased plaque accumulation, bacterial colonization of the orpharynx, and higher nosocomial infection rates, particularly ventilator-associated pneumonia. Research suggests some general nurses give oral hygiene low priority when caring for patients. King's College London Dental Institute, under the auspices of the interprofessional strand of the curriculum, implemented oral health promotion visits for the dental students to the Pediatric Intensive Care Unit (PICU) of the Evelina Children's Hospital in the Academic Health Science Centre of King's Health Partners. This study was to analyze the attitudes of the dental care professionals before and after having been involved with working with general nurses to provide oral health promotion. A further two studies are analyzing the general nurses' attitudes to the module and the health outcomes for the patients before and after the health promotion was instituted. Oral health promotion teams were formed from first- and final-year dental students, hygienists, and therapists accompanied with a qualified dental and general nurse (note that in the UK dental nurses are a registrable profession) to encourage collaborative interprofessional learning. The students received four lectures prior to participating in health promotion and the medical conditions they may encounter on the wards. Pedagogies of guided discovery, collaborative, and interprofessional learning help students to recognize their own and other professionals' contribution and role within a team-based approach to care. This education lays the foundations for future collaborative practice by enhancing mutual understanding and changing negative attitudes. The dental students consisted of first- and final-year students to encourage leadership and mentoring skills within the cohort. The attitudes to interprofessional education of the participants were assessed before the sessions began and after the participants had completed the module. A five-point Likert scale questionnaire with space for free text was used to analyze the students' attitudes. In total, the participants throughout the academic year numbered over 160. The attitudes of the dental students before the study, though largely positive, included comments like "This module is taking me out of the clinic" and "I need to complete my restorative quotas." After the module was completed, students appeared to realize the altruistic and health benefits for the patients, with a significant number reporting improvement in communicating with seriously ill children and getting life into perspective. The students reported a greater understanding of working in teams especially from across the dental-medical professional divide. Some reported a better ethical understanding of the professional duties of a dentist to care for patients as a whole. Others reported that their confidence in communicating effectively with general medical-based professionals had improved significantly. The dental care professionals (dental nurses, hygienists, and therapists) also reported that they perceived an improved understanding of their role by the general nurses for the care of patients. This study resulted in a reported perceived benefit for the dental students working within a multiprofessional team from across the dental-medical divide. The students considered that their confidence improved and that they felt they were doing a greater good for these patients than in the clinics. A second study is presently in progress to assess whether the health outcomes for the patients have improved since the introduction of the Oral Health Promotion Module for inpatients in the PICU.

140. Analyzing the Effectiveness of Residency Program Websites

Student Poster

Tamara C. Jones and Robert D. Spears, Baylor College of Dentistry

The study was carried out by analyzing the information currently available on U.S. orthodontic residency program websites and surveying current dental students to identify the most important components of a residency program website. Sixty-one residency websites were analyzed. A forty-three-item checklist form was used to identify the specific information provided by each residency website. The results of this study indicate that the current information available on orthodontic websites varies significantly from website to website (18 percent to 68 percent of the checklist items were present on each individual website). The analysis of the websites also discovered conflicting, outdated information and broken links on some websites. Secondly, we surveyed 100 dental students about their preference for information available on a residency website. We collected a survey that required current dental students to rank possible items on a website as absolutely necessary, nice to know, or not needed. The dental students indicated that 47 percent of the checklist items were absolutely necessary. Contact information for the program, length of program, application due date, tuition (fee/stipend), checklist of application materials required, address to mail application materials, and requirements for enrollment were indicated as the most important for a website. In the open-ended response, students also emphasized the importance of the accuracy of program websites and websites that correspond with the information presented on the American Dental Education Association's Postdoctoral Application Support Service (PASS) search engine as well. Overall, the majority of current websites were lacking information indicated as absolutely necessary by the dental students. In conclusion, residency program websites should consider updating their websites to include more information identified as important by dental students and correcting inaccuracies in order to improve student recruitment and simplify the application process.

141. Dental Professionals' Experience of Interdisciplinary Team Learning: A Sociological Evaluation

Richard P. Johnson; Barry F. Quinn, King's College London

Researchers have identified positives to team learning such as psychological safety, subgroup strength, cooperation, and cognitive ability. Research also suggests that team learning impacts organizational learning, the speed of technology implementation, and new product development. However, this literature is primarily concerned with nursing, medical, and associated professionals and students, while there are few studies that include dental students and particularly where learning occurs with the dental care professions. This sociological evaluation examines dental team professionals' current thinking on dental team learning within a dental teaching hospital secondary dental care provider. Team learning is when one person is engaged with or coordinating with another person or persons. Team learning requires individuals to share experiences with other team members. Team learning occurs when individuals coordinate knowledge and behaviors in order to reach a team goal. As a sociological process, team learning differs from individual learning in that it requires interaction and coordination between individuals. These individuals are members of groups that 1) work interdependently on a common task or objective, 2) have defined boundaries, and 3) are identified with a team that is recognized as such by others. Individual learning relies specifically on cognition, emotion, and behavior of individuals; team learning emerges as cognitions,

emotions, and behaviors are shared among individuals. Exposure to individuals with differing expertise and experience is a vital source of team learning. Interaction with dissimilar others promotes learning by exposing actors to new paradigms and by enabling the cross-fertilization of ideas. The more these aspects of learning are shared, the more the team, rather than the individual, can be said to be learning. Team learning can be distinguished from individual learning because team learning 1) involves interaction among team members related to gathering, sharing, processing, and acting on knowledge; 2) requires a level of agreement among team members about acceptable patterns of behavior for knowledge sharing; and 3) results in performance improvement (or deterioration) for the team that result from this interaction. For the purpose of the sociological evaluation, we chose to use audit as the evaluation tool. The term most commonly refers to audits in accounting, but similar concepts also exist in project management and quality management. Pawson and Tilley's realistic evaluation provided the theoretical underpinning for the evaluation. This approach to evaluation addresses the question of what works for whom and in what circumstances and is suited to evaluations of complex interventions, in which issues of context and process as well as outcome are of significance. An audit tool using closed questions but allowing free text was used with a convenience sample of qualified dentists, dental nurses, hygienists, hygiene therapists, and dental technicians. We acknowledge the limitations of the sociological evaluation. Eighty-eight percent of dental staff questioned understood the term "interdisciplinary team learning," with 68 percent of staff having experienced it in practice and 64 percent experiencing it in postgraduate study. The majority of the staff (72 percent) experienced their interdisciplinary learning within lecture-based sessions and 60 percent within a clinical setting. Sixty-four percent found interdisciplinary learning beneficial and added value to their learning outcomes; 64 percent would undertake interdisciplinary team learning again and believe more interdisciplinary learning should be made available; and 20 percent had not experienced interdisciplinary team learning but believed it would be beneficial to their learning. Most free text comments reflected that interdisciplinary learning allows greater understanding of each other's roles and responsibilities within the dental team care. There is growing evidence to support the contention that interprofessional education at both pre- and post-qualification levels will improve professionals' abilities to work more effectively in a team and to communicate more effectively with colleagues and patients. The United Kingdom Department of Health believes the best and most cost-effective outcomes for patients and clients are achieved when professionals work together and learn together. From the results of our study, it would appear that interdisciplinary teamwork has a positive impact on teamwork and therefore patient care and treatment, as members of the dental team understand their role and responsibilities.

142. Interprofessional Education in Periodontics

Jim A. Katancik and Paula N. O'Neill, University of Texas Health Science Center at Houston

The University of Texas Health Science Center at Houston Dental Branch's Department of Periodontics has as an overall goal the development of a collaborative and interactive model of periodontal education and patient care among dental hygiene (DH), dental (DS), and advanced periodontics (PG) programs. Ideally, this collaborative model would result in a synergistic environment in which students and faculty members will grow and, most importantly, patient care will ultimately be enhanced. An electronic survey (Zoomerang) consisting of twenty-nine questions was administered to DH programs throughout the United States and Canada to define key points on program design with regards to curriculum integration of

clinical and didactic coursework and patient management. Lists of programs and contact information were obtained from the websites of the American Dental Hygienists' Association and the Canadian Dental Hygienists' Association. The programs contacted were private, community college-based, or part of a university system. Participation in the survey was voluntary, and responses indicated informed consent. No school was excluded on any basis. Data were analyzed through the use of descriptive statistics to extract key points on curriculum integration and didactic programs, clinical training design used to integrate programs, and patient management among the hygiene, dental, and advanced programs. This study was approved by the University of Texas Health Science Center Committee for the Protection of Human Subjects as exempt (HSC-DB-08-0152). An electronic invitation to complete the survey was sent to 281 programs throughout the United States and Canada. Of those, 112 DH program directors completed the survey (40 percent response rate) with 93 percent of these responses being from public institutions. Twenty-two percent of those responding were integrated in some way with a DS program, with nearly half of these (48 percent) sharing didactic coursework, only one program sharing preclinical laboratory sessions, and 60 percent sharing clinical teaching sessions with patients. Nearly all DH programs had dentists involved in DH training (89 percent), this being primarily in didactics and the clinic; however, only 38 percent of DH program faculties were involved in DS teaching, with this being balanced in didactics, preclinical, and clinical settings. Only 16 percent responded that DH and DS students were integrated within the same clinics (shared treatment bays/practices) for patient care, and only 18 percent responded that DH and DS had concurrent care of patients. Even fewer (11 percent) integrated DH in a PG clinic. In summary, while most respondents enthusiastically welcome an interprofessional model in periodontal education, only 22 percent of those responding had such an opportunity for their students. Furthermore, only 16 percent of the programs integrated DH and DS students in the clinical treatment setting. In conclusion, few DH programs in the United States and Canada that responded to this survey have the opportunity for interprofessional collaboration in teaching periodontics.

143. Online Learning to Enhance Dental Students' Clinical Education

Erica R. Oliveira, Alexandra Forney, William F. Rose, Roger Weed, and William D. Hendricson, University of Texas Health Science Center at San Antonio

At the University of Texas Health Science Center at San Antonio, junior and senior dental students provide comprehensive patient care within General Practice Groups (GPGs). Because their clinical learning is dictated by patients' needs and thus not equivalent within the group, sharing unique experiences with peers has the potential to enhance the students' education within a group. Our hypothesis for this study was that online case-sharing will increase students' assessments of the learning environment within a clinical group practice team. With faculty guidance, a group of twenty-three seniors and twenty-six juniors enrolled in a clinical case-sharing online module, in which they shared their clinical experiences through multimedia presentations and discussion in seminars that focused on the best evidence available in the literature. Students photographed procedures that may not be experienced by all students and created online cases in which students could comment and contribute information via blogs. A questionnaire, ClinEdIQ (Clinical Education Instructional Quality) Inventory, a standardized instrument used in previous studies of clinical education in dentistry was the primary outcome measure to test the hypothesis. The ClinEdIQ is comprised of forty-five items divided into the four scales described below. Students responded to each item using a

six-point scale ranging from strongly disagree to strongly agree. The questionnaire was completed by the forty-nine students participating in the case blog intervention group and by a control group of ten students before and after the implementation of the project. The pre and post test were approximately nine months apart, reflecting the beginning and end of the academic year. The following outcomes were measured: 1) students' perceptions of their overall clinical learning opportunities, such as "most of my patients provided new learning opportunities for me" (CLO scale on the ClinEdIQ); 2) satisfaction with their involvement in specific learning opportunities, such as "making case presentations to faculty" (SLO scale); 3) perceptions of their interactions with clinical instructors, such as "check my work frequently and provide me with timely feedback" (ICI scale); and 4) assessment of opportunities for collaboration with peers and among students and faculty, such as "provide opportunities for students to review each other's cases so we learn from each other" (collaborative learning environment, CLE scale). One-way ANOVA was used for the statistical analysis to assess differences in pre to post test change scores between students in the intervention and control groups. The students in the intervention (case blog) group demonstrated statistically significant increases between pre and post tests in their assessment of the learning environment on each of the ClinEdIQ scales. The most substantial increase occurred for ICI. The control group also had statistically significant increases on three of the ClinEdIQ scales: CLO, ICI, and CLE, but not for SLO, in which their average score decreased from pre to post test. Overall, one-way ANOVA revealed no differences in pre to post intervention scores for the case blog and control groups for CLO, ICI, and CLE. For SLO, the pre to post difference between groups was significant at 0.04. The perceptions of the environment for specific learning opportunities (as measured by the SLO scale) of students in the intervention group increased significantly over the course of the year in comparison to students in a control group that did not participate in the case blog intervention. Additional assessment is needed to determine if the information exchange among students promoted by the case blog and associated evidence-based seminars produces enhanced learning opportunities for specific clinical skills. Overall, it is encouraging that dental students expressed significantly more positive perceptions of the several components of the clinical learning environment as the year progressed.

144. Pediatric Dentistry Interprofessional Education for Physician Assistant Students: Knowledge, Perceived Needs, and Curriculum Recommendations

Fouad S. Salama, Emily J. Raveill, Mark Christiansen, and Blake Lancaster, University of Nebraska Medical Center

Working as a physician assistant was ranked one of the best careers of 2008 by *US News & World Report.* Employment of physician assistants is expected to grow 27 percent from 2006 to 2016, faster than the average rate for all occupations reported by the Bureau of Labor Statistics. About 75,000 physician assistants practice in the United States. Educating physician assistants regarding pediatric dentistry would benefit improvement of oral health care for infants and children through adolescence, including those with special health care needs. In this study, a questionnaire (with thirty-six true/false, yes/no questions) was distributed and completed by all physician assistant students. The questionnaire was based on information regarding the pediatric dentistry curriculum. The questionnaire included the following demographic information about the students participating in the study: gender, student year, if they have had any formal or informal training in pediatric dentistry, and how would they rate their knowledge of pediatric dentistry. The questionnaires were distributed to students in the classroom at the end of the class/lecture.

The surveys were completed in the classroom and were collected by the investigator and placed in an envelope. Descriptive statistics were reported, and statistical differences between individual score and total scores on the knowledge test were evaluated by comparing correct answers of post-pre test score difference using ANOVA and post hoc Tukey test. Only 11.9 percent of the respondents reported having any formal training in pediatric dentistry, and 6.5 percent reported having informal training. Results of a one-way ANOVA comparing mean scores of knowledge of pediatric dentistry suggested that there was a significant difference on knowledge scores based on number of semesters in the physician assistant program F $(2, 119)$=7.47, p=.001. Post hoc comparison using Tukey HDS suggested that those students in their fourth semester (M=88.26 percent, SD=8.29) and seventh semester (M=85.78 percent, SD=8.49) scored significantly higher on knowledge questions than those students in their first semester (M=81.1 percent, SD=8.78). The specific questions most correlated with semester, meaning that those students with more semesters of training were associated with correct answers on the following questions: does milk have sugar in it? (r=.22, p<.05); cavities in primary (baby) teeth can harm permanent teeth (r=.21, p<.05); and primary tooth eruption begins around twelve months (r=.35, p<.01). Eighty-two percent of the respondents said they wish in the future to provide prenatal counseling for mothers. The main reason for not providing prenatal counseling was not a priority for the practice (11.1 percent). Students reported that the following topics in pediatric dentistry should be addressed in the curriculum: oral hygiene (88.9 percent), diet and feeding practices (80.2 percent), oral habits (79 percent), teething (78.6 percent), trauma (72.2 percent), periodontal disease (69 percent), fluoride (65.9 percent), caries risk assessment (50.8 percent), caries process (50 percent), and recall intervals (23 percent). Students reported that the following would improve their ability to provide pediatric dentistry information: further hands-on training (56.3 percent), further education (51.6 percent), continuing education courses (50 percent), and training DVD (19.8 percent). Students reported that the major reasons why it is difficult to provide pediatric dentistry information are level of their knowledge (72.2 percent), experience, training, and comfort level (61.1 percent), patients' behavior (17.5 percent), and lack of proper equipment or products (15.1 percent). The knowledge of the students who had been in the program longer had significantly higher scores than those in their first semester. An effective pediatric dentistry interprofessional education curriculum for physician assistant students should include oral hygiene, diet and feeding practices, oral habits, teething, trauma, periodontal disease, fluoride, caries risk assessment, caries process, and recall intervals.

145. Effectiveness of Online Mastery Quizzes in Dental Anatomy Education

Lisa M. Lee, Rollin W. Nagel, Douglas J. Gould, The Ohio State University

First-year dental students taking an anatomy course at The Ohio State University were given a series of online mastery quizzes designed to promote asynchronous mastery learning. The year-long dental anatomy course of 106 students covers gross anatomy, embryology, histology, and neuroscience. Each quiz was comprised of ten multiple-choice questions randomly selected from a validated, closed question bank representative of the upcoming examination material. Each quiz was made available online on Carmen (an Ohio State University course management and delivery system based on Desire2Learn technology). During the five-day window, students were able to take the quiz as many times as desired, and the highest score for each student was added to the final course grade. At the end of each quiz session, students were provided with a score but

no answer key; hence, the only way to obtain a perfect score was to take the quiz over. While the set of questions remained the same, the multiple-choice options for each question were randomized each time a new quiz session began, so the students could not memorize answer choices. A total of nine mastery quizzes and nine exams were given during the 2008–09 dental anatomy course. Statistical analysis was performed to investigate whether mastery quizzes had any predictive or performance value related to exam score. When standardized regression weight was analyzed, the results reveal that the mastery quiz scores from the students' first try often had a significantly predictive value for the corresponding exam scores. In addition to mastery quiz and exam scores, a number of other variables such as students' entering undergraduate grade point averages (GPAs) and Dental Admission Test (DAT) scores were used to perform multiple regression analysis. The results reveal that DAT total score and undergraduate GPA have a significantly predictive value for the first-year dental students' exam scores. To evaluate students' perceptions of the online self-testing mastery quiz resource, an online, anonymous survey was generated in Carmen and made available to the students at the end of the course. Students were awarded a bonus point toward their final grade for completing the survey, and ninety-nine students participated in the evaluation (94 percent participation). The survey questions included twelve Likert-scale items and one multiple-choice question. The results of the survey indicate that almost all students took advantage of the online mastery quiz resource and a majority found the mastery quizzes to be useful for reinforcing course content, clarifying concepts, and preparing for the examinations. A majority of the students also indicated that, on average, it took less than five tries per mastery quiz to obtain a perfect score. The online accessibility of mastery quizzes was perceived positively by almost all students. Course evaluations revealed students' general satisfaction with the mastery quizzes. Many students indicated that they would have benefitted more had there been more than ten questions per quiz. Of note, while most students indicated that their mastery quiz scores on their first try were not indicative of corresponding exam scores, statistical analysis revealed that initial mastery quiz scores have a significantly predictive value on corresponding exam scores. Examinations and mastery quizzes that did not have significant correlations in this study will be further investigated to analyze the exam contents and other variables that may have led to the discordance. The results of this study will be applied in the 2012 academic year's interprofessional anatomy curriculum designed to bring together dental, medical, and graduate students in the same course at The Ohio State University. In conclusion, online mastery quizzes are an effective resource to help students reach content mastery by engaging students in self-learning, testing, and evaluation processes. Statistical analyses reveal a significantly predictive value of the mastery quizzes for students' performance on examinations. Similarly, entering undergraduate GPAs and DAT total scores also significantly predict students' examination performance in our dental anatomy course. Students perceived mastery quizzes as a valuable learning resource. These results suggest that mastery quizzes are not only a valuable educational resource, but also a predictive and evaluative tool for the course itself.

146. Survey of Dentists' Practices and Barriers for Incorporating Oral-Systemic Disease

Rebecca S. Wilder, University of North Carolina at Chapel Hill; Kathryn P. Bell, Pacific University; Ceib Phillips, Steven Offenbacher, University of North Carolina at Chapel Hill; David W. Paquette, Stony Brook University

A survey questionnaire was developed, pilot tested, revised, and mailed to 1,350 licensed dentists in North Carolina. After three mailings, 667 dentists (49 percent) responded who met inclusion criteria and who contributed survey data for descriptive analyses. Data were analyzed using descriptive statistics and bivariate testing with age, gender, practice type, and setting as independent variables. Respondents were predominantly male (77 percent), in solo practice (59.4 percent), and in urban or suburban settings (74 percent). Fifty percent of responding dentists reported updating medical histories at every patient visit. While North Carolina dentists routinely query and counsel patients regarding systemic health as best practices, patient perceptions of reimbursement issues and referral options remain important obstacles for dentists playing a broader role in patient overall health. Funded by Johnson and Johnson Health Care Products, Division of McNeil-PPC, Inc.

147. Time's Ticking: The Influence of Time on Practical Exams

Margaret E. Coleman and Judy A. Kwapis-Jaeger, University of Detroit Mercy

Various testing methods are used to assess dental and dental hygiene students' understanding of concepts and attainment of knowledge as they progress through the curriculum. One such evaluation method is a timed practical exam. Students move through a series of stations at designated time intervals and answer questions following interaction with a prop. Does this type of exam tend to favor certain learning styles? Does the fact that there is a time factor influence a student's success on the exam? Previously reported research indicates that students with certain learning types perform better than others on written timed exams. Does this hold true for practical exams? If the time factor for completing each station was increased, how would this influence student success? The purpose of this study was to assess if increasing the time element on a timed practical exam enhances student performance. The Myers-Briggs Type Indicator (MBTI) was administered over a ten-year period (1998 to 2008) to dental hygiene students (n=304) during the first semester of class. The data were analyzed and compared with the scores received on two practical exams administered in a dental anatomy course during the second semester of the curriculum. Each practical exam consisted of fifty-two stations with two items per station. The first practical was administered during the eighth week and the second practical during the fourteenth week of the semester. The time interval used from 1998 until 2004 (n=203) was sixty seconds and was increased to ninety seconds from 2005 until 2008 (n=103). Analysis using frequency distribution and chi-square analysis was completed. Personality types were identified, and strength of individual preferences reported. Data indicated the mean score on the first practical exam increased by 4.9 points when time was increased; however, the mean score on the second practical was exactly the same regardless of the time factor. Introverts consistently scored higher than extroverts on everything except the second practical at sixty seconds. However, when time was increased, introverts did substantially better (three points higher) than extroverts owing to their increased time to process information. Intuitives' mean scores were higher than sensing types in all categories. The T-F scale showed no significant difference. On the J-P preference scale, Js scored higher on everything except the second practical at sixty seconds consistent with timed exams on single subject matter. We conclude from this study that adequate time must be given to address needs of differing learning styles; various methods of assessing students besides timed exams should be utilized; and implementing a mock practical prior to the actual practical exam may need to be implemented to increase students' success.

148. Teaching Practices and Integration of Oral Health/Oral-Related Education in Non-Dental Hygiene Allied Health Courses

Dianne S. Chadbourne and Joanne Doucette, Massachusetts College of Pharmacy and Health Sciences; Mary E. Foley

Full- and part-time faculty members were asked to respond to an online survey regarding their interest in and/or current use of oral health education in their respective curricula. The survey was voluntary, and requests for participation were sent to all the faculty on two separate occasions in an attempt to increase the level of participation in the survey. Faculty members who indicated they did not include oral health topics in their courses were directed to answer questions regarding their potential interest in incorporating oral health topics into future teaching activities. Faculty members who responded positively to the current inclusion of oral health content in their courses were asked to identify oral-related topics presented in their courses as well as the methodology used to deliver the content. The response rate for the survey was 28.7 percent (n=66). Seventy-seven percent of the respondents were either assistant or associate professors. Ninety-seven percent of all respondents had didactic teaching responsibilities, while 32–39 percent had lab or clinical teaching duties. Thirty-two percent stated that oral-related topics were included in their courses, but none of the respondents included these topics in more than two courses that they taught. Of the 32 percent who responded, 79 percent included oral-related topics in a didactic lecture, with 24 percent or less delivering oral-related content in a clinical/lab setting, via videos or the web, or in direct patient care experiences. Of the sixty-six respondents, 15 percent stated that they had a high level of interest in incorporating oral-related topics into their teaching activities, 44 percent had a medium level, and 41 percent had a low level of interest. Ninety-seven percent said they did not conduct research in oral-related topics, and none of the respondents included these topics in scholarly projects or college service activities. The results of the survey given at this institution indicate that integration of oral health topics is lacking in the non-dental hygiene allied health programs. The small percentage of faculty members currently including oral health-related content in their courses, as well as the level of interest in introducing such course content, indicates the need to find mechanisms to stimulate interest to introduce oral health topics in other allied health programs. Those faculty members who have successfully integrated oral health content into their courses could be interviewed further regarding their educational methodology and chosen oral health content. This data could in turn be used to develop teaching models for other allied health programs. After development of a model, those faculty members not currently including oral health content in their curricula could be solicited to consider use of the model developed and potential oral health topics suggested.

149. Retention and Compensation of Faculty Members in Dental Education

Homa Amini, The Ohio State University

Over the years, it is known that dental education is facing a severe faculty shortage. The higher salaries available in private practice and the burden of student loans deter many new graduates from joining the rank of academics as junior faculty members. This study surveyed predoctoral program directors in pediatric dentistry related to their institutions' compensation patterns and ability to recruit and retain faculty members. About one-third of the respondents reported having trouble recruiting and keeping full-time faculty members based on compensation. About 20 percent of the respondents reported having an opportunity for faculty loan repayment in their program and provide incentives to faculty members based on student productivity. Sixty percent of the programs reported that junior or new faculty members have protected time, which is defined as being devoted to professional development at their institution. Seventy percent of respondents reported that faculty members at their institutions have to generate a percentage of their base income. Fifteen percent of the programs supported the model of faculty practice (direct patient care) simultaneous with student supervision. The dental faculty shortage jeopardizes the oral health of the public and availability of the future workforce. Institutions should create innovative models in order to be able to recruit and retain faculty members.

150. Longitudinal Assessment of Dental Students' Vision During the Four-Year Dental School Curriculum

Adriana Vargas, Roger Weed, Erica C. Teixeira, Keith V. Hill, and Stefanie D. Seitz, University of Texas Health Science Center at San Antonio

This study tests the following hypotheses: 1) at baseline examination, 20 percent of freshman dental students will have visual deficits in a) visual acuity, b) ocular movements, c) color vision, and/or d) convergence; 2) 50 percent of freshman students with visual deficits will not be aware of these problems; 3) dental students' uncorrected visual acuity will decline from the first to the fourth years; and 4) the percentage of students who use prescribed corrective lenses will increase by 20 percent between the first and fourth years. One group of dental students is being followed longitudinally for four years to measure vision changes during the curriculum. Sixty-four first-year dental students out of ninety-six total at the University of Texas Health Science Center at San Antonio Dental School volunteered to participate and were screened in July 2009 for near and distance visual acuity with and without corrective lenses and for color vision, ocular movements, and stereopsis. The vision screening was conducted manually using standard vision assessment methods and equipment. This cohort of students had not yet started coursework at the time of baseline assessment. Students who had vision deficits that were identified during baseline assessment were interviewed by the investigators to determine if they knew about these deficits prior to assessment. Annual vision assessment of this cohort of dental students will continue as they progress through the second, third, and fourth years of school. Forty-nine percent of the students reported that they wear corrective lenses for routine daily activity. All dental students had at least 20/25 distant and near vision with corrective lenses. Overall, 23 percent of subjects (n=14) had deficits in one or more components of vision, which supports the hypothesis for baseline incidence. Minor color deficiencies were detected in 10 percent of students (n=6), non-parallel eye motion was detected in 8 percent (n=5), and 5 percent (n=3) exhibited less than normal stereopsis. None of the fourteen students were aware of the detected vision deficits. All students with detected deficiencies were referred to a co-investigator who is an ophthalmologist. For distant vision (ten-foot measurement), 53 percent of the students had 20/20 vision or better without correction. However, nearly 20 percent had 20/400 or worse acuity without correction. With correction, 100 percent of tested students had 20/20 or better distant vision. For near vision without correction, 75 percent of students had 20/20 acuity or better. Ten percent had 20/300 or worse without corrective lenses. With correction, 100 percent of students had 20/25 acuity or better for near vision. No red-green blindness was detected; however, six students demonstrated several different types of minor color deficiency. Dental students who have a vision deficit may be at a disadvantage when performing clinical procedures that require precise surgical technique on tooth structures. This deficit may hinder their acquisition of competence and also influence faculty members' assessment of

the students' performance in comparison to their classmates. Despite the critical role of visual acuity in dental practice, only a few studies have investigated dental students' or practitioners' vision, and most of these prior studies have focused on assessment of color vision. A literature review conducted by the investigators identified only two studies that longitudinally monitored the vision of professional students: one study followed medical students, and the other followed engineering students. No published studies have reported a longitudinal assessment of dental students' vision. The baseline assessment confirmed hypotheses 1 and 2: 23 percent (fourteen) of sixty-four first-year pre-matriculation students had visual defects in one or more of the four areas assessed, and none of these students was aware of these vision deficiencies. Ten percent of the students had minor color deficiency, 8 percent had heterophoric ocular movements, and 5 percent had less than normal stereopsis. All subjects had at least 20/25 near and distant vision with correction. This study has the potential to expand knowledge of vision deficits that exist in matriculating dental students and identify vision problems that occur during the course of dental school.

151. Development, Implementation, and Evaluation of an Innovative Health Care and Health Promotion Model for an Underserved Population with Diabetes

Marti L. Pollard, Ann Brunick, Karly Hegge, and Olayinka Shiyanbola, University of South Dakota; Christina Lammers, South Dakota State University

This unique study brought together students from five health career disciplines at two universities to develop an evidence-based program designed to teach critical components of diabetes management. Seventeen pharmacy and twelve nursing students from South Dakota State University and twenty-one medical, two nursing, one dietetic, and nine dental hygiene students from the University of South Dakota led monthly workshops covering topics on advice, blood pressure, cholesterol, diabetes control and care, dental care, diet, eye care, foot care, and guardian drugs. These topics correlated with an alphabet strategy modified from the Jaiveer model and used a mnemonic-based educational approach to teach individuals with diabetes important aspects of care. Medically underserved individuals with diabetes volunteered to participate in six student-led sessions. Students collected baseline values for hemoglobin A1c, blood pressure, total cholesterol, low-density lipoprotein, triglycerides, weight, body mass index, and oral health. Participants completed surveys assessing their knowledge of diabetes, diabetes care and self-management, nutrition, physical activity, use of tobacco, and perceptions of the health care system. The Rapid Estimate of Adult Literacy in Medicine (REALM) test was administered to assess the participants' understanding of medical reading materials and health literacy. After six monthly sessions were completed, all assessments were repeated to determine if there were improvements in disease control and understanding of disease management. Students were also surveyed before and after the six-month intervention to assess knowledge gain on diabetes management and understanding of the roles of other health professionals in diabetes care. Open-ended questions that examined the students' opinion of the multidisciplinary approach showed great success of the project. Examples of student comments were as follows: "The fact that this involves multiple disciplines allows each to place emphasis on their own respective expertise"; "This allows the greatest opportunity for the patient to be properly educated"; and "I furthered my knowledge of diabetes beyond just medications." These comments suggest that an interdisciplinary approach to teaching and learning in health care should be encouraged. This research project, funded by a grant from the Centers for Disease Control and Prevention (CDC), acknowledged the potential value of an interprofessional

team approach to diabetes education and management provided to medically underserved individuals by students. This innovative model could be applied to other practice settings and used for the management of other chronic diseases. As health care providers and educators work to improve diabetes care, this model could be incorporated into a plethora of health care policies that seek to improve health professionals' training and diabetics' access to quality, evidence-based care.

152. Knowledge of Interprofessional Education Among University of Detroit Mercy School of Dentistry Students

Student Poster

Jenna Lau, Michelle A. Wheater, and Kathi R. Shepherd, University of Detroit Mercy

The objective of this survey study was to determine the level of knowledge of University of Detroit Mercy School of Dentistry students regarding the definition of interprofessional education (IPE). Adult male and female students in the dental and dental hygiene programs were surveyed electronically. The survey consisted of four demographic questions and six questions assessing student knowledge of the concept and definition of IPE. Approval as an exempt study was obtained from the University of Detroit Mercy IRB prior to administration of the survey (IRB Protocol Number 1011-02). The response rate was 21.5 percent. Although only half (52.3 percent) of the respondents agreed that they were familiar with the term, 84.9 percent agreed that one goal of IPE is to provide students with skills to improve communication between health care professionals. The same percentage of students also agreed that they will be better able to treat patients if they have opportunities to interact with students in other health professions as part of their academic training. To gain a better understanding of the level of knowledge of students regarding IPE, they were given three sets of scenarios and asked to choose the one that best illustrates IPE. For scenario number 1, 59.3 percent of students correctly identified that IPE occurs when students in two or more health professions disciplines learn together and from each other with the aim of improving collaboration, communication, and patient care. For scenario number 2, 81.2 percent correctly identified a pharmacy student, nursing student, and physician assistant student working together on a virtual case dealing with the management of a patient with hypertension as part of a course as an example of IPE. For scenario number 3, 62.8 percent of students correctly identified a physician's assistant student, a dental student, a medical student, and a dental hygiene student on rounds together at a teaching hospital learning how to best manage a diabetic patient with severe gum disease as an example of IPE. Not all dental and dental hygiene students fully understand the definition of IPE. However, students appear to be accepting of the concept, as they agree that IPE educational experiences will provide skills for improved communication and better patient care. Not all dental schools incorporate IPE activities, and there is no agreement among academic institutions that it is even necessary for optimum education. Students' acceptance of IPE based on this survey may serve as a guide for the future development and restructuring of University of Detroit Mercy School of Dentistry dental and dental hygiene curricula.

153. How Often Are Pediatricians Performing Oral Health Assessments on Their Patients?

Nicole Morof, Eptsam Ali, and Michelle A. Wheater, University of Detroit Mercy

The objective of this survey study was to assess how often pediatricians are performing oral health assessments on their patients and to identify

factors that may limit completion of an oral assessment. A survey was mailed to 150 male and female pediatricians practicing in the state of Michigan. The addresses of the pediatricians were obtained from an Internet source, www.ucomparehealthcare.com. The fifteen survey questions consisted of fill in the blanks and yes/no, multiple-choice, and Likert scale responses. Approval as an exempt study was obtained from the University of Detroit Mercy IRB prior to administration of the survey (IRB Protocol #0910-32). This study was conducted during a Capstone course as part of the requirements for the University of Detroit Mercy Dental Hygiene Degree Completion Program. Thirty-one pediatricians representing sixteen cities across the state of Michigan completed the survey for a return rate of 20.6 percent. While 100 percent of the respondents reported that they were aware of their role in oral health prevention, only 58 percent responded that they performed oral health assessments on all of their patients under the age of five. When asked how often they examined their patients' teeth, 64 percent replied often, and 45 percent replied sometimes. When asked how often they identified carious lesions, 31 percent replied often, 54 percent sometimes, and 1 percent never. Eighty-one percent of the respondents often refer pediatric patients to a dentist. When questioned about barriers to completing an oral health assessment in pediatric patients, 39 percent of respondents reported that time constraints inhibit them from completing oral screenings, and 25 percent reported inadequate training. When questioned about fluoride varnish use, 98 percent of respondents replied that they never apply fluoride varnish on their patients, and 74 percent stated that they are not comfortable with the procedure. Pediatricians are not performing oral health assessments on all of their patients, possibly because of time constraints and lack of training. The results of this survey suggest that pediatricians/medical professionals may need more education in performing oral health assessments and the use of oral prevention tools including fluoride varnish. The results of the survey indicate that an interprofessional dental/medical curriculum regarding pediatric dentistry could be useful in overcoming these obstacles.

154. Conceptualizing Technology Literacy Competencies for Dental Education Programs

Charlotte L. Briggs, University of Illinois at Chicago

Technology is a central feature of dentistry, and advances in technology significantly impact the practice of dental medicine. In recognition of the importance of technology to the profession, the Commission on Dental Accreditation (CODA) adopted revised standards in August 2010 that include an expectation that the educational environment of dental schools emphasize the application of technology and that graduates should be able to evaluate, assess, and apply current and emerging science and technology. Additionally, CODA standards express the expectation that the dental school should use evidence to evaluate new technology, implying that to do so provides important role modeling for dental students. Similarly, the American Dental Education Association (ADEA) Competencies for the New Dentist, approved by the 2008 ADEA House of Delegates, states that "Graduates must be competent to . . . evaluate and apply contemporary and emerging information including clinical and practice management technology resources." To meet these expectations, dental programs must develop appropriate learning objectives to guide curriculum development and student outcomes assessment for technology literacy. Technology literacy objectives for dental students must be both professionally and developmentally appropriate, taking into account the full range of roles that dentists fulfill as informed oral health care providers, as key decision makers in the adoption of new technologies, and as implementers of technology change in dental offices. This poster outlines the potential contributions and limitations of existing frameworks for technology literacy that have

been developed for K-12 and higher education and proposes a more appropriate framework for dental education that addresses core roles and tasks of the general dentist, informed by research concerning the developmental needs and abilities of professional students. The framework synthesizes literature in three domains: technology transfer in dental practice, technology literacy, and adult development in college and professions. The presentation also suggests avenues of future research to refine and validate the framework. Technology is central to the practice of dentistry, and expectations are increasing that dental education programs document outcomes associated with technology literacy. However, few dental education programs have fully articulated technology literacy objectives for their graduates, and the dental education literature provides little guidance for doing so. This poster presents a conceptual framework that outlines the core technology literacy needs of dental professionals and indicates how they are more extensive and developmentally and advanced than existing technology literacy standards that have been proposed for college students.

155. Fluoride Varnish Application: A Method to Improve Patient Acceptance and Compliance

Kathleen Neveu, Durinda J. Mattana, Marge J. Buehner, and Warren C. Wagner, University of Detroit Mercy

Upon receiving IRB approval for this study, twenty-six dental hygiene students were actively involved with patient care to determine if patients would be more compliant with fluoride varnish application utilizing an educational video verses verbal instructions. The students had been trained in the importance, application, and patient education of fluoride varnish. A calibration session at the beginning of the term informed students of the project along with instruction. The calibration session included patient selection, obtaining patient informed consent, use of the fluoride video, clinical techniques, and paperwork to prepare for a follow-up phone interview. Each student provided fluoride varnish application for five patients using a patient education video and five patients receiving verbal patient education. A phone survey (conducted by dental hygiene faculty members) included questions regarding the patient's opinion of the fluoride varnish, as well as compliance with instructions. Three types of data from the survey were analyzed: score, nonparametric, and frequency. Among other data, the primary independent variable video/no video resulted in statistically significant changes in the variable that indicated how long the patient left the varnish on. Patients who viewed the video kept the varnish on 37.8 percent longer. There is limited evidence in the literature on methods utilized to enhance compliance with fluoride varnish application. Results of this study revealed greater compliance with fluoride varnish application utilizing an educational video. Hence, the use of an educational video may be a solution for practitioners and dental schools to address patient concerns and noncompliance issues. These results also emphasize the importance of incorporating electronic patient education materials in preventive dental and dental hygiene curricula in order for graduates to become competent in multiple methods utilized to enhance compliance with preventive oral health behaviors.

156. Pediatric Dentistry Interprofessional Education for Public Health Students: Knowledge, Perceived Needs, and Curriculum Recommendations

Fouad S. Salama, University of Nebraska Medical Center; Jeremy S. Cox, University of Nevada, Las Vegas; Ruth Margalit, Blake Lancaster, and Amy Kebriaei, University of Nebraska Medical Center

Effective interprofessional collaboration is an important factor in addressing health care needs and priorities. The need for an

educational component of pediatric dentistry care is important to oral health. Education of public health students as related to oral health is a critical factor in creating a tailored routine for oral care. Additionally, need assessment would consider educational issues for public health students as related to some elements of managing oral health and the responsibility in educating other health professionals. Understanding perceptions and knowledge of public health students would help address factors that improve their knowledge and overcome barriers they encounter while providing oral health care to patients. A questionnaire was distributed to a group of public health students. The questionnaire was based on information regarding pediatric dentistry curriculum. A thirty-four-question survey consisting of true/false, yes/no questions was given. The questionnaire included the following demographic information: gender, student year, if they have had any formal or informal training in pediatric dentistry, and how would they rate their knowledge of pediatric dentistry. Descriptive statistics were reported, and statistical differences between individual scores and total scores on the knowledge test were evaluated by comparing correct answers of pre-post test score difference using ANOVA and post hoc Tukey tests. Only 9.09 percent of the students reported having any formal training in pediatric dentistry, and 13.64 percent reported having informal training. Only 9.09 percent rated their knowledge of pediatric dentistry extensive, while 50.00 percent rated their knowledge of pediatric dentistry as minimal. Only 18.18 percent reported having any formal training in oral health care for persons with special needs, and 13.64 percent reported having informal training. About 86.36 percent think computer-assisted learning strengthens the curriculum, 90.91 percent think critical thinking strengthens the curriculum, and 77.27 percent think independent learning strengthens the curriculum. Students reported that the following topics in pediatric dentistry should be addressed in the curriculum: diet and feeding practices (68.18 percent), trauma (50.00 percent), oral hygiene (59.09 percent), teething (54.55 percent), oral habits (68.18 percent), fluoride (50.00 percent), caries process (54.55 percent), and caries risk assessment (50.00 percent). Students reported that the following would improve their ability to provide pediatric dentistry information: further hands-on training (63.64 percent), further education (45.46 percent), continuing education courses (50.00 percent), and a training DVD (36.36 percent). Students reported that the major reason why it is difficult to provide pediatric dentistry information are level of their knowledge (54.55 percent), experience, training, and comfort level (40.91 percent), patients' behavior (18.18 percent), and lack of proper equipment or products (18.18 percent). The specific questions most correlated with the public health students' correct answers were the following: parents should clean the child's teeth at least twice a day (86.36 percent), bruxism (grinding of teeth) can lead to headaches and shoulder pain (90.91 percent), dry mouth can contribute to tooth decay and gum disease (81.82 percent), does milk have sugar in it? (90.91 percent), some medications can lead to gingival hyperplasia (overgrowth) (86.36 percent), every child should visit the dentist by age one (77.27 percent), and gastro-esophageal reflux disease (GERD) can lead to erosion of teeth (77.27 percent). By contrast, 86.36 percent of the students incorrectly answered the question stating that an abscessed tooth will not spread infection throughout the body. Effective pediatric dentistry interprofessional education curricula for public health students should include oral hygiene, diet and feeding practices, oral habits, teething, trauma, fluoride, caries risk assessment, and caries process. The main reasons why it is difficult for public health students to provide pediatric dentistry information include level of their knowledge, experience, training, and comfort level, patients' behavior, and lack of proper equipment or products; these concerns should be addressed.

