The following abstracts were peer-reviewed by members of the ADEA Council of Sections following established criteria. —Judith Skelton, Ph.D. Councilor, ADEA Section on Educational Research/Development and Curriculum

Presented in Block 1, Monday, March 16, 11:30 a.m.–1:00 p.m.

Poster Presentations

1. The Current State of Tobacco Cessation Education in U.S. Dental Hygiene Programs: Results of a National Survey
Joan Davis, Southern Illinois University; Beth Winfree Freeburg, Southern Illinois University

Track: Educational Research

The well-documented effects of smoked and smokeless tobacco on the oral tissues and general health have been known for almost forty years. Fortunately, tobacco education in U.S. dental hygiene schools has steadily increased over the past twenty years. In order to determine what yet should be done in order to continue the diffusion of evidence-based tobacco cessation to clinical competence, a current assessment was made. The survey developed for this assessment took into account all previous national dental hygiene tobacco surveys as well as a survey developed for the assessment of a tobacco education curriculum, Tobacco Free!, by the twelve associate-level dental hygiene programs in Illinois. The survey was mailed to 283 U.S. dental hygiene program directors (excluding Illinois schools) asking specific assessments, including faculty self-efficacy when teaching tobacco education; number of minutes spent on various aspects of tobacco health effects, cessation, and prevention; what courses tobacco education was included in; and what level of clinical competence dental hygiene graduates should be able to demonstrate upon graduation.

Results: Surveys were mailed to 283 programs and returned by 182 participants, with a return rate of 66 percent. Dental hygiene program directors comprised 51.4 percent (n=94) of the participants. Represented programs offered associate (n=79; 43.4 percent) and baccalaureate (n=99; 54.4 percent) degrees. Fifty percent or more of the programs included tobacco education topics in pharmacology, seminar/theory, and prevention content areas. The most frequent topics related to tobacco education were a) a review of general diseases related to tobacco use, such as lung cancer, emphysema, and heart disease (94.5 percent), and b) a review of oral tobacco-related diseases, such as periodontitis and oral cancer. When compared to previous studies, reported tobacco education in the current study showed a steady improvement in the amount of time spent and clinical integration. Interestingly, program directors indicated they expected more tobacco use information into the health history form and/or (hands-on) approach in didactic teaching; use observation to evaluate students by placing them in a central location; make students aware of what resources are available and where to find them; encourage students to utilize the available resources; improve the 5"x7" photographs used for client education; use a more problem-based (hands-on) approach in didactic teaching; use observation to evaluate TCC competency; employ a multidisciplinary approach; incorporate more tobacco use information into the health history form; and/or make allowances for a completed Tobacco Use Assessment Form and may provide guidance to dental hygiene curriculum committees as they discuss tobacco education in their programs.

2. Evaluation of Outcomes of Tobacco Cessation Counseling (TCC) Within a Dental Hygiene Curriculum
Peggy Maillet, Dalhousie University; Cara Tax; Nancy R. Neish; Allison Denny

Track: Educational Research

As part of their curriculum, senior dental hygiene students at Dalhousie University Faculty of Dentistry provide TCC to tobacco-using clients. Students are taught to use a combination of approaches, including the Transtheoretical Model, the 5 As Model, and the 5 Rs Model to provide effective, individualized counseling. This study was conducted to evaluate the effectiveness of the TCC didactic curriculum and its clinical extensions. Research methods included a comprehensive literature search, a review of available resources related to TCC, and a structured telephone interview. The interview, consisting of ten summative questions, was conducted to determine the current tobacco use status of clients who had been counseled by a dental hygiene student for tobacco cessation. The investigators wanted to know if the client was advised to quit tobacco, informed of the health risks of using tobacco, still using tobacco, taught self-examination techniques for oral cancer, and if any post-counseling follow-up was initiated. A true sample size of fifty-one subjects was obtained.

Results: Forty relevant papers were reviewed. The review reinforced that dental hygienists are in a prime position to influence a quit decision by tobacco users but are refraining from making that intervention. S.O.A.P. notes revealed inconsistency in the quality of information provided and the counseling approach(es) taken. Students tended to follow the 5 As approach, regardless of the client's stage of change, and were not using motivational interviewing (the 5 Rs). The research shows a common trend of students providing generalized (vs. individualized) counseling. Inventory of TCC resources found that the quantity of information outweighed the quality and most of the resources were outdated. A survey population of 132 subjects was extracted from axiUm. A random sample of seventy-one subjects was obtained. With a 74 percent response rate, a true sample (n=51) was used to compile data. Results have a margin of error of ±14 percentage points at a 95 percent confidence level.