157. Developing Future Health Care Leaders: Dental Student Interest in and Preferred Format for Leadership Development Programs

Student Poster

Daniel A. Hammer, University of the Pacific Arthur A. Dugoni School of Dentistry

In April 2010, two surveys were developed and administered to the administration, faculty, and students at the University of the Pacific Arthur A. Dugoni School of Dentistry. Of the 462 students enrolled in the three-year D.D.S. program and two-year International Dental Studies Program, 266 students completed the survey, yielding a response rate of 58 percent. First-, second-, and third-year class response rates were 88 percent, 75 percent, and 28 percent respectively. Dental students and faculty members in our study strongly recognize the importance of leadership skills for success as a student and practicing dentist. In a study at Case Western University, students were asked if they thought it was important for dentists to have leadership skills, and 99 percent agreed. Similarly, 84 percent of Pacific's students and faculty members believed that a leadership development program would be beneficial to students. This nearly equals a similar study with the same question in 2008, in which 83 percent of surveyed students from across the country believed that leadership development programs in dental school would be beneficial. Students do not just see these programs as beneficial, but have demonstrated that if a program of this type is offered at their school, they will participate. In our study, 94 percent of Pacific students said they would or maybe would participate if a program were offered. Similarly, 80 percent of Case Western University students and 97 percent of students surveyed nationally would or maybe would participate in a similar program. This study has created a firm foundation to develop the pilot for the leadership development program at Pacific. In order to implement an effective leadership program, the pedagogies desired to facilitate the curriculum must match the desires of the learners. In addition, the program must reflect the dynamic, collaborative learning communities that have been very beneficial in other dental leadership programs. A leadership development program should include interdisciplinary collaboration and shared learning between dental students and allied health professionals. This study confirmed previous findings that students find it most effective to learn leadership skills from talking with dental leaders and mentors. Over 80 percent of the Pacific students and faculty surveyed believed that a faculty mentorship program would be the most beneficial aspect of a new leadership development program. To ensure that the Pacific program is feasible, over 60 percent of faculty members stated that they would be mentors if a program existed. This willingness to serve reflects the humanistic model that governs the culture at Pacific. Following faculty mentorship, small group discussion (74 percent), public speaking workshops (56 percent), San Francisco Dental Society Member Mentorship Program (40 percent), panel discussions (39 percent), community outreach requirements (39 percent), and senior capstone project requirement (13 percent) followed in popularity. Although the need and desire for dental student leadership development has been identified, there are only a small number of active programs. With increasing research on their development, more dental schools may be encouraged to incorporate leadership development programs. With more data and longitudinal studies including previous leadership experience and training, we could see how these programs translate into leadership in dental school and after graduation. Using the information from this study, we have developed a pilot leadership development program at Pacific for the 2010–11 school year and hope to report outcomes in future years.

158. Pediatric Dentistry Interprofessional Education for Nursing Students: Knowledge, Perceived Needs, and Curriculum Recommendations

Faika Abdelmegid, Elliott R. Bailey, Louise LaFramboise, Blake Lancaster, and Fouad S. Salama, University of Nebraska Medical Center

Effective interprofessional collaboration is an important factor in addressing health care needs and priorities. The need for an educational component of pediatric dentistry care is important to oral health. Education of nursing students as related to oral health is a critical factor in creating a tailored routine for oral care. Additionally, need assessment would consider educational issues for nursing students as related to some elements of managing oral health and the responsibility in educating other health professionals. A questionnaire consisting of thirty-six true/false or yes/no questions regarding pediatric dentistry was completed by a group of nursing students. The questionnaire included the following demographic information: gender, program year, if they have had any formal or informal training in pediatric dentistry, and how they would rate their knowledge of pediatric dentistry. Descriptive statistics were reported, and statistical differences between individual score and total scores on the knowledge test were evaluated by comparing pre-post test score difference using ANOVA and post hoc Tukey tests. Only 7.87 percent of the respondents reported having informal training in pediatric dentistry, and none reported having any formal training. None rated their knowledge of pediatric dentistry as extensive, while 47.19 percent rated their knowledge of pediatric dentistry as minimal. Only 4.49 percent reported having any formal training in oral health care for persons with special needs, and 17.98 percent reported having informal training. Sixty-four percent of the students wish in the future to provide prenatal counseling for mothers. The main reason for not providing prenatal counseling was not a priority for the practice (16.85 percent). Of the respondents, 85.39 percent think computer-assisted learning strengthens the curriculum, 94.38 percent think critical thinking strengthens the curriculum, 78.65 percent think integration of the pediatric dentistry with the clinical curriculum strengthens the curriculum, 79.78 percent think problem-based learning strengthens the curriculum, and 80.90 percent think independent learning strengthens the curriculum. Students reported that the following topics in pediatric dentistry should be addressed in the curriculum: diet and feeding practices (79.78 percent), trauma (61.80 percent), oral hygiene (84.27 percent), teething (77.53 percent), oral habits (77.53 percent), fluoride (65.17 percent), caries process (52.81 percent), and caries risk assessment (62.92 percent). Students reported that the following would improve their ability to provide pediatric dentistry information: further hands-on training (49.44 percent), further education (50.562 percent), continuing education courses (43.82 percent), and a training DVD (37.08 percent). Students reported that the major reason why it is difficult to provide pediatric dentistry information are level of their knowledge (53.93 percent), experience, training, and comfort level (48.32 percent), patients' behavior (16.85 percent), and lack of proper equipment or products (12.36 percent). The specific questions most correlated with the nursing students' correct answers were the following: parents should clean the child's teeth at least twice a day (97.75 percent), bruxism (grinding of teeth) can lead to headaches and shoulder pain (96.63 percent), dry mouth can contribute to tooth decay and gum disease (95.51 percent), oral habits such as tongue thrusting can be damaging to teeth (86.52 percent), does milk have sugar in it? (95.51 percent), some medications can lead to gingival hyperplasia (overgrowth) (93.26 percent), every child should visit the dentist by age one (70.79 percent), and gastro-esophageal reflux disease (GERD) can lead to erosion of teeth (97.75 percent). By contrast, 98.88 percent incorrectly answered the question stating an abscessed tooth will not spread infection throughout the body. An effective pediatric dentistry interprofessional education curriculum for nursing students should include oral hygiene, diet and feeding practices, oral habits, teething, trauma, fluoride, caries risk assessment, and caries process. The major reasons why it is difficult to provide pediatric dentistry information by nursing students are level of their knowledge, experience, training, and comfort level, patients' behavior, and lack of proper equipment or products; these concerns should be addressed.

159. Infant Oral Health Interprofessional Education for Medical Residents

Faika Abdelmegid, Fouad S. Salama, Amy Kebriaei, and Vincent Rothe, University of Nebraska Medical Center

Infant oral health is the foundation upon which preventive education and dental care must be built to enhance the opportunity for a lifetime free from preventable oral disease. Since physicians are far more likely to see new mothers and infants than are dentists, it is essential that they be aware of the infectious pathophysiology and associated risk factors of early childhood caries and make appropriate decisions regarding timely and effective intervention. Early childhood caries is preventable, but more than 50 percent of children have caries by the time they reach kindergarten. This disease affects the general population but is thirty-two times more likely to occur in infants who are of low socioeconomic status, whose mothers have a low education level, and who consume sugary foods. Team-based, patient-centered care is critical to meeting the future health care needs of the public, including infant oral health. The American Academy of Pediatrics supports that pediatricians and pediatric health care professionals should develop the knowledge base to perform oral health risk assessments on all patients beginning at six months of age. We hypothesize that viewing an educational presentation on video will provide medical residents with instructive information on infant oral health. The study involved training medical residents about infant oral health care and assessing their knowledge before and after the training in a nonequivalent control group design. Participants were given an assessment in the form of a questionnaire that they completed immediately before and after an educational intervention program. The educational presentation took approximately forty-five minutes, followed by a fifteen-minute question and answer session. The authors used the American Academy of Pediatric Dentistry guidelines to develop and produce an educational intervention using PowerPoint and an instructional video. The presentation provides an informative and concise representation of infant oral health for health care professionals designed to instruct residents in how to perform an infant oral screening, how to identify infants at increased risk for oral health problems, how and when to obtain appropriate referrals to oral health professionals, and how to provide parents with appropriate anticipatory guidance. A sixteen-item true/false/don't know and multiple-choice questionnaire based on information presented in the lecture and video was designed to assess residents' knowledge of these important aspects of infant oral health. The questionnaire was given immediately before and after the educational intervention. Statistical differences between individual scores and total scores on the knowledge-based questionnaire were evaluated by comparing correct answers of the pre-post test score differences using a paired t-test. An analysis of covariance was completed to examine differences in knowledge and potentially confounding factors including age, gender, residency year, and extent of previous training. There were 65.6 percent females and 34.4 percent males in the study. The average age was 30.2 (SD 3.26) years (range twenty-six to forty-one years). Only 15.6 percent reported formal or informal training in infant oral health, while 84.4 percent had no training. The average score on the pre test was 10.09 out of 16 (SD 1.65), which increased to 13.31

out of 16 (SD 1.84) on the post test. This difference was significant. This study demonstrated the effectiveness of a PowerPoint and video presentation to train medical residents in basic information on infant oral health. Study participants reported great interest and a gain in knowledge and that this information will change their daily practice activities in infant oral health.

160. General Dentists' Educational Needs Regarding Infant Oral Health

Student Poster

Shawn E. Powell, Fouad S. Salama, and Amy Kebriaei, University of Nebraska Medical Center

Studies from the Centers for Disease Control and Prevention and the National Institutes of Health have shown that the prevalence, seriousness, and cost of early childhood caries has increased, despite declining caries in school-age children. Since general dentists are far more likely to see new mothers and infants than are pediatric dentists, it is essential that general dentists are aware of the infectious pathophysiology and associated risk factors of early childhood caries and make appropriate decisions regarding timely and effective intervention. Relatively few studies have examined the educational needs, attitudes, and practices of general dentists regarding a child's first visit and infant oral health in general. A fifteen-item questionnaire and accompanying cover letter were sent by mail to 800 licensed general dentists in the state of Nebraska. The survey asked for demographic information, number of years the dentist had been practicing dentistry, the type of practice, the dentist's additional training (if any), and the dentist's patient base. The survey also asked questions related to a child's first visit to a dental practice and the educational needs regarding a child's first visit and infant oral health in general. A self-addressed stamped envelope was enclosed for the dentists' returned responses. Responses were tabulated, and frequency distributions for responses to each item were computed. Descriptive statistics and chi-square tests were used to analyze data. All tests utilized a 0.05 level of statistical significance. Most practitioners do report seeing children; however, only 11.9 percent see children before their first birthday. Most practitioners reported performing oral hygiene procedures for young children, but few dentists surveyed provide restorative services. Most dentists report discussing oral hygiene practices during infant oral health examinations, but few dentists discuss caries risk. Of the practitioners who do not see infants under twenty-three months, the most common reason for not doing so was because they prefer to refer children this age to a pediatric dentist (174, 69.3 percent), followed by respondents' belief that children this age do not need care (34.3 percent); sixty-six respondents (26.3 percent) acknowledged they were not comfortable seeing children of this age. Female dentists were more likely to schedule more time for an infant oral exam than male dentists (p=0.009), while dentists who reported seeing younger patients were more likely to schedule more time for an infant oral exam (p=0.009). When asked their reasons for referring children, the most common reason (87.1 percent) was a lack of cooperation, followed by cases of severe decay (59.3 percent) and cases involving special needs patients (57.4 percent). In addition, ninety-two respondents (24.8 percent) listed space management concerns as a reason for referral; thirty-eight respondents (10.2 percent) left this question blank. Infant oral health care needs to go beyond oral hygiene to include prevention and restoration of caries. This study identified the most common reasons why the practitioners do not see infants under twenty-three months as well as the reasons for referring children. More research should be done on how to best deliver information on infant oral health to general dentists and to ensure long-term retention of the information.

161. Alumni Contributions to Philanthropic Dental Care Services for Ohioans in Need

Student Poster

Sue Choi, Canise Y. Bean, Hilary A. Soller, The Ohio State University

In response to changes in distribution of need for dental services, dental schools have embraced a different approach to dental training. Unlike the conventional approach, the community-based approach is designed to require students to provide dental services for patients in settings outside the traditional school clinics. It is developed to resolve access barriers to dental care for underserved populations and to enhance social citizenship ethics among dental graduates. According to the Ohio Department of Health, access to dental care has been the number one unmet health care need for both children and low-income adult populations throughout the past decade. In the year 2010, access to dental care remains a top priority for underserved Ohioans. Despite an increase in the number of safety net clinics, it is evident that the number of dentists treating low-income patients is still insufficient. The Ohio State University (OSU) College of Dentistry recognized the need for change and sought resources needed to successfully adapt its curriculum to include significant community-based education. Since 2007, OSU dental students have been assigned to treat patients at community clinic sites for fifty to sixty full service days as part of their graduation requirements. In order to understand alumni contributions to Ohioans' oral health, the existing alumni survey was expanded to incorporate seven additional questions related to philanthropic dental care services. Those added questions were intended to expand the base of knowledge regarding donated dental service behaviors specific to the nature of payment. This phase of the project surveyed graduates who did not participate in significant community-based training. In 2010, the final version of the alumni survey was sent to the class of 2004 six years after graduation. Of ninety-two graduates from the class of 2004, 61 percent returned completed surveys. The findings from the returned surveys demonstrated similar care delivery behaviors as reflected in the 2000 *Survey of Current Issues in Dentistry* published by the American Dental Association (ADA). In the survey findings, 69 percent of respondents reported that they never treated Medicaid patients in the previous year. Approximately 60 percent of alumni time was spent on treating fee-for-service and PPO dental plan patients. However, only 4 percent saw Medicaid patients regularly in their primary practice. Sixty percent of the class of 2004 reported that they provided some dental care free of charge or at reduced fee. Approximately five in ten chose their primary practice as the setting where they provided volunteer dental care to populations in need. In addition, 40 percent responded that they treated underserved populations in community settings. Services most frequently rendered were routine dental exams and restorative, preventive, and emergency treatments. Close to 50 percent of respondents provided their volunteer dental services to low-income patients regardless of their age groups. According to the 2000 *Survey of Current Issues in Dentistry,* the OSU alumni survey results coincide with many of the ADA findings. However, the class of 2004 was a group of students who did not benefit from the community-based education program since providing dental care services at community clinics did not become fully integrated into the curriculum until 2007. Therefore, a future study will survey a graduated class who completed fifty to sixty full service days at community clinics for comparison of contributions to philanthropic dental care services. A thorough evaluation of the current data revealed a linkage with the existing national data and allowed us to establish good baseline data on donated dental service behaviors. Comparing alumni who participated in community-based clinical education to alumni who completed the traditional curriculum, the findings will help determine the significance of community-oriented dental

education and may place more emphasis on community-based clinical education in the future.

162. The Use of Advanced Simulation and Interactive Media to Predict Performance of Preclinical Dental Students

Margrit Maggio and Karina Hariton, University of Pennsylvania

Dental education involves precise acquisition of psychomotor skills. These skills are first obtained by training in a simulated preclinical environment. With ongoing advances in technology, this simulated setting now can be enhanced by allowing the students to interact with media while they are actually learning these psychomotor skills. This system is termed Virtual Reality-Based Technology (VRBT) or Advanced Simulation (AS). This technology provides interactive media in the form of graphic duplication of the student's exact tooth preparation movements in real time. The media are projected on a computer monitor in front of students as they are physically cutting the tooth in a mannequin jaw with a high-speed handpiece. The image can be manipulated by the student to view the procedure from all angles while working. The interactive technology critiques the student's preparation against pre-programmed ideal tooth preparations and provides detailed evaluation feedback. The University of Pennsylvania School of Dental Medicine was the pioneer in implementation of this unique, interactive media technology into its core curriculum eight years ago. AS is now used to augment preclinical operative dentistry education methods at the school. This technology introduces the novice dental student to tooth preparation procedures using a high-speed handpiece in an independent, evaluation-rich environment. The AS course utilizes a unique Advanced Simulator unit (DentSim) manufactured by Image Navigation, Ltd. (Jerusalem, Israel) to provide unbiased, calibrated, real-time interpretation and evaluation of the student's work. During the AS course, students interact with this data-rich media to obtain computer assessment and assistance while learning tooth preparation procedures. This enables independent, self-directed learning of tooth preparation procedures. Instantaneous feedback helps students learn self-evaluation and understand corrections necessary to successfully complete tooth preparations. In turn, the system server collects data on every student's learned tooth preparation procedure. The 2009 D1 class was involved in the study (n=116 students). An IRB approval was granted. In the first semester, an informed consent was obtained by all students to evaluate data collected during the AS course and the preclinical operative dentistry course for future studies. Students were assigned an identification number for data collection to guarantee anonymity. Students began the AS course. While each student worked on the Advanced Simulator, extensive data were collected on the closed network system server. Parameters evaluated per student included number of preparation procedures completed, time required per procedure, number of computer assistance/evaluation requests, preparation errors made, and grade received per procedure. Data related to each student's learning and performance were collected and stored during the course. The data collected from the system server were reviewed at the end of the course. Students reported by the AS server as not meeting course objectives satisfactorily were identified and offered remedial services until they showed competence. In the second semester, the group began the traditional preclinical operative dentistry laboratory course. Midway, a midterm progress tooth preparation exam was given. Randomly numbered examination jaws were given to the students and recorded. The information was kept on a secure database for identification purposes at the end of the course. The examination was blindly graded by calibrated faculty members, and grades were recorded onto a secure database. At the end of the course, final evaluation of practical examination grades

and laboratory unit grades was completed. Students identified as outliers not meeting the required psychomotor skill levels were required to attend summer remedial sessions until they could prove they met the course objectives. When the course was completed, data collection and comparison were done. Data collected consisted of AS course data, preclinical operative dentistry course midterm data, final course grades, and the number of students requiring remediation for both courses. The primary outcome measured was psychomotor performance during both courses. Comparisons between the two courses were made. Outliers for each course requiring remediation were identified and compared. During the AS course, nineteen students were identified as outliers not meeting course objectives and requiring remedial psychomotor work. In the preclinical operative dentistry laboratory, at the midterm evaluation, twenty students were identified as outliers requiring tutors to meet course requirements. Of these students, sixteen (80 percent) were in the original group identified by the AS system. At the end of the preclinical operative dentistry course, eleven students were identified as not meeting the required psychomotor skill levels and were required to attend summer remedial sessions until they could prove they met the psychomotor skill levels. Of these eleven, ten (90.9 percent) were identified in the original group by the AS system. This study showed a correlation existed between early utilization of AS during psychomotor skill training and the prediction of outcome performance in preclinical operative dentistry training. This study has relevance in that it may assist dental schools in early identification of students requiring remediation. Early intervention could improve likelihood of success in necessary psychomotor skill acquisition and perhaps reduce the need for post-course remediation. This study may also assist dental education institutions with future student acceptance practices. This may validate an exercise in psychomotor activity utilizing interactive media, such as AS, during the dental school application process.

163. Correlation of Dental Hygiene Students' MBTI Learning Styles with the OSCE

Judy A. Kwapis-Jaeger, Margaret E. Coleman, and Kathleen Neveu, University of Detroit Mercy

The objective structured clinical examination (OSCE) has become a standard for measuring dental and dental hygiene students' outcome performance. The OSCE, a method of testing application of knowledge, has students move through a series of stations designed to be interactive and to test mastery of various skills. The format consists of a series of stations that examinees rotate through at designated time intervals and conduct a demonstration, perform a task, and/or answer questions following interaction with some type of material. Material or props may include clinical photographs, radiographs, instruments, etc. Do the students' learning styles increase their ability to successfully complete this type of exam? Does this type of exam tend to favor certain learning styles? Does the fact that there is a time factor influence a student's success on the exam? The purpose of this study was to assess the relationship between differences in learning style of dental hygiene students and their performance on two OSCEs. The Myers-Briggs Type Indicator (MBTI) was administered over a ten-year period (1998–2008) to students (n=264) during the first semester of class. These data were analyzed and compared with the scores received on two OSCE exams administered in the curriculum (1999–2010). Each OSCE consisted of thirty stations. The first OSCE was administered during the third semester of the first year just after completing the first semester of clinic and the second OSCE during the last semester of the second year. The data were analyzed using frequency distribution and chi-square analysis. Personality types were identified, and strength of individual preferences reported. The mean score on the first OSCE was 83.7, while the mean score on the second

OSCE was 66.4. The large discrepancy in scores may be attributed to low motivation. The first OSCE serves as a final exam in the first-year clinical course and is worth 26 percent of the course grade, making it a high-stakes exam. On the other hand, the second OSCE is worth only 6 percent of the final grade for the course, which may affect motivation. On the first OSCE, INTJs represented the highest mean scores, consistent with previous research. ENTPs ranked second, although on the second OSCE they received the highest mean score. ENTP is a type that typically scores lower in traditional liberal arts colleges. On the four preference scales, Intuitives (Is) scored better on the first OSCE. This may indicate the three-minute time constraint may not have been sufficient time to allow them to process the material and answer the question. Is did better than Sensors on both exams. This is also consistent with previous MBTI research. Thinking types did better than Feeling types on both exams, which may be due in part to the scientific subject matter of this exam. The Judging preference did better on the first exam perhaps because of the link to higher course grades. Perceptives did better on the second OSCE possibly because they favor a wide acquaintance with many subjects or in the case of the OSCE a wide range of clinical experiences. Curricular intervention, test construction (amount of time allotted to each station and amount and depth of material covered in each station), multiple methods of assessing students, mentoring, strong counseling, and advising especially to those in learning styles that tend to fall below the mean may need to be implemented to increase students' success.

164. Measuring the Short-Term Effects of Incorporating Academic Service-Learning Throughout a Dental Hygiene Curriculum

Melanie L. Simmer-Beck, Karen B. Williams, Cynthia C. Gadbury-Amyot, Nancy T. Keselyak, and Bonnie Branson, University of Missouri-Kansas City

In July 2007, the American Dental Education Association (ADEA) Commission on Change and Innovation in Dental Education (CCI), through an ADEA CCI Task Force, recommended modifying predoctoral accreditation standard 5, Patient Care Services. The recommendation stated that dental education programs must make available sufficient opportunities and encourage students to engage in structured learning experiences that combine community service with preparation and reflection (service-learning). The intent of this recommendation was to promote professional responsibility that addressed the low-income, unserved, and underserved communities. Academic Service-Learning (ASL) has become increasingly recognized in the literature as an important pedagogy in higher education. Some states now urge institutions of higher education to utilize ASL as a central vehicle for campus-community collaboration. Dental hygiene programs have incorporated ASL activities into their curricula to prepare students to work with interprofessional teams while providing care to patients who lack access to care. Dental educators have traditionally integrated experiential learning through clinical rotations in community health centers, hospitals, and private practices located in health care provider shortage areas. In addition to clinical rotations, dental education typically sends students to community sites to provide oral health education presentations. The literature states that quantitative research, across the curriculum and over time, needs to be conducted to evaluate the effects of ASL and its impact on access to care. Ultimately being able to influence and predict students' attitudes towards normative helping behaviors, connectedness, costs, awareness, benefits, self-awareness, seriousness, career benefits, intentions, sense of individual responsibility, volunteerism, enhanced learning, and career choices could help align dental education and dental hygiene education with improving access to care and working in interprofessional teams.

The investigators hypothesized that incorporating ASL experiences throughout a dental hygiene curriculum would have a positive impact on students' perspectives and attitudes regarding normative helping behaviors, connectedness, costs, awareness, benefits, self-awareness, seriousness, career benefits, intentions, sense of individual responsibility, volunteerism, enhanced learning, and career choices during students' program of study. This study was designed to allow subjects to serve as their own control. Ninety first-year dental hygiene students from the Classes of 2006–08 were recruited for this study during their first semester in the program. Students volunteering to participate (n=77) completed the consent form approved by the University of Missouri-Kansas City Social Sciences IRB. Subjects completed the surveys described below during November of their first semester of the program and again at the end of the program before graduation. The survey instrument developed by Shiarella, based on Schwartz's helping behaviors model, was used to assess students' attitudes towards community service. This instrument established psychometrics on forty-six items assessing community service attitudes on eight subscales. All items use a seven-point response format. Additionally, questions were developed using Shinnamon's methods and strategies for assessing service-learning in the health professions. This instrument uses a five-point Likert scale asking students their level of agreement with twenty-five statements. It was designed to assess students' change in perceptions and attitudes over time upon completing multiple ASL courses across their academic program. Both instruments are public domain and have no restrictions. Data were entered into Statistical Package for Social Sciences (SPSS) software for descriptive and inferential analyses. Internal estimates using Cronbach's alpha were computed on subscales as defined by Shiarella and were all above 0.8. The distributional characteristics of the data were explored, and the investigators determined the data conformed to non-parametric assumptions. Wilcoxon signed-rank test was used to analyze change over time. Median values and semi-quartile ranges were used to further describe the data. Results of the study revealed that academic service-learning was effective at changing dental hygiene students' perspectives and attitudes regarding costs, self-awareness, sense of individual responsibility, perspectives and attitudes regarding normative helping behaviors, connectedness, awareness, benefits, seriousness, career benefits, intentions, and enhanced learning. Future studies should have an increased number of subjects and evaluate these domains over a greater length of time.

165. Determining Extent of Reliability in Course Evaluations

Student Poster

Paul Lazari, New York University

Course evaluations are widely used as a quality assurance component in health care education and are intended to serve as an instrument to provide feedback about students' perception and attitude. However, the internal consistency of course evaluations as a survey instrument may be affected by their design and by the individuals completing them. Therefore, it is imperative to utilize an interprofessional approach in design, administration, and interpretation of such frequently used instruments. The purpose of this study is to examine psychometric issues related to surveys in terms of acquiescence bias, alternative-form reliability, and intraobserver reliability using a questionnaire designed with redundancies that test for stability and internal consistency in student responses. The first part of the questionnaire asks subjects to rate, on a five-point Likert scale, the extent of their agreement with statements regarding students' learning preferences in a positive manner, balanced with statements inquiring about the same concepts framed in negative manner. The scale is presented in a rubric format to truly engage the respondent and allow for a degree

of standardization in responses. The second part of the questionnaire asks subjects to select and rank attributes that they consider to be the top three facilitators in their learning (1=greatest facilitator, 2=second greatest facilitator, 3=third greatest facilitator). Further, the subjects are asked to provide and rank any other unlisted attributes that they perceive as facilitators in their learning in the comments section. Using separate methods of inquiry to collect data regarding a collection of learning attributes within the same instrument allows for a method to probe the extent of stability and internal consistency in student responses to survey instruments. Conclusions are pending. The evaluation is to be administered to dental students at New York University College of Dentistry at the end of their orthodontics course in the upcoming semester.

266. The Importance of Multiple Collaborations as a Strategy to Deal with a Reduced Research Faculty and Shortages in Infrastructure

Rich J. Crout, West Virginia University

The five-year West Virginia University Health Science Center Strategic Research Plan (WVU HSC SRP), which was approved in 2005, had among its objectives the development of the infrastructure needed to be more competitive for National Institutes of Health (NIH) grants; fostering translational linkages between research and both our educational and patient care initiatives; and the recruitment of outstanding basic and clinical faculty members with cutting-edge research expertise aligned with specific interdisciplinary thematic areas of research. Thematic areas included neurosciences, cancer cell biology, cardiovascular sciences, respiratory biology and environmental science, immunology/microbial pathogenesis, and metabolic, endocrine, and exercise sciences. It was recognized in this plan that new faculty members were necessary in all units including our School of Dentistry (SoD). The aim of the present study was to investigate strategies that could be helpful in addressing a shortage of full-time faculty and infrastructure as it pertains particularly to research in the WVU SoD. Methods included inviting members of our WVU SoD Research Committee along with faculty members from the School of Medicine and a past dean of the WVU College of Arts and Science to be members of our Strategic Research Planning Committee. Important input was provided by a visit from Dr. Lawrence Tabak, director of the National Institute of Dental and Craniofacial Research, who recommended that, to be productive in our present environment, we should increase our collaborations in our health science center and our university at large as well as with other universities. We then made the decision to wait until the WVU HSC SRP was approved and implemented. Due to the high level of dental disease in our state as evidenced by the highest edentulism rate in the country for those sixty-five and older, combined with high rates of heart disease, stroke, and lung pathology, our planning committee chose the same research themes as that of the HSC Strategic Research Plan. We found that communicating the findings of the first-ever surgeon general's report on oral health, released in 2000, was very helpful in initially establishing our collaborations. The implementation of our WVU SoD Strategic Research Plan then included new objectives and correlated benchmarks. Increased WVU SoD FTE faculty and infrastructure were also integral parts of our plan as they were in the HSC SRP. Results from our outcomes assessment and recent accreditation have revealed that these strategies have been positive. We have increased collaborations within our health science center and university and with other universities, resulting in more interdisciplinary publications, presentations, and extramural (primarily NIH) funding, which increased from $25,000 in 2000 to over $500,000 in 2010 without the addition of any new research SoD FTE faculty members. Most recently, a comprehensive accreditation

review/revision has been suggested due to a decline in resources, forcing some schools to reduce their full-time basic science and clinical faculties and to delay needed infrastructure investments. We have found that increasing collaborations within the HSC and the university and with other universities has been helpful in growing our research enterprise even though we have not been able to add to our research infrastructure.

267. Prevalence of E-Cheating Among Second-Year Dental Hygiene Students in Mississippi, North Carolina, and Texas

Student Poster

Jessica Huffman, Teresa Duncan, and Lisa Englehart, University of Mississippi

Recent reports examining the increased incidence of academic dishonesty in higher education have fueled a renewed interest in the subject of academic integrity and methods to reduce cheating. As high-tech resources such as electronics and electronic devices become more readily available to students, e-cheating continues to increase. Little research has been published addressing the prevalence of academic dishonesty in dental hygiene programs, and no research has been published concentrating on the prevalence of academic dishonesty with electronic devices. The purpose of this study was to investigate the prevalence of e-cheating among second-year dental hygiene students. An explanatory e-mail and survey link were sent to the thirty-nine dental hygiene program directors in Mississippi, North Carolina, and Texas. Each director was asked to forward the survey link to all second-year dental hygiene students enrolled in the program. A total of 103 usable surveys were completed. Descriptive statistical analysis was used to analyze the collected data using measurements of frequencies and cross-tabulations. The results from the study revealed that 20 percent of responding second-year dental hygiene students in Mississippi, North Carolina, and Texas have participated in at least one form of e-cheating. Students identified sharing homework answers via instant-messaging, text-messaging, or e-mail as the most frequent form of e-cheating. Students acknowledged peer pressure and not knowing the material as the most common reasons for cheating. The data reveal that electronic academic dishonesty is prevalent in dental hygiene schools and honor codes are a deterrent to this type of behavior. This study may enlighten dental hygiene faculties as to the issues of electronic academic dishonesty. The data may also make clear the need for dental hygiene programs to formulate and implement honor codes. As an added prevention, faculty members may want to include in their syllabi an electronic dishonesty policy.

268. A Cross-Sections Analysis of NBDE Part I Transition to Pass/Fail: Grade-Based vs. Pass/Fail Dental Schools

Student Poster

Daniel H. Johnson, Jason Scott, James Blackburn, University of California, Los Angeles

A twenty-four-item web-based survey was administered through the American Student Dental Association listserv to sixteen dental schools nationwide in accordance with University of California, Los Angeles IRB guidelines. Multiple-choice and short essay questions addressed the following topics: dental students' attitude towards the transition, time allocation towards studying for the National Board Dental Examination (NBDE) Part I and extracurricular activities, and interest in specializing. Statistical analysis was performed using Medcalc. Bivariate analysis was done with chi-square tests. Significant values were set at 0.05. Surveys were received from 1,131 dental students from all sixteen dental schools. In a post hoc analysis of the data,

many of our findings were statistically significant: students at pass/fail schools were more opposed to this change (p=0.0407), would study less (p=0.0187), would be more involved in extracurricular activities (p=0.0105), and would be more likely to specialize (p=0.0001) compared to students at grade-based schools. This study also found that a higher percentage of students at pass/fail schools are interested in specializing. NBDE Part I scores and grade point averages (GPAs) have, in the past, been an integral part of the admissions process to specialty programs. Because pass/fail schools do not have a traditional grading scale, more weight has been placed on NBDE Part I scores for specialty applicants. Transitioning the boards to pass/fail prevents specialty programs from evaluating applicants based on their exam scores. Therefore, students at pass/fail schools will not be evaluated on either GPAs or board scores and thus are more opposed to a pass/fail board exam. This suggests that students interested in specializing at pass/fail schools feel compromised in being evaluated by specialty programs. This may imply that students at pass/fail schools will look to other means to be competitive for specialty programs. We conclude that students at pass/fail schools, in comparison to students at grade-based schools, will be more likely to spend less time studying for a pass/fail NBDE Part I while dedicating more time to extracurricular activities. Further research is suggested to discern students' opinions and concerns about specific extracurricular activities and an additional competency exam for specialty school admission.

269. What Are Your Roots Made Of? The Effect of Implant Placement on the Endodontic Curriculum in U.S. Dental Schools

Student Poster

Ryan N. Smiley, Lauren R. Hansen, Daniel J. Nicorata, Brian M. Kreutz, and Thomas J. Beeson, Creighton University

Endodontics, with a standard of care, has been recognized as a definitive dental specialty for more than forty years. It is an essential treatment modality, helping patients maintain their dentition when teeth have been ravaged by caries or traumatically injured. Although the number of classroom hours and clinical competency criteria in endodontic education varies from school to school, all U.S. dental schools report that endodontics is incorporated at some point in every student's predoctoral education. In contrast, there is not yet a standard for implant education at these institutions, although its incorporation into the predoctoral curriculum has been on the rise. Because implant dentistry is now being considered a standard of care and can be recommended routinely in general practice, implant education needs to be further developed and incorporated into predoctoral dental education. Studies have indicated that, with an increase in knowledge of implant dentistry, more dental students and general practitioners are choosing extraction and implant placement over endodontic treatment. This potential trend, in combination with the difficulty of incorporating more courses and clinic hours into an already full predoctoral schedule, raises this question: is endodontics being affected by the increasing popularity and incorporation of implantology into U.S. dental curricula? Our initial research included looking at implant trends and the incorporation of implantology into the predoctoral curriculum, as well as correlations between endodontic treatment and implant placement volumes. This led to questioning the criteria used for deciding root canal treatment versus extraction and implant placement and what groups were making those decisions. An individualized survey focusing on departmental involvement with implants was sent to endodontics, periodontics, prosthodontics, and oral and maxillofacial surgery (OMFS) department heads at each U.S. dental school (fifty-six). For each survey, the first six questions were identical, whereas the remaining questions were individualized for each specialty. The survey was sent using an electronic format in two week-long waves in order to maximize response. Subsequently, the data were collected anonymously and analyzed. Results showed that some schools (16 percent of respondents) have not yet implemented an implant board or committee. For those schools that had boards, the departments most involved were periodontics, OMFS, and prosthodontics; endodontics was seldom involved. Our conclusions from this study are as follows: 1) periodontics, prosthodontics, and OMFS were most heavily involved in implant boards and predoctoral implant education; 2) OMFS and periodontics were most heavily involved in implant placement; 3) prosthodontics and general dentistry restored most implants; 4) more corporate funding was provided for implants than for other departmental procedures; and 5) more schools have increased (than decreased) their endodontic production in spite of increases in the number of implants being placed. Thus, implant placement and education did not show a major effect on the clinical endodontic curriculum and production in the U.S. dental schools that responded to this survey.

270. The Effect of Knowledge on Oral Self-Care Practices of Dental Hygiene Students

Carolyn H. Ray, University of Oklahoma

Dental hygiene students are educated to prevent oral diseases in their patients. Preventive dentistry is a cornerstone course they are required to take during their first semester in dental hygiene. They are asked to complete a survey regarding their oral self-care prior to starting the course. The goal of the survey is to provide opportunity for the students to think about and record their current home care routines. The course content includes recognizing risk factors, techniques to eliminate modifiable risk factors, and ways to engage patients in prevention of oral diseases via self-care practices. Students are asked to complete the same survey at the end of the course and then to review their individual surveys to see if they changed their home care practices. The purpose of this research is to determine if change occurred in home care practices. Dental hygiene students from 2008–09 enrolled in the course completed the surveys and sent them electronically to their instructor. The pre and post surveys were analyzed to assess the changes that occurred from the baseline to the end of the course in such areas as type of toothbrush and toothpaste used, number of times toothbrushing occurs in a day, dental care products used, and other oral habits reported. More students reported using manual toothbrushes at the beginning of the course (N=32, 76 percent) than at the end of the course (N=6, 14 percent). Inversely related to this, more students used powered brushes at the end of the course (N=39, 93 percent) than at the beginning (N=14, 33 percent). Sixty-two percent (N=26) indicated their reason for change was that the powered toothbrush was given to them during the course. The frequency of brushing did not change from the beginning of the course to the end. Students reported brushing 2.2 times per day at the beginning and end of the semester. The amount of time taken to brush increased slightly during the semester. In the beginning, students reported taking 2.6 minutes to brush while taking 3.0 minutes at the end of the course. All students reported using toothpaste in the beginning and at the end of the semester. Fifty-two percent (N=22) indicated other as the determining factors for toothpaste selection. Personal preference was the main reason given for toothpaste selection. Students changed the amount of toothpaste used from the beginning of the course to the end. Seventy-four percent (N=31) reported covering the top of the toothbrush with toothpaste in the beginning while 67 percent (N=28) reported using a pea-size amount at the end of the course. When asked the properties they felt were important in their toothpaste, fluoride ranked number one at the beginning and end of the course. Other properties ranking equally at the beginning and end of the course included prevention of gum

disease, whitening effects, and prevention of bad breath. The number of students who reported flossing changed. Seventy-six percent (N=32) reported flossing at the start of the course while 93 percent reported flossing at the end. When asked how they learned to floss their teeth, most students reported that their dental hygienists taught them (N=18, 43 percent). Eleven students (26 percent) indicated that they learned the correct flossing technique during the course. Another change students reported was their use of xylitol products. At the start of the semester only 17 percent (N=7) reported using it on a regular basis while at the end 67 percent (N=28) reported using it. Small changes occurred in snacking between meals and soft drink consumption from the beginning to the end of the course. Seventy-four percent (N=31) reported snacking in the beginning with 57 percent (N=24) reported it in the end. Twenty-nine students reported drinking soft drinks at the beginning, and twenty-three were still drinking soft drinks at the end. Changing from a manual to a powered toothbrush was the most reported change in self-care. More students reported including flossing in their self-care regime at the end of the course than at the beginning. More students used less toothpaste to brush with at the end of the course. Change in the number of times per day of toothbrushing and the amount of time taken to brush was not noteworthy. While it is not clear how much the content of the preventive dentistry course influenced the self-care behaviors of these dental hygiene students, changes were reported in their self-care practices.

271. Student Performance in Mastering Skills in Assessing the Professional Literature (SAPL): EBD Competency SAPL Exam Results, 2004–10

Student Poster

Paul Kang, Ralph V. Katz, Lin Li, and Andrew Chang, New York University

Incorporating into the dental curriculum a literature analysis course that focuses on building skills to insightfully read and interpret an original, clinically relevant, research article has been historically overlooked in dental education, despite being widely acknowledged as a skill critical for a health professional's self-education. For the past eight years, New York University (NYU) College of Dentistry has taught just such a set of specific skills to first-year students, defined as Skills in Assessing the Professional Literature (SAPL). The first-year SAPL curriculum culminates in a four-hour competency examination testing students' mastery of skills to assess an original, human-based research article using the literature analysis form (LAF). The SAPL competency is one of the thirty-two core competencies that NYU states (as a part of the American Dental Association's accreditation process) have been mastered by our graduates. This intensive and in-depth NYU SAPL model requires a total of only sixty hours of D1 curriculum time: a forty-hour fall semester foundation course (Epidemiology and Critical Thinking for the Dental Practitioner) followed by a twenty-hour spring semester course (SAPL I). Although these sixty hours constitute only 1.2 percent of the 4,891 hours of the total four-year curriculum, most schools' faculty representatives at meetings have stated a lack of available curriculum time as the major barrier to instituting this critical skill into their current curricula. While many dental schools in the current evidence-based dentistry (EBD) era have a broadly stated competency attesting to their students' ability to utilize and incorporate summarized literature reviews into EBD care, no other schools appear to specify competence in skills needed to read a single original research article. This is a fundamental EBD skill given there is typically an eight-to-ten-year gap between the surfacing of some clinically related issue and the appearance of the first literature review article. Our project analyzed the student mastery level of SAPL skills at the end of the first year

as measured by student scores on the four-hour SAPL competency final examination at NYU. This study used all available past SAPL competency examinations, which included the SAPL exam sets from 2004 to 2010. Using SPSS data analysis software, we created the SAPL exams 2004–10 database, which consisted of item-by-item test points earned on the annual SAPL competency exams administered to first-year dental students. The final database consisted of the SAPL exam data on 1,606 students' results over the seven-year period for an annual class size of around 360 students (around 240 students in the four-year D.D.S. curriculum plus around 120 foreign-trained dentists in the three-year program who join the D.D.S. class at the end of the first year). While complete student exam sets were only available for the years 2006–10, the surviving exams from 2004 and 2005 were included in this analysis as they were considered to be a representative random sample of exams from those two years. Three variables are presented in this report: 1) the TOTal exam score, out of 100 points (TOTscore), and its two main component subscores: 2) the IDentification of key research design elements score (IDsubscore), which had a maximum of 61 points, and 3) the INterpretation of those design elements score (INsubscore), which had a maximum of 39 points. Finally, a more detailed level of analysis was performed on each of thirteen specific test topics (questions or question sets) on the SAPL exam. These preliminary data indicate that the observed mean TOTal scores, mean IDsubscores, and mean INsubscores were highly consistent over the seven-year period. These findings were not surprising given that this was a mature course continuously taught by the same course director at the post-D.D.S. graduate level in the M.P.H., M.S., and Ph.D. programs since 1974. Finally, this study indicates that a judicious use of only 1.2 percent of the four-year curriculum time can result in a mastery of these critical and EBD-fundamental SAPL skills, which support a lifetime of self-education by future practicing dentists.

272. Benefits of Casual Random Blood Glucose Assessment of Diabetic Dental Patients in an Urban Dental School Clinic

Shin-Mey R. Geist, James R. Geist, Claudine M. Sordyl, and Jan LeBow, University of Detroit Mercy

Two major concerns in managing diabetic dental patients are hypoglycemic episodes and increased risk of surgical site infection (SSI) due to hyperglycemia. Standards of medical care in diabetes published by the American Diabetes Association (ADA) recommend the glycemic control goal for non-pregnant adults in general should be HbA1c <7 percent (equivalent to an estimated average glucose less than 154 mg/dl). Although this goal is aimed at reducing the long-term complications of DM, it increases the frequency of hypoglycemia. Dental school treatment times are prolonged, and many patients tend not to eat before or after the treatment. For these reasons, the risk of hypoglycemia in the dental clinic is high for diabetic patients who are on an intense treatment regimen that will meet the ADA's glycemic control goal. On the other hand, hyperglycemia (>200 mg/dl) around the time of the surgical procedure increases the risk of SSI. Our patients' profile has shown that many of our diabetes patients are not in the intense treatment regimen and do not check their blood glucose regularly. These patients may have perioperative glucose levels higher than 200 mg/dl, which exposes them to greater risk of SSI than nondiabetic patients. In 2007, the University of Detroit Mercy dental clinic started to take casual random blood glucose (CRBG) measurements without charge for self-reported diabetes patients when information on the standard health questionnaire (e.g., most recent HbA1c, glycemic control goal, medications and eating before dental appointment, history of hypoglycemic episodes, etc.) indicated the risk for either hypoglycemia or hyperglycemia. Precautions were

taken for patients based on their blood sugar levels. For our regular diabetes patients, if the CRBG measurements were repeatedly higher than their estimated average glucose level, consultation letters were sent to their physicians for further evaluation. From March 2007 to June 2010, there were 279 individual measurements, ranging from 39 to 600 mg/dl. There were seventy-four (26.5 percent) measurements above 200 mg/dl and fourteen (5 percent) lower than 70 mg/dl. We were able to prevent severe hypoglycemia requiring a 911 call to 100 percent. No 911 call was made during this period of time, compared to two to three calls per year prior to this policy. There was no report of SSI in diabetic patients whose preoperative CRBG levels were above 200 mg/dl and received surgical procedures as needed. Other diabetes patient management policies starting in March 2007, including routine request of HgA1c level, standard health questionnaire, and teaching CRBG in our CPR courses, ensure that we have a high awareness of the importance of diabetes patients' glycemic control and their dental care.

273. A Comparison Between Haptically and Traditionally Trained Preclinical Dental Students for Cavity Preparation

Barry F. Quinn, King's College London; Margaret J. Cox; Jonathan P. San Diego; Tracy-Ann Green

Haptics is the study of human touch and interaction with the external environment via touch. Haptics could therefore be used for training and education purposes in a range of professions that require the development of expert manual skills. The HapTel devices were introduced into the year 1 curriculum in the academic year 2009–10 (Phase 1 of the project). One hundred forty-four students were recruited into the project. Two-thirds (ninety-eight students) were trained traditionally on preparing Class I cavities on a lower left first plastic molar (Frasaco Gmbh), and one-third (46 students) were trained haptically using the twelve HapTel work stations (virtual phantom work station) that replicated the traditional tasks in the virtual environment. Phase 2 of the study, using an improved version of the HapTel work station, commenced at the beginning of the academic year 2010–11, replicating Phase 1 with the new cohort of 144 first-year dental students. A range of traditional, psychological, and computer-based formative and summative assessment tests has been used for both phases of the project. First, the traditional assessment of the students has included the following: tactile and visual feedback from the tooth itself as the artificial caries is removed; formative assessment via verbal feedback from the tutors in both traditional and HapTel simulation laboratories during the teaching sessions; and peer assessment between paired students. All students were finally assessed on a traditional phantom head work station preparing an occlusal Class I cavity that had artificial caries on a plastic tooth to the depth close to the pulp chamber. Secondly, the psychological test was selected to measure students' spatial reasoning, gross and fine motor skills, and attitudes towards using new technologies in their learning. A twenty-nine-item online test consisted of a numbered picture showing the top, front, and side representations of a 3D object. Students had to select one of the four 3D choices that would have those surface representations. A fifty-three-item online test measured attitudes and beliefs about learning with TEL based on the theory of planned behavior. In the visual-spatial and motor skills test, students were shown a pattern and were required to take and arrange a number of blocks that have red, white, and red and white sides to form the pattern. For rapid hand-eye coordination and manual dexterity skills, two tests were administered, one measuring fine motor and another measuring gross motor skills. The former required picking up pins with the participants' dominant hand, assembling it with collars and washers, and putting it in a hole on a board, whereas the latter one required participants to pick up the disks in one hand, turn them with

the other hand, and replace the disks in the holes on the board. Finally, the haptically trained students were assessed through the system itself as follows: tactile and visual feedback from the virtual tooth itself as the virtual caries is removed; magnification of the virtual tooth provides formative self and tutor assessment through visually revealing the progress on caries removal. Tooth preparation tasks consisted of three occlusal cavity preparations to the following carious pathological depths: through the enamel touching the amelo-dentinal junction, progressing half way through the dentine, and progressing to almost touching the pulp chamber. These three tasks were replicated in both the plastic and virtual teeth. The traditional student group worked in the conventional simulation laboratory. There was a limitation of two plastic teeth per student per session. The HapTel student group worked in the virtual laboratory on the same tasks. The same tutors taught in both laboratories. Comparison of HapTel versus traditional training Phase 1 results showed that the HapTel-trained students performed equally well as the traditionally trained students in the preparation of an occlusal Class I cavity. Phase 2 results will be compared with these at the end of 2010. The tactile and visual feedback from the plastic and virtual teeth was similar. However, by being able to enlarge the virtual tooth x 6, the HapTel-trained students were better able to evaluate their own progress compared with the traditionally trained students. The verbal feedback of the tutors and the student partners was more precise in the HapTel lab because of the affordance provided by the magnification facility of the virtual tooth. A comparison between the haptically and traditionally trained students showed that in terms of clinical performance they performed equally well in cavity preparation. The HapTel system provided additional affordances through the formative assessment facilities. The psychological test results for Phase 1 showed that there was an improvement in both fine and gross motor skills for all students over the three-month period; a statistically significant correlation between their gross motor skills and the visual-spatial tests and their clinical performance at the end of term test; and positive attitude amongst students that increased the likelihood of using haptics to improve their learning.

274. University of Detroit Mercy Faculty Members' Knowledge of Interprofessional Education

Michelle A. Wheater, University of Detroit Mercy; Jessica Kosinski; Pamela Zarkowski, University of Detroit Mercy

The objective of this study was to determine the level of knowledge of University of Detroit Mercy faculty members teaching in health and/or oral health professions programs regarding the definition and concept of interprofessional education (IPE). Adult male and female faculty members who teach in the health professions programs at the University of Detroit Mercy were surveyed electronically. Faculty members from the School of Dentistry who teach dental and dental hygiene students and faculty members from the College of Health Professions and McAuley School of Nursing who teach in the nursing, nurse anesthesia, physician assistant, and health services administration programs were surveyed. Seven of the ten questions were posed to determine faculty knowledge of the concepts of IPE, based on elements of the CAIPE definition, using a Likert scale response. Approval as an exempt study was obtained from the University of Detroit Mercy IRB prior to administration of the survey (IRB Protocol Number 1011-04). Fifty faculty members from all of the above stated health professions programs responded to the survey, and 88 percent of the respondents agreed that they had knowledge of the term IPE. One hundred percent of the respondents agreed that IPE involves students from two or more professional programs and that IPE occurs when student learn with, from, and about each other. Eighty-eight percent agreed that IPE is an effective

learning strategy to promote better patient health care quality, and 84 percent agreed that IPE results in improved quality of care for patients. While 98 percent of the respondents agreed that students who participate in IPE experiences will gain a greater appreciation for the roles and responsibilities of all health care professionals, 84 percent agreed that a health care professions curriculum should include IPE opportunities. We conclude from our study that the majority of faculty members who teach in health professions programs at the University of Detroit Mercy are knowledgeable about the concept of IPE. Not all professional schools incorporate interprofessional education activities, and there is no agreement among academic institutions that it is even necessary for optimum education. It is interesting to note that while almost all respondents agreed that students will have a richer educational experience by participating in IPE, relatively fewer faculty members thought that IPE should be a component of the curriculum.

275. Dentists' Knowledge and Opinions of Oral-Systemic Disease Relationships: Relevance to Patient Care and Education

David W. Paquette, Stony Brook University; Kathryn P. Bell, Pacific University; Steven Offenbacher, Ceib Phillips, and Rebecca S. Wilder, University of North Carolina at Chapel Hill

An IRB-approved questionnaire was pilot tested, revised, and mailed to 1,350 licensed North Carolina dentists. After three mailings, 667 dentists (49 percent) responded and met inclusion criteria. Only descriptive statistics are reported. The respondents were predominantly male (77 percent), in solo practice (59.4 percent), and in non-rural settings (74 percent). More than 75 percent of the respondents correctly identified risk factors like diet, genetics, smoking, obesity, and physical inactivity for CVD and diabetes. The majority of dentists rated the evidence linking periodontal disease with CVD and diabetes as strong (71 percent and 67 percent, respectively), but not for the other systemic conditions surveyed. Respondents were most comfortable inquiring about patient tobacco habits (93 percent), treating diabetic (89 percent) or CVD (84 percent) patients with concurrent periodontal disease, and discussing diabetic-periodontal disease risks with patients (88 percent). Fewer respondents were comfortable asking about alcohol consumption (54 percent) or providing alcohol counseling (49 percent). While most agreed that dentists should be trained to identify risk factors (96 percent) or actively manage systemically diseased patients (74 percent), less than 20 percent felt that patients or medical colleagues wanted them to have a more active role in systemic health management. North Carolina dentists are knowledgeable regarding some oral-systemic health associations and feel comfortable translating the evidence into clinical practice for chronic diseases, but are less comfortable assessing behavioral risk factors. Funded by Johnson and Johnson Health Care Products, Division of McNeil-PPC, Inc.

277. Computer-Assisted Dental Simulation as a Predictor of Preclinical Operative Dentistry Performance

Alice Urbankova and Steven P. Engebretson, Stony Brook University

Thirty-eight dental school freshmen were randomly selected to participate in this study. Prior to the course beginning, each student participated in one four-hour computer-assisted dental simulation (CDS) session aimed at completing a Class I occlusal cavity preparation. The best two examples were submitted for evaluation. The students then entered the operative dentistry course and completed two practical examinations. Masked, calibrated faculty members scored and graded the CDS and the examination preparations. Thirty-eight students completed the CDS exercise, and nineteen of thirty-eight (50 percent) were given a passing score. Twenty-five of the thirty-eight

students (66 percent) subsequently passed practical Exam 1. Of the nineteen students who passed the CDS test, eighteen passed Exam 1, and one failed. Of the nineteen who failed the CDS test, seven passed Exam 1, and twelve failed. Odds of success on Exam 1 were 30.9 if the pre-test was completed successfully (two-sided Fisher's exact P=0.0004). Also, students who passed the CDS test had significantly higher average Exam 1 scores. These findings suggest that a pre-course CDS test may help to identify students in need of early instructional intervention. Future studies are warranted to further define and implement the use of simulation technology in the assessment of students' psychomotor learning potential.

280. Teaching Evidence-Based Dentistry by Using the American Heart Association 2007 Guidelines on Antibiotic Prophylaxis for Prevention of Infective Endocarditis

Shin-Mey R. Geist and James R. Geist, University of Detroit Mercy; Teresa Jeo-Chen Yin

Evidence-based clinical practice guidelines have been very helpful in the practice of evidence-based medicine and evidence-based dentistry (EBD). These guidelines, which are periodically updated, have a clear level of evidence quality and strength of recommendations. They provide clinicians with sound guidance in making clinical decisions about selecting the treatment that best benefits their patients. The guidelines are also good tools for teaching EBD because they can serve as examples of patient assessment, evidence appraisal, and clinical decision making, the essential elements of EBD. We chose the American Heart Association (AHA)'s 2007 guidelines on antibiotic prophylaxis (AP) for infective endocarditis (IE) prevention as a model of EBD teaching because of their relevance and frequent application in dentistry. Also, they have a simple scale of evidence level (Levels A through C), strength of recommendation (Class I through III), and suggested phrases used in recommendations. The Class IIa recommendation classification (reasonable instead of recommended) for AP use is especially valuable for critical thinking exercises in EBD regarding implementing the guidelines. We examined dental students' cognitive level of the specific AP guidelines and their application after classroom and clinical instruction to reflect the effectiveness of EBD teaching. In January 2010 the eighty-seven third-year dental students began their first course in oral medicine, in which the AP guidelines were discussed in the context of EBD. The second oral medicine course began in May 2010 and reinforced the application of these guidelines in more complex case scenarios. During this period, the students were treating patients in the clinic and routinely screened their patients for any heart condition for which AP was deemed reasonable according to the 2007 guidelines. Questions in case scenario and multiple-choice format regarding the guidelines were included on the final examination for the first oral medicine course in April 2010. Similar questions with more complex scenarios were included on the examination in the second oral medicine course in July. Point-biserial correlation and p-values were used for assessing students' cognitive level. Results of the first exam revealed correct responses on the questions ranging from 14.0 percent of the class to 93.0 percent. More students who scored in the upper 27 percent of the class on the overall exam responded correctly on each question compared to students in the lower 27 percent (point biserial 0.24 to 0.36 for these questions). On the second examination, the percentage of correct responses to the questions regarding the guidelines ranged from 20.0 percent to 87.7 percent. For all questions except one, greater numbers of students in the upper 27 percent responded correctly than students in the lower 27 percent (point biserial 0.27 to 0.63). On both examinations, students did better with questions involving clear-cut answers, such as whether AP is recommended or not recommended

(Class I or III). They did not score as well with questions regarding strength of recommendation, such as when AP is reasonable or may be considered (Class IIa or IIb) as opposed to recommended. This was especially a problem for the students who scored poorly overall on the exams. The results indicate that more instruction is needed in interpretation of strength of recommendations in the guidelines and application of critical thinking in making judgments to implement the specific recommendations in guidelines. Our investigation indicates that students have a difficult time interpreting the meaning of classification of recommendations in the AHA's 2007 guidelines on AP for IE prevention. It suggests that more instruction is needed, especially for weaker students, in understanding the guidelines' true meaning as a guide in making judgments in clinical situations when practicing EBD.

281. Early Performance in the Patient-Doctor Relationship as a Predictor of Success in Dental Education

Elsbeth Kalenderian, Taru H. Kinnunen, Peter Maramaldi, Diane Spinell, and Linda Pollak Nelson, Harvard School of Dental Medicine

Students attending the Harvard Schools of Medicine and Dental Medicine are required to take a first-year, two-semester patient-centered course that teaches the medical interview titled Patient-Doctor I (PDI). The student-faculty ratio is 2:1, which provides extended time for the faculty to observe student performance during the first academic year. General consensus among the PDI faculty indicates that performance in this course—specifically outliers—predicts high or low performance in the later dental clinical education years. If the faculty's anecdotal predictions have empirical support, early identification of high or low performance may provide opportunities to address the unique needs of outliers to improve academic success and satisfaction among students. The objective of this study was to develop a rating method to quantify existing qualitative formative narratives to rate individual performance of first-year dental students in an applied patient-centered course. This will form the basis for the second phase of this study in which we will use the quantified ratings to predict later clinical performance. The first aim of this study is to demonstrate the feasibility of quantifying narrative assessments to determine high and low performance in a patient-centered course for dental students. The longer range aim assesses whether there is a relationship between the performance of dental students in a first-year patient-centered course and performance in later clinical years. This qualitative research study utilized individual interviews, focus groups, and an empirically driven content analysis. Individual faculty interviews and a focus group were conducted with a convenience sample of nine faculty members (nearly 50 percent of the dental PDI faculty). An empirically based coding strategy was developed to quantify the PDI year-end formative narrative evaluations. Twenty formative narrative evaluations were used to test the coding strategy. A five-point scale was developed based on our coding strategy. Three PDI course faculty members were extensively trained in the coding strategy. They used the developed coding strategy to rate 209 narrative evaluations of student performance. As the anchor points 1 and 5 were essential for our study, if any of the coders had rated the narrative as 1 or 5 those cases were discussed and resolved. Given that our research questions are new and innovative, it is hard to estimate an exact effect size. However, as the initial population that we are drawing from is 350, allowing generously for missing data or non-availability and hence using n=209 as an estimate, even a small effect size can be detected with .80 power. Thirty-nine narrative evaluations (18.7 percent) had to be resolved and recoded (twenty-six anchored at 1 and thirteen anchored at 5). Prior to resolving these disagreements, the interrater correlations ranged from .68 to .74. After recoding, agreements of .82,

.84, and .84 were achieved. Cronbach's alpha, which assesses internal consistency of the ratings, was 0.75, which is considered good. The widely accepted cut-off in social sciences is 0.70. Based on the ratings, twenty-four (11.5 percent) of the narrative evaluations were coded as high performers, and seven (3.3 percent) as low performers in the PDI course. If performance in a patient-centered course predicts success in later clinical years, it may underscore an increased importance of humanistic qualities in dental education. Early identification of low performers will allow the faculty to develop interventions aimed at improving self-awareness and interpersonal communication skills with patients. An example of such an intervention may be the development of a mentorship program in which high performers are paired with low performers. This and other prospective interventions need to be more fully explored and evaluated. Our study demonstrated the feasibility of quantifying narrative evaluations to determine high and low performance in a patient-centered course for dental students. This will provide the basis for examination of a relationship between student performance in a first-year patient-centered course and performance in later clinical years.

284. A Model Nutrition Rotation at Tufts University School of Dental Medicine Fosters Interdisciplinary Collaboration Between Graduate Nutrition Students and Dental Students

Carole A. Palmer and Dorothy L. Vannah, Tufts University; Medha Singh, Harvard School of Dental Medicine

A model applied nutrition program at Tufts University School of Dental Medicine helps improve dental students' effectiveness in communicating oral health nutrition messages by teaching dental professionals some of the bread and butter nutrition counseling skills that are central to clinical nutrition training and training graduate nutrition students about oral health aspects of diet and nutrition. The program, in operation for over thirty years, is directed by a doctoral level registered dietitian with the assistance of other dental school faculty members and also provides oral health nutrition education via continuing education and the development and dissemination of educational methods and materials. For dental students, the nutrition curriculum spans the four years of the dental curriculum and includes didactic coursework, seminars, and clinic patient diet assessment and counseling designed to meet the ultimate goal of competence in diet risk assessment and counseling. For nutrition students, graduate students from the combined Dietetic Internship/ Master's program of Tufts Friedman School of Nutrition Science and Policy and Tufts Medical Center spend a three-week rotation at Tufts Dental School to learn about nutritional applications in oral health by participating in seminars, classes, clinic, and community outreach with dental students. The overall goal is to foster interdisciplinary training between dentists and nutritionists to improve the skills of both. The dental student nutrition education goal is for the student to be competent in diet risk assessment and counseling for oral health. After participating in the Applied Nutrition in Dentistry Program, the dental student will have foundation knowledge about diet and nutrition and its relationships to health and disease; understand the roles of diet and nutrition in oral health and disease; provide appropriate diet assessment and management to clinic patients; and provide appropriate oral health-related nutrition messages to patients. The nutrition student goal is for the student to have an appreciation for the roles of diet and nutrition in oral health and disease. After participating in the Applied Nutrition in Dentistry Program, the nutrition student will appreciate the importance of oral health in nutrition care; understand the role of diet and nutrition in oral health and disease; provide appropriate oral health-related nutrition messages to patients; know basic oral health promotion guidelines

that can be disseminated to patients; and be comfortable interacting with dental professionals regarding nutrition for oral health. The dental rotation plays an important role in the overall training of the nutrition students as it fulfills several of the competencies required by the Commission on Accreditation for Dietetics Education (CADE) of the American Dietetic Association for licensure eligibility. The rotation is also well received by the nutrition students, as judged by program evaluation. Further, the uniqueness of the dental rotation is mentioned by some applicants yearly as one of the specific reasons they are applying to the program. The rotation also provides some dental students the opportunity to interact with nutrition students regarding nutritional aspects of patient care. The dental students learn clinical diet assessment and counseling skills and are able to be more patient-centered in their implementation of diet risk assessment and counseling in the clinic. They also learn the roles that nutritional professionals can play in patient care and may be more likely to refer patients to nutritionists while in practice. The nutrition students are evaluated in writing only by the rotation preceptor, who elicits feedback from each supervisor prior to conducting the final student evaluation. The evaluation is designed from the CADE competencies appropriate to the rotation plus several other rotation-specific items. The completed evaluation is given to the dietetic internship director and is kept with all other clinical evaluations and used for overall student assessment and accreditation. Results of a survey conducted of the eight students in the class of 2010 and five of the eight students who have completed their dental rotation from the class of 2011 indicate that the students felt that their knowledge and awareness of the role of nutrition in oral health increased, as did their knowledge of specific nutrition and oral health interactions and their understanding of interdisciplinary practice. This multidisciplinary clinical nutrition program benefits both dental and nutrition students. It allows for interprofessional learning, as dental and nutrition students interact in an interdisciplinary team. Nutrition students become more familiar with dental practice and the roles of nutrition in clinical care. The dental students learn patient-centered, evidence-based practices for providing comprehensive patient care, which includes diet and nutrition assessment and education, and they learn how nutritionists can be meaningful allies in patient care.

285. Is Academic Dentistry Invisible on the Web?

Student Poster

Jason L. Outlaw, Harvard School of Dental Medicine

Currently, there are more than 400 vacant dental school faculty positions, which endangers dentistry's ability to invest in research and discovery to sustainably advance the field of oral health and to improve public health in the future. A study by Rupp et al. found that, while 91 percent of schools responding to their survey had initiatives to prepare, recruit, and retain faculty, 71 percent of students reported knowledge levels between none and low with respect to twelve selected issues of academic dentistry. Rupp et al. declared that, while the dental profession as a whole has done a superb job of selling the benefits of a private practice career, the same message regarding an academic career often goes unvoiced and therefore unheard by dental students. Bertolami has suggested that innovations in imprinting students early with the identity of being an educator could enhance faculty recruitment. Currently, the web makes it possible to reach out to students in a more affordable and scalable way than ever before. Digital natives (students born after 1982) are fluent in online communication. Spallek found that 75 percent of dental school applicants made their first contact with their school via its website. He suggested that dental schools attempting to recruit a particular type of student should concentrate their recruitment resources on their websites to maximize applicant attention. My study analyzes

the degree to which dental schools leverage the web as an innovative means to inform students of career paths in academic dentistry. The websites of fifty-six dental schools in the United States and Puerto Rico were examined for content related to careers in academic dentistry. Secondly, the dental schools' presence in the social media world was examined, and schools' use of the three most widely used social media platforms (Facebook, YouTube, and Twitter) was recorded. If a school had a presence on a social media platform, each linked page was examined to see if it addressed issues related to career paths in academic dentistry. All fifty-six dental schools had working websites, but only five of the websites contained information on their websites introducing students to careers in academic dentistry. Fourteen of the dental schools had an active presence in social media with links to their webpage. Seven used Twitter, thirteen used Facebook, and seven used YouTube. Of the thirteen schools that used Facebook, none addressed careers in academic dentistry on their Facebook page. Of the seven with YouTube pages, none of these schools addressed careers in academic dentistry in their videos. Two schools used other social media (Flickr and iTunes/iTunes University); however, neither of these two schools addressed careers in academic dentistry. Academic dentistry is essentially absent from the websites of dental schools and in the social media world. This is an important factor to acknowledge considering that the web and social media are the primary means of communication for digital natives who will inherit the field of dental medicine. Given that sustainable faculty development is one of the most pressing challenges in modern dentistry, academic dentistry must market itself on the web. To be silent in the digital age is to be absent in the minds of students who might eventually ascend in the ranks of the academic world.

286. Incorporating Oral-Systemic Evidence into Patient Care: Knowledge and Opinions of North Carolina Dental Hygienists

Kathryn P. Bell, Pacific University; Ceib Phillips, University of North Carolina at Chapel Hill; David W. Paquette, Stony Brook University; Steven Offenbacher and Rebecca S. Wilder, University of North Carolina at Chapel Hill

Although associations between periodontal and systemic health have been consistently reported, little data are available on the knowledge and attitudes of dental hygienists (DH) regarding this relationship. The purpose of this study was to determine the knowledge levels of North Carolina (NC) DH regarding oral-systemic evidence and assess their attitudes and confidence toward incorporating this evidence into practice. An IRB-approved survey was developed, pilot tested, revised, and mailed to 1,665 licensed DH in NC. After three mailings, the response rate was 62 percent, with 52 percent (N=859) meeting inclusion criteria. Only descriptive statistics are reported. DH most often identified "poor oral hygiene" as a risk factor for periodontitis (98 percent), cardiovascular disease (CVD) (75 percent), adverse pregnancy outcomes (62 percent), and diabetes (62 percent). Risk factors for systemic conditions were correctly identified less frequently (33 percent identified alcohol use as a risk factor for osteoporosis, and 24 percent identified race as a risk factor for adverse pregnancy outcomes). Almost all (94 percent) agreed or strongly agreed that DH should be trained to identify risk factors for oral-systemic disease, and 78 percent felt that DH should be trained to actively manage patients with systemic disease. More than 75 percent reported being confident about discussing potential oral-systemic risks with patients who have CVD and diabetes. Far fewer were confident (36 percent) that they had the skills to ask patients about their alcohol consumption habits although 48 percent were confident about counseling patients about the effect of alcohol on systemic health. Eighty-eight percent felt that dental and medical

professionals should be taught to practice in a more collaborative way, and 75 percent felt that medical providers should be trained to screen patients for periodontal disease. In-depth, interprofessional, and continuing education on oral-systemic health are indicated to improve DH knowledge levels and confidence in translating the evidence to patient care. Funded by Johnson and Johnson Health Care Products, Division of McNeil-PPC, Inc.

287. Assessment of Clinical Competence in Radiology of Dental Hygiene Students: Comparison of Two Successive Student Cohorts

Kristina V. Okolisan-Mulligan, Ashok Balasundaram, James R. Geist, University of Detroit Mercy

It is not uncommon for dental hygiene students to experience difficulty attaining clinical competence in radiology. Radiology in the dental hygiene curriculum prepares the student to practice the science of oral and maxillofacial radiology and to develop the student's ability to think conceptually and use problem-solving skills. It is important that the curriculum prepares the student to be competent in making high-quality radiographic images. This essentially means reducing the number of re-exposures. The objectives of this research study are to 1) institute a formal competency calibration mechanism to assess radiology faculty members' assessment skills driven by an established rubric; 2) develop a mechanism to closely monitor individual competence in intraoral radiography skills; 3) incorporate a formal means of designing remedial experiences in order to achieve competence in radiology for those who are not progressing toward competence; 4) increase the accuracy of student self-evaluation of technical quality of radiographs and provide knowledge for the practice of dental hygiene; and 5) evaluate the effect of intervention on student performance and self-evaluation. The radiology faculty must be capable of providing high-quality instruction; therefore, it is necessary for all faculty members to be evaluated and calibrated equally before authentic learning can take place. Several studies have found that the resulting effect on student performance and achievement has positively increased after faculty assessment calibration strategies were employed. It has been proposed to devise intervention strategies earlier in the program, thereby making sure graduating hygiene students possess skills to limit the frequency of re-exposures, leading to reduction in radiation dose to patients. A formal mechanism is essential for successful outcomes and attainment of competence.

New Programs

170. Analysis of Dental Workflow with an Integrated Medical-Dental Electronic Health Record: A Time and Motion Study

Student Poster
Ryan R. Cooper; Andrea Mahnke; Carla Rottscheit; Zhan (Harold) Ye; Amit Acharya, Marshfield Clinic

Oral health has recently gained much attention regarding the correlation it shares with systemic health. Many systemic diseases such as coronary heart disease (CHD), diabetes mellitus, and Alzheimer's disease have been associated with periodontal disease. Based on the latest understanding of the correlation between oral and systemic health, it seems apparent that there is a need to integrate medical and dental health records in order to provide the greatest quality of care for patients. Dentists and physicians are beginning to treat the oral cavity and the rest of the body as a single entity.

Marshfield Clinic, founded in 1916 in Marshfield, WI, is one of the largest comprehensive medical systems in the nation. With 775 clinicians and more than 6,500 staff, this multispecialty group practice provides patient care, research, and education in fifty locations in central, northern, and western Wisconsin. CattailsMD, the internally developed electronic health record (EHR) developed by Marshfield Clinic, is one of the oldest electronic medical records systems in the country. Marshfield Clinic recently developed an integrated medical-dental electronic health record (iEHR) environment to further advocate this new idea of practicing the integrated approach to medicine and dentistry. This new technological advancement provided an excellent opportunity to study the human-computer interaction with the iEHR environment at the Marshfield Clinic dental centers. A data collection tool was used to capture the dental workflow. Two researchers first tested and modified the tool during pilot observations in dental clinics. Both researchers then collected final data by observing the workflow of dentists, dental hygienists, dental assistants, and appointment coordinators at four Marshfield Clinic dental centers. Patient encounters observed included initial visits, planned visits, emergency visits, and front desk interactions. Researchers documented the entire workflow of each role with a primary focus on their interaction with the iEHR. The time and motion tool allowed the researchers to record all aspects of the encounter including medium, activity, and information. Types of medium recorded were paper, computer, and tray sheet. Activities included five main areas of tasks: data-related, patient-related, talking, walking, and miscellaneous with minor tasks listed under it. Information items allowed researchers to record detail about tasks. Examples of the information items include scheduling info, extraoral exam, intraoral soft and hard tissue, intraoral and extraoral imaging, chief complaint, problem list, medication, medical and dental history, treatment plan, prescription, progress notes, and social conversation. Also, researchers conducted brief exit interviews and focus groups to collect participant opinions and experiences about working with the iEHR and other workflow issues within the dental centers. Focus groups were audio- and videotaped to allow for later, detailed analysis to identify themes. The study protocol was submitted to the Institutional Review Board and approved under 45 CFR 46, 21 CFR 50, and 21 CFR 56 (Marshfield Clinic Research Foundation IRB number ACH10110). Researchers observed 143 encounters in the four dental centers during July 2010. These encounters were fourteen initial visits, 104 planned visits, sixteen emergencies, and nineteen front desk encounters. Focus groups were conducted at two dental centers over the lunch hour, with lunch provided. Dentists in particular found that posting charges significantly interrupted their workflow. It was not easy to see at a glance which charges had been posted or not. Posting charges was also inconvenient because dentists needed to go to their office computer after every patient to post charges. The operatory was often far away from their office, and they had multiple patients waiting. The ASAP list is a list appointment coordinators use to call patients to come in on short notice to fill in cancelled appointments. The ASAP list took too long to load, and there was no way to minimize the list once it was open. The patient's phone number was available, but not the specific patient's name in the case of families. The provider drop-down selects the staff entering certain actions on the iEHR, and this selection often changes throughout an encounter. If a staff member forgets to check that the proper staff is selected and then enters information and tries to submit, the system alerts the user that a different staff member must be selected. The problem arises when the proper staff is then selected and all of the information previously entered is deleted. Dentists found that ordering prescriptions took too many clicks. Also, the default setting for ordering prescriptions is to send orders electronically to a Marshfield Clinic pharmacy. Prescriptions

were often sent electronically when the dentist intended to print them out. Often, clinical information systems are designed without efficient workflow and end users' contextual environment in mind. This forces the users of the system to adapt to the inefficiencies of the system design, which could sometimes be time-consuming and lead to complicated work-arounds. The information gained from this study will be shared with the development team and allow for future enhancements to improve the iEHR.

177. Oral Effects of Patients with End-Stage Liver Disease (ESLD) and Prevention with CAMBRA Prior to Liver Transplantation

Student Poster

Allen Wong and Nina Tecson, University of the Pacific Arthur A. Dugoni School of Dentistry

Each year, thousands of patients with end-stage liver failure are waiting to undergo liver transplantation. As their general health declines, end-stage liver failure patients are prone to experience a dramatic decline in their oral health. Prior to liver transplantation, candidates must have a dental examination and treatment to eliminate any dental disease or oral infection. Medications prescribed to end-stage liver disease (ESLD) patients may have increased detrimental effects on the oral cavity, leading to the need for invasive dental procedures, including removal of remaining dentition. While side effects of medications are a cause of declining oral health in liver transplant candidates, there may be other contributing factors. The purpose of this study is to explore factors contributing to the decline in oral health of ESLD patients and integrate a minimally invasive regimen. Using caries management by risk assessment (CAMBRA) procedures, a liver transplant candidate's lifestyle may be able to prevent disease progression and promote oral health. A sample list of medications prescribed to a preoperative liver transplant patient was studied to determine effects of medication on the oral cavity. Scientific literature was reviewed to determine the need for liver transplantation, effects of saliva, minimally invasive dental procedures, and suggested dental treatment guidelines for treating patients with end-stage liver failure. Findings show that while the dental health status of liver transplant candidates shows no significant difference compared to the national population, medications prescribed to end-stage liver failure patients are associated with xerostomia, stomatitis, and acid from reflux, which contributes to an increased caries risk and decline in oral health. Liver transplant candidates have also been found to have an increase in periodontal disease directly proportional to the number of months since the patient had been to a dentist. Liver transplant candidates are also more likely to smoke compared to the national population, which can also increase the risk of dental caries and periodontal disease. Based on this research and following dental guidelines for preoperative liver transplant patients, the caries balance method comparing patients' pathologic factors (bad bacteria, absence of saliva, poor dietary habits) versus protective factors (saliva and sealants, antimicrobials, fluoride, and an effective diet) was used to suggest a minimally invasive CAMBRA regimen, including oral hygiene instruction, daily antibacterial mouth rinses, topical fluoride application, and dietary counseling, to improve ESLD patients' oral health. Further studies are necessary to determine other contributing factors to increased dental disease in this patient population, the effectiveness of a proposed minimally invasive CAMBRA regimen on the oral health of ESLD patients, and possible alternative treatment methods to decrease dental disease and progression. Studies on minimally invasive CAMBRA regimens can also be applied to other medically compromised populations. Increased communication and education with the medical community are crucial to improving patients' overall health as well as their dental health. Medications

taken by patients along with lack of attention to oral care with end stage liver failure candidates contribute to a decline in oral health. With an increased progression of dental disease, many candidates for liver transplantation must undergo invasive dental procedures to eliminate oral disease. Early prevention and treatment protocols with proposed CAMBRA regimens can improve the oral health of liver transplant candidates and minimize the need for invasive dental procedures.

184. Oral Health Barriers and Beliefs of the Araucanian People of Chile

Student Poster

Indira Rocha-Bhandari, Sana Ahmed, Dan C. Colosi, and Dolores Cannella, Stony Brook University

The Araucania region of Chile is inhabited by a heterogeneous population that includes individuals of Hispanic and indigenous (Mapuche) ancestry. Despite advancements made to increase access to health care and reduce health disparities in this area, significant obstacles to the adequate provision of oral health care remain. Oral health problems are a major public health issue in the Araucania region. In a study of school age children between the ages of six and twelve, 99 percent presented with existing caries or had a history of caries. In another study of adolescents and young adults, 92 percent presented with missing or hopeless teeth. It is estimated that 46 to 64 percent of people living in this area are in possession of a toothbrush, with only 58 percent using toothpaste. Alternatives used by these communities include the use of bicarbonate as a cleansing agent (19 percent) and using their finger and water (23 percent). IRB approval was obtained for this study. During a dental outreach mission to this area, data were collected to identify barriers to oral health care in these communities, explore reasons that prompted people to seek oral health care by the outreach team, and examine perceptions about receiving oral health care by local and foreign dental practitioners. Fifty-nine parents or guardians who accompanied their child to the dental care outreach centers completed a questionnaire about their perceptions of dental care and their child's dental experiences. The children of surveyed respondents ranged in age from four to seventeen years (M=8, SD=3.5). Thirty-six percent had a dental visit within the past six months, and 36 percent had a dental visit within the past two years. Ten percent had not visited a dentist in more than two years, and 17 percent had never seen a dentist in their lifetime. Many children were not seeing a dentist regularly. Only 8 percent of children visited a dentist every six months, and 6 percent visited a dentist yearly. Rates of those who visited the dentist regularly were comparable for participants of Hispanic and Mapuche ancestry. Participants reported several barriers to their child's oral health care; the most significant was difficulty getting a dental appointment (67 percent). Many participants indicated that affordability of dental treatment (29 percent) and the child's fear of the dentist (27 percent) were also significant barriers, as were travel time (10 percent) and lack of transportation (8 percent). Participants were also asked what motivated them to bring their child for oral health care services. Many reported that it was the ease of obtaining an appointment (62 percent), receiving free care (54 percent), receiving quality care (52 percent), convenient location (32 percent), and pain relief (15 percent). Lastly, we examined participants' perceptions about receiving oral health care by local and foreign dental practitioners. Both Hispanic and Mapuche participants felt that foreign dentists respected traditional Mapuche medicine more than local dentists. In addition, both Mapuche and Hispanic participants reported being comfortable with their child being treated by a foreign dentist. However, Mapuche were significantly more comfortable receiving treatment from a foreign dentist than Hispanic participants, t(34)=

-2.01, p<.05. Several barriers to oral health care exist in the Araucania region of Chile for both Mapuche and Hispanic populations. The most significant barriers include difficulty in obtaining a dental appointment, affordability of dental treatment, child's fear of seeing the dentist, travel time, and lack of transportation. These barriers to oral health care likely contribute to the higher prevalence of oral diseases in this area. Factors that motivated participants to seek care from the outreach team were related to barriers reported by participants, such as the ease of obtaining an appointment. Another motivating factor to seek care was affordability, which coincided with the second most common barrier to care. Although many of the children who received treatment had seen a dentist within the last two years, most of the children do not see a dentist on a regular basis. Lastly, we examined participants' perceptions about receiving oral health care by local and foreign dental practitioners. We found that both Hispanic and Mapuche participants favored foreign dentists from the outreach team as compared to local dentists. This finding may be explained in part by the easy access to dental treatment provided by the outreach team. Environmental factors and culture play an important role in oral health care in the Araucanian region and contribute to explanatory models of health and illness. In the United States and Chile, efforts are under way to increase cultural sensitivity of health care providers to improve patient care. Bridging the gap between disparate belief systems may lead to increased patient understanding of oral health, fostering increased adherence, and positive clinical outcomes. Future studies should determine whether the Araucanian people accept scientific and biological explanations for the development of oral diseases and further evaluate the impact of culture on oral health behaviors.