Conclusions: The TCC being provided by dental hygiene students is ineffective in meeting its objective. The current TCC curriculum needs to be modified to improve dental hygiene students’ clinical implementation. Significance: Many changes were made as a result of the research. An oral cancer self-examination handout was developed as a take-home tool for clients. A tobacco use assessment form was developed to help define user habits and guide students to the proper counseling approach. Updated TCC resources were obtained for the clinic. The following additional changes were recommended: appoint a TCC coordinator to manage the program; make resources accessible for students by placing them in a central location; make students aware of what resources are available and where to find them; encourage students to utilize the available resources; improve the 5"x7" photographs used for client education; use a more problem-based (hands-on) approach in didactic teaching; use observation to evaluate TCC competency; employ a multidisciplinary approach; incorporate more tobacco use information into the health history form, and/or make allowances for a completed Tobacco Use Assessment Form.
(as developed during this study) to be kept in the client’s chart; and use an interprofessional approach when teaching dental and dental hygiene students.

3. The Effect of Supplemental Instruction on Power-brush Efficiency

Peggy Mailliet, Dalhousie University; Erica Campbell

Track: Educational Research

The study was a variation on the single blind randomized crossover design. The population sample was twenty-seven first-year dental hygiene students at Dalhousie University with no previous experience using an Oral-B Triumph power toothbrush. The subjects were divided into two homogeneous groups based on the initial plaque score obtained before the brushes were distributed. Instruction was given to Group One by way of a video and pamphlet that described and illustrated the brushing technique. Group Two did not receive supplemental instruction. Both groups then brushed for two weeks using the Oral-B Triumph ProfessionalCare powerbrush. All individuals used the same toothpaste and floss as a control. Plaque scores were taken at four intervals using the University of Mississippi Oral Health Index. A two-week washout period followed the two weeks of using the powerbrush and preceded the reversal of groups. Seventeen subjects completed the study.

Results: Descriptive statistics and ANOVA were used to analyze the data gathered. The p-values showed that there was no significant difference between groups or within a group before and after supplemental instruction. Mean values of the change in plaque scores within a phase or the complete study showed decreases or minor but not significant increases. All plaque scores fell between 12 percent and 62 percent, with the majority between 17 percent and 35.75 percent. The results did not show a significant effect on plaque scores due to supplemental instruction.

Conclusions: The results of this study did not show that supplemental instruction by way of a video and detailed pamphlet significantly affected brushing efficiency with the oscillating rotating power toothbrush. The video and pamphlet were shown only once to each group, and the individuals were not able to brush along with the video. One exposure did not significantly affect brushing efficiency. Twenty-seven individuals from the Dalhousie Dental Hygiene first-year class volunteered for the study with seventeen individuals participating in each of the four plaque scores and one of the supplemental instructions. The ten students who did not participate in all four plaque scores did so for reasons separate from the study, such as absence from school due to illness or travel.

Significance: The analysis of data collected over the course of the study showed no significant effect on power toothbrush efficiency due to supplemental instruction. More research should be completed with a larger random population sample to test if multiple exposures to video instruction would affect power toothbrush efficiency.

4. Calibration for Community-Based Adjunct Faculty

Becky Smith, University of Missouri–Kansas City; Joseph Parkinson; Pamela Overman; Michael McCunniff; Moncy Mathew

Track: Educational Research

This study assessed the variations in teaching perception and practices among adjunct faculty and determined the need for calibration. An author developed a pencil and paper survey that was administered to full-time adjunct faculty members who supervise junior and senior dental students in community health centers (n=50). The survey contained questions related to teaching philosophies by the institution, self-perceptions of teaching competence, and perceptions of generational issues between faculty and students. Questions also pertained to comfort levels of adjunct faculty members in working with the dental students in endodontic, pediatric, and restorative techniques.

Results: Seventeen surveys were collected for a response rate of 34 percent. A high variance rate occurred in teaching philosophies, 35.5 percent felt students understood endodontic techniques, 53 percent felt students knew about their materials, and 47 percent knew the operative teaching trends at the institution. Self-perceptions of teaching varied, with 29.4 percent agreeing that students require a great deal of instruction. Generational differences were observed, with 29.4 percent of faculty members not familiar with Generation Y.

Conclusions: Current calibration efforts for community-based adjunct faculty should be strengthened by incorporation of specific techniques recommended for endodontic and operative techniques, types of dental materials used, and general differences between students and faculty.

5. Clinical Decision-Making Skills in Genetics with Dental Hygiene Students: Baseline

Christine Klausner, University of Michigan; Amy Coplen; Wendy Kerschbaum; Lynn Johnson, University of Michigan; Carol Anne Murdoch-Kinch

Track: Educational Research

This research project addressed two Healthy People 2010 priority issues: oral health and genetics. Baseline data were collected from first-year (sophomore, n=27) and third-year (senior, n=24) dental hygiene (DH) students in what is to be a multiphased study of students’ ability to plan DH treatment for patients with genetic links to oral-facial diseases. Two instruments were used: case simulations and participant perception inventory (PPI). For the simulations, students were paired and provided patient information including medical/dental history, clinical photos, periodontal chart, plaque index score, self-care habits, and a pedigree chart. Based on the review of assessment information, the students identified patient problems and etiological factors and developed a dental hygiene diagnosis. A prototype DH treatment plan was developed through faculty collaboration as a basis for evaluating student responses. The PPI required students to rank their knowledge, experience, and confidence levels about treatment planning, working in a group, using online resources clarifying patient history information, and genetics. Responses from the PPI were entered into SPSS and analyzed using ANOVA.