192. Predoctoral Student Contributions to the Development of Educational Resources in Human Gross Anatomy

Student Poster
Alison F. Doubleday, Matthew S. Hamedani, Anastasiya Quimby, and Kelley Gyllenhaal, University of Illinois at Chicago

In summer 2010 eight predoctoral dental students at the University of Illinois at Chicago College of Dentistry participated in a project designed to produce various educational resources for use by first-year dental students in the human gross anatomy course. Resulting resources include a prosected upper limb, several plastinated specimens, and video footage demonstrating dissection procedures and illustrating anatomical structures. The use of these resources was implemented in the gross anatomy course in fall semester 2010 for incoming dental students. Using survey data we investigate the perceptions of these resources by first-year dental students at the college. Additionally, we discuss the effects of participation on reinforcement of anatomical information and on the development of cooperative learning skills for project participants. Collaboration between faculty members and predoctoral students in the preparation of educational resources for use by incoming students results in educational benefits for participants as well as for first-year students. Additionally, the collaborative effort provides opportunities for mentorship as well as for more precise recognition and identification of student needs within a particular course.

199. Review of a Unique Partnership to Provide Oral Health Care for Homeless Veterans

Student Poster
Mary H. Parise, Anthony L. Neely, Diane C. Hoelscher, and Thomas Christy, University of Detroit Mercy

There are an estimated 26.4 million veterans nationwide. Due to current economic conditions, the number of veterans who have suffered homelessness and vagrancy has continued to increase. Two ongoing wars have decreased the capacity of the U.S. Department of Veterans Affairs (VA) to provide oral health services to homeless veterans. Concurrently, dental schools have had difficulty in recent years ensuring an adequate variety of patient care experiences for their students. Cuts in Medicaid funding for non-emergency dental treatment and greatly reduced numbers of patients with third-party insurance or cash to pay for services has contributed to the crisis. These conditions set the stage for collaboration between the Department of Veterans Affairs John D. Dingell Medical Center and the University of Detroit Mercy School of Dentistry. The objectives of this program are to 1) provide oral health services to homeless veterans enrolled in the Homeless Veterans Dental Initiative (HVDI); 2) increase the number and variety of clinical experiences available to fourth-year dental students; 3) provide students with experience in modifying treatment plans to meet medical, social, and economic factors; and 4) expose students to patients facing the challenges of homelessness. Key features of the HVDI are as follows: 1) veterans must meet VA qualifications to enroll; 2) a one-time course of dental care necessary for health and employment; 3) coverage for preventive services, basic periodontics, operative, removable prosthodontics, limited endodontics, and single unit crowns; 4) oral surgical procedures performed at the VA medical center; 5) VA approval of all treatment plans; and 6) treatment at a forty-chair School of Dentistry clinic located near the VA medical center. Following IRB approval, medical and treatment data from VA participants were gathered to assess the outcomes of this program. Data included records for patients treated between July 2007 and November 2009. Patient medical and treatment information was abstracted from an electronic health record system. Only unique identifying numbers were utilized to identify subjects; hence, confidentiality was maintained. Seventy-eight fourth-year dental students delivered oral health care services to 354 veterans at the University of Detroit Mercy School of Dentistry. In general, the population was healthy. The most frequently occurring medical conditions among this group were hypertension (31.4 percent), history of depression (24.9 percent), and type II diabetes (9.6 percent). Completed dental procedures totaled 3,995 with another 2,306 procedures treatment planned. Complete edentulism was found in 15.5 percent of subjects with 6.2 percent completely edentulous in the maxilla only. Preventive services were the most frequently administered, including scaling and root planing (313 quadrants), periodontal maintenance (109 visits), and fluoride application (88 patients). Other experiences included root canals (34 teeth), crowns (53 units), cores (41 units), amalgam and composite restorations (387 units), complete dentures (132 units), and partial dentures (98 units). The program's success was due to collaboration and communication between directors at the two institutions. The program provided oral health care to homeless veterans and increased the number and variety of clinical procedures available to DS4 students. It provided them with experience in modifying treatment plans to meet medical and socioeconomic factors and allowed interaction with patients facing the challenges of homelessness. In fact, the dental portion of the Health Care for Homeless Veterans program received Best Practice commendation in 2007 from the Council on Accreditation for Rehabilitation Facilities (CARF). Other schools could seek similar collaborations to improve access to care and enrich student experiences.

200. Oral Health Literacy Pilot Program Initiative

Andrea Beall, Cheryl M. Westphal, and Lisa B. Stefanou, New York University; Lita Anglin; Sallie Willcox

This oral health literacy pilot program initiative (OHLPPI) responds to the American Dental Association's Health Literacy in Dentistry 2010–15 Action Plan and specifically addresses objective B,

encouraging the education and training of current and future health care workers including dentists, dental hygienists, dental assistants, and students of each discipline to include principles of effective communication and use of plain language in the dental practice. The emphasis of this program is placed on the awareness of oral health literacy and practical application of tools and techniques for enhanced patient-provider communication. As a pilot program, it currently involves partnership with the New York University College of Dentistry's Dental Hygiene Department and the Health Sciences Libraries to integrate the concept of oral health literacy into the curriculum by lectures and presentations, development of an oral health plain language handbook, and resource and advisement for student community oral health projects. Feedback from dental hygiene students has been favorable with demand for earlier integration and an expansive plain language handbook. If dental schools make students aware of low health literacy, students will learn to identify existing limitations, set goals for further learning, and ultimately achieve better patient oral health outcomes. The OHLPPI fills an important gap in the curriculum by cultivating knowledge, opportunity, and collaboration within disciplines.

254. Development of a Clinical Research Rotation for Third-Year Dental Students

Student Poster

Meghan E. Dubois, Thomas G. Green, and William V. Giannobile, University of Michigan

Dental students have numerous opportunities to participate in research during the dental school curriculum, but they must often spend time outside of the planned program of study. To date, there has been no structured clinical research experience to introduce dental students to the unique processes and challenges involved with this type of endeavor. Clinical research education is available from other departments within the University of Michigan, but they are not closely affiliated with the School of Dentistry and dental students rarely utilize them due to time constraints. If students develop an interest in clinical research but feel that taking a year out of dental school is not ideal for their career planning, the opportunity to learn about clinical research is limited. Additionally, a competent clinician must be able to critically evaluate the procedures, materials, and diagnostic techniques he or she draws on in practice using evidence-based approaches. Currently, little formal teaching of this critical skill exists in the predoctoral dental curriculum. This structured course addresses this issue and demonstrates how to apply these skills during dental practice. The students will gain valuable exposure to advanced and novel techniques, materials, and procedures not routinely encountered in the dental curriculum. This rotation is a vehicle to fill these dental student educational gaps. In this program, we created definitive goals for the course that provided a framework for many of our decisions. We developed a curriculum that includes learning objectives, competencies addressed by the course, methods of assessment, educational resources, weekly schedule, syllabi, and a coursepack. We also designed a prerotation and postrotation survey to analyze students' responses to the course. The course consists of various topic presentations, literature reviews of clinical trials led by faculty and clinical research scholars from health disciplines throughout the university, observation of appointments for clinical trials, and attendance at a research team meeting. After approval by our school's curriculum committee, the course was implemented as a required rotation for all third-year dental students. In the spring prior to the required rotation, a group of five dental students participated in a pilot rotation. All five were recently completing their third year of study and freely volunteered their time in response to a request for participation. They were involved in all aspects of the rotation and provided valuable feedback used to modify the course for the

fall semester. Using a 5.0-point scale survey similar to the one for the required rotation, students rated each component of the course and their own knowledge or beliefs before and after the pilot. On average, all five students increased across measures of confidence in knowledge of clinical research (3.0 to 3.8), ability to evaluate a trial (3.0 to 4.1), and future interest of pursuing clinical research (3.0 to 3.8) and remained relatively constant in the belief that clinical research is important to dentistry (5.0 to 4.8). While students were volunteers and thus results are likely higher than that of a representative dental class, the pilot students gave us information about the predicted success of the course. Once the first semester of the course is complete, we will have more comprehensive data to analyze and further evaluate students' response to the rotation, which will be reported on the poster publication. This clinical research rotation will help develop more well-rounded and competent dental students and future dentists. It opens the opportunity for students to engage in clinical research, effectively evaluate future studies, and incorporate these into their own clinical practice. This opportunity will allow students to engage in advanced dental procedures that are routinely unavailable to them and gain the confidence to evaluate new material that is essential to the dental professional in practice today.

256. Medical Providers' Dental Data Needs in an Integrated Medical-Dental Electronic Health Record Environment

Student Poster

Richard Mathias, Arizona School of Dentistry & Oral Health; Andrea Mahnke; Ryan R. Cooper; Amit Acharya, Marshfield Clinic

Marshfield Clinic, founded in 1916, is one of the largest comprehensive medical systems in the nation. With 775 clinicians and more than 6,500 staff, this multispecialty group practice provides patient care, research, and education in fifty locations in central, northern, and western Wisconsin. CattailsMD, the internally developed electronic health record (EHR), is one of the oldest electronic medical records systems in the country. As part of an initiative to bridge the gap between the practice of medicine and dentistry, Marshfield Clinic recently developed an integrated medical-dental electronic health record (iEHR) environment. Clinicians are commanders of complex vessels of information that have to be processed, perused, and applied in order to formulate diagnoses and focus on treatment plans. With a plethora of recent research reviving an oral-systemic connection, physicians need even more information to provide holistic care. There are many oral manifestations of systemic disease, so the bidirectional flow of information between dental and medical records is now more important than ever. To obtain opinions from health care providers on what specific dental information was most important to them and identify the best way to access dental information through the iEHR, focus groups were scheduled in twelve Marshfield Clinics across central and northern Wisconsin. Focus groups were decided to be the best choice to obtain additional spontaneity of responses and allow free flow of information (snowballing effect). The focus groups consisted of five to six medical providers ranging from nurses to surgeons. Furthermore, various medical specialties at the twelve clinics were chosen to provide variance in opinion and to identify if different specialties desired different information. An information sheet was developed and sent in advance to all participants. A focus group moderator initiated the discussion regarding the use of iEHR, advantages and disadvantages of such an integrated care delivery environment, and most significant dental information that would be appropriate to have access to in the iEHR environment. The focus group lasted for approximately one hour while the moderator asked open-ended questions, such as whether the oral health status, dental radiographs, dental diagnosis, or tooth charts would be regarded as suitable dental data to be incorporated into

the iEHR. Concurrently, the focus group sessions were audio- and videorecorded to archive the responses, which were later transcribed. The transcribed data were then annotated and coded for identifying individual issues or themes. Relevant concepts pertaining to the opinions of medical providers were grouped into major and minor themes. The study protocol was submitted to the Institutional Review Board and approved under 45 CFR 46, 21 CFR 50, and 21 CFR 56 (Marshfield Clinic Research Foundation IRB number ACH10409). A total of seventy-four medical providers participated in the twelve focus groups. Physicians, surgeons, registered nurses, nurse practitioners, and medical administrators comprised 70 percent of the participants. Additionally, support staff (medical assistants and physician assistants), including health information management, were involved in the study. Participants from family medicine represented the majority of the medical specialties, followed by OB-GYN, internal medicine, emergency medicine, pediatrics, cardiology, and neurology. Participants were employed in a range from one to thirty years, with a majority serving from six to ten years. The outcome from the participation in this study was that an overwhelming majority of medical providers found the iEHR useful and advantageous. Oral health status, dental alerts, treatment plans, and dental diagnosis were commonly discussed as topics that warranted inclusion in the iEHR. Some generalized negative feedback involved including dental radiographs (although some emergency physicians deemed x-rays worthwhile) and worries over privacy issues. Different specialties had different views, which made perfect sense considering that some specialties such as cardiothoracic surgery and transplant medicine require dental clearance before procedures are commenced. Nevertheless, the coding demonstrated common themes such as the reliability of patient self-reporting, the need for dental information to be in a separate tab to prevent clutter, and the ability to more easily communicate with dental counterparts. The results of the study will be presented to the information systems developers and will be applied to the process of enhancing the iEHR environment in an iterative research and development cycle. Content and design of the iEHR will be reviewed in the near future to examine how well the end-users are interacting with the new system software. The focus of treatment is the patient. The patient by all accounts is deserving of being treated as a whole body, and thus the concept of integration of dental and medical records into one entity warrants adoption. The clinician, however, is already burdened with inordinate amounts of information. Thus, having medical providers provide their input into what dental information is needed and how to access it in a quick and comfortable interface will result in a system that not only helps the patient, but facilitates the optimal care provided by the medical team.

Works in Progress

219. Preparing the Dental Student for Private Practice: A Study of the University of Illinois at Chicago's Predoctoral Orthodontic Program

Student Poster

Robert D. Pedersen, University of Illinois at Chicago

220. Organizational Diversity and Inclusion Self-Assessment Tool at the University of Pittsburgh School of Dental Medicine

David A. Anderson, Paula K. Davis, and Ryan P. Parker, University of Pittsburgh

221. Perceptions, Values, and Factors Involved in Caries Risk Assessments: A Focus Group Analysis

Student Poster

Olga Isyutina and Gerardo Maupome, Indiana University

222. Electronic Portfolios That Make Learning Visible

Celeste V. Kong, Boston University Goldman School of Dental Medicine

223. How to Implement an Interprofessional Ethics Curriculum: Practical Guidance for Dental Educators and Administrators from a Program in Progress

Nathan Carlin, Catherine M. Flaitz, Jayne A. McWherter, and Richard D. Bebermeyer, University of Texas Health Science Center at Houston

224. Collaborative Care: A Pilot Study

Becky M. Smith and Catherine Saylor, University of Missouri-Kansas City

225. Evaluating a Blended-Learning Infection Control Course in a Dental Hygiene Program

Kandis V. Garland, Idaho State University

226. Formative Evaluation of a Dental School Facebook Fan Page

Student Poster

Miquala S. Branklin, University of Michigan

227. Integrating Periodontal Risk Assessment for Effective Treatment Planning

Thomas S. Wirtz and Lynn Bergstrom Bryan, Marquette University

228. The Fixed Bridge Experience: An Alternative Method of Assessing Competence

Gary L. Stafford, Marquette University

229. Potential of Project Management Software in Development of an Improved Restorative Dentistry Curriculum

Warren C. Wagner, Walter C. Lim, and Dincer C. Gurun, University of Detroit Mercy

231. Teaching and Learning Together for Better Health: Integrating Medical and Dental Records to Improve Care and Education

Gerardo Maupome, Mary Gray, George P. Willis, and John N. Williams, Indiana University

232. Use of a PBL Case, Community Experiential Learning, and an OSCE in Tobacco Dependence Education with First-Year Dental Students

David A. Zahl, Stuart M. Schrader, Laura Romito, and Joanna Gestner, Indiana University

233. Increasing Access to Care by Way of an Interprofessional Dental Hygiene/Physician Assistant Curriculum

Kathi R. Shepherd, Michelle A. Wheater, and Suzanne K. York, University of Detroit Mercy

234. Evaluating Interprofessional Disciplines to Educate Dental Hygiene Students on Proper Ergonomics

Marilynn J. Heyde and Colleen Whitt, Loma Linda University

235. Virtual Humans in Dental Education: The Case of an Emergency Patient

Gail S. Childs and Roberta Pileggi, University of Florida

236. An Interdisciplinary Approach to Diabetes: Pacific Interprofessional Diabetes Clinic/Clinica Multiprofesional Para La Diabetes

Gail Aamodt, Pacific University

237. Incorporating Intraoral Cancer Examinations into a Physician Assistant Curriculum Through Interprofessional Education

Jacqueline J. Freudenthal, Idaho State University

238. Authentic Assessment Using a Comprehensive Patient Care Case Competency Rubric in the Dental Hygiene Education Clinical Setting

Kristin H. Calley, Kandis V. Garland, and Brooke Agado, Idaho State University

239. Course Evaluations: Reliability and Precision

Student Poster
Paul Lazari and Mitchell J. Lipp, New York University

**Presented on Tuesday, March 15, 2011
12:30–2:00 p.m.**

Educational Research

108. Accuracy of Student Strategic Plans in a Dental Management Simulation

David G. Dunning and Brian M. Lange, University of Nebraska Medical Center

At our school, D-3 students take a practice management course in which they participate in a dental management simulation based on *The Dental Practice: A Management Simulation* (2006) by David Willis. Students in the simulation all purchase the same "small" general dental practice with essentially the same initial financial parameters: a practice generating annual collections of approximately $130,000 with one operatory and one staff member. Groups of two or three students manage this one-dentist practice. As part of the simulation, students develop, monitor, and evaluate strategic plans for their practices. These strategic plans forecast outcomes for the ending quarter (quarter 12) of a three-year period. Three important data points from these strategic plans were identified to study: forecasted vs. realized revenue/collections, forecasted vs. realized overhead percentages, and forecasted vs. realized indebtedness. The revenue/collections variable excludes "adjustments" for participation in managed care plans and accounts receivable. The overhead percentage is computed by dividing total costs into revenue/collections. The indebtedness variable includes the initial purchase price of the practice and additional loans needed for operating expenses and expansion (especially additional operatories purchased by students). Students receive normative data for "real" general dental practices about revenues and overhead percentages to help guide them in strategic planning. Given that students typically lack formal education in business and practical experience in strategic planning, we made the following hypotheses: 1) students would forecast significantly higher revenues/collections than realized revenues/collections; 2) students would forecast significantly lower percentages for overhead than those realized; and 3) students would forecast significantly lower amounts of practice indebtedness than those realized. Data were obtained from three consecutive classes from the years 2008–10 for analysis. A total of forty-seven student groups completed the simulation. Forecasted and realized data were available for 100 percent of the students since the simulation was a requirement for the course. Data were analyzed using one-tailed, paired t-tests. Hypothesis #1 was supported: students on average predicted revenues of $191,360 for quarter 12 and yet realized $160,294 (p=.009; SD=$74,513 and $61,051, respectively). Hypothesis #2 was rejected: students predicted an average overhead level of 54.8 percent and realized 53.1 percent (p=.21; SD=7.1 percent and 12.7 percent). Hypothesis #3 was supported: students on average forecasted $54,894 in debt and experienced $84,176 (p=.005; SD=$52,567 and $50,638). Students tended to project more favorable financial outcomes than those realized in the simulation. Students overestimated revenue/collections by $31,066 for quarter 12, an annualized amount of $124,264. The rejection of the second hypothesis may be due to the fact that overhead percentages in general dental practices tend to fall into a rather narrow range from about 50 percent to 70 percent. Student projections of $31,066 in revenue beyond that actually realized in quarter 12 translate to being off by $124,264 for an annualized amount. This may suggest that students have somewhat unrealistic expectations about practice financial performance when transitioning into private practice, especially in regard to building a smaller practice into a larger one over time. Similarly, students tended to underestimate the debt needed to build a practice (working capital for hiring staff and purchasing additional operatories, for example). Students had, on average, $29,282 in additional debt than they had originally forecasted.

109. Clicking Through Biochemistry: Correlation Between Clicker Response and Exam Performance in Dental Biochemistry

Alan E. Levine, University of Texas Health Science Center at Houston

First-year dental students at the University of Texas Health Science Center at Houston Dental Branch are required to take a basic biochemistry course in their first semester. The course consists of forty-two contact hours in addition to web-based modules covering a basic introduction to amino acids and proteins and basic metabolic pathways. The contact hours cover molecular biology, protein chemistry, cell signaling, extracellular matrix and mineralization, and metabolic pathways. This content was presented in a lecture format with PowerPoint slides. In order to facilitate learning, the Turning Point audience response system (clickers) was introduced in most lectures with the goal of increasing student interactivity and allowing for students' self-assessment of their progress in learning course material. Clicker questions were designed as multiple-choice questions, and four to six questions were included in most lectures. Questions were placed at the beginning of a lecture to review material from the previous lecture, at the end of a lecture to review material covered in that lecture, or throughout the lecture to emphasize topics. Some questions were used to preview material and gauged students' previous knowledge of a topic. IRB approval was obtained for this study, which consisted of a survey of six Likert scale questions and a free text question asking for additional comments. The survey was administered to students on the last day of class. Participant lists were used to track individual student responses to each question throughout the semester. The percentage of correct answers to the clicker questions for each student for the four sections of the course was correlated with performance on an instructor-generated exam for each section. Each exam consisted of fifty multiple-choice questions. After matching student exam performance with the clicker question score, all student identifiers were removed before analysis of the data. Fifty-one of the eighty students (64 percent) of the 2009 fall class agreed to participate in the study. Ninety-two percent of the respondents agreed or strongly agreed with the statement that "clickers helped me judge my knowledge." Greater than 80 percent agreed or strongly agreed that "clickers made me feel more involved in the learning process" and "pay more attention in class" and that they "enjoyed using the clickers." Fifty-eight percent felt the clickers helped them integrate concepts of biochemistry with dentistry. The free text comments from eleven students generally supported the survey results. A statistically significant positive correlation was obtained for each exam between exam score and the number of correct answers to clicker questions with r values of .55, .36, .36, and .43 for exams 1–4, respectively. All p values were <.01. The introduction of clickers into the dental biochemistry classroom was successful as judged by the overwhelmingly positive response on the student survey. The positive correlation between correct answers on clicker questions and exam scores suggests that encouraging students to become engaged and think about the material being presented can improve learning. These results suggest students would benefit from increased use of clicker questions in the dental curriculum and reinforce the concept that increased student engagement with immediate feedback enhances the learning process.

111. Anxiolytic Intervention Preference of Dental Practitioners in the Savannah, Chatham County Area: A Pilot Study

Suzanne M. Edenfield and Kimberly Coulton, Armstrong Atlantic State University

The purpose of this study was to identify preferred anxiolytic interventions (AI) employed by dental practitioners in the Savannah, Chatham County area. A questionnaire was developed to test dental practitioner preferences of eleven AIs shown to reduce anxiety in dental patients. The sample consisted of dental hygienists, dental assistants, and dentists randomly selected via the telephone book. A total of 305 surveys were distributed. Prior to voluntary completion of the questionnaire, respondents received oral and written instructions regarding the purpose of the study. A 43 percent return rate was achieved. Results from analysis with the median and Kruskal-Wallis tests suggested that the most commonly used AI was ambient background music (83.2 percent). The second most commonly used AI was having literature available for patients to read (75.6 percent), followed by providing a way for the patient to inform his or her provider of anxiety (67.2 percent), the use of pharmaceutical agents (60.3 percent), and decorating the walls (51.9 percent). It is important for dental professionals to employ interventions and management techniques that may reduce dental anxiety.

124. Determining Learning Styles to Engage Student Dental Hygienists in Didactic Courses

Denise A. Kissell, The Ohio State University

The purpose of this study is to gain insight into the learning styles of student dental hygienists through use of the VARK questionnaire and determine how to apply the results to enhance didactic course curriculum and student engagement. The needs of millennial students offer new challenges to traditional teaching models, especially lecture-based didactic courses. For the faculty, having an increased awareness of these students' learning styles would be beneficial to determine if current curriculum approaches are the most effective possible. For students, self-awareness of learning styles can provide a focused approach for effective studying and more success in their courses. This study addresses the findings and possible applications of a learning style survey among the students in three dental hygiene classes. The VARK questionnaire consists of sixteen situational questions that help determine an individual's preference for Visual, Aural, Reading/ Writing, and/or Kinesthetic learning style methods. Three classes of student dental hygienists at The Ohio State University were asked to take the VARK questionnaire during the community dental health courses in 2008 and 2009. This assignment was given to increase the students' awareness of their learning style preferences as they prepared to develop their own lesson plan for outreach presentations. Students were advised to use the support materials offered with this questionnaire to guide their study methods based on their determined preference. Ninety-one of the ninety-seven students completed this questionnaire for a response rate of 93.8 percent. Of the ninety-seven students in this group, approximately 90 percent fell into the traditional college age group by years of age and are considered millennial students. The results of this study revealed a strong preference for the kinesthetic learning style. Nearly half of the students displayed a singular learning style preference, of which 60 percent was kinesthetic. Of the half that showed a bimodal or multimodal preference, an additional 30 percent included kinesthetic for a total of 67 percent of the respondents. Preferences that included aural or reading/writing were nearly equal at around 40 percent, and preferences that included visual learning trailed at 26 percent. This strong focus on kinesthetic learning follows the trend reported by other younger students who have taken the VARK questionnaire that their preference is to learn by doing rather than by reading, watching, or listening. In the field of dental hygiene, our lab and clinical courses are inherently kinesthetically focused. Pursuing a hands-on type of career may be a draw for many students, so it was not surprising that the kinesthetic learning style preference showed prominence. In contrast, didactic courses have traditionally been lecture-based, offering little in the way of kinesthetic learning opportunities, which can result in a lack of engagement of millennial students. Knowing the learning preferences of these students, it is important to offer them opportunities to apply the information and material we expect them to know as part of in-class activities and outside class assignments. Using this knowledge to move away from lecture-only didactic courses to include kinesthetic activities such as role playing, games, case studies, and discussion could enhance the students' retention and application of the material. Technology options offer prime opportunities to apply kinesthetic learning activities to the didactic lecture material. Response systems such as the Turning Point and interactive databases or games offered through many health websites can prompt student participation in class. Sites offered through the university such as Blackboard, or in our case Carmen, can offer tools to engage the students such as blogs, wikis, and discussion boards. Using a learning style survey such as the VARK questionnaire can help faculty members determine the most effective ways to engage students in didactic courses and use this information to plan course work that complements the dominant learning styles. Activities and technology that cater to the preferred learning styles could result in increased engagement in the classroom as well as improved student performance.

130. Implementing Media in the Dental Curriculum

Alia Eldairi and Timothy C. Daugherty, University of Louisville

One of the challenges students face when they go from preclinical to clinical dentistry is handling the overwhelming amount of dental materials available in the clinic: which one to use, when, and how to handle it to get the correct results. To make this transition between preclinical courses and the clinical reality smoother, a clinic manual was developed to provide a step-by-step use of each dental material available in the dental office using digital photographs as a type of media for demonstration. The clinical manual is titled the *Dental Material Clinical Guide*; all materials are organized under different categories with the variations of use for each, along with written details attached to each picture. We made this manual available for all students on their computer stations in the clinic's cubicles so they can access it at any minute it is neeeded to use a certain material for any procedure performed. The student can select the material under the correct category, and the slides will be displayed. We also made the manual available on Blackboard (a university website) for an easy access out of the clinic. After almost one year of using this program, a survey was developed to find out if this attempt was successful and served the purpose for which it was created. The survey consisted of six questions about the role media may play in the learning process of this generation, which types of media students would like to have included in the dental curriculum to make their learning process more efficient and productive, and whether the guide served the purpose for which it was developed. The survey was given to 140 junior and senior students; 115 completed the survey. The results were as follows: 98 percent believed that media plays an effective role in their learning process; 95 percent wanted different forms of media (video, pictures, PowerPoints, audio, etc.) while only 4 percent wanted to remain with the traditional way of learning through lectures and textbooks; 93 percent varied between helpful to very helpful in their opinions about the guide and gave some suggestions to make it more helpful; and 99.1 percent encourage implementing media into the curriculum. Our

goal as dental educators is to rise with our students to the highest level of education and confidence to provide the best patient care. If this generation is more challenging to teach, then we all should take the extra step to help them narrow the gap between the literature and the practical aspect of dentistry. If the responsible use of media is one of the ways to fill the gap between the literature and what is practical, then we all should give it a try.

131. Comparison of Ultrasonic Light Attachment Versus a Built-in Light for Enhanced Visibility and Ergonomics

Wendy J. Moore and Michele P. Carr, The Ohio State University

Ergonomics has come to the forefront in the way dental hygiene students are educated regarding clinical practice. Several companies have developed ways to illuminate the oral cavity, claiming to enhance visibility and ergonomics during ultrasonic scaling procedures. The objective of this study was to determine if dental hygiene students felt the addition of an ultrasonic light enhanced visibility and ergonomics during ultrasonic scaling and to determine if there was any difference in overall effectiveness between a light attachment versus a built-in light. Senior dental hygiene students at The Ohio State University's Division of Dental Hygiene were given a Cavitron Steri-Mate light attachment and a Protg built-in light insert to use in separate clinic sessions. After both were used, students were asked to complete a ten-question, five-point Likert scale survey (5=strongly agree to 1=strongly disagree). Twenty-two students completed the surveys. When asked about the Protg insert, 95 percent agreed or strongly agreed that built-in illumination was easy to use, 67 percent thought the light enhanced visibility, and 71 percent felt it improved ergonomics (mean=3.86, 3.67, and 3.29 respectively; SD=3.19, 3.03. and 3.11 respectively). Fifty-seven percent of the students felt they utilized the ultrasonic more effectively, and 53 percent stated they preferred using the ultrasonic tip with the built-in light (mean=2.67 and 2.81; SD=2.95 and 2.35). When asked about the Steri-Mate light attachment, 65 percent agreed or strongly agreed the light attachment was easy to use, 55 percent thought the light enhanced visibility, and 55 percent felt it improved ergonomics (mean=3.8, 3.55, and 3.45 respectively; SD=2.55, 2.55, and 2.12 respectively). Only 25 percent of the students felt they used the Cavitron more effectively when the light was utilized, and 30 percent stated they would prefer using the light with the Cavitron (mean=2.8 and 2.95; SD=3.16 and 2.35). The results of this study showed that the majority of dental hygiene students felt the addition of illumination during ultrasonic scaling enhanced visibility in the clinical working area and allowed for improved ergonomics. The students also felt they were more effective with ultrasonic instrumentation and, if given the choice, would prefer using the ultrasonic tips with built-in illumination. More students felt illumination with the built-in tip was easier to use when compared to the light attachment. Due to its advantages, dental hygiene programs may want to consider incorporating built-in illumination ultrasonic inserts into their clinical curriculum, and insert manufacturers should consider producing a variety of inserts with built-in illumination.

134. Implementing Comprehensive Clinical Education: Faculty and Student Experiences

Linda S. Behar-Horenstein, Kellie Roberts, Mueen A. Zafar, and Gail S. Childs, University of Florida

The purpose of implementing this comprehensive care preclinical educational model was to increase faculty mentoring of students, faculty demonstration of good dentist-patient relations, critical thinking skills, and clinical judgment as well as to increase interdisciplinary teaching and communication, collegiality, and collaboration among faculty and broaden students' clinical experiences and expertise. Using qualitative research methods and focus groups, this study provides in-depth descriptions of student and faculty experiences of the TEAM program. Senior dental students (n=80) at a research l university were invited to participate in this study. A random sample of six to eight students was selected. TEAM leaders (n=10) and a group of non-TEAM faculty members (n=10) were also asked to participate. Seven focus group meetings elicited participants' perspectives about the effectiveness of the new comprehensive clinical care program. Field notes were recorded during the focus groups, and debriefings by the researchers followed each meeting. Focus group interviews were audiotaped and transcribed verbatim. This study used a constructivist approach to analyze data that included the basic unitizing, coding, and categorizing. The narrative part of this case study relates the participants' stories and provides rich descriptions required of qualitative research. The inductive analysis began with data deconstruction using open-coding within the transcripts. Using the constant comparative method, each identified unit of data was compared to the labels of existing nodes and the previously coded units of text within those nodes. After coding, data units within each node were reread. Units that did not completely fit the definition were moved to better-fitting nodes. Some nodes were combined to create new themes while some were moved to more logical themes. Data from each focus group transcription were analyzed as a distinct and separate set before proceeding with the next focus group transcription. This approach was justified because it was anticipated that the student, TEAM, and non-TEAM faculty groups would have inherently different perspectives. Because of the study's narrative nature and the multiple cases involved, the presentation format is referred to as a multiple-case study narrative with the primary goal of creating understanding. The findings showed that collaboration and communication among faculty members, among students, and between faculty members and students had increased. Faculty members demonstrated how to resolve their differing viewpoints about treatment planning, while students reported that observing these interactions provided valuable learning experiences. Students and faculty members lauded the increased efficiency in patient care, including patient scheduling, the availability of patient chairs, and students' ability to accomplish multiple procedures during one appointment. Owing to faculty collaboration, the process of treatment planning became more efficient. Students also appreciated the ability to receive "just in time" consultations with departmental faculty members. Despite these changes, students were initially disappointed with the lack of faculty feedback but later appreciated faculty knowledge of their skill strengths. Students pointed out that although one aim of the program was to ensure the development of general practitioners, competencies still drove the program, often resulting in their exchanging patients with other students so that they could fulfill requirements. Initially, students reported feeling stressed by the evolving academic requirements. Faculty members concurred and suggested that the grading system needed to be realigned with new program goals. Students anticipated their weekly Friday educational meetings with dread and complained about an inequality across the educational component requirements among the TEAM program groups. Non-TEAM and TEAM faculty members reported that the school's aging computer systems and lack of training for support staff hampered the type of assistance that the program needed. TEAM and non-TEAM faculty members remarked that TEAM leaders needed more authority in signing off on student competencies. Non-TEAM faculty members wanted the selection criteria of TEAM leaders to be made apparent and requested that the faculty be held accountable through an evaluation process. Non-TEAM faculty members and students pointed out the lack of

professional behaviors among some students. Both students and the faculty groups reported that critical thinking skills were not fostered within the program, suggesting the need for periodic appraisal of clinic teaching to help the faculty think differently about the ways in which they can teach and challenge students. These findings can assist other health care school administrators who are planning major curriculum changes. Additionally, the study's findings, presented to administrators and the faculty, were utilized to strengthen the program during its second year of implementation. Participants agreed that the program model guaranteed greater access to chairs, the completion of more procedures in one appointment, more efficient clinic operations, increased clinic revenue, and timely patient care. Communication with students was more individualized and patient-friendly, but opportunities for faculty-student consultation were rare. The model promoted student-centered instruction; however, it also highlighted deficiencies in the preclinical curriculum. None of the participants asserted that critical thinking has increased as a result of the model.

136. Using Active Learning Strategies in a Short Didactic Course to Improve Student Learning

Ronald J. Hunt, Midwestern University-Arizona; Marsha A. Pyle, University of Missouri-Kansas City

We introduced a short course of 0.5 hours quarter credit in managing geriatric special needs dental patients that employed several strategies to engage students and to promote active learning. A visiting faculty member conducted this course, designed for rising third-year dental students, in seven clock hours over two consecutive days. Prior to the course, the class received a journal article to read. On the first day of the class, the course launched with a ten-item pretest, an hour and a half interactive lecture using a digital audience response system, and other student engagement strategies, followed by two and a half hours of individualized self-directed study using three assigned journal readings and three faculty-generated PowerPoint presentations. On the second day, student-led small groups discussed faculty-assigned questions for an hour. Then, all students convened in the lecture hall for a faculty-led half-hour discussion of their findings. An hour and a half interactive case-based lecture followed. In the final half hour, the students completed a final examination containing nineteen multiple-choice questions and one short answer question. This dental class experienced many traditional lecture format courses, some of which used some case-based lectures. They saw limited use of pretests, digital audience response systems, or faculty-guided small group discussions. They had not participated in self-directed study, student-led small group discussion, or intensive short courses by visiting faculty members. In a post-course evaluation at the end of the quarter, 76 percent of the students said they read at least three of the four assigned readings; 77 percent reviewed all three PowerPoint presentations; 93 percent participated in electronic polling with the audience response system clickers; and 98 percent met in their small groups for discussion. Students' perceptions of the usefulness of the learning strategies showed fairly consistent ratings across strategies: clicker use in lectures, small group discussion of assigned study questions, whole class discussion of assigned articles and PowerPoint presentations, and case-based instruction. In general, 45 to 56 percent agreed that the strategies helped them learn, while 14 to 21 percent neither agreed nor disagreed, and 24 to 31 percent disagreed. The students achieved a mean final exam score of 85.9 percent (7.6 standard deviation, 70 to 100 percent range), compared to mean pretest scores of 62.3 percent (15.5 standard deviation, 20 to 100 percent range). All students passed the final examination and therefore the course, but 41 percent felt the course did not prepare them for the exam. A majority of the class used the learning strategies provided and felt the strategies helped them learn. Those who said

the methods did not help them learn may not be ready for such methods or used the evaluation to resist future use of the methods. This class had seen limited use of alternative learning strategies and experienced success with traditional methods, at least in terms of successfully completing traditional course examinations in predental courses, the first two years of dental school, and Part I of the National Board Dental Examination. Early anecdotal evidence upon their entry to major time commitments to patient care in the third year suggested inadequate retention of what had been studied earlier. We did not test the class readiness for alternative learning strategies. Further, prior education research suggests students need repetition and reinforcement, including repeat examinations, to best reinforce learning. Short, intensive courses offer little opportunity for repetition, so subsequent curricular planning must deliberately reinforce key concepts introduced earlier. The post-course evaluations indicated a fourth or more of the class was not ready for, did not value, or did think they benefited from the new learning methods used, even though they passed the course. In the same summer quarter, this class completed four other intensive short courses with visiting faculty members using traditional lecture methods. Attendance in the experimental class remained high throughout the course, while attendance in the other four courses declined as the lectures proceeded. Some members of the class failed the first attempt at the final examinations in all four other courses, suggesting a structural or process failure of those courses, not the strategies of the experimental course. This study suggests a short course using alternative learning strategies improved learning, at least in terms of passing course examinations, compared to concurrent short courses using lecture-only methods. A quarter-long course using these learning strategies, with increased repetition and reinforcement may yield even higher exam scores, even more positive student perceptions about the strategies, and greater retention of learning into patient care activities.

137. The Use of Interactive Media and Its Effectiveness in the Study of Human Occlusion and the Temporomandibular Joint

Margrit Maggio and Karina Hariton, University of Pennsylvania

The 2009 incoming D1 class was involved in the study (110 students) during their second-semester preclinical operative dentistry course. A randomized, voluntary group of 26 percent of the students (n=28) was recruited to participate in the study. The study group was known as the +interactive digital media (+IDM) group. The remaining students (n=82), the control group, were known as the -interactive digital media (-IDM) group. Informed consent was obtained. The +IDM group was given online, independent study materials for the human occlusion and temporomandibular joint (TMJ) module of the operative dentistry course. The independent study materials included learning objectives, pre-assessment quizzes, study guide, digital lecture materials with embedded interactive quizzes, and access to the *Human Occlusion and TMJ Atlas* (eHuman, Portola Valley, CA). Rather than attend lectures on the topic (nine hours), students met in a classroom setting on five separate occasions for one to two hours each session. During these classroom sessions, they independently accessed the database of specific digitized lectures, interacted with links to the *Human Occlusion and TMJ Atlas,* and took interactive quizzes during the session. Primary investigator faculty members were present for technology assistance only during the classroom sessions. Additional independent access to these materials outside of these sessions was also expected. +IDM students had learning activities in the form of laboratory exercises to parallel the individual sessions. These laboratory sessions were alongside, and identical to, the -IDM group. The +IDM students took a didactic lecture examination on the topic of human occlusion and the TMJ. At the completion of

the study, a survey based on a five-point Likert scale with closed ended questions regarding student perception and utilization of the technology was given. The -IDM group experienced the current, traditional classroom-based occlusion module of the operative dentistry course at the same time. The -IDM attended the traditional, scheduled nine lecture hours on the identical topics, were given online access to lecture handouts, and given the *Human Occlusion and TMJ Atlas* DVD program to augment lecture handout materials, as this is the current method of teaching the course. The access to the DVD program was not mandated, but strongly recommended. They did not have access to the online interactive quizzes or the digital, interactive lectures. Their learning activity laboratory sessions on the topics were identical and at the same time as the +IDM group. The written examination at the conclusion of the module was identical and at the same time as the +IDM group. Data reports of the grades received for both groups were anonymously evaluated and tabulated. The outcome of this examination was categorized as pass/fail and not numerically tabulated into the course final grade to avoid any conflict between participation or nonparticipation in the study and final grade outcome for the operative dentistry course. The primary outcome measured was performance in the written examination testing didactic knowledge of the subject of human occlusion and the TMJ. Data from the two groups were evaluated and compared. Analysis of the actual online usage of the +IDM group was measured as well. Survey data measuring student perception toward this method of teaching were evaluated and tabulated. The examination average grades were 85.5 percent and 86.5 percent for the +IDM and -IDM respectively. This difference was not significant. This study showed a correlation between the use of independent interactive media as a substitution for traditional linear education methods and student performance. The +IDM group performed the same as the control group receiving traditional classroom education. The +IDM group achieved the course objectives utilizing independent, interactive media in lieu of the traditional classroom setting. One hundred percent of the +IDM group completed the post-study survey prior to the exam results. The survey responses indicated 77.8 percent strongly agreed or agreed that they preferred online video lectures to the traditional lecture hall format. Of the remaining 22.2 percent, 11 percent disagreed with that statement, 3.2 percent strongly disagreed, and the remaining were neutral. In addition, 70.3 percent of the respondents strongly agreed or agreed that this interactive media module was an effective way to learn human occlusion and the TMJ. Of the remaining 27.7 percent, 11 percent disagreed with that statement, 3.2 percent strongly disagreed, and the remaining were neutral. Finally, 92.6 percent strongly agreed or agreed that they think interactive media helps them learn better. The remaining 7.4 disagreed with that statement. No one strongly disagreed or was neutral with regard to that statement. Survey results showed student acceptance of this form of learning was high. The study group performed just as well as the control group, although survey results showed students preferred the interactive method of learning, to an extent. Interactive media use positively engaged the new generation dental student and was successful in the dissemination of foundational knowledge on the topic of human occlusion and the TMJ. This study may influence future dental education pedagogical methods in the movement to embrace the new generation of learners.

262. Dental School Culture and Identity

Karen Miller, University at Buffalo

As dental students are socialized into the field of dentistry, they are simultaneously establishing their collective and individual identities; therefore, it is paramount to understand the spaces they inhabit during their four-year dental experience. These spaces contribute to an experience that, in effect, dictates how the dental novice will conduct his or her professional life. The dental school is a site where socialization occurs for all students who pass through its doors. While the process itself may vary for every dental student, the dental school, its inhabitants, and practitioners within the dental profession itself all have an impact upon how the dental student is socialized into this profession. The exploration of the dental school culture is framed by the concept of professional socialization, which is assembled within a continuum of different responses by the dental students to the varied socialization processes and by an analysis of the degree to which the dental profession appears to create "communities of difference." This poster focuses on the mechanisms through which dental students are socialized into the profession of dentistry while simultaneously establishing their collective and individual identities. This study documents the philosophies, programs, and daily life experiences of dental students and their collective effect upon the students' professional socialization. The question that dominates the study focuses on how the dental student learns the role that he or she is preparing to play upon graduation. When students enter the dental school, they are lay people with some knowledge of science, a very good academic record, and scores that indicate they have mastered the Dental Admission Test. When they leave four years later, their career has been shaped by the professional socialization processes and the generally accepted standards that often define the accepted boundaries of dentistry for its practitioners. The student participants were examined closely for what they brought to the dental school as individuals. The supplementary attributes that a dental student brings to the school often distance the student from his or her colleagues; in some cases, they may bring them closer together. The unveiling of the dental school's pedagogy is relevant to this study and its findings. In order to unravel this pedagogy, it was necessary to deconstruct the educational space of the first- and fourth-year dental student. My research questions focus on how the socialization process in this dental school contributes to students' professional socialization and construction of their professional identities. What does the process of professional socialization look like in the school of dental medicine? What factors (curricular, social, and administrative) influence the process itself? How do these factors present themselves within this educational space? The primary questions were supplemented by additional questions that provided significant and relevant information. How does a student empower himself or herself in this school? Is a student able to express his or her individual identity in the dental school? How does one express one's individuality? How does a student become a part of the mainstream group within the dental school? Are conflicting messages prevalent in the dental school? If yes, how are they articulated within this educational environment? Are relationships between faculty and students collegial or adversarial in nature? What is the consequence of such interactions? To what extent does a hidden curriculum or agenda exist within the school? How does it manifest itself within this educational milieu? Examination of these concerns en masse allows one to fully absorb the culture of this dental school and consider the process of professional socialization in a step-by-step fashion. Students form a collective identity with their classmates, faculty members, administration, and the profession of dentistry itself. Some dental students maintained their personal identity. Others felt that abandoning one's personal identity is necessary to survive in the dental school. Collegiality between the faculty and the students or its lack was noted. Faculty members function as socializing agents and positive and negative role models. The presence of the academic perspective during the preclinical and clinical experiences appears to create an atmosphere of confusion and disconnect among the student population, as they attempt to learn the role of their chosen field.

276. Interprofessional Ethics Education for Dental and Dental Hygiene Students: Student Perception Versus Student Performance

Irmgard U. Willcockson; Nathan Carlin and Catherine M. Flaitz, University of Texas Health Science Center at Houston

In many health professional schools, ethics education is woven through the curricula with the goal of providing students with a knowledge base in health professional ethics as well as critical thinking skills to make sound ethical choices in practice. Students are often exposed to more sophisticated problems as they gain more experience. This is the approach at the University of Texas Health Science Center at Houston Dental Branch (UTDB). The University of Texas Health Science Center at Houston (UTHealth) launched a campus-wide interprofessional ethics program in 2009. To obtain baseline data on the effectiveness of current curricula in UTHealth's six professional schools, representative upper class students were invited to participate in a ten-question survey, following approval from the Institutional Review Board. Part I of the survey asked the students to rank the perceived amount of time spent on addressing didactic content (seven subparts) and clinical/laboratory learning and training (seven subparts), ranging from no time to too much time. A combined score of 21 indicated that students felt that the right amount of time was spent; lower scores indicated that students felt too little time was spent. In addition, students were asked to rank their level of comfort in identifying, analyzing, and resolving ethical and professional issues (seven subparts), ranging from very comfortable to very uncomfortable. Part II of the survey focused on evaluating the students' ability to identify and solve an ethical dilemma. Students were asked to describe an example of an ethical or professional dilemma that they had encountered, its significance, options for addressing the issue, and supporting arguments for achieving the best course of action. Standardized reviewers, using an ethics and professionalism rubric, scored the open-ended questions (score range 4–12). Data were entered for statistical analyses using the Statistical Package for the Social Sciences (SPSS) software. The survey results included a sample of students at six health professional schools: sample=832, responses=437 (52.5 percent). From UTDB, 117 were surveyed, and ninety-three responded (79.5 percent; fifty-seven dental students, thirty-six dental hygiene students). Both groups reported that almost the right amount of time was spent on ethical issues in both coursework (mean=19.45; nine students rated >22) and clinical/laboratory training (mean=19.54; eight students rated >22). When asked how comfortable they were in dealing with ethics and professionalism, sixty-eight students (75 percent, n=91) indicated that they felt overall very comfortable or comfortable with no statistical difference between dental and dental hygiene students (two-tailed Students t-test, p=1). When asked to estimate the need for ethics and professionalism training, three (3 percent) students responded that it was not needed, nine (10 percent) somewhat needed, thirty-eight (41 percent) needed, and forty-two (45 percent) absolutely needed (n=92). The scores on the open-ended questions regarding ethical dilemmas showed lower levels of knowledge and application. The average combined score for the open-ended questions asking students to describe an ethical dilemma was 5.0 out of 12 (SD=1.5, 42 percent) for the dental students (n=37) and 4.5 out of 12 (SD=1.1, 38 percent) for the dental hygiene students (n=23). There was no statistically significant difference between the two groups (two-tailed Students t-test, p=0.13). The qualitative results were striking between the two student groups. While there was no statistical difference between dental and dental hygiene students with regard to performance, there were differences in the types of issues that the student groups identified as ethical concerns. Dental students raised concerns about cheating—specifically, being

sick on test day to gain an advantage over other students—as well as concerns about overtreating patients for the sake of fulfilling clinical requirements. Dental hygiene students did not raise these concerns, perhaps signaling programmatic differences between the dental and dental hygiene curricula. Dental hygiene students raised concerns about the hierarchy among health professionals, in particular the dentist-dental hygienist relationship, and they expressed confusion over their role in diagnosis of disease. The two groups did identify common ethical issues as well. These included issues such as 1) how to deal with interpersonal issues related to patient care (e.g., how to handle difficult patients or how to implement the process of informed consent when there are language barriers in place); 2) disagreement over best treatment, whether with a colleague or with a patient; 3) how to navigate difficult relationships with faculty (e.g., what to do when a faculty member is demeaning); and 4) problems with the system, such as how to deal with insurance companies that seem to make unfair decisions or how to manage conflicts between accepted best practice standards and individual office policies and procedures. While both dental students and dental hygiene students felt that ethics education was important and that sufficient time was spent on this topic, students were unable to identify and analyze an ethical dilemma and its resolution adequately. These findings appear to be universal among health professional students in an academic health science center, although specific examples of unethical behavior tend to be school-based. As the UTHealth interprofessional ethics program is implemented throughout the campus, further research will examine how this new curriculum impacts students' perceptions, as well as performance, among and within the schools.

278. Research in Prosthodontics: A Ten-Year Observation of Trends in Topics, Collaboration, and Funding

Damian J. Lee, Judy C. Yuan, Kent L. Knoernschild, Stephen D. Campbell, and Cortino Sukotjo, University of Illinois at Chicago

Three peer-reviewed prosthodontic journals were used for the analysis of articles published from 1998, 2003, and 2008. The articles were analyzed based on associations between the types of article, types of original research, collaboration, and funding. Chi-square test and logistic regression test were used for data analysis (alpha=0.05). An increase in original research and collaboration was observed from 1998 to 2008. Studies that reported funding remained constant. A strong association with collaboration and funding was observed, along with studies involving clinical care, education, public health, and dental materials.

279. A Combination of Team-Based Learning and Conventional Lecture-Based Teaching Approach in a Preclinical Removable Partial Denture Module

Reem N. Haj-Ali, University of Missouri-Kansas City

Course material was transformed into seven conventional lecture-based and seven team-based learning (TBL) sessions. Students (n=98) were divided into small groups of five or six. Each TBL session consisted of preassigned reading, in-class individual and group readiness assurance tests (IRAT, GRAT respectively), group application projects (GAP), and faculty-led class discussion. Students' performance was evaluated through assessments during TBL sessions (IRAT, GRAT, GAP) and through course final written exam and final practical exam. Correlations between TBL scores and final exam results were analyzed using linear regression, while independent t-test was used to compare final examination scores to previous year scores (n=94). Student course evaluation and faculty feedback were also collected. While students' final written exam mean scores were

comparable to last year's scores, practical exam mean scores were significantly higher. TBL is an effective active-learning instructional strategy for courses with large student-to-faculty ratios. It provides students the opportunity to become self-directed learners and develop higher reasoning skills.

282. Summer Medical and Dental Education Program: An Interprofessional Academic Enrichment Program at the University of Texas Health Science Center at Houston Dental and Medical Schools

Paula N. O'Neill, Philip P. Pierpont, Andrew Harper, and Judianne Kellaway, University of Texas Health Science Center at Houston; Martha Robertson

The University of Texas Health Science Center at Houston (UTHealth) Dental Branch and Medical School's Summer Medical and Dental Education Program (SMDEP) is a tuition-free six-week preparatory program that includes students with a wide range of economic, cultural, racial, and ethnic diversity. The program includes intensive and personalized medical and dental school preparation experiences to facilitate students' acceptance into professional school. Each year, eighty SMDEP students are offered enrichment courses in organic chemistry, physics, anatomy and physiology, microbiology, and calculus. Laboratory experience in the human anatomy facility is also provided along with dental and medical simulation experiences. As a part of their orientation all students are pretested in the five core courses to assist the faculty in the preparation of materials targeted at specific needs of the students. The overall purpose of the UTHealth SMDEP is to provide academic enrichment courses including organic chemistry, physics, anatomy and physiology, microbiology, and calculus. The six-week program offers rising sophomore and junior college students intensive and personalized medical and dental school preparation through an intense exposure to basic sciences, clinical dentistry and medicine, ethics/cultural competence, financial management, health policy, humanism, professionalism, communication and study skills, preparation for professional school application, and career counseling for students who want to attend dental or medical school. The SMDEP is a nationally funded initiative by the Robert Wood Johnson Foundation supported by the American Dental Education Association and Association of American Medical Colleges (AAMC) through the National Program Office and involves only twelve professional schools across the United States. The UTHealth SDMEP had as a major program objective the academic assessment of its core courses to ensure that academic enrichment courses presented to the students have adequate rigor and significant outcomes. To demonstrate those programmatic outcomes, all eighty students have been academically assessed each year in all five of the core courses. Since the inception of the program, students have been surveyed prior to beginning each of the classes to determine whether they have had any of the five core courses and what grades were earned upon completion of the course if they had taken it. During the program orientation on day 2 of the program, a twenty-item pretest is administered in the five core basic science courses. Each item of the pretest is worth five points totaling 100 points if all items are answered correctly. All tests are reviewed for content validity by departmental faculty members as well as the SMDEP Curriculum Coordinator from San Jacinto College, who provides oversight for the faculty and the courses taught. At the conclusion of the program, the parallel posttest is administered. The pre- and posttest scores are then averaged, and the total points earned by each student, as well as all students in each course, are averaged. In the five years since the SMDEP began, the scores are calculated annually for pre- and posttests in each of the curriculum components described above. The analyses demonstrate significant differences from pre- to posttests in all five core courses.

Over the five years, in anatomy and physiology the average gains from pre- to posttest (44.6 to 68.4 points) equaled 23.85 points; in physics the average gains (30.5 to 56.8 points) were 26.3 points; in calculus the average gains (50.6 to 77.4 points) were 26.7 points; in microbiology the average gains (48.4 to 74.5 points) were 26.11 points; and in organic chemistry the average gains (42.2 to 62.7) were 20.51 points. Based upon the pre- and posttest outcomes reported since its inception, it is apparent that the SMDEP has been successful in enhancing the academic preparation of the eighty students who have participated each year since 2006. Very preliminary reports from the National Program Office at AAMC for years 1 and 2 of our program indicate that our former SMDEP students who apply to either medical or dental school are successful in their quest to gain admission.

283. Effective Use of Skype Videoconferencing and an Audience Response System (Clickers) in a Blended Learning Dental Hygiene Course

Lisa A. Harpenau, William P. Lundergan, Gretchen Bruce, Jace Hargis, and Deborah J. Horlak, University of the Pacific Arthur A. Dugoni School of Dentistry

The dental hygiene (DH) 130 course integrates periodontal surgical therapy into the dental hygiene curriculum and is taught by periodontal faculty members from a separate campus, located eighty miles away. The class size of DH 130 is twenty-four students, which is ideal for small-group interactive methods of teaching and learning. However, the three-to-four-hour drive to the dental hygiene campus and back is simply not practical. The DH 130 course has traditionally been taught via videoconference using a station-to-station system, which allows students to view PowerPoint slides and hear the instructor. Faculty members can see and hear students, but interaction is difficult at best and students are easily disengaged. Our innovation for DH 130 was to employ Skype (a freeware desktop conferencing application), faculty offices, a classroom facilitator, an audience response system (clickers), and a more Socratic, inquiry-based method to increase interaction between faculty and students. Four Logitech cameras and four sets of Insignia speakers were installed in the offices of the four lecturers for the course. Skype technology allowed multiple displays on a single screen, making it possible for both students and faculty members to see each other, themselves, and the PowerPoint slides simultaneously. It also allowed the faculty members to lecture from the more comfortable environment of their own office with more immediate access to resources including textbooks, class photos, student performance data, etc. The audience response system enabled faculty members to assess student baseline knowledge and understanding of the material as it was being presented while allowing the students to be actively engaged in the learning process. Faculty members also used a Socratic method of teaching: posing questions and calling on students by name to begin a discussion. The students were unquestionably more engaged in the learning process. All four faculty members enjoyed the process, with the only negative response associated with the loss of control over the PowerPoint slide advancement and the mouse arrow for pointing (facilitator controlled). A survey of students indicated they appreciated the use of technology but preferred an in-person lecture format.

288. SARET: Interdisciplinary Program in Addiction Education and Research

Frederick G. More, Adina Kalet, Marc Gourevitch, Colleen Gillespie, and Madeline Naegle, New York University

The goal of this project is to increase the number of dental, medical, and nursing students who select careers in addiction research. The investigators in this project incorporated interprofessional expertise

in substance use, risk assessment, intervention, treatment, and research. The project plan was to 1) determine gaps in education on substance abuse and addiction research; 2) develop computer-based interactive modules to provide content; 3) create PICO questions as a foundation for exploring topics of interest; 4) incorporate ongoing interprofessional evaluation for all products and processes; and 5) recruit dental, medical, and nursing students into research projects with seasoned mentors. Content areas and research questions were developed. In addition, there was skill in curriculum design, content development, and applying technology appropriately to explore those questions. As a result, eight interactive computer-based modules were created to explore addiction research, research methods, neurobiology, and the social impact of alcoholism, risk assessment, treatment, epidemiology, and health policy. A student research program was implemented that matched dental, medical, and nursing students with experienced addiction researchers. Most mentors were in a different profession from their mentee. The student research program included a seminar series and collaborative projects with students from the three disciplines. As part of the curriculum in ethics and professionalism, dental students completed two modules. The linkage between substance use and oral health that are well established for conditions such as extensive caries (meth mouth) and oral cancer was the justification for including these modules. The modules are designed to provide background information to build an appreciation for the ubiquitous nature of substances in society and their own use of substances and to stimulate interest in the broader research questions that remain unanswered. In research, first-year dental students were recruited to apply for summer research projects. A total of ten dental students were selected for summer research grants. All were matched with seasoned researchers. Examples of their projects are data analysis for a project with HIV health interventionists, tobacco cessation programs for patients in inpatient and outpatient hospital setting, naltrexone clinical research project, and survey studies of dental and nursing student choices about substance use. During the past two years, nearly 800 dental students have completed SARET modules. A survey was done to assess the students' experiences with the modules. The survey was presented online, consistent with the students' experience with the SARET modules. The response rate was 65 percent. A complete analysis has been completed for one module: the Activation module, which presents an in-depth view of research technology applied to addiction questions. Overall, about 80 percent of dental students responded that their interest in substance use/abuse research increased to a level of somewhat or very interested compared with about 54 percent prior to completing the module. Fifty-eight percent of dental student respondents said they had experience doing research before attending dental school. Eighty-one percent of dental students responded that they were somewhat or very likely to view modules on basic science, risk assessment, and treatment of substance abuse. As a result of completing the module, a consistently high percentage of dental students felt they had a good sense of what is involved in conducting substance abuse research, found research to be very rewarding and satisfying, and could formulate a testable research question. An exit interview conducted at the completion of the 2008 and 2009 summer research program showed that dental students learned a significantly greater amount of information about addiction/addiction research and all made a connection between their summer research project and their future career as a dentist. All reported positive experiences from their interactions with other health professions students. The strength of this interprofessional approach has been to create interactive modules that were effective across the three disciplines. The interprofessional collaboration incorporated the perspectives, strengths, and experiences of persons with experience in addiction research, curriculum development, risk assessment, and treatment. The shared vision in this group has overcome barriers of

territoriality that can result from the shared vision and mutual respect. We conclude that 1) interprofessional collaboration is an effective means to create content-based education programs that meet the needs of each discipline and often exceeds the expectations of any given discipline; 2) dental students recognize the importance of education in substance abuse as part of their dental education; 3) research skill, not typically recognized as a core skill in dentistry, was viewed as important and interesting; 4) dental students recognize the importance of framing testable research questions; and 5) dental students can be easily recruited into interprofessional research opportunities and have a positive experience.

289. Evaluation of Outcomes Following Changes to the Tobacco Cessation Counseling Program at Dalhousie University Faculty of Dentistry

Peggy J. Maillet, Heather J. Doucette, Nancy R. Neish, Cara L. Tax, and Mary Ellen McCarvill, Dalhousie University

Tobacco cessation counseling (TCC) is provided to all tobacco-using clients of the Dalhousie Dental Clinic treated by dental hygiene students. A 2008 study found that improvement was needed, prompting changes in the curriculum. A TCC coordinator was appointed to manage and provide quality assurance for the program. In addition, a problem-based approach was adopted in teaching the didactic portion of the curriculum. Motivational interviewing techniques were introduced and implemented since they give the client a more active role in his or her therapy. The clinical TCC resources were updated and made readily accessible to students. Increased post-counseling and follow-up with the client were also implemented. It was further recommended that increased information on tobacco use be incorporated into patients' medical history and that an increased interprofessional approach to TCC take place with the dental students and other health professionals. With these recommendations, increased faculty development within the Faculty of Dentistry would also have to be implemented. The research method was of an experimental design. A current comprehensive literature search was done to update evidence and knowledge. The structured ten-question telephone interview regarding the current tobacco use status of Dalhousie Dental Clinic clients was duplicated from the 2008 study. The population was clients who had received TCC from September 2008 to May 2010. A target population of ninety subjects was extracted from axiUm, Dalhousie Dental Clinic's database, and a true sample size of sixty-two subjects was obtained. With the true sample size being sixty-two, the survey had a margin of error of 6.98 with a 95 percent confidence interval. The 2010 study found clients reported a quitting rate increase of 5 percent from 2 percent in 2008. There was a slight increase in the number of clients reporting quitting temporarily and also an increase in the number of clients who reported having reduced their tobacco consumption. It was found that the number of clients reporting being shown the method of self-examination for oral cancer has increased since the 2008 study. It was also found that 11 percent fewer clients reported being advised of the health risks associated with tobacco use than in 2008. The follow-up study shows that improvement has been made in some areas. However, the small sample size resulted in no statistically significant improvements to the TCC program. The TCC program will need to be monitored for several years to allow for an appropriate sample size. The most significant positive change or trend has been the increase in the oral self-examination technique. All other areas also had positive changes except for reported lack of information on health risks being taught. A possible explanation for this is that students were assuming that the tobacco users were already aware of the health risks and did not spend time on this important teaching area. The literature also supports that it is essential for tobacco users to receive information

from more than one source. The addition of interprofessional TCC seminars involving dentistry as well as dental hygiene may help with this area of tobacco education. Beginning in the fall of 2010, TCC has also been added to the dentistry curriculum at Dalhousie University. Discussions with local community colleges, which house the dental assistant program, have begun; this interprofessional sharing will hopefully lead to curriculum changes to incorporate TCC into their teaching programs. With more collaboration between the professions, the education for tobacco users will be more substantive. This study was conducted to evaluate changes made in the TCC curriculum of the dental hygiene program at Dalhousie. The incorporation of motivational interviewing techniques with increased knowledge of the transtheoretical model (5 As) and the National Cancer Institute's 5 Rs model has shown positive results within the TCC program. Further assessment needs to be carried out by the investigators to examine why clients feel they are not being advised of the health risks of tobacco usage. Continued emphasis must also be focused on ongoing interprofessional development of the TCC curriculum.

820. Impact of Economic Changes on Trends in Dental Hygiene Education

Judy Kreismann, Cheryl M. Westphal, Lisa B. Stefanou, Eva M. Lupovici, New York University

The results of the last released ADA Survey of Allied Dental Education (2008) were compared with those of the 2005 survey to assess trends in dental hygiene programs that may have been impacted by economic changes. The selected years for comparison represent pre- and existing downturns in the U.S. economy. Compared were trends in number of existing programs, tuition cost, first-year student capacity, number of applications versus actual enrollment, age, students with job/family responsibilities, financial aid requests, and financial aid awarded. In 2005, there were 285 programs compared to 301 in 2008, a 5.3 percent increase. The cost of tuition increased from 2005 to 2008 for out- and in-district students by 19 percent and 16 percent for out-of-state enrollees. The number of applications decreased by 5.6 percent in 2008 and 4 percent in 2005 compared with the previous year. There was a 1.2 percent increase in enrollment in 2008 and 4 percent increase in 2005 over the previous year. In 2008, 29 percent of applicants were accepted, as compared to 27 percent in 2005. The first-year capacity versus enrollment in 2005 was 95.2 percent, while in 2008 it was 89 percent. In 2008, the educational setting with the greatest increase in capacity and enrollment was in schools of allied health science and technical college/institute, with a 10 percent and 14 percent increase in student capacity respectively and 12 percent increase in enrollment in both educational settings. There was a 50 percent increase in the number of vocational schools compared to 2005 and a 66 percent increase in university-based separate dental departments. The vocational schools had a 66 percent increase in capacity and 64 percent increase in enrollment, while in the dental departments there was a 64 percent increase in capacity and 62 percent increase in enrollment. There was a 4 percent decrease in programs based in dental schools, with a 1 percent decline in capacity and 9 percent decline in enrollment. In 2008, there was a 3.19 percent increase in students enrolled whose age was twenty-three and under and .9 percent to 1.6 percent decline in students aged thirty and older. There was a 7.3 percent increase in enrollment of Hispanic students, 4.4 percent in black students, and 7 percent in Asian students. In 2005, 58.3 percent of first-year students declared job/family care responsibilities, 63 percent of students requested financial aid, and 53 percent were approved for financial aid. In 2008, 60 percent reported having job/family responsibilities, 68 percent requested financial aid, and 58 percent received aid. Based on the comparison results, the impact of the change in the U.S. economy for 2008 programs

was a decrease in number of applications, an increase in number of educational settings with lower tuition base, and increases in capacity, enrollment, and requests for financial aid. The student population has greater ethnic diversity, is younger, and has greater job/family responsibilities. These findings could be applied in developing future recruitment strategies by dental hygiene programs.

New Programs

166. Dermatology and Oral Medicine Grand Rounds: A Unique Opportunity for Interprofessional Education

Michael A. Siegel, Carlos H. Nousari, and Tracy Favreau, Nova Southeastern University

A unique educational program has been created by Nova Southeastern University (NSU)'s College of Dental Medicine (CDM) and College of Osteopathic Medicine (COM). Many diseases of the skin have manifestations within the oral cavity. For example, lichen planus is a common dermatopathosis with cutaneous manifestations on the sun-exposed skin. Both dentists and dermatologists can cross-utilize these clinical signs to enable a proper and accurate diagnosis and to establish referral sources to ensure that both clinical sites are managed properly. Two board-certified dermatologists and a board-certified oral medicine specialist host eight dermatology residents from local hospitals in a clinical setting to evaluate skin and oral lesions in patients referred for this purpose. The clinical setting utilizes the NSU Dermatology and Oral Medicine Clinics that are situated next to each other in the COM. One Thursday each month, patients from outside practitioners are scheduled (approximately twenty-five patients/month). First-year, second-year, and third-year dermatology residents are grouped together and assigned patients for presentation to the dental and medical attending faculty (mentors). Patients are present, allowing for direct patient-resident interactions during history acquisition, physical examination of the skin and the oral cavity, differential diagnosis, medical laboratory analysis, procurement of oral and cutaneous biopsies, diagnosis, and management strategies. The dermatology residents participate in the entire process for each of the patients assigned to them and are held responsible for all aspects of care for these patients as well as follow-up with the referring physician. Oral biopsies are obtained for routine evaluation (hematoxylin and eosin) as well as direct and indirect immunofluorescence, exposing the dermatology residents to local anesthesia and biopsy techniques they would not otherwise learn. Moreover, because some of these conditions can occur in the oral cavity prior to cutaneous manifestations, the dermatology residents begin to understand the importance of interprofessional management to afford the patient a diagnosis at the earliest possible time. The most important aspect of this program is to show the dermatology residents the benefit of interacting with dentists on cases in which the oral cavity might provide them with diagnostic information not attainable via cutaneous examination. The residents are exposed to terminology and other aspects of dentistry not learned as part of a traditional medical education. The program's objectives were evaluated by a ten-question survey with each item rated on a five-point scale. The survey was distributed to all eight dermatology residents. There were four females and four males with an age range of thirty-one to forty-one years. The response rate was 100 percent. Overwhelmingly (overall average across all questions=4.45/5.0), the residents felt that this program enhanced their medical training, improved patient diagnosis, management, and access to care, and exposed them to dental manifestations of cutaneous diseases. The

results further indicated that the residents felt this program was unique, allowing for better interprofessional relationships with their dental colleagues. The residents also felt that they would be more likely to interact professionally with their dental colleagues once in private practice. This new interprofessional program was successful in exposing dermatology residents to the interactions between specialists in dermatology and dentistry (oral medicine) by utilizing case-based learning to teach about oral manifestations of dermatologic disease. This program encouraged interprofessional evaluation of patients for improving diagnosis, management, and access to care.

168. Electronic Evaluation of Applicant Interviews: Facilitating the Process

Steven C. Levine and Daniel H. Bair, *University of Pittsburgh*

The number of applications for dental school has been increasing over the past several years. With this increase comes the need to identify from a list of academically qualified applicants the best candidates who also possess the noncognitive qualifications to be successful in our school as well as the dental profession. Assessment of the candidate's demeanor, maturity, motivation, shadowing experience, interpersonal skills, personal essay, and letters of support by faculty interviewers has traditionally been submitted in writing following the interview using a standardized hard copy form that requests objective and subjective information regarding the candidate. However, these forms must then be processed by hand to provide documentation for committee review, which results in a significant delay of final determination to accept the applicant. In order to streamline this process, the University of Pittsburgh School of Dental Medicine has developed an online interview evaluation form that permits faculty members to submit a summary of their assessment electronically that can then be collated and presented in a more timely manner to the Admissions Committee for further review. This system should facilitate the interview process, ensure confidentiality and accuracy of the documentation, and hopefully be effective in encouraging more faculty members to participate in the dental admissions process. At the conclusion of the current admission cycle, the admissions committee will survey faculty members who have used this electronic evaluation to determine if this system does facilitate the interview process. Future development of this online evaluation form will be based on an outcomes assessment process that has been developed by the members of the Admissions Committee.

169. Recruiting URM High School Students into Dentistry and Dental Hygiene Programs: Development of a Structured Educational Program and Student Mentoring

Marita R. Inglehart, Stephen J. Stefanac, Brittany R. Williams, Anne E. Gwozdek, and Kenneth B. May, *University of Michigan*

In 2004, the Sullivan Commission published the report *Missing Persons: Minorities in the Health Professions.* This report showed that students from underrepresented minority (URM) backgrounds are disproportionally less likely than other students to be enrolled in health-related professional programs. The American Dental Education Association in collaboration with the W.K. Kellogg Foundation therefore funded a project in three U.S. dental schools to explore how the numbers of URM high school students in dental school programs could be increased. This poster describes a new health elective class for high school students that introduced them to these careers and was complemented by an extensive mentoring program. Key features of this program were the following. High school students signed up for a Saturday morning program (9:00 a.m. to 12:30 p.m.) that started in the first week of October and ended

in the last week of March. Every high school student was paired with a junior or senior dental or dental hygiene student as a mentor. During the fall term, the classes took place in the media center of the high school, and in the winter term the students came to the dental school building. During the fall term, the students were introduced to issues concerning oral health of children and adults, disparities in the access to oral health care services, and oral health-related careers. In November, they organized and conducted a health fair in the cafeteria of their high school. During the winter term, the students learned about clinical dentistry (HIPAA, sterilization, setting up a cubicle, patient records, X-rays, dental treatment) and about dental specialties. They shadowed their mentors during two free Saturday clinics, with the first clinic focusing on pediatric patients (Give Kids a Smile) and the second clinic on adult patients. In August 2009, thirteen junior and senior dental hygiene students and twenty-two junior and senior dental students volunteered for this program. Twenty dental and four dental hygiene students were selected by the project team to participate as mentors. In September, these mentors visited the high school and recruited twenty-three high school students into the Saturday program. The high school students received one credit for a health class for participating in this program. The mentors received financial compensation for participation. The program started in October and ended on the last Saturday of March. Survey data were collected from the mentees and the mentors before the program, at the end of every Saturday session, and at the end of the program. Seventeen students received full credit for participating in this program, and one student received half a credit for his participation; two students attended only one class and then dropped the program; two students attended only the fall program and therefore did not receive any credit. Concerning the baseline survey results, the data showed that both dental and dental hygiene mentors were highly interested in becoming a mentor (on a five-point scale with 1=low interest: dental students 4.73, dental hygiene students 4.73) and looked forward to talking with the high school students (4.80, 4.81) and to developing a mentoring program (4.47, 4.38). The mentees were also very interested in participating in this program (mean=4.18), wanted to talk to dental students (mean=4.18), and looked forward to learning more about dentistry (mean=4.41). When the mentees were asked at the end of the Saturday sessions how much they looked forward to the next Saturday session, their responses ranged from an average score of 4.24 to a high of 4.92 on a five-point scale. They rated the Saturday activities as rather interesting with means ranging from 4.24 to 5.00. On the whole, hands-on activities received more positive evaluations compared to lecture-based programs. At the end of the program, the mentors agreed that the mentees had learned a lot about how to get into dental school (mean=4.55), what dentistry is all about (mean=4.50), and how to keep teeth healthy (mean=4.32). The mentees also agreed that they had learned a lot about how to get into dental school (mean=4.00) and what dentistry is all about (mean=4.36) and agreed that they wanted to go to college (mean=4.73). The collaboration with the high school administration was a crucial factor in the success of this program; the level of parent involvement was crucial as well. Involving dental and dental hygiene students in recruitment outreach and mentoring activities during a structured educational program for high school students was quite successful. Most high school student program participants showed a high level of commitment to the program and developed a good understanding of oral health-related issues and careers. Most importantly, they increased their interest in continuing their education after high school by attending college. Future activities have to explore how to develop an ongoing relationship with these students that continues after the structured program is concluded. This program was supported by a grant from the American Dental Education Association and the W.K. Kellogg Foundation.

171. Searching Effectively and Efficiently for Accurate Answers to Clinical Questions Utilizing Interprofessional Collaborations to Optimize Training and Teaching

Andrew B. Schenkel, Richard McGowan, and Mark S. Wolff, New York University

Evidence-based decision making (EBDM) is one of the driving forces in our health care delivery system today. It is an aspect of dentistry and dental education that is ideal for taking advantage of opportunities in interprofessional teaching and learning. The theories, processes, and applications of EBDM are the same across all fields of health care and provide the perfect opportunities for collaboration. Many fields can be tapped for their expertise in order to optimize its learning and teaching. Acquiring the literature needed to answer a clinical question is usually presented as the second step in the EBDM process. This poster will outline the steps and describe the process necessary for the searching experience to prove efficient and effective. Through the collaboration established between New York University's College of Dentistry and the Medical Center Health Science Library staff, we will show how to comfortably and confidently apply the principles and practices of EBDM in searching existing databases in order to obtain the literature to correctly answer clinical questions. This association has afforded us the opportunity for collaboration in this area with the establishment of courses and support for students and faculty members in the area of searching. The medical librarians' knowledge and expertise are essential for training students and faculty members searching for answers to clinical questions. This format for collaboration between library and dental school faculty and staff has formed the basis of our collaboration for teaching and learning effective and efficient searching strategies.

172. The Journal Club Is Dead! Long Live the Evidence-Based Decision Making Club!

Andrew B. Schenkel, Judith Haber, Mary Brennan, and Joan A. Phelan, New York University

Evidence-based decision making (EBDM) is one of the driving forces in our health care delivery system today. It is an aspect of dentistry and dental education that is ideal for taking advantage of opportunities in interprofessional teaching and learning. The theories, processes, and applications of EBDM are the same across all fields of health care and provide the perfect opportunities for collaboration. Many fields are ahead of dentistry in adoption of EBDM, so rather than reinvent the wheel, expertise can be tapped to optimize its learning and teaching. An EBDM club provides a format that allows participation and buy-in of the process by the clinical faculty in the dental school. At New York University College of Dentistry our close association with the College of Nursing afforded us the opportunity for collaboration in this area with the establishment of an evidence-based practice steering committee. This facilitated the integration of EBDM throughout the curriculum. When this integration was complete, the committee suggested that we try the EBDM approach ourselves in the form of a journal club. It quickly became apparent that the traditional journal club format was at odds with the process of EBDM. Journal clubs have long been used in health care settings as a means of disseminating health care information. This poster will outline the history and evolution of the typical journal club and examine whether this format is appropriate in today's world of EBDM. We will illustrate how to convert a journal club into its natural modern iteration as an EBDM club. We will also illustrate the components necessary to start a club from scratch if no journal club exists. Data will be presented from the literature representing journal club experiences from multiple institutions as well as our own. This data will form the basis of our suggestions for the format of a modern EBDM club.

173. Oral Health of Children with Special Health Care Needs: Multidisciplinary Working Collaboration with a Children's Hospital and Community-Based Groups

Romer A. Ocanto, Stephen N. Abel, and Oscar A. Padilla, Nova Southeastern University; Eric Cameron

The need for oral health care continues to be the most prevalent unmet health need among U.S. children and adolescents with special health care needs (SHCN) ages seventeen and under. In addition to the unmet needs, the issue of increasing access and utilization of dental services for Florida residents with SHCN must consider both the availability of care and the willingness of the person with a disability to seek and utilize necessary care. Nova Southeastern University College of Dental Medicine (NSU-CDM) and Memorial Healthcare System-Joe DiMaggio Children's Hospital (JDMCH) in Hollywood, Florida, established a partnership in 2007 to develop and implement a collaborative oral health education and training program for the treatment of children with SHCN by pediatric dental residents. The Center for Craniofacial Pediatric and Special Needs Dental Care was created through the Training in Primary Care Medicine and Dentistry grant provided by the U.S. Health Resources and Services Administration, Bureau of Health Professions. The planning and implementation of the program emphasized three major components: education, clinical training, and increased access to care. Didactic education was provided to pediatric dental residents on oral diseases and conditions associated with pediatric SHCN. An oral health curriculum was developed with the participation of medical providers (mostly department heads) at the hospital and members of the pediatric dentistry department at NSU-CDM. The curriculum included craniofacial anomalies, medically compromised children, and children with SHCN. Topics included normal growth and development, seizure disorders, mithocondrial disorders, spina bifida, muscular dystrophy, mental retardation, infections of the mouth, the HIV/AIDS-infected child, kidney disease and renal transplants, nonpharmacological strategies for anxiety and pain control, obstructive sleep apnea, asthma, cystic fibrosis, ENT for the pediatric dentist, GERD, genetic disorders, and pediatric oncology. In addition, a self-study section on sedation and pain control has been implemented; its main focus is to review sedation guidelines and how common conscious sedation drugs can interact with other drugs and the potential side effects when used among children with SHCN. All pediatric dental residents in the program provide dental treatment to children with SHCN. On-site training on how to handle these populations and their parents, caregivers, or guardians is provided by faculty members who have received one or two years of training on treating children with SHCN. Residents perform preventive and comprehensive care, and a more effective referral system and OR scheduling have been established with the hospital for those children requiring treatment under general anesthesia. The program has also identified residents who will dedicate more than 50 percent of their time treating children with SHCN upon graduation, and these individuals spend more time in the clinic, are assigned a greater diversity of challenging cases, and have focused their required research on specific special needs topics such as sedation for the special patient, autism, and craniofacial anomalies. The dental clinic opened in January 2009. Four dental operatories are fully equipped to provide comprehensive dental treatment five days a week. First- and second-year pediatric dentistry residents rotate through the center and complete other hospital rotations (anesthesia, ER, oral medicine, craniofacial center team, OR) at the adjacent hospital. The target populations of children treated include children and adolescents with

craniofacial anomalies who attend the JDMCH Cleft and Craniofacial Center. In addition, treatment is provided to children served by Children's Medical Services (CMS). CMS is a collection of programs coordinated by the Florida Department of Health and is designed to help children with a variety of conditions. Close collaboration has been established with CMS case managers to ensure patient attendance and compliance with treatment. Children referred to the center by CMS come from six counties in south and central Florida and are all Medicaid recipients. Approximately 2,000 children have been treated in the center since operations started in January 2009. Due to the nature of their medical conditions, residents are now able to treat these children in close collaboration with other health care providers (physicians, psychologists, nutritionists, social workers). The constant interaction with hospital staff has greatly contributed to pediatric dentistry faculty members' and residents' being recognized and respected as valuable members of the health team among the hospital's pediatric specialties. Because of the diversity of complex medical problems many of our patients present, our residents are now preparing and doing grand rounds presentations that are truly interdisciplinary and include the participation of several dental and medical specialties working together in the treatment planning and comprehensive care of the patient. Over a period of eighteen months since the opening of the dental clinic we have provided comprehensive dental treatment to over half of what was originally expected. We firmly believe the success of the project is largely due to our ongoing collaborations. Having different groups working as equal partners due to institutional agreements has enabled us to plan and implement a didactic and clinical program that will benefit those residents of the state with the least access to oral care.

174. Cooking with Glass: Learning from World-Class Ceramists

Steven Resnick, Eric S. Studley, Mihaela M. Harutunian, and Ralph P. Cunningham, New York University

Today, world-class esthetic dental ceramists possess tremendous knowledge in regards to esthetics of individual teeth, esthetics of arch form, esthetics of smile design, and esthetics of the dentition within the frame of the lips and face. They are truly professionals deeply involved in oral care. In today's dental curriculum, less and less time is being spent by students creating their own restorations. In an attempt to improve our students' knowledge and abilities in envisioning and creating natural esthetic restorations and beautiful smile designs, we brought our students to a commercial dental laboratory to view and learn from dental ceramists known as being among the best in their field. The students observed esthetics being created from the inside of the restoration outward. They observed the ceramists using a fixed space to create different smile designs. They were made aware of the precise attention to detail needed to create an esthetically excellent restoration and how technicians use photographs and lab instructions to fulfill the needs of the doctors they work with. In order to assess whether this trip outside the confines of our college was beneficial, a group of students were evaluated for knowledge and skills by way of a written exam and a practical exercise prior to the trip. A comparable but not identical written exam and practical exercise were given to the same group following the visit. The exams and exercises were judged by predetermined standards and methods. The experiences of our visit and the results of our assessment will be presented. A clear measurable increase in knowledge and skills can be demonstrated in a group of dental students following a visit to a commercial dental laboratory featuring world-class esthetic ceramists. This educational gift to the future members of our profession is a creative and enjoyable methodology in the enhancement of knowledge and skills.