Results: The results of the case simulation revealed sophomore DH students scored higher than senior DH students in treatment planning, with 46 percent and 38 percent, respectively, although the difference was not statistically significant. On the PPI, seniors rated their knowledge, experience, and confidence significantly higher than did sophomores.

Conclusions: Scores for all students were low on the case simulation, reinforcing a need for a genetic component in the curriculum. On the PPI, senior students rated themselves higher on knowledge, confidence, and experience, which would be expected. This established a baseline assessment of students’ perceptions of their knowledge, confidence, and experience for future research.

Significance: With the increasing importance of genetics in health care, this study provides baseline information so the effectiveness of a formalized genetic curriculum can be evaluated.

6. Restorative Treatment Strategies Reported by U.S. Dental School Faculty

Margherita Fontana, Indiana University; Waller Smith; George Eckert; Sophie Domejean-Oriaguet, University of Auvergne, France; Ivar Espelid, University of Oslo, Norway; Anna Tveit, University of Oslo, Norway

Track: Educational Research

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The study population consisted of 290 full-time/part-time (FT/PT) faculty members and 100 fourth-year students. The survey was posted on surveymonkey.com. The voluntary participants were asked questions concerning restorative treatment decisions based on selected clinical and radiographic images and patient case scenarios, including choice of cavity preparations and dental materials. They were also asked how, if at all, caries risk assessment affected their decisions.

**Results:** The response rates to date for FT and PT faculty members and students were 27 percent, 7 percent, and 22 percent, respectively. There were many differences in diagnoses and treatment decisions. For example, diagnosis of an occlusal/radiographic image of a fissure system ranged from 28 percent sound to 61 percent enamel-only lesion, 3 percent dentin lesion, and 8 percent uncertain, with varying recommendations: 13 percent no treatment, 15 percent fluoride, 51 percent fissure sealant, and 22 percent operative intervention.

**Conclusion:** Disparities exist amongst faculty and students in treatment decisions for noncavitated caries lesions and use of risk-based caries management.

**Significance:** Understanding if disparities exist and what they are can help in the design of faculty education and training calibration tools.

This study was funded by a grant from Indiana University School of Dentistry.

### 7. Best Practices in Local Anesthesia Curriculum Design for Dental Hygiene Education

Laura Webb, Truckee Meadows Community College

**Track:** Educational Research

Administration of local anesthesia is an important skill for dental hygienists to utilize for adequate pain management and hemostasis during therapeutic scaling and root planing as well as during less aggressive procedures when patients find themselves experiencing discomfort. Over 80 percent of state dental practice acts allow dental hygienists to administer local anesthesia to administer local anesthesia. More than twenty states have added this skill to their practice acts in the last five years. The development of curricula that support a high level of skill attainment in administration of local anesthesia for dental hygienists is appropriate and timely. The purpose of this poster is to share data, in progress, regarding best practices in curriculum design that help dental hygiene students develop a high level of confidence and proficiency in the provision of local anesthesia prior to graduation. Data have been collected via electronic survey and discussions with dental hygiene educators throughout the United States. Key elements of the exploration include foundation local anesthesia course placement, course length, and competencies required; teaching strategies; evaluation mechanisms; challenges relating to institution policies regarding course length/time; and strategies for maintaining competence throughout ensuing clinical courses. Examples of best practices, opportunities, and challenges for curriculum design and resources are highlighted.

**Results:** Mechanisms of course design that facilitate students’ attaining and maintaining competence in providing local anesthesia include timing of introductory course placement in curriculum, adequate hours for introductory course, use of online didactic vs. traditional lecture, organization of introductory course clinics, and distribution of requirements for injections for ensuing clinical courses. Types of injections reported as should be taught and should require student competence in dental hygiene education programs vary. Some programs avoid Gow-Gates, infraorbital, and palatal anesthesia. Evaluation tools helpful in determining student competence in local anesthesia include process evaluations (used early and for remediation), competency evaluations (for testing and mock boards), and daily clinic evaluations. Opportunities for threading local anesthesia content and requirements through the curriculum include head and neck anatomy, introductory dental hygiene courses, peer observation, pharmacology course, clinical experiences, periodontology courses, special patients courses, ethics course, and senior year clinics. The most reported challenge has been calibration of faculty in local anesthesia content for both didactic and clinical courses.