175. Interprofessional Faculty Development Institute: Empowering Leaders in Advanced Teambuilding

Elizabeth S. Pilcher, Mary Mauldin, Samar Hammad, Carol McDougall, and David Howell, Medical University of South Carolina

The Interprofessional Faculty Development Institute was designed to meet an increasing demand for faculty members with the knowledge and skills to help students and colleagues work in interprofessional environments. The institute was designed and implemented as part of a university-wide quality enhancement plan focusing on interprofessional education. Graduates of this institute are expected to achieve the following objectives: 1) explain the importance and relevance of interprofessional education and building effective teams in a health care setting, 2) develop and teach advanced teambuilding skills, 3) analyze examples of effective interprofessional health care teams, 4) develop communication skills for an effective interprofessional environment, 5) examine obstacles to building an effective team, 6) practice negotiation and conflict resolution skills, 7) identify and use appropriate measures for outcome management, 8) participate in interprofessional experience with students, and 9) develop and participate in at least one interprofessional project. The institute was offered in both 2009 and 2010. Participants averaged a class size of eighteen and represented all of the six colleges at the Medical University of South Carolina (MUSC) as well as the clinical enterprise and hospital system. The format of the institute consisted of six half-day interactive sessions over a six-month time period and the development of individual projects focusing on interprofessional education. Participants were interviewed prior to the commencement of the program and again midway through the program to assess their expectations. The program curriculum was tailored to meet the needs of the participants as appropriate. The six sessions included topics of team concepts and roles of team players, impact of culture, gender, race, and power on teams, communication in health care, negotiation skills, problems within teams, and assessment of interprofessional education and team construction. A pre- and posttest of interdisciplinary education perception was administered to the participants. Each participant was also asked to evaluate the institute by individual session and in its entirety. Scores on the Interdisciplinary Education Perception Scales improved in the area of perception of actual cooperation. This showed a statistically significant improvement in year one. The remaining scales, while improving, did not show a statistically significant change. However, participant evaluation of the institute was very favorable. Eighty percent of the participants in year two felt the experience was either very positive or positive. Eighty percent also reported an increased desire to participate in interprofessional efforts, felt more qualified to teach teambuilding skills, and felt that participation in this program increased their desire to become involved in interprofessional efforts. Seventy-three percent felt that the institute improved their communication skills. Connecting and understanding roles of colleagues in the institute were cited as the most valuable aspects of the experience. The results of the individual session evaluations showed a very positive response (over 80 percent) to the sessions on team skills, impact of culture, gender, and race, communication, and conflict negotiation. The sessions on management of successful teams and outcomes assessment of interprofessional education were perceived as less valuable. As a result of this evaluation those sessions were changed in year two to reflect a desire for more interactivity. Based upon participant evaluations, we feel the experience is valuable and recommend continuing the program in the future. Each year the content and format of the institute change based upon feedback from the participants. Feedback from year two reflected a desire to clarify and support the project phase of the institute. It is anticipated that the institute will continue with a third cohort in 2011.

176. A Program to Recruit and Mentor Future Academic Dentists: Successes and Challenges

Melanie Gironda, Diana V. Messadi, Carol A. Bibb, Karen H. Lefever, and Clarice S. Law, University of California, Los Angeles

There is a continuing shortage of academic dentists due to myriad factors, yet each graduating class of dental students includes a select group who persist in seeking and finding academic positions. It is this group of potential academic dentists that this four-year project has targeted with the intent of increasing their numbers and mentoring them for success in a future faculty position. This presentation highlights successes and challenges of recruiting, mentoring, and providing professional development to the next generation of academic dentists. The recruitment to the academic track program has targeted candidates from a variety of sources including those enrolled in the dual D.D.S./M.S. and D.D.S./Ph.D. programs, dental residents, Ph.D. candidates in other disciplines, and predental students. Participants receive teaching, leadership, mentorship, and learning community experiences as well as individualized guidance. The academic track was able to capitalize on existing research and teaching apprenticeship programs at the University of California, Los Angeles School of Dentistry. The track faculty designed leadership development and mentoring programs to prepare participants for roles in academia or community health. A monthly learning community, linking students with faculty from within the School of Dentistry as well as across institutions and disciplines, provides additional opportunities for mutual mentoring and informal networking. Participants are asked to rank these academic track components (teaching apprenticeship, research training, mentoring workshops, learning community, and individualized guidance) according to their entering priorities and again during a follow-up interview. Biannual interviews with each track participant and their yearly progress reports provide data for monitoring participant progress and outcomes of various track activities. The eighteen participants accepted to the academic track program during the first two years are from the following programs: three pediatric dentistry residents, ten D.D.S./Ph.D. students, three D.D.S./M.S. students, and two predental students. Two participants (D.D.S./Ph.D.) withdrew due to their lack of interest in academic dentistry. Priority ranking of components from each participant at initial interview and at one year follow-up interview demonstrates that opportunities to develop good teaching pedagogy is the highest priority among track participants. The next priority is establishing strong mentorship relationships, followed by training in leadership skills. Examining qualitative data from track participant progress reports and individual interviews indicates that participants view the teaching apprenticeships as a major strength of the program and these positive experiences reinforce their commitment to an academic career. Time management is the major challenge for all participants. Many of the D.D.S./Ph.D. and D.D.S./M.S. participants report difficulty balancing workload and requirements of the dual degree programs, especially in years one and two of the D.D.S. program. Other challenges include finding financial support, access to research mentors, and prioritizing activities. Recruitment to the academic track requires targeting candidates from a variety of sources with the least effective outreach being that to predental programs. It appears to be premature to inform students about careers in academic dentistry before they have actually entered dental school and had an opportunity to interact with faculty role models. Teaching apprenticeships seem to be a key element in designing a successful academic track program due to the apparent widespread interest in teaching. Successful recruits seem to intuitively link teaching to an academic career; however, other aspects of academia such as research and leadership are elusive in the early years of dental school. Time management is a major challenge for academic track participants especially those in the dual degree programs. This finding mirrors the challenges they will face as academic dentists; thus, the advice and examples of successful mentors should be provided early in the process. Opportunities in academic dentistry vary widely among institutions, specifically at research-intensive versus non research-intensive universities. Therefore, individual mentorship that supports a variety of future pathways is recommended. This study was supported by NIDCR #R25DE018437-03.

178. Showcasing Excellence: Students Present Clinical and Scholarly Achievements During a One-Day, Campus-Wide Interprofessional Event

Jessie V. Vallee, Laura Reid, Marc J. Geissberger, and Philip M. Buchanan, University of the Pacific Arthur A. Dugoni School of Dentistry

During the course of dental studies, there are many students who produce remarkable clinical dentistry cases worthy of recognition. In addition, scientific research takes place, often without awareness or recognition from the larger student body, faculty, or others who might take an interest in this research. The clinical and research components of dental school education so often are kept separate from each other that it seems these two are not related. This is an unfortunate paradigm since the successes and advancements in clinical dentistry result from advances in research. We set out to bring these two worlds together by simultaneously celebrating student achievements in these separate areas and broadening the audience participating in the event to foster diversity of thought. Dental students, faculty members, associated laboratory professionals, alumni, patients, and researchers from other universities come together to celebrate our accomplishments. The result is an interprofessional environment of collaboration and learning that realizes the relationship between research and clinical dentistry and inspires creative thought from people with differing perspectives and expertise. Excellence Day was founded with two distinct purposes. To bring the exceptional dental care provided to patients at the University of the Pacific Arthur A. Dugoni School of Dentistry into the spotlight and to exhibit the depth of clinical and laboratory research being conducted throughout the year. Presented side by side, attendees can make connections between research and its impact on clinical care. Involving professionals from different backgrounds has given this event another purpose. It serves as an interprofessional forum for sharing ideas. The clinic floor is closed for an afternoon session on the day of the event. Students are assigned operatories to set up their clinical or research presentations. Presentations are organized by category. There are nine categories for clinical work: 1) aesthetic dentistry, 2) complex restorative dentistry, 3) removable prosthodontics, 4) dental supportive therapies, 5) implant dentistry, 6) CAD/CAM dentistry, 7) orthodontics, 8) second-year clinical dentistry, and 9) first-year preclinical dentistry. The following are categories for the research component: 1) faculty and student presentations, 2) senior research competition, 3) second-year research competition, 4) IDS student presentations, 5) dental hygiene research (from Pacific's Stockton campus), 6) orthodontic research, and 7) oral surgery research (from Highland Hospital program). On the day of the event, all students and faculty members wear their Pacific white coats, and all have a professional badge with a ribbon signifying their role in the day. Each research and clinical category is judged by a different panel of experts, including faculty members and staff from the Pacific family, university alumni, university dental materials vendors, partner dental laboratory owners, and university administration. Students presenting a clinical case are encouraged to invite their patient to participate in the event. We treat these patients as honored guests, giving them a name badge with an Honored Guest ribbon. They are invited into the operatory to answer questions and

serve as a testament to the student's work. The panel of experts circulates, views the presentations, asks questions, and ultimately votes for their collection of student presenters and their clinical cases or research. Prizes for top presenters in each category are given. These can be paid expenses to present winning posters at conferences (e.g., American Dental Association Annual Student Clinician Research Program, Hinman Symposium Conference) or recognition and a nominal monetary prize. This year, our aim is to link the research being done in the school with improved clinical outcomes and add one additional component, Pacific's outreach success, to Excellence Day. A vision statement for Excellence Day is being written to include three components: exceptional clinical outcomes, robust research, and community outreach efforts in our community and communities abroad. To further demonstrate the link between research and clinical outcomes, we will group related research and clinical cases, showing them side by side. Students will be asked to present research and the practical implications of that research, emphasizing the application of research to clinical outcomes. While Excellence Day is established as a premier event for our school and a number of alumni and university partners have participated in the past, we will be reaching out to our surrounding community of University of San Francisco Medical Center and Dental School, California Pacific Medical Center, and others to further broaden the scope of participants. We will also extend invitations to our international partners in Egypt and China. Excellence Day is an ideal venue for students to display the work they have done in the clinical and research settings. It can also highlight the positive community impact our students have made through outreach efforts locally and abroad. This one-day event is an opportunity to link together the way in which dental research ultimately affects patient care, can foster school spirit, encourage alumni support, promote interaction between professionals from diverse backgrounds, and create awareness of what a dental school can offer the members of a community.

179. Building a Genuine Collaboration to Enhance Cultural Competence: Women's Domestic Violence Shelters and Nova Southeastern University College of Dental Medicine

Stephen Abel, Hendi Crosby-Kowal, and Deborah Brimlow, Nova Southeastern University; Barbara Gerbert, University of California, San Francisco

Women who have recently fled their abusive homes to safety have an overwhelming number of needs. Domestic violence shelters and other community-based settings offer women survivors numerous services to address those needs. These include career training, counseling, child care, health care, food, lodging, and support. One critical lack in many of these women's lives is oral health care. In some cases, women presenting at shelters have oral injuries as a result of injuries from abuse. In fact, 60 to 90 percent of women in abusive relationships have head and neck injuries. In addition, perpetrators may keep survivors from receiving dental services for years or even decades. There is a need within the shelter community for well-trained oral health care providers to improve the quality of life for shelter residents, by reducing oral pain and increasing function, in a sensitive, nonjudgmental, comprehensive manner. Nova Southeastern University's College of Dental Medicine (NSU-CDM) recognized this need. We applied for and received funding from the Health Resources and Services Administration (HRSA) to form a working collaboration with three sites in Florida's Dade and Broward counties that provide residential and outpatient services to women survivors of domestic violence. The grant aims to train advanced education in general dentistry (AEGD) residents, empowering them to provide culturally competent oral health services to survivors of domestic violence. Once

NSU-CDM identified the shelters, we created an advisory board to oversee the development of the training and service provision. The advisory board is comprised of key administrators at the shelters, the dean of extramural programs at NSU-CDM, and experts in the field of domestic violence and dental education. The task of the advisory board was to review the literature; design a curriculum that focused on evidence-based practice and that included didactic, experiential, and evaluation components; and develop a plan for implementing and monitoring an on-site clinical program. The advisory board focused upon developing the training experience so that it would enhance the cultural competence of the dental residents participating in the program when on-site at the shelters. The curriculum was finalized and AEGD residents participated in a day-long didactic training. Elements of this training included lectures from experts in the fields of dental education and domestic violence; participation in the AVDR (Ask, Validate, Document, and Refer) domestic violence training, a multimedia, interactive, proven training for dentists; and a roundtable that included survivors of domestic violence who told their stories and a facilitated discussion between the AEGD residents and NSU-CDM faculty to address the residents' apprehensions and feelings about working in a domestic violence shelter setting. Comprehensive planning went into setting up the portable equipment necessary for two operatories at our first shelter site operational two to three days per week throughout the year. In partnership with each shelter we 1) identified shelter staff who could work with the NSU and the dental residents to schedule and support patients; 2) found appropriate space for a small dental clinic; 3) set up the equipment and supplies; and 4) developed a scheduling system for appointments. Upon completion of the training and establishment of the on-site clinics, residents participated in one-month rotations at the shelter. The collaboration has been in place for approximately two years, and we have provided oral health services for one year. During that time, we have had over 275 patient visits by women residing in the shelter and their children. The collaboration has been successful, according to reports from all constituents. The shelter residents appreciate having easy-to-access, free dental care provided by trained and professional staff who treat them with respect and sensitivity. The AEGD residents report that they have gained confidence in providing sensitive, expert dental care to the shelter residents and say that participation in this program has altered their perspective and given them a new appreciation for the needs of the target patient population. The shelter staff members confirm that their clients' lives have improved as a result of participating in our program. We believe that our project has been successful largely due to our ongoing collaboration. Having key stakeholders working as equal partners during the development and implementation phases has enabled us to create a culturally competent program and to provide critical guidance as to what our didactic and experiential training program should look like and how it should be implemented. This collaboration has therefore been instrumental in our ability to create a unique and successful training program. After having provided free dental care to seventy-six women and children within the shelter setting, we have learned that there are key components to creating an effective working collaboration. These include careful planning and frequent communication; comprehensive training and oversight; and cross-training shelter staff, clients, and dental residents so that each constituency understands and values the role of the others. We have been welcomed at the shelters with enthusiasm and have found that our collaborative approach has enabled us to change the lives of women who are in dire need of dental care.

180. International Dental Studies (IDS) Program: A Review of Student Satisfaction of a Two-Year Curriculum

Shika Gupta, Noelle Santucci, Patricia King, Bina Surti, and Philip M. Buchanan, University of the Pacific Arthur A. Dugoni School of Dentistry

A survey was designed with input of faculty members who taught the international dental students and the staff who are involved in the administrative part of the International Dental Studies (IDS) program. IRB approval was obtained. A ten-question survey was used, using a rating scale with 5 being excellent and 1 being very poor. Overall, the IDS students stated that they had a great educational experience at Pacific's IDS program. The results indicate that the program met their expectations and that they are now better prepared for practice and more competent than they were prior to attending the program. They felt the program in general was organized and that clinical experience was very close to that of a private practice model. To that end, their experience would definitely lead them to recommend the program to others. The survey also revealed some areas that the students felt should be evaluated and addressed. They found the program to be quick and fast-paced. Prior educational and clinical experience of the international dental student applicant may need to be looked at as a factor in the admission process because it influenced the pace and subjects in the curriculum. The diversity of the class needs to be embraced in the selection process. Transition to the clinic from the preclinical component of the clinical program needs to be analyzed, as the students would like more clinical time and more interaction with the D.D.S. classes as well as incorporation of a more structured research component into the program. A subcommittee is being formed to address the comments from the survey in our ongoing efforts to look into changes that can be made to improve the curriculum and enhance the admissions process. A more interdisciplinary and interprofessional approach may lead to better student experience and satisfaction. Our long-term goal is to survey successive IDS classes to determine the success of the implemented changes and share that information with the dental community.

181. Educational Tools to Enhance Efficiency in Predoctoral Endodontic Clinics at New York University College of Dentistry

Laurie R. Fleisher and Paul A. Rosenberg, New York University

This poster demonstrates specific educational tools used collaboratively to increase efficiency of clinical endodontic skills at the predoctoral level. The use of interactive and visual aids helps establish consistency, reinforcement, and self-evaluation by the predoctoral student. Beginning with a daily care plan, the student formulates his or her clinical treatment prior to the clinic session. This plan is reviewed by the endodontic faculty member prior to the commencement of treatment. The endodontic supply checklist is utilized for efficient preparation by the student to minimize his or her need to return to the supply area to supplement any missing material for the clinical procedure. This creates an awareness of the need for clinical efficiency. A visual aid that exhibits the endodontic clinic setup of instruments is present in all endodontic operatories as a guide. This streamlined approach of preparing in advance what is necessary for a procedure helps the student focus on the task at hand. Each student has an endodontic self-assessment form within his or her operatory. This is a convenient and reusable marker-style laminated form. At the conclusion of the clinical appointment, each student assesses his or her skills, and this is reviewed with the faculty member overseeing the student's work. This serves as an invaluable tool in providing immediate feedback regarding the student's clinical abilities. These educational aids provide reinforcement, uniformity, and an excellent means of communication between student and faculty

members within the clinical milieu. The educational tools highlighted in this poster are currently utilized at New York University College of Dentistry. A student-prepared daily care plan establishes the educational momentum for the student prior to his or her scheduled clinic session. Providing an endodontic supply checklist and the visual aid for the clinical endodontic setup enhances efficiency for both student and clinical faculty members. The ability to review and assess performance after each clinic session reinforces the educational process and endodontic excellence. Enhanced skills for quality patient care along with confidence of the student have been the successful outcomes of these educational adjuncts.

182. Integrating Leadership into the Dental Curriculum

Elsbeth Kalenderian, Angelique D. Skoulas, Peggy Timothe, and Bernard Friedland, Harvard School of Dental Medicine

In addition to learning the theory and concepts behind leadership, students will actively participate in exercises to better understand why and how to integrate skills such as relationship building, facilitation, negotiations, communication, and development of emotional intelligence. Students will gain an understanding of the complexity of management in a health care setting, including acquiring skills in staff management, communication, and marketing as well as obtaining a basic level of understanding of financial analysis, quality improvement, and team dynamics. Lastly, students will gain knowledge in diversity and cultural awareness and start a journey of evaluating their own values and beliefs and how those may match up with their professional goals. The course emphasizes systems analysis and strategic thinking as well as the development of the individual as leader through the introduction of the concepts of self-awareness and self-management. Because creating leadership competence comprises not only theoretical and conceptual lessons but also practice in the application of broader skills, the course includes literature reviews, lectures by domain experts from various professions, and interactive components consisting of student presentations, breakout sessions, and individual and group exercises. Each student must remain current by attending and participating in each weekly session and complete associated assignments within the period described. The third-year (junior class) course consisted of ten modules divided between two topics: management and leadership. The management topic included practice management, patient-centered care, public health dentistry, and systems analysis of medical errors, including how to improve patient safety. The leadership topic included ethics, systemic intervention to reduce oral health disparities, cultural awareness, building a team environment, interpersonal communication skills, and conflict management. The course met weekly for a total of fifty-four hours over twenty-two weeks, with the time split evenly between management and leadership. All students passed this course. Six students received an honors grade; two students received a marginal pass, mainly due to poor participation. Attendance was consistently high. Six of the thirty-five students (17 percent) attended all twenty sessions. Ten students (29 percent) missed one session, and ten students missed two sessions. Overall, average attendance was 89 percent, with a range of 77 percent to 97 percent. Students participated actively in the class with a subset being consistent leaders in the discussion. Students were able to distinguish and assess their level of various leadership skills at the end of the course. The course received an overall rating of 4.23 on a scale of 1 (poor) to 5 (excellent) with 84 percent of the students indicating that their interest (specifically in the areas of clinical efficiency, practice management, reducing medical errors, communication, business, team building, leadership, and access to care) was enhanced. Students assessed their current leadership skills overall at a 3.84 score. They assessed themselves best at integrity

(4.48 score) and worst at managing conflict (3.12 score). They felt that ability to build trust with others is the most beneficial skill for a dentist, while ability to influence is the least beneficial. Eighty-eight percent indicated it as very likely that they would continue to practice developing their leadership skills. Qualitative feedback was overwhelmingly positive and indicated that students found the course life-altering and highly valued its breadth of topics. We see this course as the first building block in the Harvard School of Dental Medicine students' education in oral health leadership. In the near future we hope to open the D.M.D. leadership course for cross-registration to medical students who are interested in general practice management as well as leadership skill development in the health care setting. With respect to the advanced graduate students, we have developed a master's/doctoral level course in which these topics are further explored and other topics (emotional intelligence, conflict resolution, organizational theory, and strategic planning) are added. The qualitative and quantitative data gathered in the form of two end-of-course evaluations suggest that a classroom-based course using lectures, guest speakers to introduce specific topics, case studies, and interactive learning strategies is a successful approach to introducing dental students to concepts of leadership in the oral health arena.

183. Interprofessional Planning and Assessment at a Geographically Distributed Health Science Center with TracDat

Ann L. McCann, Baylor College of Dentistry; Kaye Olsson

The specific objectives of the project were to 1) ensure that all components had a strategic planning process; 2) confine all plans to the same format and schedule; 3) link the component plans to the overall health science center (HSC) plan; 4) meet regional accrediting (SACS) requirements for institutional effectiveness; and 5) create a means for interprofessional collaboration among the various health profession programs. Over time, TracDat should allow the HSC units to align their planning and programs and identify the opportunities for interprofessional collaboration. This has been an important goal for the HSC but has been difficult to achieve due to the physical distances between the various campuses. Other TracDat tools that are available to the colleges are program assessment and curriculum mapping to competencies; programs can link their competencies to specific courses and assessment methods over an entire curriculum. The HSC implemented TracDat in spring 2010 and requested that all of the professional schools begin using it for strategic planning. Training for TracDat was conducted in a series of three hands-on workshops. The first session was for planning the database (March), the second for entering strategic plans (June), and the third for setting up the reporting of results (August); two units had to develop strategic plans. The sessions were conducted in both College Station and the various sites by remote transmission. Several individuals from each institution were selected for training, including the members of the HSC Institutional Effectiveness Council. The following information was entered into TracDat: institutional goals, desired outcomes (objectives), means of assessment (methods) with annual quantitative targets, and requests for funds. Each outcome is linked to college goals and HSC goals and then assigned to a leader. Requests for results are emailed from TracDat to the assigned leader at the end of the fiscal year. They can enter this deadline into their e-calendar. They are asked to report the result in terms of the expected target, whether the target was met, and an action plan. When the leader enters the data into the email message and submits it, the results go directly into TracDat database. Once all the results are entered, at least twenty different types of reports can be run and can be downloaded

into Excel for further modification. Any number of related documents can be attached to TracDat for archival purposes. Currently, the dental school has forty-three desired outcomes and 106 assessment targets that are being tracked. For the entire HSC, there are 288 desired outcomes and 951 assessment targets that are being tracked by the system. The first request for results of the 2009–10 academic year was in August 2010, and they were due by September 15, 2010. The College of Nursing is also using the curriculum mapping function to show how its professional competencies are taught and evaluated throughout the curriculum. The Graduate School is preparing to do the same in the near future. Dentistry plans to add departmental assessment plans in the future, a process that is now accomplished in a paper system. An initial result of this new system was the elimination of one planning process at the HSC. In past years, the deans were responsible for developing an annual compact with the president using some performance measures from their strategic plans. Once the planning process shifted from paper to TracDat, the overlaps between the compact and the strategic plans were apparent, and the compact was deemed unnecessary. An anticipated result is that the number of outcomes and targets will decrease in the future. With TracDat, upper-level administrators are now more involved in extensive data collection than in the past and are realizing the comprehensiveness of this process. At Baylor College of Dentistry, just moving the strategic plan from paper to TracDat, with the focus on quantitative results, resulted in fewer data targets. All HSC strategic planning and assessment have been centralized and can be viewed at one website. All colleges now have plans in TracDat, and reporting of results has begun. Improvements/resulting actions are readily apparent, which is very important for accreditation. The Institutional Effectiveness Council will be able to monitor all planning and assessment. This system will facilitate annual reports, accreditation, and other accountability requirements. Planning has been streamlined, which will continue. The connections between programs are being revealed and will facilitate interprofessional collaboration. This centralizing and streamlining will help us focus on our true priorities for goal achievement and improvement.

185. Repetition: The Cornerstone to Preclinical Competence

James M. Kaim, Kenneth L. Allen, Josephine Lomangino-Cheung, and Mark S. Wolff, New York University

Due to the large amount of material being taught, students must often practice hand skill procedures on their own to become competent. Providing students with additional supervised practice opportunities will allow the weaker students to achieve competence and the already competent student the opportunity to excel. In the past, these practice sessions would take place on nights and weekends when the laboratory is open to complete assignments or practice, especially prior to practical examinations. However these sessions were never faculty supervised. In 2009–10, New York University College of Dentistry instituted and funded a new program. A faculty member was hired to be present in the lab during both the Saturday and Sunday open times, which were 10:00 a.m. to 4:00 p.m. This faculty person was calibrated in all the D1 and D2 preclinical courses in order to be able to assist any student in need of help. Students interacted with this faculty member in two ways: 1) students who performed poorly on practical exams were assigned homework that was to be done prior to the next laboratory session; this homework was supervised by the weekend faculty member so that a student would not continue making the same mistakes; and 2) students who wanted to practice (usually prior to an examination) would attend the laboratory session and ask for feedback from the faculty member present. Originally intended

for the weaker student, what we found is that students who received a grade equivalent to a B also came to the weekend session to learn how they could improve their work to make it an A. An analysis of one course was made between the academic year 2008–09 and 2009–10. The total number of scheduled sessions was the same, and the requirements and the required procedures were identical. With a class size of over 325 students, the class of 2012 had seventeen students who were deemed not competent at the end of the course. The class of 2013 with the same class size had only two students who were deemed not competent at the end of the course. Anecdotally, the faculty noticed a marked improvement of not only the weaker students but the class in general during the course itself. When the class performs better in the simulation lab, their transition into the clinics will be easier and faster for both the student and the faculty. In addition, the patient will have a more confident student who performs at a higher level. A comparison of just one of the classes between two consecutive academic years demonstrated a significant improvement. A follow-up study using faculty questionnaires and assessing student productivity will evaluate the performance of the students who had the opportunity for supervised practice and determine if they perform in the clinic at a higher level.

186. Calibration of Interdisciplinary Faculty Members in a Preclinical Laboratory Course

John D. Jones, Jose M. Gutierrez III, Diane J. Sullivan, Mark L. Littlestar, and Richard R. Seals, University of Texas Health Science Center at San Antonio

In dental education, there are many courses that utilize graded exercises in preclinical laboratory settings. These exercises vary widely among disciplines and dental schools and in the skills that students are taught to master. Evaluation criteria are usually developed to help both the students and instructors. Evaluation criteria allow students to know what will be evaluated and instructors to know how the projects will be evaluated. To provide standardization to the grading process, calibration has been recommended. A number of articles have reported the advantages of calibrating multiple graders in preclinical settings. The objective of this report is to describe a calibration exercise for interdisciplinary faculty members used at the University of Texas Health Science Center at San Antonio (UTHSCSA). The calibration exercise described was for removable partial denture mouth preparations in a preclinical laboratory. The UTHSCSA Dental School has recently opened a new Interdisciplinary Simulation Laboratory (A-dec, Newberg, OR and NevinLabs, Chicago, IL). Second-year dental students perform removable partial denture mouth preparations on dentiforms (Kilgore International, Coldwater, MI) in simulator heads. The students were asked to prepare guide planes on the distal of tooth #11 and the mesial of tooth #13, a cingulum rest on tooth #11, an occlusal rest on tooth #13, and embrasure rests on the distal of #13 and the mesial of tooth #14. Students were instructed to use the evaluation sheet as a checklist during the mouth preparation exercise. The evaluation sheet had specific criteria for each preparation. Two faculty members used the criteria to evaluate three standardized casts with the requested mouth preparations, and these evaluations were used as the baseline by which other evaluations were compared. All faculty members in the course evaluated the three casts. Faculty members were calibrated using the baseline evaluations and their evaluations and feedback provided for each of the instructors. Analysis of the calibration exercise revealed a narrow variation between the graders that was not statistically significant. Even though there were limitations to the described exercise, calibration was still helpful in the grading process for this preclinical course.

187. Improving Student Learning Experiences Using a Patient Simulator in a Preclinical Laboratory

John D. Jones, Jose M. Gutierrez III, Michael A. Mansueto, Richard R. Seals, University of Texas Health Science Center at San Antonio

Dental schools have traditionally used articulated casts and bench top dentiforms to approximate clinical procedures and techniques. With the advent of more anatomically correct patient simulator units in preclinical laboratories, student-performed preclinical exercises more closely simulate clinical environments. This report describes current prosthodontic preclinical procedures in the Interdisciplinary Simulated Laboratory (ISL) at the University of Texas Health Science Center at San Antonio and how these exercises are improving student learning. Three second-year prosthodontic preclinical laboratory courses use the new Interdisciplinary Simulation Laboratory (A-dec, Newberg, OR, and NevinLabs, Chicago, IL): Fixed Prosthodontics, Removable Partial Denture Prosthodontics, and Complete Denture Prosthodontics. Each course uses customized dentiforms (Kilgore International, Coldwater, MI) that are placed and are anatomically correct within the mouth of the simulator head in the ISL unit. Students position simulated patients to correctly access the teeth in the simulator head's mouth, thus teaching proper clinical techniques that are reinforced during preclinical instruction. Proper illumination of the oral cavity, patient positioning, operator posture, and handpiece delivery are but a few of the training objectives maximized by simulator head use. The procedures accomplished in the simulator head are many. These include but are not limited to 1) Fixed Prosthodontics, in which students prepare teeth, fabricate provisional restorations, and make master impressions; 2) Removable Partial Denture Prosthodontics, in which students perform tooth preparations, make impressions, use a record base, make a centric relation record, and obtain a facebow record; and 3) Complete Denture Prosthodontics, in which students make preliminary impressions, border mold custom impression trays, and make master impressions. An obvious improvement in clinical readiness of ISL-prepared students has been observed by clinical faculty members. Third-year students are more confident and ready to perform clinical procedures. The similar nature of the preclinical and clinical environments has been a key factor in overcoming student tentativeness during their early training in delivery of clinical dental care. There are obvious limitations to the use of the Interdisciplinary Simulation Laboratory. Still, prosthodontic preclinical procedures performed on the simulator heads closely follow clinical techniques. Both students and faculty members recognize that the ISL enhances the students' preclinical education and facilitates the students' transition into clinical dentistry.

188. Small-Group Active Learning in a DS1 Evidence-Based Dentistry Course

Diane C. Hoelscher, Michelle A. Wheater, and Anthony L. Neely, University of Detroit Mercy

Dental schools are searching for ways to incorporate evidence-based dentistry (EBD) into curricula to develop competencies necessary for practice and also in response to Commission on Dental Accreditation standards requiring graduates to be competent in applying critical thinking and EB decision making skills. Previous courses at the University of Detroit Mercy School of Dentistry taught research methodology, but provided little opportunity to access, critically appraise, and apply scientific literature to patient care situations. Additionally, the relatively large class size (eighty-seven) presented challenges to implementing active learning strategies. To address these issues, a new course was developed as the first in a series of EBD courses. Goals of the new course include 1) introduce students

to EBD principles and EB decision making in an active learning environment, 2) teach search strategies including development of PICO questions, 3) support development of critical thinking skills through critical appraisal of scientific literature, and 4) provide clinical context for EBD through application to cases. Key features of this innovative course are 1) interdisciplinary approach, 2) extensive small group work, 3) minimal time spent lecturing, 4) case-based activities, 5) all course materials available online, and 6) case-based final exam employing actual search and application of all EB decision making steps. A biomedical sciences faculty member, periodontist, and general dentist taught this one credit hour course and modeled integration of biomedical, behavioral, and clinical sciences. During the first class session, students were divided into groups of five or six students and were given an assignment to develop a clinical question and search for scientific literature to help answer it. Students stayed with the same group for the entire semester. The course ran for half of the DS1 fall semester for two hours, during which time students did a variety of activities including small group work, debriefs, question and answer, and mini lectures. A "small groups within a large class" model was used with the three faculty members circulating among groups to answer questions, focus student activity, and challenge students to think critically during the group work. A relaxed and open atmosphere was established to encourage student participation in both group and whole class discussions. Structured activities and online quizzes were provided to ensure learning objectives were being met. Activities included development of PICO questions, PubMed and other online search strategies, critical appraisal, and application to patient care situations via cases. The final exam required students to develop a PICO question related to a clinical case, search for an article meeting stated criteria, rank the level of evidence, answer questions regarding the suitability of research methods used, assess whether the conclusions were appropriate, and explain whether and how the results could be applied to the clinical case. An eighteen-item pre- and post-test of basic research concepts, online student course evaluations, and the case-based written final exam were used to evaluate outcomes of this course. Of eighty-seven students, eighty-four completed both the pre- and post-tests. The mean pre-test score was 10.39 (median 11) and post-test was 14.52 (median 16), and 86 percent of students improved their score post-test. Paired t-test shows the difference between pre-test and post-test was statistically significant. This new DS1 EBD course met its objectives of introducing EB decision making principles in an active learning environment, teaching search strategies and critical appraisal, and supporting development of critical thinking skills. A number of students did not appreciate the significance of this course in preparing them for clinical application of EBD. In the future, more emphasis could be placed on clinical application and less on teaching research concepts. Strategies used in this course could be applied by faculty members at other schools who are seeking to introduce EBD concepts and critical thinking activities.

189. A Model Program: Interdisciplinary/Interprofessional Approach to Access to Oral Health Care for Older Adults

Rosemary Hays, Lisa B. Stefanou, Donna Shelley, Theresa Montini, and Eva M. Lupovici, New York University

A population-based model program was implemented with an interdisciplinary/interprofessional approach to oral health promotion and disease prevention for elderly individuals attending Naturally Occurring Retirement Communities (NORCs), with the participation of an M.D. faculty member, dental hygiene and dental faculty members and students from the College of Dentistry, R.N.s, and social workers. This model demonstration project was in response to the 2000 surgeon general's report on oral health care in America, stating there is a silent epidemic of oral disease affecting our most vulnerable citizens, the elderly. The projected aging of the U.S. population heightens the urgency of addressing the needs of the increasingly dentate elderly. Also, the cause and effect relationship between oral health and general health is particularly pronounced among older people. Many older adults suffer from severe periodontal disease or tooth loss, which may be associated with poor diabetic control, respiratory disease, cardiovascular disease, stroke, and lower intake of nutrient-rich food. Furthermore, chronic systemic diseases and the side effects of medications affect oral health leading to reduced salivary flow, altered senses of taste and smell, and oral and facial pain. Through collaboration of a dental school, the College of Nursing, and Visiting Nurse Services, a linkage was established between dental care settings and community organizations that serve older adults as well as housing units where there are large populations of adults over sixty. The program was conducted in fifteen NORCs, providing dental screenings, oral health promotion education, and referral for dental care for elderly individuals attending the community centers. An interdisciplinary/interprofessional educational approach to access to oral health care was used in this project and incorporated into the dental hygiene curriculum. Dental hygiene student participation in the model project was established as a new clinical rotation. Weekly, two or three dental hygiene students were accompanied by a dental hygiene faculty member, social worker, or M.D. faculty member to each senior community. This interprofessional educational opportunity for the dental hygiene students and accompanying faculty members provided a team-based patient-centered services approach. Presented at each community center were oral hygiene patient education workshops, handouts, demonstrations, and dissemination of preventive oral health products, followed by a question and answer period responding to individual oral health concerns. The accompanying M.D. faculty member presented topics on the connection between oral health and systemic health, diabetes, identified low cost dental care, Medicaid coverage for oral health, and referrals. The dental hygiene team presented workshop topics on preventing tooth decay, proper brushing and flossing techniques, preventing periodontal disease, coping with dry mouth, and denture care. The handouts were in English, Spanish, and Chinese. The model project is at the midpoint of the scheduled goal in providing oral health promotion and disease prevention to 300 elderly adults. The dental hygiene faculty and students completed an evaluation form on the satisfaction and educational benefits of participation in this interdisciplinary/interprofessional model project. The dental hygiene team responded that their participation was a rewarding educational experience. The participation of the dental hygiene faculty members and students in the model project will be continued to completion. The project will be evaluated as to number of clients who attended the workshops, number screened, percentage of those screened in need of follow-up treatment, and those who accepted referral. Evaluation will also include the percentage of completed dental visits, completed full treatment plan, reason for not completing visits, and satisfaction with outreach service and referral process. The primary aim of the program is to develop a replicable referral model that bridges community service settings and dental clinics and to evaluate the potential for this interdisciplinary/interprofessional new model to promote oral health and increase access to dental services for the elderly.

190. Using PreViser as an Oral Health Management Tool in the Dental Team

Ershal Harrison, Thomas F. Carroll, Deborah S. Ray, Patricia Nihill, and Angela Baxley, University of Kentucky

PreViser was introduced into the student patient care program late in the spring semester. When a patient is screened for treatment at the University of Kentucky College of Dentistry, a medical history, dental history, soft and hard tissue exam, periodontal probing, and necessary radiographs are completed. The data collected from the examination process are entered into PreViser. A dental hygienist helps with the data collection and entry to expedite the process. The PreViser program assesses the patient's risk for periodontal disease, caries, and oral cancer using a five-point scale that is easily explained to the patient. The results of PreViser are discussed with the patient, and recommendations are given to decrease risk when needed. Each patient is given a printout of his or her results. Adding a hygienist to the team has improved the efficiency of the process. The hygienist has made it possible to complete more PreViser reports and improve the accuracy of the data. Students' assisting in data collection and entry have made the process easier to manage. Currently, there is a dental practice management software integrated with PreViser that populates some of the fields required for the report. The software at the college does not integrate with PreViser, which adds time to the process. Several studies have discussed the use and validity of periodontal risk assessment tools in dental practice. This program addressed the need for improving the students' exposure to, knowledge of, and use of risk assessment in the dental setting. The benefits of utilizing PreViser are many. Monitoring a patient's risk over time can help the student and faculty member discuss appropriate treatment recommendations with the patient. The patient is better educated about his or her dental health and risk for disease. Recommendations can be made to the patient to reduce risk. Risk can be assessed over time with feedback provided to the patient. PreViser has proven to be a valuable tool for assessing risk in dental patients. The addition of a dental hygienist to the dental team was instrumental to the success of the program. As of September, over 240 PreViser reports have been completed for patients in the student patient care program. Complete results of the number of patients at risk will be evaluated at the end of the semester. The information provided by PreViser helps influence treatment options and decisions for patients at risk. The dental student and faculty member can make informed treatment recommendations based on the findings.

191. Impact and Costs of Using YouTube to Share Dental Education Resources Worldwide

Emily Springfield, Daniel Bruell, and Lynn A. Johnson, University of Michigan

All materials were distributed as Open Educational Resources under a Creative Commons Attribution-Only license. Anyone may reuse the videos for any purpose, so long as the author is cited. The video files were rendered in H.264/.mov format and uploaded both to YouTube and iTunesU. The collection was also distributed on hard drives to three universities in Africa and a military base in Afghanistan to serve populations with irregular Internet access. To date, the most popular fifty videos have been transcribed. Transcription of the videos was deemed necessary to increase accessibility for viewers with visual or learning disabilities, to facilitate future translation of the videos, and to increase the searchability of the videos. Costs were determined by tracking staff time spent on the project. Four sources of data were used to determine the effectiveness of delivering dental procedure videos via YouTube. First, the following YouTube statistics were compiled: a frequency count of video views and channel subscribers; demographic information including viewers' country of origin, gender, and age, expressed as percentages; and the method of video discovery, also expressed as a percentage of total views. Second, a sample of sixty of the 280 comments left on YouTube from March 2009 to August 2010 (21 percent) was analyzed to gauge overall viewer reaction. Third, an anonymous online survey was created and posted for two weeks on the YouTube site in August 2010. The survey contained five multiple-choice and one open-ended question and asked viewers about themselves (e.g., if they were students, faculty, or in practice) and how they use the videos. Sixty-nine viewers responded; responses were calculated as percentages. Fourth, link referrals and publications mentioning the project were counted. Digitization and transcription were the main costs associated with the project. Once a staff videographer developed a procedure for converting the video tapes to DVD, a non-expert staff member was trained to process the videos. It took about five hours to create the archival DVD and an additional two hours to compress and upload each hour of video. However, much of this was machine time, meaning staff members were free to complete other tasks while computers processed the video. In all, it took approximately eighteen months of 0.75 FTE non-expert time to process 850 videos. Only existing video-processing computers and software were needed; equipment costs were zero. An experienced transcriptionist spent six minutes captioning each minute of video. Transcripts were synched to video using YouTube's automatic transcript-synching service with satisfactory results. Global Impact YouTube statistics show that between March 2009 and August 2010, the 850+ videos were viewed over 2.2 million times. Views-per-day grew very rapidly over the first eight months, then leveled off. The videos now receive around 6,500 views daily, and the rate is still increasing slowly. Over 3,000 people subscribed to the videos in that time period. Viewers in that time period were 69 percent male and 31 percent female; over half were between the ages of thirty-five and fifty-four. Videos were discovered by clicking on YouTube's related videos (47 percent) and YouTube searches (21 percent), and 12.7 percent of videos were discovered from outside of YouTube, e.g., Google searches or direct links. Most viewers were from the United States (26 percent); India, the UK, Egypt, Germany, and Canada each represented 4 to 5 percent of viewership. Views were recorded from nearly every country in the world. Comments received via YouTube (n=280) have been overwhelmingly positive. A sample of 21 percent (n=60) of the comments shows 47 percent were thanks or compliments and 25 percent (n=15) of comments were technical discussions of the procedures shown and/or discussion among those making comments. The only negative comments refer to the age of the videos: 20 percent of the sampled comments (n=12) complained about practitioners' lack of gloves, outdated procedures, etc. An August 2010 online survey of YouTube users (N=69) shows that 37 percent of viewers are practicing oral health professionals and 34 percent are students. Respondents primarily watch the videos to refresh their memories before performing a procedure (45 percent), learn topics not covered in class (45 percent), and help them study for class (39 percent). The top improvements requested by respondents were to make newer versions (82 percent) and add captions (33 percent). Thirty-five percent of respondents said it is more important to post new material than to redo old material; only 8 percent said it is more important to redo old material than post new material. Fifty-nine percent of viewers said they would rather have old videos than none at all, suggesting that users perceive value in videos, regardless of their age. Worldwide, millions of dental and dental hygiene students, as well as practicing oral health care professionals, perceive direct benefit from open access to videos depicting dental procedures. Institutions distributing such videos develop good will, name recognition, and a reputation of generosity. More open-access videos are needed, especially up-to-date videos of modern procedures. If existing video collections are being digitized, the additional time and expense to publish the videos via YouTube are minimal.

193. An Interprofessional Approach to Smoking Cessation: NYU College of Dentistry Teaming with the Manhattan Tobacco Cessation Program and Nurse Practitioners

Morey J. Gendler, Diana Zraik, Corey Corpodian, Madeleine M. Lloyd, and Donna Shelley, New York University

Smoking cessation is an integral part of our students' clinical education. Manhattan Tobacco Cessation Program (MTCP) is a New York State-funded cessation center that has been located at New York University (NYU) College of Dentistry (CD) since 2007. In addition, NYU's College of Nursing Faculty Practice (CNFP) provides an onsite office, advice, and referral source. Students are exposed to the merits of tobacco cessation beginning in their first year of dental school during our Integrated Clinical Case Presentation Seminars. Our Smoking Cessation Program is designed to assist our patients in quitting their addiction to smoking. This interprofessional interaction with MTCP and the CNFP has created a team approach to care and a forum in which our students can obtain the most up-to-date and professional knowledge about smoking cessation. Our major goal is to help our patients to stop smoking while educating our students about counseling techniques and treatment modalities. This educational model of working with other trained health care providers will greatly expand our students' ability to help not only their patients but the public at large. Students follow the Clinical Practice Guidelines on Treating Tobacco Use and Dependence, in which they learn the five As of smoking cessation counseling: Ask, Advise, Assess, Assist, and Arrange. Based on the patient's readiness to quit, the students then continue their counseling by utilizing techniques designed to increase motivation such as the 5 Rs: Relevance, Risks, Rewards, Roadblocks, and Repetition. Students learn and understand that a patient attempting to quit tobacco use generally does not follow a straight path; rather, it is convoluted with many twists and turns. The patient requires a caring health care counselor and someone to monitor, support, and reinforce his or her efforts. This interprofessional model with MTCP and the CNFP has also helped to broaden the NYUCD educational experience. MTCP and the CNFP are integrated into the student's education and patient care. This provides students with an ongoing reminder about providing nicotine replacement therapy (NRT) to their patients in need who wish to quit. Smoking cessation has become a part of each comprehensive exam and every patient appointment. Our patients are routinely screened for tobacco use and if necessary are given smoking cessation treatment. Tobacco-related information is documented in the patient record at every appointment by utilizing a progress note stamp. MTCP gives the students the tools and skills necessary to provide proper care and tobacco cessation therapy and has provided an algorithm to follow for successful therapy. This algorithm focuses on over-the-counter NRT products and gives guidance on proper use. Dental students dispense NRT in the form of the nicotine patch, gum, or lozenge, which all come in varying doses designed for an array of patients, whether they be heavy or light smokers. Patients with complex medical histories or those requiring individual or group counseling or other modes of tobacco use treatment like prescription Chantix can be referred to the nurse practitioners at the CNFP. Working closely with MTCP and the CNFP has also helped to open new doors by creating community service and public health advocacy opportunities in which our students can become involved. Students have volunteered and participated with MTCP in communicating with several local New York State legislators by writing letters or attending in-person meetings with representatives. In doing so, they received valuable experience in advocating for public health issues. The students and MTCP helped the legislators better understand the role dentistry plays in prevention programs such as MTCP and the effects that budget cuts could have on this important program. This experience is creating a great foundation on which our students and future practicing dentists can build, allowing them to work within their community to advocate for important public health issues and programs such as the MTCP. To evaluate the effectiveness of MTCP's efforts with NYUCD, statistical assessments are performed on a monthly basis to analyze the fourteen group practices and the amount of NRT requested. From August 2008 to August 2010 there have been 1,227 requests for NRT. A monthly average of 49.08 requests for NRT has been documented; a peak in requests was seen in July 2009 at 102 requests. MTCP has found that the peaks coincide with follow-up tobacco cessation training in which both students and group practice directors are present. In addition, charts are randomly audited to ensure compliance with the requirement of addressing tobacco use at every visit and reinforcing the guidelines by counseling and treating the patients who smoke. This interprofessional collaboration with MTCP and nurse practitioners allows for an open exchange and sharing of knowledge while training our students to assist their patients in quitting tobacco usage. The knowledge and skills gained by our students will greatly benefit their current and future patients, the community, and public health issues. This interaction and team approach to delivering care and seeing the positive results obtained by working together with other health care providers will have a long-lasting beneficial effect as our students progress through school and residencies and into practice.

194. Dental Information on a Web-Based Patient Health Portal: A Pilot Survey

Andrea N. Mahnke; Jennifer L. Ciske; Amit Acharya, Marshfield Clinic

Beginning in 2002, Marshfield Clinic partnered with Family Health Center of Marshfield, Inc. to provide dental services to rural communities throughout central and northwestern Wisconsin. Seven dental centers serve residents who come from all over Wisconsin. Two additional sites are scheduled to open in 2011. Between November 2002 and May 2010, 47,861 patients were treated at these dental centers. Health care delivery systems are moving towards a patient-centric approach. As part of this paradigm, more and more patients are moving towards the use of patient health portals for managing their health care needs. Patient health portals are online applications mostly made available by individual health care organizations or service providers through which the patients interact and communicate with their health care providers. They can also keep track of their health history, medication history, test results, historical vitals, immunizations, billing, and future and past appointments and can access educational materials. Based on the latest understanding of the correlation between oral and systemic health, it seems apparent for a need to integrate medical and dental health records to provide the greatest quality of care possible for patients. To further advocate the idea of integrated approach to health care, Marshfield Clinic, with support from Delta Dental of Wisconsin and Family Health Center, recently developed an integrated medical-dental electronic health record (iEHR) environment. Currently, Marshfield Clinic also provides access to patients' personal health information through a secure online health portal called My Marshfield Clinic. However, the health portal only houses patients' medical information and not the dental information. As the next logical step to providing both medical and dental health services in an iEHR environment, Marshfield Clinic is working toward making appropriate dental information available to patients as part of their overall health information through the health portal. As part of this effort, a pilot survey was conducted to assess and collect the types of dental information that patients would want made available to them via the portal. A seventeen-question paper survey was designed and administered in five Marshfield

Clinic dental centers. A research coordinator worked with dental center managers to determine the best way to administer the survey. The survey was administered by appointment coordinators at the patient check-in desk over a three-week period. Based on average patient visits in that timeframe, each center received 250 blank surveys. An instruction sheet including a sample script, frequently asked questions and answers, and contact information was included with the packet of surveys. Patients between the ages of eighteen and eighty-nine were eligible to complete the survey. Patients returned completed surveys to the appointment coordinators. Of the seventeen questions, three addressed demographics, six addressed current patient portal use, two addressed where patients would like to access the patient portal, and six addressed interest in accessing dental information and dental education through the patient portal. The research coordinators' contact information was included on the survey in the event patients had questions about the survey. The study protocol was submitted to the Institutional Review Board and approved as exempt under 45CFR46.101 (b) (Marshfield Clinic Research Foundation IRB number ACH10310). At the end of the three-week period, a total of forty-nine surveys were completed. Of the completed surveys, 32.7 percent were male and 67.3 percent female. The majority (70.2 percent) had Internet access at home, with work at 27.7 percent being the second most popular place they had Internet access. Only 32.7 percent had previously accessed My Marshfield Clinic. The main features used by those accessing My Marshfield Clinic were viewing their health summary (66.7 percent), reviewing a test result (58.3 percent), appointments (41.7 percent), and health education information (41.7 percent). When asked if they would feel comfortable accessing My Marshfield Clinic at a kiosk in a waiting area, 60.9 percent responded positively. When asked if they would like My Marshfield Clinic to provide access to their dental information, 71.1 percent responded positively. The top areas of dental information that respondents would like to be able to view were dental appointments (86.7 percent), routine dental appointment reminders (80 percent), date of last dental visit (62.2 percent), previous dental procedures (55.6 percent), and dental history. A majority of patients (77.3 percent) said they would access dental information through My Marshfield Clinic. Also, 60.9 percent said they would like as much dental information included in My Marshfield Clinic as possible. Finally, the respondents indicated roughly equally that they would like dental educational materials presented in video (61.4 percent), diagram (65.9 percent), and text (63.6 percent) formats. The majority of respondents were not only interested in viewing their dental data through the My Marshfield Clinic patient health portal, but were also interested in having access to as much of their dental information as possible. Based on the experiences of the pilot survey, a larger survey is planned in the near future. The survey responses will help steer development to include dental information in the patient health portal. The responses will also be used to make any general improvements to the patient health portal.

195. Improving the Marketability of New Dental Hygiene Graduates

Kimberly J. Werth and Judy A. Kwapis-Jaeger, University of Detroit Mercy

The transition from dental hygiene student to professional practitioners has become all the more difficult by unemployment rates that are hovering above 14 percent and the current economic picture causing dental offices to downsize or cut hours of practice. Add to this the fact that the majority of dental hygiene students historically have a very limited work history or prior experience applying for employment. What can be done to help increase the marketability of graduates? A solid curriculum and clinical experiences will give

them the educational background and experience necessary to practice, but what skills will help them land the initial job? A mock working interview was initiated as part of a Professional Issues course during the last semester of the dental hygiene program. As part of the course, students were taught to create a cover letter and resume, then learned interviewing techniques through presentation and role playing. Dental faculty members, dental alumni, and office managers with a recent history of practice management were recruited to act as interviewers. A simulated want ad was posted on the course website. Students called in to the posted number and requested an interview and then dropped off a resume and cover letter prior to the mock interview. Students were randomly scheduled with one of the volunteer interviewers. A calibration session was held with the volunteers prior to the interview session to discuss types of questions to be asked and the use of a feedback form. Core questions were agreed upon for each of the interviewers. Flexibility of additional questions was allowed so information could be exchanged to simulate a realistic interviewing environment in a dental setting. Following the interview, students received feedback forms. Criterion-based assessment categories were captured on the feedback form, which was consistent with the instructional design in the classroom. A survey of participants (n=24) was conducted at the end of the course. Over two-thirds of the students reported that prior to the mock interview they had experienced fewer than five interviews, mostly in non-dental settings. After the mock interview, 86 percent of the students ranked themselves from more prepared to well prepared to go into a dental interview. The remaining students stated they were still nervous but felt more confident and more competent. Based on the significant research that verifies the educational value of mock scenarios and role playing in preparing students to be competent practitioners, the students were able to achieve competence in increased marketability through this project.

196. Broadening Dental Hygiene Education Through Interprofessional Collaboration

Susan Jenkins, Massachusetts College of Pharmacy and Health Sciences

The literature indicates that most interprofessional education initiatives do not include dental professionals. The Massachusetts College of Pharmacy and Health Sciences (MCPHS) is positioning itself to be a leader in interprofessional collaboration. In the summer of 2008, the Schwartz Center Educational Rounds: Difficult Conversations Committee was established on the Boston campus of the college. The committee is comprised of faculty members from dental hygiene, pharmacy, physician assistant studies, nursing, radiological sciences, health psychology, and health science/premed studies. The Schwartz Center Educational Rounds is a multidisciplinary forum located in hospital settings, in which caregivers discuss difficult emotional and social issues that arise in caring for patients. With its Schwartz Center Educational Rounds developed for medical, nursing, and allied health professional students, MCPHS became the third educational setting in the United States, along with Massachusetts General Hospital Institute for Health Professions and Northeastern University, to host student rounds (www.theschwartzcenter.org). Difficult Conversations is a forum in which students from all disciplines share their clinical experiences, both positive and negative. To date, there have been three events, one held during each semester. All members of the college community are invited to attend. The sixty-minute forum is presented during the college's mid-day activity period. The committee meets monthly to plan the events. Recent topics presented have been "The Bridge Between Student Expectations and Clinical Realities," "HaHaHa-Oops! Humor and Its Boundaries in Patient Care," and

"Er Um Talking with Patients about Sexual Issues." Once the topic is determined, an e-mail is sent to the entire student body inviting them to participate. On average, four to six students respond with their personal experiences addressing the topic. The committee evaluates the submissions and chooses four students for the panel. The program is guided by an outside facilitator. Each student is given five minutes to present his or her story, followed by a question and answer period. The event has attracted 510 attendees. Attendees are asked to complete a four-question, five-point Likert scale evaluation. Student evaluations have been consistently high. A 28 percent response rate (n=365) has yielded the following results: 91.6 percent responded that the case presentations were thought-provoking; 87.3 percent that the discussion facilitated reflection about their current or future clinical experiences; and 88.5 percent that the discussion facilitated reflection about their current or future personal experiences. Additional comments from the attendees included these: "Good to learn from other health profession areas"; "Opened my eyes to issues I never thought about"; and "Students' presenting is the best." The success of the Boston campus rounds has expanded to the college's Worcester and Manchester campuses. The members of the Schwartz Center Educational Rounds Committee are Susan Jenkins, Lois Angelo, Marie Dacey, Timothy J. Maher, Ana Maldonado, Stephanie Rhymer, and Rick L. Shifley. Interprofessional collaboration involving students and faculty members has demonstrated the importance of including all medical/dental professionals in patient treatment. An amalgamation of experience was exchanged between the panel and the audience. The results confirmed the benefits of continuing this program.

197. Input=Output: A Review of Practice Location Decisions Following Implementation of a Comprehensive Care Model

Sheila E. Stover and Lance K. Hashimoto, Marquette University

The Marquette University School of Dentistry (MUSoD) adopted a comprehensive care model for dental instruction in 2002. This patient-centered approach was supported with early exposure to patient care, quality didactic instruction, expansive and diverse clinic outreach programs, and a commitment to the development of ethical, service-minded practitioners. The School of Dentistry has now graduated five classes (2006–10) who have completed the curriculum in its entirety. The purpose of this poster is to review the practice location choices of dental students who graduate from a comprehensive care model and to display the range of clinical and professional opportunities available in this instructional model. The poster includes a curriculum map outlining specific educational interventions that provide a visualization of the breadth and scope of interventions offered to students under the comprehensive care model including seven unique outreach centers in both urban and rural communities, introduction to clinical practice opportunities at the D1 and D2 years, and other key interventions that are in place throughout all four years of the curriculum. A review of practice location outcomes for recent graduates identified that a significant number of MUSoD graduates chose rural practice, community health center clinics, military, National Health Service Corps, and Indian Health Service career paths. It was also noted that students were choosing to stay in Wisconsin to practice dentistry, many in close proximity to school-affiliated outreach clinics' rotations. Unfortunately, these service-minded practice choices have been casually used as significant determinants for the argument that a traditional dental school curriculum cannot graduate dentists willing and/or prepared to serve the future population in addressing the access to dental care disparities that exist throughout the United States. It is concluded, based on the practice location outcomes for recent graduates, that

the key interventions in place related to a comprehensive care model can, in fact, be highly effective in fostering service-minded practice location decisions.

198. There Are 350,000 Stories in the "Naked (Dental) Clinic"

Ralph P. Cunningham, Eric S. Studley, Steven Resnick, Rosita Marzan, and Alyson Leffel, New York University

In a large clinic environment such as that at New York University College of Dentistry, patient management can become an overwhelming problem. A team approach has been initiated in order to educate both students and faculty for the purpose of minimizing difficult patient encounters. Our team is comprised of an administrative patient advocate, a social worker, and a faculty group practice director. The goal of the members of our team is to teach students to recognize patient encounters that are difficult to manage, thus avoiding dramatic confrontations between patient and provider. In order to accomplish this goal, we proactively educate our students and faculty members regarding patient management issues, and we also provide support by our team on the clinic floor. In order to teach both students and faculty how to prevent and address patient management problems, our team delivers a presentation to students and faculty at a group practice monthly operational meeting early in the academic year. The administrative patient advocate, social worker, and group practice director discuss and enact patient encounters that are difficult to manage and open a discussion about how these encounters could best be handled. To avoid patient management problems, the administrative patient advocate stresses the importance of maintenance and review of chart and progress note entries. Any untoward incidents must be recorded in the charts. New students reviewing the charts will then recognize indications of irregularity such as documentation of patient complaints and management incidents. The student will then be aware that this patient might need an intervention from our patient advocate or social worker. The social worker impresses upon the students the social needs of the patients and how recognizing and addressing these needs can prevent management problems. Questions addressed include these: How should the student handle a patient who presents smelling of alcohol? How should the student handle the repeat emergency patient who requests pain killers but no treatment? How should the student handle a patient who cannot pay his or her bill? Finally, clinic directors and faculty, the first line of defense on the clinic floor, need to be aware and educated to recognize the red flag factors in a patient's history that could initiate a patient management incident. Our social worker is on site to assist our faculty members in learning to be calm, understanding, empathetic, and proactive in referring patients who have social needs. The interprofessional team approach has proven effective in reducing the number of patient management incidents. Additionally, students have expressed that they feel more confident as a result of the training they received and the support of the team. This knowledge not only helps our students in dental school but is a lifelong benefit as they progress in their career in dentistry.

201. Increasing Dental Students' Understanding of Nutrition-Related Behavior Change: Does Experiential Learning Work?

Marita R. Inglehart, George W. Taylor, Brittany R. Williams, and Wendy E. Kerschbaum, University of Michigan

The two most prevalent oral diseases—caries and periodontal disease—are both strongly affected by behavioral and lifestyle-related factors. For example, if patients would engage in proper oral health promotion and brush and floss regularly and effectively, and if they

would avoid smoking and the consumption of food rich in sugar, their oral health would clearly benefit from such behaviors. When dental care providers encounter patients with self-destructive behaviors such as patients who smoke or consume sugary drinks or cariogenic food, they have an opportunity to engage these patients in health education efforts to change these behaviors. While dental students learn about the underlying theoretical models of successful behavior change such as the health belief model, the transtheoretical model of behavior change, and motivational interviewing in behavioral science classes, abstract knowledge about these theories might not be sufficient to allow them to engage successfully in educational efforts with their patients. According to the humanistic model of professional education, these providers should also have a certain level of awareness concerning their patients' behavior change as well as skills necessary to engage optimally in these changed behaviors. In order to raise future dental care providers' awareness, skills, and knowledge (A-S-K), fourth-year dental students in a nutrition course were challenged to engage in an experiential exercise concerning changing one aspect of their own diet over a four-week time period. Key features of this intervention were as follows. These students were first informed about the principles of three theories concerning behavior change, the A-B-C model, the transtheoretical behavior change model, and the theory of motivational interviewing. Their first weekly assignment was then to decide on one nutrition-related behavior they wanted to change in their own diet and to reflect on why they wanted to change this behavior, which challenges they might encounter, and how their behavior related to the A-B-C model of change and the transtheoretical model of change. They then had a one-week time span to engage in the diet changes. At the beginning of the second week, they reflected in their second assignment on the progress they had made with the diet changes and discussed how the four principles of the theory of motivational interviewing (creating a discrepancy, having empathy, rolling with resistance, creating self-efficacy) were related to their own progress. After a second week of self-change efforts, Assignment 3 asked them to reflect again on their own progress and to discuss how they could have been more successful. At the end of the fourth week, they responded to a survey assessing their behavior change and evaluating the intervention. Data were collected from the 105 fourth-year dental students at the end of each of the four weeks of this intervention with web-based assignments and surveys. At the beginning of the program, 80.7 percent of the students indicated that they were motivated or very motivated to change their chosen behavior, 7.9 percent were neutral, and 11.4 percent were negative (Mean=3.87 on five-point scale with 5=very motivated). The majority thought that it would not be very difficult to change the behavior (Mean=2.52). After one week, the majority of the students were in the action phase (60.7 percent) and maintenance phase (13.4 percent) of behavior change, and 73.7 percent of the students were motivated to change their behavior. On average, the students reported success concerning their efforts (on a ten-point scale with 1 being unsuccessful: 6.68). At the beginning of the third week, the students indicated that on average they found the A-B-C model of behavior change quite helpful for their efforts (five-point scale: Mean=3.62), while they did not find motivational interviewing concepts equally helpful (Mean=2.95). At the end of the intervention, the students assessed the intervention as moderately interesting (Mean=3.00), but likely to be helpful (Mean=3.47). They tended to agree that the exercise made them more interested in helping their patients to change behavior related to their diet (Mean=3.45). The majority of the students (73.4 percent) agreed that this exercise should be continued as part of this course. Patients' oral health promotion efforts and lifestyle-related behavior affect their oral health. Health care providers should therefore focus on educational efforts that promote positive behaviors. Educating future dental care providers

about the principles of behavior change with an experiential exercise was promising. The end evaluations showed that the majority of the students found this exercise helpful, felt that it had helped them to understand the theoretical concepts applicable to behavior change strategies, and wanted to have the exercise continued as part of a nutrition class in the future.

202. Reorganization of Faculty Roles for a New D.M.D. Curriculum

Charlotte L. Briggs, John M. Crawford, Lea Alexander, Philip A. Patston, and Nancy Norman, University of Illinois at Chicago

The College of Dentistry at the University of Illinois at Chicago has reorganized its predoctoral curriculum to better integrate biomedical, behavioral, and clinical sciences through small-group discussions of case scenarios that promote a combination of orofacial, systemic, and behavioral learning objectives. As a result, the college has also reorganized its faculty roles to meet the requirements of this new instructional approach in order to eliminate discipline-based silos and to ensure program cohesion. The new organizational structure is designed to improve coordination between faculty Course Teams that develop and administer individual courses and the Curriculum Committee, which is charged with oversight and governance of the curriculum as a whole. To facilitate this coordination, the new structure includes a year-round D.M.D. Coordinating Team comprised of three faculty members representing orofacial, systemic, and professionalism aspects of the curriculum, as well as specialized teams for scenario writing and assessment. To support the new structure of faculty roles, an Office of Dental Education has been established within the Office of Academic Affairs to provide faculty development and consultation regarding curriculum design, instructional methods, assessment, and instructional technology. At the course level, roles are divided among course directors, associate course directors, content experts, laboratory facilitators, clinic facilitators, and small-group facilitators. In this scheme, content experts maintain primary responsibility for learning objectives and assessment standards, but carry out their role in ways that are significantly different from the traditional role of a lecturer. In addition, the new structure employs a system of reporting and planning relationships to ensure continuous monitoring and improvement of the curriculum. This poster will present a diagram of the new organizational structure and descriptions of the new faculty roles and their coordinating relationships. As dental schools across North America undertake significant curriculum changes, new faculty roles and coordinating relationships are required for curriculum administration, coordination, and governance. Without reorganization of faculty roles, curricular reorganizations will tend to be add-ons relegated to the margins of the traditional curriculum, remaining underresourced, at odds with faculty reward structures, and vulnerable to reversal. Our college's new structure of faculty roles is designed to meet the needs of its own reorganized curriculum, but will be of interest to other schools undertaking similar shifts to an integrated, organ systems-based curriculum that employs small-group learning as a central feature of instruction.

203. Dalhousie Health Mentors Program: An Inter-professional Experience with Stories of Chronic Conditions

Cynthia L. Andrews, Dalhousie University; Susan L. Nasser

The Dalhousie Health Mentors Program was launched in September 2010, placing patients/clients at the center by recognizing their expertise about themselves and their health and acknowledging the unique contribution they can make to health professional education. The program provides an innovative, collaborative approach for

health professional students to learn about a patient/client-centered focus, interprofessional teamwork, long-term relationships, and chronic conditions and disabilities. The program, sponsored by the Faculties of Medicine, Dentistry, Health Professions, Science, and Computer Science, encompassed seventeen professional programs and included over 500 students in its pilot year. Health mentors are adult volunteers with a chronic condition and/or disability who share with a small interprofessional team of four students their experience of living with their condition and navigating the health care system. Student teams do not provide care, treatment, or medical advice; rather, they listen to and learn from the health mentors, who share their unique perspective. Students ask questions about the health mentors' life stories and their chronic condition journey, developing a picture of the whole person. Students share their observations with the mentor to determine whether they have understood the mentor's experience. They finish the year by reflecting on what they have learned and identifying learning objectives for future programs. During the year, student teams meet with their mentor four times. The chronic conditions/disabilities learning objectives for the program are as follows: 1) to develop an understanding and appreciation of the impact of the condition/disability on the health mentor's life and the lives of family members and the experiences of health mentors in navigating the health care system, and 2) to reflect on and relate the observations from interactions with health mentors to curriculum in the students' home program. The patient/client-centered focus objectives are as follows: 1) to interact respectfully with the health mentor by developing effective interviewing skills and using active listening skills that acknowledge the health mentor as an expert about his or her health and condition; and 2) to demonstrate professional behaviors that recognize and safeguard the health mentor's rights to privacy and confidentiality. The team functioning objectives are as follows: 1) to learn about, from, and with each other in a team climate of mutual respect and sharing of awareness from each student's perspective as an individual and as a student in a particular profession; 2) to develop effective communication and collaboration skills with others as part of a team; and 3) to reflect on the observations from interactions with team members whose backgrounds and health career paths are different from their own. One of the biggest challenges facing the program organizers was in the area of student learning, assessment, and supervision. Other challenges included recruiting suitable health mentors, ensuring ethical interactions among participants, and safeguarding health mentors' privacy. The logistics of organizing such a complex program in the short time period of four months also necessitated teamwork and ingenuity. The first year of operation is being treated as a pilot project and will be evaluated as such. Preliminary findings about how the program unfolded from the perspective of health mentors, students, faculty supervisors, program organizers, and senior administration will guide future development of the program. Interprofessional collaboration is a reality in today's health care system. The Dalhousie Health Mentors Program was developed as one way of providing a rich experiential learning opportunity for a broad range of health professional students to help prepare them to be respectful, caring, and productive members of interprofessional teams in their practice.

204. Promoting Collaborative Partnerships: Building Futures in Dentistry

Kimberly Johnson, University of Minnesota

Augsburg Fairview Academy (AFA) is a Minneapolis public charter high school with an academic focus on health careers. AFA invites young adults from diverse communities to prepare for college, career, and life through an intense program of study and real-world connections to health care professions. AFA supports, motivates,

and challenges high school students to achieve academic excellence. Students explore health care careers through mentoring relationships with working professionals while gaining valuable experience in professional settings. AFA partners with educational institutions to engage students in service-learning projects. The University of Minnesota has established a partnership with AFA, introducing diverse high school students to careers in the dental profession. Activities include guided tours of the dental school, the Simulation Clinic, and demonstrations by dental and dental hygiene students in the areas of instrumentation skills, biomaterials, and expanded functions. The University of Minnesota and AFA partner with inner-city community programs to bring educational opportunities to at-risk children attending after school programs. Dental hygiene students design and implement educational programs while actively engaging AFA students in oral health presentations to inner-city community-based program participants. Dental hygiene students educate and empower AFA students to go out into their communities to promote oral health. This collaborative partnership between AFA and the University of Minnesota expands the service-learning opportunities for dental and dental hygiene students and improves the overall health of an underserved community while inspiring diverse, underrepresented populations to seek career opportunities in the dental professions. Preliminary results show that 100 percent of AFA students intend to move on to higher education and 92 percent of AFA graduates go on to higher education. Current data collection includes presentation pre- and posttesting data. Future data collection will include subsequent entry into the dental professions.

205. Using an Interdisciplinary Approach in Dental Hygiene Educational Research

Shawna Rohner, Pacific University

Senior dental hygiene students gather research on medically compromised patients regarding the special conditions and challenges these patients present. Students prepare to learn how to make treatment modifications and work with these special needs patients. In addition to researching information from traditional sites such as texts and peer-reviewed journals, students interview faculty members from other health professions in order to obtain real life information regarding special needs patients and how to best work with and modify treatment that might not be discovered through the written word. Pacific University in Hillsboro, Oregon, includes a health professions campus that includes a bachelor's degree program in dental hygiene and master's or doctoral programs in pharmacy, psychology, physical therapy, occupational therapy, ophthalmology, and physician assistant. Working with other health professionals to provide total patient care as a student can open the door to future comfortable collaboration as a working professional. Using faculty members from other health professions as an information source provides inroads for quality patient care for all involved. As a result of collaboration and interdisciplinary experiences, students and faculty members from each health discipline located at this university become more familiar with each health profession. Collaboration improves respect and knowledge and leads to a future in health care that can be better than the current model. The Patients with Special Needs course is divided into ten presentation groups with three to four students in each group. Group topics include immune system dysfunctions, seizure disorders and diabetes, respiratory illnesses, cardiology, blood disorders, developmental disabilities, musculoskeletal disorders, neurologic conditions and palsies/Parkinson's disease, mental and emotional disorders, and cancer. Students interview faculty from the physician assistant program to discuss possible medical emergencies that may present during treatment. Pharmacy faculty review medications patients may be taking and possible drug interactions with

medications prescribed in a dental office. Occupational and physical therapy faculty members help the students understand physical conditions and treatment modifications that some compromised patients may need. They also offer suggestions for modified home care and information for caretakers that dental hygiene students can provide for them. Faculty members from psychology help students understand the mental and emotional issues special needs patients may have. Patients with mental health impairments and alcohol/drug abuse issues are also discussed relating to patient care. Ophthalmology and occupational therapy faculty members work with students who may treat patients who are visually impaired about how to address their needs and challenges. This interdisciplinary course was piloted for the first time last year. Students and faculty members who participated and those currently participating will be surveyed to learn the perceived benefits of this interdisciplinary approach at the conclusion of this year's course, and a study is currently being constructed by four faculty members from dental hygiene, pharmacy, physician assistants, and physical therapy. All of Pacific University's health professions programs endorse this model of education to teach and train students to use an interdisciplinary approach for total patient care.

206. A Course in Interprofessional Competence for the Health Professions

Gail Aamodt, Pacific University

The College of Health Professions (CHP) at Pacific University currently offers programs in dental hygiene, health administration, occupational therapy, optometry, pharmacy, physical therapy, psychology, and physician assistant. The mission of the college is to work collaboratively to provide students an outstanding education in their chosen health care profession. CHP advocates for excellence in health care education and practice within the university and beyond. It responds to challenges brought on by societal changes, opportunities, and community needs. Four educational themes utilized across the curriculum and clinical approaches within the CHP have been identified: 1) commitment to interprofessional practice, 2) fostering ethical decision making, 3) serving the underserved, and 4) focusing on evidence-based practice. Interprofessional education has been defined as an educational approach in which students from various health-related occupations with different educational backgrounds are brought together to understand a particular problem or experience. Interprofessional education occurs when students from various professions learn from and about each other to improve collaboration and the quality of care. With the recognition of Pacific's commitment to interprofessional practice, it became increasingly evident that a new course should be added to CHP programs. Challenged to address the topic of interprofessional competence, a committee was formed to develop an interprofessional course for all incoming students within CHP. The course was designed to include a didactic and experiential component in which interprofessional teams from all programs would participate together over the course of the first year in their respective programs. All students are required to participate and pass the course to fulfill program requirements for graduation. This course provides basic guidance in developing essential skills and attitudes in order to function effectively in an interprofessional health care community. It is comprised of two half-credit phases: didactic and experiential. The highlights of the didactic topics are to recognize one's own and others' health care professions, develop interprofessional skills in communications and interactions, and appreciate the important role that leadership, professionalism, and diversity play in health care environments. In addition, issues are discussed related to health care access, services, and awareness of community resources to support the health care community. In the second phase, students fulfill an experiential component in which they engage in a community service experience as an interdisciplinary team. The experience facilitates an opportunity for integration of didactic learning in the areas of team-building, leadership, professionalism, diversity, and community resources. The experience culminates in a demonstration of learning at a College of Health Professions Interdisciplinary Event. The principal course goals addressed in this course support CHP's mission in preparing students for a diverse health care community and patient/client populations. Through the team-building skills component, students are able to apply basic principles and practices of interprofessional team-based communications, interactions, and learning. Leadership and professionalism are addressed as an essential attribute for all health care providers. Through activities, students begin to recognize characteristics of effective leadership, identify behaviors and attitudes associated with professionalism in health care, and apply concepts of leadership and professionalism in team-based health care scenarios. As the population continues to increase in diversity, it is important that students understand the importance of conversations about diversity. During this course the students explore the impact of patients' and health care providers' diversity when working within health care environments and the community at large. They examine how personal filters influence the way we respond to others. Community resources are invaluable in today's health care system. Students learn how to identify clients'/patients' needs beyond each discipline's scope of practice. They learn the importance of referring and coordinating care with other health care providers and how to develop skills to utilize high and low tech methods of finding community resources across the lifespan (infants to older adults) and across professions (physical health, dentistry, pharmaceutical needs, mental health, addictions, and basic needs). In addition, they discuss how to motivate and empower clients/patients to find the desired community resources and take advantage of them. In the 2009–10 academic year, 360 students from seven programs participated in the course. Over sixty CHP faculty members volunteered their time to advise the sixty interprofessional student teams. All first-year CHP students participated in providing over 1,800 hours of volunteer service to the community. Each team participated in a poster presentation highlighting their ability to incorporate key concepts of the didactic portion of the course into their experiential component as an interprofessional team. Providing evidenced-based health care in an ever-changing society requires the health professional of today to participate in interprofessional collaboration. Service-learning is one component in the development of the health care professional. However, as the current model of health care is expanding to include an understanding and application of patient-centered care in an ever-growing, diverse population, it is becoming increasingly important to arm those entering our professions with the skills needed to understand the importance of collaboration and the ability to work in the interprofessional team.

207. Deconstructing a Complex Skill: Incorporating Training Blocks for Full Crown Preparation Training

Ranier M. Adarve, University of Minnesota

Students learn tooth preparation for full crown restoration during their preclinical education. The traditional method of learning utilizes typodont teeth whereby students perform a series of tooth reduction steps simulating the tooth preparation procedure. These steps include correct occlusal reduction, achieving the right taper, finishing the right margin configuration, and avoiding adjacent tooth contact. For a beginner, the skill is complex and can sometimes be overwhelming. In 2010, an alternative approach to learning tooth preparation for beginners was developed. Several training blocks instead of typodont teeth were carefully designed to provide specific and targeted psychomotor skill development. Individual training

blocks are designed for taper, biplane, shoulder margin, chamfer margin, occlusal planar reduction, proximal contact, and bevel. Students learn and practice on each of the training blocks on bench top by focusing on a specific skill one at a time. A measuring tool was also developed that students can use during the preparation to provide feedback on the accuracy of the preparation for each block design. This approach in training deconstructed a complex skill into smaller components. The goal is to allow beginners to learn and practice each targeted skill first before putting them together as one whole skill. With the measuring tool, students can practice the skill without faculty and still get feedback in the accuracy of their preparation. Overall, this method is a useful adjunct to traditional training that makes beginners highly engaged and focused in their skill development while working independently.

208. Assessment and Training of Senior Dental Students in Infant Oral Health and Knee-to-Knee Examinations in an Early Head Start Program

Carolynn A. Zeitz and Hassan S. Oueis, University of Detroit Mercy

The American Academy of Pediatric Dentistry recommends that all children have their first dental checkup at the age of one. Training senior dental students and providing a clinical experience in infant oral health can be very limited. An infant oral health screening rotation was developed in collaboration with an Early Head Start facility. This rotation provided dental students an opportunity to practice infant oral health examination on children twelve to thirty-six months of age. Students were assessed on their infant oral health knowledge prior to and after clinical rotation. The students were greatly satisfied with the clinical rotation at the Early Head Start facility. Overall, the students gained a better understanding of how to perform and provide comfort in performing a knee-to-knee examination with this clinical rotation. The majority agreed that the rotation was beneficial and provided an opportunity to perform multiple infant knee-to-knee examinations. The clinical rotation also helped the students feel more comfortable with the examination and prepared to conduct infant oral examinations after graduation.

209. An Interprofessional Course at Pacific University's College of Health Professions with a Focus on Community Outreach

Amy E. Coplen, Kelli Shaffer, Gail Aamodt, Pam Kawasaki, and Shawna Rohner, Pacific University

This course provides basic guidance in developing essential skills and attitudes in order to function effectively in an interprofessional health care community. Pacific University's School of Health Professions educates students in seven fields: dental hygiene, professional psychology, pharmacy, physician assistant, physical therapy, occupational therapy, and health care administration. Students are assigned to work in groups of six with students from other schools. The course is comprised of two half-credit phases: didactic and experiential. In the first phase, professional first-year students will attend a two-hour seminar once a month to increase their knowledge in four didactic topics (leadership, professionalism, diversity, and community resources). The highlights of the didactic topics are to recognize one's own and others' health care professions, develop interprofessional skills in communications and interactions, and appreciate the important role that leadership, professionalism, and diversity play in health care environments. In addition, issues are discussed related to health care access, services, and awareness of community resources to support the health care community. In addition to the team-based approach with students, the didactic topics are also taught by faculty teams from different schools to encourage

interdisciplinary collaboration. In the second phase, students fulfill an experiential component in which they engage in a community service experience as an interdisciplinary team. The experience provides an opportunity for application of didactic learning in the areas of teambuilding, leadership, professionalism, diversity, and community resources. The experience culminates in a demonstration of learning at the College of Health Professions Interdisciplinary Event. Each group is required to design and present a professional poster in an event open to students, faculty, and the community.

240. The OSCE: A Picture IS Worth a Thousand Words!

Mark S. Ferriero, Boston University Goldman School of Dental Medicine

Purely objective-style examinations (e.g., case-based or context-free multiple-choice questions) have been a staple in education for decades. In clinically oriented professional education (medical, dental, pharmacy, physical therapy, nursing, chiropractic, etc.) environments, additional/adjunct testing styles and methods are quite beneficial, even necessary for ultimate success and proficiency. Objective structured clinical examination (OSCE) testing, in one form or another, has been used in medical school education worldwide for many years. In dental education, this style of exam has been used predominantly in the study of gross anatomy. Students are asked timed, station-based questions based on visual cues or markers presented on human cadavers (e.g., "Identify this nerve" or "What is the insertion point of this muscle?"). In recent years, dental education has benefited greatly from the OSCE. It tests the application (versus simply the recall) of knowledge: the what, how, when, organization, and communication of information. By way of clear definition, style and design explanation, examples, evidenciary data, and questions and answers, I propose to educate, enlighten, and inspire other academicians in the importance spectrum of this ever-expanding testing medium. There is much to be learned through correctly processing and responding, in a timed and timely fashion, to both simple and complex visual, multimedia, and media-like cues/scripts/stimuli (e.g., a radiograph, an Rx, a phlebotomy video, a med/dent patient hx, a national licensure testing question). I have been using the OSCE for over five years in my preclinical occlusion course at the Boston University Henry M. Goldman School of Dental Medicine with much success and positive feedback from students and colleagues alike. Students' resultant clinical comprehension and National Board Dental Examination success in this discipline have improved. The National Dental Examining Board of Canada (NDEB) and the state of Minnesota utilize the OSCE as 50 percent of their licensure examination. All indicators point to the validity, efficacy, and even necessity of the OSCE as a critically important evaluation tool in clinical and professional sciences education. Nonetheless, OSCEs seem mysterious to many and remain underutilized. Competency-based education is predicated on their innovative, stylized, and integrated use.