**Conclusions:** A variety of approaches have been used in providing local anesthesia content for dental hygiene programs. Significant differences are evident in the number of hours of instruction as well as the number of clinical experiences afforded to the students. Many states that have had local anesthesia curricula longer place the introductory course earlier and have more comprehensive experiences for students throughout the curriculum. They report that, even with rigorous requirements, most students exceed requirements for experiences. Programs with newer local anesthesia curricula find challenges with inconsistent curricular requirements, student confidence, treatment planning methodology, and acceptance by patients.

### 8. Dental Hygiene Students’ Ability to Self-Assess Patient Care

Christine Blue, University of Minnesota; Sandra Eliason

**Track:** Educational Research

Self-assessment—the process of collecting and analyzing data on one’s own performance—is a viable and important part of quality assurance in health care practices. The research on self-assessment presents substantial evidence regarding the impact of self-assessment on practitioners and quality care. As direct providers of care, dental hygienists must be able to assess the quality of their care using established standards of clinical practice. University of Minnesota dental hygiene students are taught self-assessment skills in the curriculum and are required to conduct self-assessments in all areas of the dental hygiene care process as part of their clinical education. The purpose of this study was to determine senior dental hygiene students’ ability to self-assess the dental hygiene care they provide. Using patient charts, students were asked to complete an evaluation of care document for a periodontally involved patient and a patient with an active or at-risk caries status whom they had continually provided care for over the course of their clinical experience. Thirty-five periodontal patients and thirty-five caries patients were evaluated. After conducting the self-assessment, students were required to submit the results to their clinic group director for evaluation. The faculty member also evaluated the care provided using the same evaluation document. Students’ ability to self-assess the care they provided was determined by the level of agreement between faculty and student evaluations. The overall agreement between the faculty assessment and students’ self-assessment of care was calculated for each evaluation sections—patient assessment, treatment planning, implementation of care, evaluation of care, and documentation—and for each criterion in each section.

**Results:** Findings indicate that students can self-assess the patient care they provide with a high level of faculty agreement. The percent agreement and Kappa statistics with a 95 percent confidence interval were calculated for each criterion. Only four criteria had less than 80 percent agreement.

**Conclusions:** Self-assessment training had positive outcomes in the dental hygiene curriculum. Dental hygiene students can self-assess the patient care they provide with a high level of faculty agreement. It is important that dental hygiene curricula not only implement strategies to develop students’ self-assessment skills, but evaluate the outcomes of skill assessment training.

**Significance:** Lifelong learning requires that individuals be able to assess their own performance and progress. Teaching self-assessment skills to students may provide the foundation necessary to provide quality health care delivery after graduation.
9. Randomization Effects of Pretest Item Locations on Estimating Item Difficulties and Examinees’ Abilities
Shu-Ren Chang, American Dental Association; Tsung-Hsuen Tsai, American Dental Association; Chien-Lin Yang, American Dental Association; Anne Koch, American Dental Association

Track: Educational Research
Beginning in 2006, items on the computerized Dental Admission Test (DAT) were presented in random order. The item sequence for each individual examinee could be different as it is assigned by computers through pure randomization algorithms in order to prevent examinees from copying others’ answer choices. Since the DAT is a timed test, fatigue and forced guessing usually come into play near the end of the test due to time pressure. Typically, examinees might have limited time to respond to items at the very end of a test. In order to gather item properties (e.g., item difficulty, percentage of correct responses), pretest items are embedded among operational items. The locations of pretest items might have an impact on item difficulties and examinee ability estimates. Therefore, it is critical to investigate the potential effects of item randomization to ensure that examinees are receiving fair and valid performance estimates.

Results: The expected results are that the locations of pretest items have an impact on item difficulties and examinee ability estimates. For the same items, estimated difficulty levels of the items embedded at the end of the test are expected to be higher than those of the items embedded in the beginning.

10. A Study Using Audience Response System and Collaborative Group Testing for Pediatric Dental Residents
Fouad Salama, University of Nebraska Medical Center; Valerie Shostrom, University of Nebraska Medical Center

Track: Educational Research
The study population consisted of all pediatric dental residents at the University of Nebraska Medical Center College of Dentistry postgraduate program. The residents were tested during each academic year, and exams consisted of three parts. One part was the paper exam, while the second part was the exam using ARS. The third part consisted of a randomly selected subset of questions from part one and two exams in which groups of two residents (one first-year resident and one second-year resident) were allowed to discuss the question before transmitting their answers. An objective test consisting of multiple-choice questions was used to evaluate the residents’ knowledge of the different pediatric dental topics covered in lectures and seminars. Each question was followed by four or five statements, only one of which was correct in regard to the core question. One point was awarded for a correct answer and nothing for a blank or incorrect answer. The answers were manually reviewed for the paper exams, and the data were entered into a database for statistical analysis. The answers for the second and third exams were graded by the eInstruction software. For comparison, we analyzed the results obtained by the same resident in the paper and ARS exams. The scores of the exams and results of this evaluation were presented as percentages of questions the residents answered correctly. Statistical analysis was also undertaken to determine whether collaborative testing increased student performance on exams. For each method, a paired t-test was used to examine the differences between paper vs. ARS only, paper vs. collaborative ARS, and ARS only vs. collaborative ARS. The statistical level of significance used in all analyses was 0.05.