241. Advanced Simulation Clinic Orientation

Heather J. Conrad and Judith A. Buchanan, University of Minnesota; Alexander Welk

DentSim is an advanced, interactive dental system that combines clinical and virtual environments to enhance dental training and practice. Problem-oriented learning is followed by detailed and objective feedback and allows students to progress at their own pace towards optimal performance. The Advanced Simulation Clinic includes a clinical environment with a patient simulator and dental instruments along with a virtual environment that includes a case history, online instructor, real-time feedback, and evaluation. DentSim provides students with a smoother transition into the clinic

by developing fine eye-hand coordination, supporting and reinforcing ergonomics, mimicking real patient conditions, and encouraging self-training through immediate feedback of preparations. Compared to traditional laboratories, research has shown that students who use DentSim acquire psychomotor skills using computer-generated feedback, learn faster, complete more practice procedures per hour, request more evaluations per procedure, and arrive at the same level of performance. The tracking system for DentSim is based on the principles of Global Positioning System (GPS) technology. The camera placed above the workstation tracks the light-emitting diodes (LEDs) on the handpiece and simulated patient jaw. The LEDs on the handpiece signal the operator's motion and the LEDs on the jaw signal the location of the teeth. The GPS data are sent to the computer. The exact location of the cutting but in relation to the tooth is calculated and translated into a virtual color-coded three-dimensional image. All of the DentSim workstations are networked to an instructor's workstation allowing for display of information to individual students or a group of students. Ergonomics is the adaptation of the workplace to the worker through correct sitting posture. The goals of ergonomic design are to improve the job process by reducing or eliminating unnecessary tasks, overexertion, and mental or physical fatigue. Dentists are prone to forward-head postures after years of holding the head and neck in an unbalanced forward position to improve visibility. Maintaining a neutral balanced posture will promote efficient use of the muscles and keep one comfortable for longer periods. This online module provides the student with an overview of DentSim, why it is used, and how it works. The module also explains to students how to position the patient simulator and themselves at the workstation, how to use the software to complete a lesson, and what maintenance should be done at the end of the session to maintain the workstation. This web-based tutorial is being used by 100 first-year dental students every fall semester prior to entering the Advanced Simulation Clinic. It has proven to be effective at decreasing the students' dependence on faculty when beginning and while advancing through an introductory operative course. DentSim is designed to provide a smoother transition for the students into the clinic by supporting and reinforcing ergonomics, mimicking real patient conditions, and offering practice in the documentation of patient care. The system promotes the development of fine hand-eye coordination while encouraging self-training through visualization of preparations and immediate feedback. Students who used this tutorial were able to acquire psychomotor skills and complete more practice procedures more quickly due to an understanding and familiarity of the software and hardware components.

242. Introduction of Power-Driven Scalers Early in the Dental Hygiene Preclinical Curriculum

Beverly A. McClure, The Ohio State University

The evidence-based *Annals of Periodontology* 2003 workshop concluded that both manual and mechanical instrumentation is effective in improving the clinical parameters associated with periodontal health. Because of the evidence, the power-driven scaler was introduced earlier in the dental hygiene preclinic curriculum. Power scaling was introduced in the first few weeks immediately after the lab and clinic practice of the 11/12 explorer. In the past it was introduced toward the end of the preclinic course with no evaluations. Due to the lack of available ultrasonic scalers for all students, the sickle scalers were also introduced at the same time so that one half of the class could clinically work on the ultrasonic scaler and the other half on the sickles. This was followed by evaluations on each. More practice and evaluations on the power-driven scaler were also implemented at the end of the course. A seven-question Likert survey was given to the preclinic class (N=32) at the end of the course. Ninety-four percent either strongly agreed or agreed the introduction of the power-driven scaler early in preclinic was appropriate. Ninety-four percent strongly agreed, agreed, or slightly agreed that they felt prepared to use the power-driven scaler on their first clinical patient. Sixty-seven percent strongly agreed, agreed, or slightly agreed that there was enough practice time before their first clinical patient. Comments included the following: "Watching correct technique one time at the beginning and then again maybe 2 weeks later (refresher) would have been beneficial to me" and "Talk about the tips and uses, more practice in preclinic." The introduction of the power-driven scaler early in the curriculum appears to be successful. Students were taught that both effective hand instrumentation and power instrumentation are necessary in providing care. The majority of students felt prepared to utilize power scalers on clinical patients.

243. The AMA-Sponsored Course on Core Disaster Life Support Presented to Senior Dental Students

David L. Glotzer, New York University

One way to implement the new recognition by the federal government of dentistry's role was to decide what additional meaningful training could be given to dental students in the curriculum time available. At New York University College of Dentistry (NYUCD) we chose to capitalize on a program developed in 2003 by the American Medical Association (AMA), in partnership with four major medical centers and three national health organizations. This established the National Disaster Life Support (NDLS) training program to better prepare health care professionals and emergency response personnel for mass casualty events. The NDLS courses stress a comprehensive all-hazards approach to help physicians and other health professionals deal with catastrophic emergencies from terrorist acts as well as from explosions, fires, natural disasters (such as hurricanes and floods), and infectious diseases, which are much more likely to occur. The overarching goal is to standardize emergency response training nationwide and strengthen our nation's public health system. Subsequently, NYUCD became designated an official NDLS Training Center by the AMA governing body. The four-hour Core Disaster Life Support (CDLS) Course Version 3.0, the first in the series of NDLS courses, was chosen for presentation to the NYUCD senior dental students. The CDLS course is a competency-based, awareness-level course that introduces clinical and public health concepts and principles for the management of disasters and public health emergencies. The course incorporates the "all-hazards" approach to personal, institutional, and community disaster management through the use of two unique mnemonics, the predisaster paradigm (which applies to event mitigation and preparedness) and the disaster paradigm (which applies to event recognition, response, and recovery). The overarching aim of the CDLS course is to provide participants from diverse professions, disciplines, and backgrounds with a common lexicon, vocabulary, and knowledge in disaster-related medicine and public health that can be reinforced and expanded in the eight-hour Basic Disaster Life Support course. By viewing this poster, attendees will learn about the federal government's project for dentists in any (all hazards) disaster situation. In addition, they will become aware of how one dental school employed interprofessional education via the AMA series of approved disaster-related courses in its curriculum to teach for better public health effectiveness.

244. An Interprofessional Integrated Clinical Case Presentation Model Involving Students from All Four Years of Dental School, Nursing, and Dental Hygiene

Morey J. Gendler, Mark S. Wolff, and Andrew I. Spielman, New York University

This program is designed to integrate students across all four years of dental school as part of a small group basic science/clinical case presentation (BSCCP) with an interprofessional interaction with nursing and dental hygiene students and create a forum in which students can apply their knowledge of science into actual patient care situations. One of its major goals is not only to teach clinical dentistry very early in a student's education and to integrate basic science concepts into clinical dentistry, but to incorporate this with other professions. Traditional dental education is still taught along academic years: freshman, sophomore, junior, and senior, with academic courses sometimes integrated across multiple disciplines, but usually not across years (vertical integration) and not across different health care professions. This educational model will greatly expand upon this interprofessional interaction. Our previous model placed students from all four years into small groups at the same time in the same place discussing different aspects of a clinical case. Each student preassigned to the case contributes to the discussion in a different way. Senior students bring a case from their clinical portfolio. The junior student creates a PICO (Population, Intervention, Comparison, and Outcome) question and does a literature search for evidence at the highest level to support a particular aspect of the patient's medical or dental diagnosis or treatment. The sophomore discusses a small aspect of the pathology and/or pharmacology related to the patient. Finally, the freshman makes a brief presentation on the biochemistry, cell biology, physiology, and/or anatomy related to the patient's case. Now, there will be additional input and discussions. The nursing student will discuss an aspect of the patient's medical history including the patient's need for medical intervention, how the diagnosis was made, which tests were conducted, and how the disease can affect the patient's daily life. This discussion will enhance and assist all students in becoming compassionate caregivers and health care advisors and medical screeners for early onset of diseases. The dental hygiene student will give a presentation on the patient's oral hygiene and customize a home care regimen to assist patients in achieving their goals. Students have four to eight weeks to prepare for their presentation and are expected to take ownership of their material and to present as experts and interact with the audience. They are strongly encouraged not to read from their slides and avoid text-only slides if possible. Students are also required to read the articles that are presented in advance and to complete a literature analysis form demonstrating their interpretation and understanding of the topic. Each student attends eight seminars a year, presents actively in one or two, and is expected to contribute in all others by asking and answering appropriate questions. This seminar should be a dynamic discussion and flow of information from all participants. As dental students move from their freshman to sophomore years, their role changes according to the subject they present. This educational model involves peer teaching, team and active learning, evidence-based dentistry, problem-based learning, and an interprofessional interaction while the student is learning communication and presentation skills. Students staying within the same group for four years create an environment for student bonding and a cooperative work atmosphere while integrating basic, clinical, and behavioral principles. This interprofessional approach encourages communication with not only dental students but other health care providers. This interaction will improve future communication with our colleagues during general practice residencies and future interactions while in practice. These open discussions will benefit all patients, especially those who are medically compromised or who have been screened and need referral and/or additional medical evaluations. It also allows the new students to more clearly understand and apply basic science education to the clinical setting through use of this problem- and case-based model. Additionally, the discussion of dentistry will expand the nursing students' knowledge and will greatly benefit their future interactions with patients. This educational interaction facilitates development of both students and faculty while allowing for the growth of all of our students' critical thinking, clinical performance, and proficiency by building upon their basic science knowledge. The improved communication skills that our students will gain will greatly benefit their relationships with their patients as well as their current and future interactions with other health care professionals. To quantify potential outcomes and results, exit survey data from D1, D2, D3, D4 students (1,300) and also nursing and dental hygiene students will be conducted after eight months of launching this new course. These outcome assessments will include questions related to the experience of interacting with other health care providers. This interprofessional involvement and experience in clinical case presentations early in a student's education will facilitate the development of all of the participating students' communication and presentation skills, vertically integrate basic sciences across the four academic years, enhance the relevance of basic science principles in patient care, and allow for interaction and sharing of knowledge with colleagues and other health care providers, while creating future men and women of science and a team of clinicians working together.

245. The Use of a Mobile Computer to Survey Dental School Patients Currently Receiving Care

Marnie Oakley and Jonathan Holton, University of Pittsburgh

A patient satisfaction survey should be easy to use, easy to understand, offer appropriate questions to assess the patient's satisfaction, be anonymous, and minimize the effort required by the staff to implement and retrieve data. Prior to 2009, patient satisfaction surveys at the University of Pittsburgh School of Dental Medicine were conducted by requesting that a staff member from each department contact by phone at least ten patients presently undergoing treatment. The staff member was instructed to document the patient's responses to the survey questions. Several challenges to the system arose. Specifically, staff would often make 100–125 phone calls to reach ten patients who would be willing to take the survey, thus wasting countless hours of valuable staff time. Additionally, the survey was not anonymous, as the staff member was able to tie the survey to the patient information provided to make the phone contact. It was also noted that some patients openly and sometimes unpleasantly voiced the opinion that they did not appreciate being contacted via this method. Since 2009, a new way of conducting the patient satisfaction survey has been developed and implemented at the school. A mobile computer, wheeled to each department, is now specifically dedicated for the survey. The nine questions comprising the survey are answered by patients in an electronic format by requesting that they simply click their responses. An additional area, at the end of the survey, has been included so that patients may type in additional comments if they so choose. The entire process of completing the survey takes no more than two to three minutes per patient. At no time is a patient required to identify him- or herself, ensuring anonymity. No patients' complaints related to this revised survey method have been noted. At the conclusion of the survey cycle, the data can be easily retrieved and separated by departments, thus giving the department chairs an opportunity to review the patients' concerns and make any necessary adjustments. Additionally, comprehensive data are available for review by the school's Quality Assurance Committee for further action related to clinical operations. The use of a mobile computer has offered the University of Pittsburgh School of Dental Medicine a more effective and efficient method to survey patients and review data related to the dental services provided.

246. Refining a Treatment Planning Curriculum That Capitalizes on an Electronic Health Record: One Dental School's Experience

Karen A. Nedwick-Castro, Marnie Oakley, and Jean O'Donnell, University of Pittsburgh

Experienced clinicians understand that effective treatment planning is a complex skill and one that is critical to the success of the care they provide. Teaching treatment planning to predoctoral students can present a challenge in the preclinical and clinical years of the curriculum, a challenge that may be exacerbated by the introduction of new technology in the form of the electronic health record (EHR). As the University of Pittsburgh School of Dental Medicine (UPSDM) changed from a paper-based system to an EHR, its curriculum needed to change to accommodate the new treatment planning method. Little information, however, was available from any source to guide this transformation. The teaching plan used by the UPSDM to address this challenge adapted to the limitations, as well as the advantages, inherent in the system through a seemingly unavoidable trial-and-error process that, if shared, might be circumvented by other institutions. There were a number of opportunities to capitalize on the advantages of the EHR. The first was to use the EHR to provide authentic experiences for students to learn treatment planning beginning in the preclinical curriculum in a simulation environment. This changed the forum for information delivery from a classroom lecture to a hands-on experience using de-identified cases extracted from axiUm patient records. The EHR was used to emphasize and support the first-year curricular theme, Health Promotion and Disease Prevention, by creating and implementing electronic diet and risk factor forms to house data collected by the student during the simulated or live patient interview; the data were then used in formulating a treatment plan that emphasized risk reduction and prevention as essential components for successful treatment. The EHR also provided an opportunity to reinforce a curricular topic with its structural support of phasing and sequencing a comprehensive treatment plan. Allowing each treatment entry to easily be assigned a numbered phase and sequence permitted the student the opportunity to organize and implement his or her patients' care. Documentation of treatment was also controlled and simplified through the use of a template designed to support the SHAPED and SOAP note formats used by the school. Teaching treatment planning through the use of the EHR also presented challenges. In addition to the general apprehension of the unknown and resistance to change across many users at various levels, the implementation of treatment planning via an EHR in the preclinical and clinical environments generated a number of issues related to teaching for both students and faculty. Institutions facing similar curricular modifications with the implementation of an EHR may find their challenges lessened by considering the following: the time needed to modify the treatment planning course to teach to this new management system is substantial; faculty calibration to adapt to the EHR is crucial; how-to videos are helpful to train faculty, staff, and student users to perform previously simple tasks such as documenting the medical history, hard tissue charting, accessing and viewing electronic radiographs, and incorporating the data into a comprehensive treatment plan; and cases need to be identified, extrapolated, and then de-identified from axiUm before being used as teaching cases in the simulation lab, requiring considerable support from technology staff. Additionally, technological facilities must be of sufficient number and strength to support multiple simultaneous users throughout the institution; anticipating solutions during unexpected system failures and providing appropriately limited access to ensure confidentiality of patient records must also be considered. The use of axiUm has provided the UPSDM with the structure to strengthen several curricular philosophies related to treatment planning. Further capabilities of this system are still being realized throughout the school. Dental institutions that use this system can benefit from the actions taken by this school to support their own treatment planning teaching philosophies through the use of an EHR.

247. Introducing Communication Skills to the Dental Student and Dental Technician Through Interprofessional Education

Donnie G. Poe, Marc J. Geissberger, Elsie Woo, Richard G. Lubman, and Philip M. Buchanan, University of the Pacific Arthur A. Dugoni School of Dentistry

A ten-question survey was developed to investigate various options and methods of developing a meaningful relationship between the dentist and the dental laboratory technician. The questions were designed to collect information on how dental schools approach this realm of their curriculum. This survey was distributed to all the American Dental Education Association (ADEA) member dental schools through the listservs of Prosthodontists, Implantologists, Dental Anatomy and Occlusion, and TMD Specialists. The results for each question are as follows: 1) does your school use an outsource dental laboratory? 84 percent yes; 2) does your school have predoctoral/dental laboratory communications in the curriculum? 70 percent yes; in what way? laboratory prescription instruction-small shade matching seminars; 3) how are the predoctoral/dental laboratory communications developed in your school? 74 percent we use our own prescription; 4) what are the known strengths in your school's approach to developing interprofessional communications? 70.4 percent quality control dental technician; 5) what are the known issues of concern in your school's approach to interprofessional communication development? 49 percent loss of communication skills and quality; 6) should your school's approach to interprofessional education be—didactic, mentorship, both 91 percent; Why? didactic to teach basics, mentorship to teach communication; students should be taught the value of team relationships; 7) how can your school improve the interprofessional communication skills between the dentist and the dental laboratory technician? introduce more understanding of laboratory procedures and foster the idea of team-building; and 8) as a dental educator do you feel this subject warrants more discussion in the dental community? 87 percent yes. ADEA has sixty-one member schools in the United States and ten in Canada. Seventy percent of the respondents to the survey agreed that the number one concern to educating dental students to work effectively with dental technicians was the development of good interprofessional skills. Fifty percent of the respondents listed points such as loss of quality treatment planning, loss of quality control, and added economic burden as major concerns. There is a need to be aware of and to focus on the development of interprofessional communication skills between the dental student, clinical faculty member, and dental laboratory technician. This subject warrants much more discussion and attention among dental educators.

248. Wellness Boot Camp: A Vehicle to Foster Collegiality and Improve Systemic Health of Members of the Dental School Community

Marc J. Geissberger and Cindy Lyon, University of the Pacific Arthur A. Dugoni School of Dentistry; Teresa Kuhlman; Bernadette Alvear Fa; Philip M. Buchanan, University of the Pacific Arthur A. Dugoni School of Dentistry

One key component essential to a life of health is physical activity. The U.S. surgeon general now advises thirty minutes of physical activity five days per week. To assist members of our community in reaching the recommended level of exercise, the dental school established a weekly boot camp. This group exercise program is offered to all members of the community and focuses on camaraderie and exercise in a fun, rewarding, and motivating setting. It has been operating successfully for a year and half and now boasts forty-five regular participants. Currently, sessions involve administrators,

faculty members, staff, and students helping each other accomplish a challenging workout through positive reinforcement and coaching. Perceived barriers between the three groups are broken down and friendships are formed. Thirty-one participants responded to a ten-part IRB-approved survey of open and closed end questions. The intent was to identify changes in personal fitness, dietary changes, the sense of well-being, and the sense of developed camaraderie. The results revealed that, of the respondents, 39 percent were faculty members, 35 percent were staff, 16 percent were students, and 10 percent were administrators, while 23 percent were with the beginning class and 29 percent began within the last three months. When queried about noticeable changes, 77 percent reported a change in energy level, 65 percent reported a change in eating habits, and 42 percent experienced weight loss. Participants reported that, since beginning the program, 81 percent had changed their exercise routine outside of the program. Noticeable was the enthusiastic 100 percent response when asked, "Do you feel that participating in this Wellness Boot Camp with other individuals from all areas of the dental school family increases the feeling of healthy community, collaboration, and encouragement of your exercise and well-being goals?" Introducing a wellness boot camp into a dental school milieu can be beneficial to the well-being of the faculty, staff, students, and administrators who participate and correspondingly beneficial to the school.

249. Dental Clinical Faculty Members' Perspectives on an Electronic Chart

John D. Jones, Diane Sullivan, Norma Olvera, William D. Hendricson, and Gary F. Guest, University of Texas Health Science Center at San Antonio

Electronic dental records are currently being used in a significant number of dental schools around the country. Studies indicate that most entering students are highly computer-literate, but dental faculty members are not nearly as computer-savvy. Dental school faculty members are accustomed to paper charts, and most entering students are not familiar with dental charts or recordkeeping. The purpose of our evaluation of this new program was to determine the ease of use of electronic charts from the dental clinical faculty members' perspective. A survey evaluating the electronic chart (axiUm) was given to clinical dental faculty members at the University of Texas Health Science Center in San Antonio. A seven-point scale from very easy to very difficult was used for respondents to rate twenty components of an electronic chart. Three items of over 16 percent were noted as very easy: accessing patient information (Rolodex) (28.6 percent), writing a note (17.1 percent), and approval of entries (16.7 percent). Three items of over 4 percent were noted as very difficult: comparing periodontal evaluations and re-evaluations (9.5 percent), outcomes of care (4.9 percent), and formulation of treatment plan (4.8 percent). Although all the faculty members were trained in the use of paper charts, most appear to accept the concept of electronic charts. While the survey indicates that, overall, this specific electronic chart was not particularly difficult, common themes of some comments focused on specific difficulties. One respondent wrote, "The chart is cumbersome, time-consuming, and inflexible," while another commented that "it is easy to use and user-friendly." The comments were helpful in providing valuable information for future changes of the electronic chart.

250. Dental Student Perspectives on an Electronic Chart

John D. Jones, Diane Sullivan, Norma Olvera, William D. Hendricson, and Gary F. Guest, University of Texas Health Science Center at San Antonio

Electronic dental records are currently being used in a significant number of dental schools around the country. Studies indicate that most entering students are highly computer-literate, but dental faculty members are not nearly as computer-savvy. Dental school faculty members are accustomed to paper charts, and most entering students are not familiar with dental charts or record keeping. The purpose of our evaluation of this new program was to determine the ease of use of the electronic chart from a dental student perspective. A survey evaluating the electronic chart (axiUm) was given to third- and fourth-year dental students at the University of Texas Health Science Center in San Antonio. A seven-point scale from very easy to very difficult was used to rate twenty components of an electronic chart. Four items of over 15 percent were noted as very easy: accessing patient information (Rolodex) (19.8 percent), writing a note (19.5 percent), use of templates (17.4 percent), and recording medications (15.1 percent). Three items of over 18 percent were noted as very difficult: use of signature pad (23.3 percent), perio charting (19.5 percent), and approval of entries (18.4 percent). All the students surveyed have not used paper charts and are only familiar with the electronic format. They are very comfortable with computers in an electronic age and appear to embrace the technology and the use of the electronic chart. However, additional comments showed that students believed the electronic chart was difficult to use. Common themes included the following: difficulties with the signature pad, difficulties with the use of a Mac, and recommendations to use a hyperlink or the ability to click and see more information at one time. Some mentioned it is time-consuming for faculty approval, yet they realize the importance. The comments were helpful in providing valuable information for future changes of the electronic chart.

252. Selling Prevention to Dental Students Via an Online Course

John G. Palanci, Durinda J. Mattana, and Diane C. Hoelscher, University of Detroit Mercy

Dental schools are seeking innovative ways to improve student learning and address various challenges including overcrowded curricula. One such strategy is the development of online courses. The preventive dentistry course at the University of Detroit Mercy School of Dentistry has historically been viewed by dental students as less important than other didactic courses and of limited relevance to clinical dentistry. In addition, student ratings of organization and quality of instruction for previous prevention courses were inconsistent. Faculty members were also concerned that the crowded predoctoral curriculum provides students little flexibility or time off campus, especially during the DS2 year. Furthermore, outcomes data indicated students were not well prepared to develop effective prevention plans for their clinical patients. Therefore, an online course was developed to offer student flexibility in scheduling their leaning, improve the learning experience by enhancing course organization and access to faculty feedback, and incorporate learning activities that focus on critical thinking and evidence-based application to clinical situations. Key features of this DS2 course include 1) online course administration with limited face to face (F2F) sessions, 2) course organization into weekly learning units, 3) an interprofessional education approach with dental hygienist and dentist course directors, 4) timely feedback and improved access to course directors, 5) case-based application assignments, and 6) assessment of critical thinking through two projects based on real clinical situations. Students were already familiar with the online course management system, Knowledge. Technical support is available through the Instructional Design Studio and Help Desk. This two-credit, fifteen-week course was divided into fourteen learning units. Prior to the beginning of the course, the codirectors sent students an e-mail message explaining the rationale for moving from an F2F course to an online course. Only the first class and midterm and final written examinations took place

F2F; all other sessions were online. The first F2F session involved introduction to the course directors, syllabus, and course website. Materials for each learning unit were posted in a folder on the course website three weeks in advance and included learning objectives, instructions, an online quiz based on readings, online resources, a narrated PowerPoint presentation, and an application assignment, usually involving a patient case. Students moved from passive learning activities in the beginning of each unit to active learning experiences. In addition to reading assignments, students were expected to spend an average of two hours per week on course activities. Although the course was asynchronous, each learning unit quiz and assignment were due on Sunday evening for consistency. Students also completed two projects: a product evaluation report and a prevention plan. The first project required students to select an oral health product and report on its efficacy, employing evidence-based research. The final project was development of a prevention plan for their sophomore clinic patient. Student learning was assessed with weekly online quizzes, written midterm and final examinations, and grades for each of the projects. A dental hygienist and dentist served as codirectors of this course to model the importance of collaboration between oral health professionals. The dentist course director was available on campus full-time, and both directors were available online. In addition, four guest presenters participated and were responsible for all aspects of their learning unit. The codirectors divided course responsibilities and met weekly to discuss course issues. Immediate response to student questions was provided, and results to quizzes and projects were posted within one week of due date. One hundred percent of eighty-nine students completed anonymous online course evaluations. Results showed that 86 percent agreed or strongly agreed that they gained a good understanding of concepts and principles; 88 percent agreed or strongly agreed that the course integrated basic science/clinical science concepts and clinical practice; 86 percent agreed or strongly agreed that overall this course was excellent; 88 percent agreed or strongly agreed that each online learning unit was well organized with clear objectives and instructions; and 87 percent agreed or strongly agreed that the product report and prevention plan assignments helped them apply information learned to clinical situations. In addition, there were several positive comments regarding the flexibility provided by this online course and the value and applicability of the information presented. Three of the students suggested less work and felt weekly assignments were unnecessary. One student reported a problem with audio on a narrated PowerPoint, and one student commented on issues with e-mail responses from the faculty. All students passed all course components. The average grades for the product evaluation were 89 percent and 97 percent for the prevention plan. The main disadvantage was the faculty time commitment needed to manage an online course for eighty-nine students. This online course met its objectives of improving student scheduling flexibility, enhancing student learning experiences, and engaging students in active learning to facilitate critical thinking. Student ratings of course quality, integration, and application to clinical situations were higher than for other School of Dentistry didactic courses. Other institutions could apply the strategies used in this course to improve learning outcomes in preventive dentistry courses.

253. Conceptual Instruction and Character Shaping in Practice Management Education: A Concept-Based Curriculum Integrated with Inquiry-Based Learning

Steven C. Reynolds, University of Detroit Mercy

Course evaluation analysis at the University of Detroit Mercy School of Dentistry suggested that additional classes and further development of the practice management curriculum would be desirable. Survey results from earlier courses indicated that students wanted more time

to be able to assimilate the volume of material that was applicable in practice management. In addition, students felt that they needed additional fundamental information. A new curriculum was created with goals of 1) promoting active learning, 2) creating an application to real-world situations, 3) promoting critical thinking, and 4) increasing student interest and appreciation of the subject matter. This is in direct contrast to the traditional practice management coursework, which includes in-depth lectures and discussions of business and economic theory. The curriculum utilizes both small- and large-group interaction and case-based problem-solving exercises and culminates with the utilization of a computer-simulated dental practice as a capstone exercise. The structure of the curriculum involved a first term comprised of exposure to basic business and economic principles as well as business law and risk management. Hands-on case-based learning was used extensively. Assessments included short online quizzes given immediately after the class period, case-based individual and group projects, and a summative final exam that was structured to include complex multiple-choice questions. The second term continued to introduce important business subjects as well as to introduce leadership, management, communication skills, and diversity in the workplace. Small- and large-group discussions and projects were used to reinforce concepts for the student. Assessments were similar to the first term; in addition, one-sentence summaries were used at the end of some classes to assess students' understanding of the concepts. One-sentence summaries ask students to write sentences describing who, does what, to what or whom, when, where, how, and why. The final semester included employee-employer law and a review of the National Practitioner Data Bank. Next, interview and interviewing skills were practiced using small-group session role playing and by observing videos of interviews and then producing written evaluations on the features in the interview. The final nine weeks focused on the capstone dental practice computer simulation. In the simulation, the student has purchased a practice from an older dentist. A scenario is presented that describes the city in which the practice is located and the general business environment of that city. The student begins with one operatory and one staff person. The student must then make decisions on when to add staff, when to purchase a new operatory, how much managed care to accept, what the advertising budget should be, the practice style, the credit policy, and other pertinent decisions. An ethical or moral dilemma is presented at each period also; that dilemma has two to four possible solutions. The student selects one, and that decision is used by the computer to help in the calculation of that quarter's results. The simulation computes on a quarterly basis and can be run for four to twenty quarters; ours runs for twelve. At the end of each simulation run, a data sheet is posted online for the students. The instructor can make comments on the website to the students, and the practices are ranked by how well they are doing. At the end of the simulation there is a section entitled Report to the Banker. This is used as the final exam. It is a reflective piece on the results of the computer simulation. Students are asked to describe how well their practice did, why it performed as it did, and how they might have had better results. Outcomes for this first year of operation are positive. Classroom evaluations, using a five-point Likert scale, showed achievement of the stated goals and high levels of approval with the curriculum. For example, 83 percent of students agreed or strongly agreed that they gained a good understanding of concepts and principles; 79 percent agreed or strongly agreed that the format of this course (group interaction as well as individual projects) was useful in providing a better way of learning; 78 percent agreed or strongly agreed that the simulation was a useful tool in helping them understand how to make decisions necessary to run a dental practice; 87 percent agreed or strongly agreed that they were building a better understanding of how to run a dental practice; and 85 percent agreed or strongly agreed that they understand the basics of business

better because of the course. The new curriculum thus met its goals of promoting active learning, creating applications to real world situations, promoting critical thinking, and increasing student interest and appreciation of the subject matter. The inclusion of a computer simulation encouraged active learning and critical thinking as well as promoting application of the principals and skills learned in the previous courses. Other dental schools should consider expanding and revising their practice management curricula to include principles outlined in this abstract.

255. Interprofessional Learning Modules for Dental and Dental Hygiene Students

Nancy R. Neish and Cynthia L. Andrews, Dalhousie University

Dalhousie University has made a commitment to interprofessional health education and is currently planning broad-scale learning initiatives to be implemented in 2010–11. These initiatives will involve all the health professions from the Faculties of Medicine, Dentistry, and Health Professions. However, the Faculty of Dentistry recognizes that there is also a need for dental and dental hygiene students to learn about, from, and with one another. Although the two dentistry programs exist within the same faculty, it was clear that the inclusion of more interprofessional learning experiences common to the two could enhance both programs. During the 2009–10 academic year, a committee of faculty members and students from both programs designed and implemented four interprofessonal modules aimed at promoting communication and understanding of the roles and responsibilities of the two professions. The four modules chosen were Teamwork, Optimizing Working Relationships, Tobacco Cessation Counseling, and Patient Co-Management. Students evaluated each module anonymously at the end of the session, and their evaluations indicated a high level of satisfaction with all four modules. Students who were unable to participate in a module were required to complete an alternative project. Students also provided suggestions for future modules. The modules were designed as two-hour sessions. The format included an introductory plenary session, small-group work, and a reconvening plenary session at which representatives from each of the small groups gave presentations to the whole group on their group's activities. Each small group was comprised of both dental and dental hygiene students. At the end of the session, students signed out as a means of recording attendance and handed in their evaluation forms. The sessions were held mid- to late afternoon, and the course directors who would normally be teaching the students at that time participated as module facilitators. Each module has specific learning objectives. The Teamwork module included first-year dental and dental hygiene students. Degree completion baccalaureate dental hygiene students acted as facilitators. By the end of the session, students will be able to recognize oral health care providers as members of patient-centered interprofessional teams; appreciate the unique and shared roles of interprofessional team members; and appreciate the major role interpersonal dynamics plays in creating effective interprofessional teamwork. The Optimizing Working Relationships module included second-year dental and dental hygiene students. By the end of the session students will be able to become familiar with the professions of dentistry and dental hygiene; further understand their chosen profession's role in providing patient-centered oral health care; and discuss strategies for optimizing working relationships between dentists and dental hygienists. The Patient Co-Management module also included second-year dental and dental hygiene students. By the end of this session, the student will be able to appreciate the patient as an individual with self-identified human needs; understand that an individual's oral needs are influenced by human needs; begin to construct a patient-centered oral health care plan (including recognition of the patient's human needs, priorities, and constraints; an appropriate timeline for addressing or treating

these needs; identification of appropriate health care providers and services for each need; identification of oral health treatment needs; and development of a detailed plan for efficient, shared provision of oral health care); and analyze and discuss aspects that are currently working well and brainstorm ideas for improvements to the system in the context of patient co-management within the Faculty of Dentistry. The Tobacco Cessation Counseling (TCC) module included first-year dental and dental hygiene students. By the end of this session, students will be able to increase awareness of and reflect upon group dynamics (group process) while sharing information and TCC-related discussions; describe the term motivational interviewing (MI) and discuss how MI applies to their role as an oral health care provider; and discuss TCC and its role in their practice as oral health care providers. To facilitate the implementation of similar modules at other interested institutions, the poster presentation will provide a description of each module, including the learning objectives, the course format, and the content and evaluation forms. The literature supports interprofessional education as a means of fostering collaboration among health professionals and anticipates that this will improve health care outcomes. To date there have been few published studies concerned with dental and dental hygiene students. It is hoped that fostering interprofessional educational opportunities for dental and dental hygiene students will enhance collaboration and mutual respect among future oral health care professionals.

257. A Guide to the Successful Implementation of a Laptop Program in Dental and Dental Hygiene Education

Blaine M. Cleghorn, Nancy R. Neish, and Peggy J. Maillet, Dalhousie University

The Faculty of Dentistry at Dalhousie University has successfully introduced a comprehensive laptop program into the D.D.S. program and more recently began the process for the dental hygiene program. Beginning with the dental program, the goal was to integrate and provide access to the entire curriculum through a student laptop program. The process began as the faculty considered the merits of a mandatory electronic textbook package (VitalSource) and computer for the dental program. Multiple information sessions were arranged to provide information and demonstrations of the software to faculty members. These included an exhaustive series of one-on-one, small-group, and large-group orientations presented by one faculty member. Once faculty members had the opportunity to assess the software, the decision to approve the dental laptop program was made through a voting process at a faculty meeting. This initial key decision was made in a democratic process and had the buy-in of the faculty before being initiated. A number of key elements were then necessary in the development and implementation of the laptop program. The first key element in the process was to identify a faculty member to champion the project. Once identified, a working group of key decision makers in the faculty was formed to begin the planning process for the project. The Laptop Planning and Implementation Team outlined an implementation process for the program. This included a unique staged implementation of the electronic textbook program. Faculty members received the complete electronic library of approximately seventy textbooks one year before it was introduced to the DDS1 students. This allowed the faculty members to learn the software and determine how to integrate this new technology into their courses. Training sessions were scheduled regularly to support faculty members during the year. Support and training continued to be available to faculty and students through a faculty member and the technical support team. Online resources for faculty members and students were developed and continue to be updated to provide support. As part of the staged planning, the first-year dental students received the MacBookPro with Mac OS as the standard platform.

The students received their first laptop as a leased computer that was returned upon completion of DDS2. All data from the computers were transferred to a new MacBook Pro with an extended warranty and a built-in lease with a compulsory buy-out. This plan allowed students to graduate with relatively new computers still under warranty. Electronic course materials continue to be added to OWL (Online Web Learning) to house various electronic course materials including manuals and lecture material in a variety of formats. The Laptop Planning and Implementation Team planned to have the laptops utilized in clinic by year 4 of the program. Access to the clinic information system (axiUm) and patient records was through secure web-accessed Citrix terminal services. Each clinic cubicle was hard-wired to provide a secure, fast method of connectivity to patient records. Infection control in the clinic was addressed through the use of flat, glass keyboards and customized Plexiglas shields for the laptops. Both the keyboard and shield are conducive to the clinic's standard disinfection protocol. An added benefit to the faculty was that fewer faculty-owned computers were needed for the clinics. The student laptops allowed for a continued renewable supply of current computers in the clinic. The dental hygiene laptop program was implemented in 2009 with first-year students only. At this time it was not possible to use VitalSource, so a combination of electronic Evolve Select electronic, web-based, and hardcopy textbooks was used. A complete electronic library through VitalSource became available in 2010 and will be used for both first- and second-year students. The laptop program at Dalhousie University is in its fifth year in dentistry and its second year in the dental hygiene program. An exit survey was recently conducted for the first D.D.S. graduating class to use the laptop program. Overall, the surveyed students generally reported very positive feedback for the laptop program at Dalhousie University. Introduction of laptops and an electronic curriculum into a dental and dental hygiene program can be fraught with problems. The laptop program at Dalhousie University has generally been a positive experience for both faculty and students as a result of carefully planned process. Key elements to the success of a laptop program include having one or more faculty members to champion the process and an infrastructure in place for ongoing support and development of the program.

264. Use of Electronic Portfolios to Foster Critical Thinking and Assess Competencies in Pediatric Dentistry Postdoctoral Students

Kavita R. Mathu-Muju, David A. Nash, Raven Piercey, and John R. Mink, University of Kentucky

Electronic portfolios are a web-based tool that help foster reflective learning and critical analysis in students. E-portfolios provide a dynamic record of learning and achievement. Research suggests that use of e-portfolios leads to better learning outcomes. The purpose of this presentation is to discuss implementation of e-portfolios as a tool for professional development for pediatric dentistry postdoctoral students. The pediatric dentistry faculty at the University of Kentucky developed thirteen competency statements with tangible assessments associated with each. Successful completion of each competency would result in validation of the knowledge, skills, and attitudes essential to being a pediatric dentist and would also document the achievement of accreditation standards. An e-portfolio for each postdoctoral student was developed using PB Works, a commercially available Wiki website. Students were required to provide documentation for each competency by posting records such as photographs, radiographs, and videos. Additionally, residents were required to write a reflective paragraph on lessons learned from each experience. Faculty members provided formative feedback to students on the documentation provided and their reflection of

what they had learned. Preliminary results suggest that postdoctoral students and faculty members find the use of an e-portfolio effective in fostering reflective learning and documentation of competence. Use of the e-portfolio is proving to be an effective tool in aiding the professional development and ability to think critically of pediatric dentistry postdoctoral students.

265. Why Students Forget Most of What They Are Taught and What You Can Do About It

Pauletta G. Baughman and Keith Lyle, University of Louisville

Our introduction to the clinic course is a two-semester course that meets for four hours each week. In the fall semester, we gave traditional quizzes covering the previous week's lecture or the required reading assignment. In the spring semester, we adopted a recently developed procedure in which, at the end of many lectures, we asked students five or six multiple-choice or true/false questions. These exercises were called PUREMEMs (pronounced "pure-mems") for Practicing Unassisted Retrieval to Enhance Memory for Essential Material. At the end of the spring semester, students completed an anonymous survey concerning various aspects of the PUREMEM system. According to the survey, students felt the procedure encouraged them to take more notes, ask more questions in lecture, come to lecture more, and pay more attention in class. Students also responded that the system helped them identify important topics from lecture, identify points they did not understand, practice questions similar to those on exams, develop a better sense of what they had learned, and increased their critical thinking skills. Overall, students felt the procedure was a positive addition to the course, preferred it over the traditional system of being quizzed on material from the preceding week, and thought the procedure should be used in other courses. Males and females alike responded very favorably to PUREMEMs. The system has also been used in a psychology course with students answering a small set of questions that required them to retrieve information from the same day's lecture. Scores were significantly higher in the section taught with PUREMEMs than in the one taught without it. As in the dental course, the students believed it increased learning. This approach appears to promote activities that are likely to increase retention of lecture material in a dental class and a psychology course. This survey is only a preliminary assessment of the effectiveness of the PUREMEM procedure. Additional research is needed to determine if the procedure actually improves learning outcomes and if it is equally well received in other types of courses.

Works in Progress

210. Qualitative Analysis of Students' Perceptions of Curricular Change

Angela Wetzel, Sharon K. Lanning, and B. Ellen Byrne, Virginia Commonwealth University

211. Development of a Non-Erroneous HIPAA Monitoring and Compliance Enforcement Program

Janet B. Markell, Tufts University

212. Integrated Case-Based Preclinical Assessments Expand Learning

Bradford Smith, Midwestern University-Arizona; Christine Halket, Arizona School of Dentistry and Oral Health; Lisa Schnaidt, Midwestern University-Arizona

213. Embracing Those in Need by Embracing Other Professionals: NYUCD Program for Survivors of Torture

Steven Resnick and June Weiss, New York University

214. Partners in Health Care: The Role of Medicine in Dentistry

Kanchan Ganda and Diana J. Esshaki, Tufts University

215. Building Collaborative Research Infrastructure to Reduce Oral Health Disparities Among Low-Income Older Adults

Susan Reisine, Ruth S. Goldblatt, and Laura Jensen, University of Connecticut; Robyn Harper-Gulley; Jean Schensul

216. Digital Intraoral Photography Aiding Students for Dental Examining Boards

Ridley O. Ross and J.D. Overton, University of Texas Health Science Center at San Antonio

217. Segmentation as a Technique to Articulate Outcomes for Critical Thinking

David C. Johnson, Teresa A. Marshall, Michael W. Finkelstein, Galen B. Schneider, Steven A. Aquilino, Steven R. Armstrong, Marsha A. Cunningham-Ford, Cheryl L. Straub-Morarend, David C. Holmes, Catherine M. Solow, University of Iowa

218. Improving Student Outcomes Through Ongoing Course Revision in a Local Anesthesia Course

Ershal Harrison, Pamela A. Stein, and Sandra D. Challman, University of Kentucky

230. Implementation of Critical Thinking Assessment Strategies Following Completion of a Faculty Development Workshop

Joyce C. Hudson, Ivy Tech Community College; Lorinda L. Coan, Indiana University

263. Does Haptic Technology Have a Place in Dental Education? An Interprofessional Approach

Gary D. Hack, Eric D. Levine, Julie Gilliam, and Carroll Ann Trotman, University of Maryland

806. Information-Seeking Strategies of Dental Hygienists

Sandra D. Osborne, Howard University