Results: The results from the paired t-tests showed that there was no statistically significant difference between paper and ARS exams. A signed rank test of the difference between the percentage of correct answers from the paper exam and the corresponding questions on the collaborative ARS exam, as well as from the ARS exam, and the percentage correct from the collaborative ARS exam was performed. For the paper exam, the p-value was greater than 0.05, indicating we failed to reject the null hypothesis and concluded there was not enough evidence to indicate that there is a difference in score between the paper exam and the collaborative ARS exam. For the ARS exam, the p-value indicated some evidence of a difference. The p-value was less than 0.05, indicating we reject the null hypothesis and conclude there was enough evidence to indicate that there is a difference in score between the ARS exam and the collaborative ARS exam. For all residents, there was improvement over the initial ARS exam.

Conclusions: There was no significant difference between paper and ARS exams. There was no difference in score between the paper exam and collaborative ARS exam. Compared to individual ARS testing, collaborative-group testing using ARS improved performance of pediatric dental residents.

Significance: It is unknown whether use of ARS and collaborative testing improves exam performance of dental residents. Therefore, this study tested the hypothesis that using ARS improves exam performance compared to paper exams and that collaborative testing improves exam performance of pediatric dental residents.

11. Development of a Critical Thinking Assessment for Clinical Decision Making
Angela Monson; Brigitte Cooper; Terri Brown

Track: Educational Research
According to the standards of dental accreditation, critical thinking skills should be fostered and measured in students; however, limited assessment measures are currently available. Three dental hygiene faculty members developed a clinical case study that included a case history, periodontal measurements, and radiographs. Twenty-one senior students and twenty-two junior students were given fifteen minutes to review the case study and develop their treatment plan according to four areas: 1) conditions/factors, 2) dental hygiene diagnosis, 3) evidence/justification, and 4) questions that would help with diagnosis. After piloting the case with dental hygiene faculty, a rubric was developed with a range of zero to forty-four points. One faculty member graded each rubric, with one point awarded for each correct answer within each of the four areas. An independent t-test revealed senior students scored significantly higher than junior students (p=.01) in total points awarded. In addition, seniors scored significantly higher in the areas of 1) dental hygiene diagnosis (p=.04), 2) evidence/justification (p=.01), and 3) questions (p<.001). When examining reliability, Cronbach’s alpha for the present study on the four areas within the rubric was .94. To determine interrater reliability, a second faculty member independently graded the same rubric. No significant differences were found between the total scores of the two instructors (p=.67).

Conclusions: Preliminary findings suggest that a case study with rubric can be used to measure critical thinking skills applied in clinical decision making. Assessment measures of critical thinking should continue to be investigated.

12. Dental Students and Occupational Exposures: Reporting of Incidents, Knowledge of Bloodborne Pathogen Transmission, and Exposure Management
Ronnie Myers, Columbia University; Julie Myers, Columbia University; Polly Wheat, Columbia University; Thomas Mele, Columbia University; Michael Yin, Columbia University

Track: Educational Research
It is believed that underreporting of bloodborne pathogen exposures (BPEs) is common among dental students. Prevalence and reporting
of BPEs, along with knowledge of BPE prevention/management among students, were assessed for all matriculated students through an anonymous questionnaire administered at Columbia University College of Dental Medicine in May 2008. The survey contained questions concerning circumstances surrounding the most recent BPE and knowledge about transmission and management of BPE. Data analysis was conducted using SPSS version 15.0.

**Results:** The internally developed, paper-based questionnaire contained questions about circumstances surrounding the most recent exposure, including reporting and management, as well as knowledge about transmission, appropriate exposure management, perception of adequacy of education on this topic, and attitudes about bloodborne pathogens and their effect on practice. A total of 220 out of 305 students responded for a response rate of 72 percent. Percentages were calculated using the 215 acceptable surveys. Prevalence of exposures among students was 19.1 percent (41/215) and was greater among clinical (years 3 and 4) than preclinical students (years 1 and 2; 26 percent vs. 10 percent, p<0.002). The majority of exposures occurred within the past year (83 percent), involved a percutaneous exposure with a sharp object (63 percent), and occurred during a procedure (51 percent) as opposed to during preparation, clean-up, or some other stage (8 percent vs. 23 percent vs. 18 percent, respectively). Most students reported the incident to a supervisor (79 percent) and received medical assessment and counseling at the Emergency Department or Student Health Services (SHS) (59 percent). Over the past year, the SHS evaluated twenty dental students for exposures. The majority reporting that they declined medical evaluation said they did so because the source patient in the exposure was known to be HIV negative (26 percent) or because the exposure was considered low risk (57 percent), but 13 percent reported that they did not want the side effects of antiretrovirals. Preclinical students answered fewer questions correctly about transmission of bloodborne pathogens (65 percent vs. 76 percent).

**Conclusions:** Bloodborne pathogen exposures are common among dental students and occur at the time they are performing few at-risk procedures a week, an inherent reality of training. This relative inexperience may enhance their risk. Only 59 percent of students seek medical attention after exposures, and many decline evaluation based upon their own assessment of risk, even while knowledge of transmission risk is objectively inadequate, especially among preclinical students. Of particular concern is failure of students to seek medical evaluation if the source patient is known to be HIV negative or because they do not wish to take antiretrovirals. Such approaches ignore the risk of Hepatitis C (more easily transmitted than HIV) and the opportunity to receive counseling and post-exposure education (even in the absence of specific post-exposure prophylaxis). In addition, those with exposures were significantly better versed on exposure management, yet those seeking medical care and those not had insignificant differences in their knowledge of transmission. Innovative educational strategies during the preclinical years with reinforcement throughout training should be developed and evaluated for their potential to prevent exposures and, if and when exposures do occur, to improve post-exposure care.

13. **An Evaluation of Patient Screening Outcomes**

Diane Hoelscher, University of Detroit Mercy; Kimberly Werth; Anthony Neely

**Track:** Educational Research

Screening exams of new patients that include estimates of specific treatment needs can be used when assigning patients to help balance student comprehensive care experiences. However, inaccurate estimates lead to inefficiency. The objectives of this study were to 1) assess outcomes of the screening process by comparing treatment needs estimated at screening with actual treatments planned, and 2) pilot a method for gathering data to improve the screening process. After IRB approval, a randomized list of 200 records of patients having a 0150 exam between 1/03 and 1/07 was generated. Eighty-six records met inclusion criteria of screening exam immediately prior to treatment plan. Treatment needs estimated at screening and actual treatment on the signed treatment plan were compared. Descriptive statistics for patient demographic data were completed. The data suggest clinically apparent treatment needs had a higher level of agreement. The collection and analysis of additional data to identify variables that modify treatment choices are needed.

**Results:** The sample was 44.2 percent male and 55.8 percent female. A total of 65.1 percent had private dental insurance, 23.3 percent Medicaid, and 10.5 percent self-pay. Twenty-four potential procedures were analyzed. Treatments where >50 percent of subjects had data were defined as sufficient for data analysis. Amalgam restoration, composite restoration, scaling/root planing, prophylaxis, crown, and post/core met the criterion for analysis. Percent agreement between initial clinical screening and final treatment plan were 70.8 percent, 52.5 percent, 52.5 percent, 44.3 percent, 36 percent, and 25.7 percent, respectively.

**Conclusions:** More data are needed to make inferences regarding screening agreement or relationship between demographic or other variables and estimations of treatment needs at screening. Many variables, such as screener calibration, limited diagnostic ability during screening, patient desires, capacities of student dentists to provide care, and others may impact the ability to predict patient treatment needs. Further study, including task analysis of steps between screening and treatment plan, faculty calibration, and longitudinal assessment of patients from screening through treatment completion, is needed.

**Significance:** The comparison of agreement between screening and treatment plan is a logical first step in evaluating outcomes of a patient screening system and could be used by schools to make informed decisions regarding improvements.

14. **Use of Podcasting to Improve Student Performance**

Alexander Bendayan, Boston University; Celeste Kong

**Track:** Educational Research

Course evaluations were given in two courses: Dental Occlusion DMD 2 and AS 1 courses. One hundred and fifty-four evaluations were distributed on Courseinfo.

**Results:** Adequate preparation time should be given to the students to review digital recordings. Faculty members should be familiar with the use of podcasts. IT support is required.

**Conclusions:** The significance can only be measured with several years of evaluation.

15. **Informational DVD for Incoming Dental School Patients**

Dianne Buccella, University at Buffalo; Elaine Davis, University at Buffalo; Jude Fabiano, University at Buffalo

**Track:** Educational Research

Prospective patients received the informational DVD prior to their new patient screening appointment and were encouraged to view it. A brief (five-item) survey was completed by 375 patients at their new patient screening appointment. Respondents were first asked whether they had watched the DVD. Those who had not watched it were asked to indicate the reason. Those who had watched were asked to indicate how helpful it was, on a scale of 1 (not helpful at all) to 5
(very helpful) and to list what information was helpful and what could be improved or included in future DVDs. Age (18–25; 26–65; >65) and gender were recorded as was the opportunity to make additional comments regarding the DVD. Fifty-seven surveys were incomplete, for a net response rate of 84.8 percent. One hundred forty-one of the respondents were male (44 percent). Age breakdown was 18–25 (9 percent), 26–65 (63 percent), and >65 (28 percent). A total of 190 (60 percent) had watched the DVD.

Results: There was no significant association between gender and DVD viewing, but there was a significant relationship between age and viewing (p<.05). Those over sixty-five were more likely to have viewed the DVD than those aged 26–65 or 18–25 (73 percent, 54 percent, and 61 percent, respectively). Most of those who had seen the DVD reported it to be very helpful (median ranking of 4); only two reported that it was “not at all helpful.” The most common reason cited for not watching the DVD was “no time” (N=60; 47 percent), followed by “no access to DVD player” (N=39; 30 percent).

Conclusions: These results suggest that a brief educational DVD can be an effective method of providing information to new patients. However, the facts that the 26–65 year old age group was least likely to have watched the DVD and that lack of time was the most commonly cited reason for not watching suggest that other methods might be more effective in reaching this important demographic.

Significance: Future research will focus on DVD improvements and follow-up with patients who did not view the DVD to determine alternative methods to disseminate this information effectively.

16. Effectiveness of Computer-Aided and Traditional Patient Education in a Culturally Diverse Population
Brigette Cooper; Angela Monson; Anne High, Rochester Community and Technical College

Track: Educational Research

The purpose of this study was to assess the effectiveness of three models of oral health instruction (OHI) given to culturally diverse Head Start preschool children. The three models of OHI were traditional one-on-one demonstration, computer-aided video with narration designed specifically for children, and computer-aided video utilizing graphics without narration. One hundred eighteen preschool children were asked four questions and observed for current brushing and flossing technique. The children were given a five-minute oral hygiene instruction, utilizing one of the three models. Following instruction, identical questions and observations were performed. Pre-instruction and post-instruction scores were tabulated, ranging from 0 to 15. A paired sample t-test found a significant increase in mean scores.

Conclusions: All three models of OHI were found to be effective when assessing children’s knowledge and performance following instruction, with traditional demonstration and use of a narrated video designed specifically for children scoring highest. It is recommended to continue efforts to educate culturally diverse children to improve their oral health.

17. Self-Reflection: Test Prediction and Performance in a Dental Hygiene Classroom
Elizabeth McClure, University of Cincinnati

Track: Educational Research

“Self-reflection” is a common term in clinical dental hygiene. Dental hygiene students are provided with numerous opportunities to reflect on their clinical work and refine their clinical skills. In the dental hygiene classroom, however, formal self-reflection is not frequently practiced. Zimmerman (1998) defines three phases to self-regulation: forethought, performance, and self-reflection. In self-reflection, students evaluate how effectively their strategies help them meet their academic goals and adjust their strategies accordingly. Hacker (2000) examined undergraduate students’ ability to predict and “postdict” test performance and concluded that higher achieving students were better able to predict tests and that their prediction abilities improved over time. My presentation will examine second-year dental hygiene students’ ability to self-reflect on their preparation and performance on multiple Community Oral Health II examinations. In addition, the study seeks to identify if students with higher grade point averages can more accurately predict their examination scores. Finally, information regarding study techniques and methods of studying will be presented.

Results: I will report the outcomes of my data analysis comparing the accuracy of predictions to grade point averages and examination scores. In addition, qualitative data will be presented regarding study techniques.

Significance: One of the major goals of any dental hygiene or dental program is to produce professionals who can not only self-reflect on the adequacy of their clinical work, but also on their knowledge base. This presentation will be valuable to faculty in all disciplines who wish to provide the student with more ownership and reflection coursework.

18. Effectiveness of a Basic Training Presentation on Infant Oral Health
Fouad Salama, University of Nebraska Medical Center; Amy Kebriaei; Vincent Rothe

Track: Educational Research

Participants were thirty-seven family medicine residents. Assessment in the form of a questionnaire was completed immediately before and after a sixty-minute educational intervention. The intervention was in the form of a PowerPoint presentation and video of infant oral health for health care providers. The sixteen-question (true/false/don’t know or multiple choice) questionnaire was based on the information presented in the lecture and video.

Results: There was a significant difference between the pretest and posttest scores.

Conclusions: This study demonstrated the effectiveness of a PowerPoint and video presentation to train family medicine residents in basic information on infant oral health. Study participants reported great interest and a gain in knowledge and said that this information will change their daily practice activities in infant oral health. More research should be done on how to best deliver information on infant oral health to family medicine residents and ensure long-term retention of the information.

Significance: The American Academy of Pediatric Dentistry (AAPD) recognizes that 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. The AAPD encourages parents and other care providers to help every child establish a dental home by twelve months of age. Since physicians, nurses, and other health care professionals 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 (ECC) and make appropriate decisions regarding timely and effective intervention. Therefore, all primary health care professionals who serve mothers and infants could provide parent/caregiver education on the etiology and prevention of ECC. Recent studies have reported lack of up-to-date information and knowledge of infant oral health by health care professionals and
concluded that an infant oral health education program can improve physicians’ oral health knowledge and behaviors, particularly regarding promoting the age one dental visit. This study demonstrated the effectiveness of a PowerPoint and video presentation to train primary health care professionals (family medicine residents) in basic information on infant oral health.

19. Infant Oral Health Curriculum in Ohio Dental Hygiene Programs
Homa Amini, The Ohio State University; Beth Noel

Track: Educational Research
The most recent report by the Centers for Disease Control and Prevention documented that, for the first time in forty years, dental caries increased among children aged two to five years. The American Academy of Pediatric Dentistry (AAPD) has recognized that, in order to create a disease-free lifetime for children, infant oral health (IOH) should be the foundation upon which preventive education and dental care must be built. IOH risk assessment, anticipatory guidance, early intervention, and establishment of a dental home by age one will create an opportunity to keep children free from oral disease. To achieve this goal, IOH education should be included in the curriculum of dental and nondental health professionals. The purpose of this pilot study was to assess attitudes of graduating Ohio dental hygiene students toward the infant oral health curriculum at their respective institutions. A survey questionnaire was mailed to 144 dental hygiene students enrolled in twelve dental hygiene programs across Ohio. Results: Seventy-seven percent of the respondents indicated that their dental hygiene program had a portion of its curriculum dedicated to infant oral health. Only 19 percent indicated they had clinical hands-on experiences with infant knee to knee exam; 54 percent were not familiar with the term “Anticipatory Guidance”; and 63 percent felt more education and hands-on experiences was needed in the dental hygiene curriculum in the area of infant oral health at their institution.

Conclusion: The results of this survey indicate that dental hygiene programs in Ohio should review their infant oral health curricula.

20. Peer Review of Teaching: Creating Meaningful Documentation
Cynthia Stegeman, Raymond Walters College; Patricia Frese

Track: New Program
Student diversity, economic pressures, and decreased professional satisfaction are creating challenges with accountability and productivity in higher education. Documentation of teaching by peers provides a mechanism for self-reflection, course improvement, and a renewed sense of professional enjoyment. The “scholarship of teaching and learning” has become a commonplace term indicating that teaching is becoming more public and is being critiqued and exchanged with our professional community for continual improvement. Therefore, new ways of documenting quality teaching are necessary. The purpose of the poster is to present tools that assist peers in the review of course materials and provide relevant documentation after observation in a didactic and/or clinical setting. Special settings, such as case-based learning, will also be discussed. The outcome of this process contributes to a stronger argument for promotion and tenure decisions.

Results: After viewing the poster, the learner will be able to select appropriate tools for peer teaching observations and create appropriate documentation for a stronger dossier of a peer.

21. Beneficial Outcomes from a Service-Learning Community Program
Carolyn Ray, University of Oklahoma

Track: New Program
The objective of this study was to obtain data on the retention rate of pit and fissure sealants placed during a 2007 school-based program that networked community resources providing experiential service-learning to first-, second-, and third-year dental hygiene (DH) students. DH faculty, community dentists, the local DH association, United Way volunteers, and a local community clinic came together to unite their resources in order to provide for a school-based sealant program. Five elementary schools were selected based on their free-lunch status. The second grade classes were selected to receive classroom oral hygiene instructions by senior DH students. Local dentists volunteered to complete oral screenings to determine need for pit and fissure sealants on permanent first molars. School nurses oversaw the permission slips and communication with teachers and parents. First- and second-year dental hygiene students served as assistants and translators. A local community clinic provided mobile dental equipment. A dental hygiene faculty member coordinated the program. During this 2007 program, 521 second graders received classroom oral hygiene instructions. Fifty-two percent (n=271) of the students with permission to participate in the program were screened by a local volunteer dentist to identify their oral needs. Twenty-five percent (n=68) of the students were referred to dentists for more involved dental needs. Two hundred five students (75.6 percent) received an average of 3.3 sealants each with a total of 675 sealants placed. During the spring of 2008, the dental hygiene faculty coordinator returned to the five schools to complete a visual dental exam to determine the number of sealants that remained after one year.

Results: Of the 205 students who participated in the program, 147 (71.7 percent) were available to recheck in 2008. A total of 479 pit and fissure sealants were placed on the first molars of these students. This represented approximately 71 percent of the total sealants placed during the spring of 2007. Two hundred eighty-nine sealants were identified by visual oral exams. This indicates a 60.3 percent one-year retention rate for sealants placed in this program.

Conclusions: More outcomes need to be reported on school-based sealant programs to determine their long-term effectiveness. The outcomes from this program (60.3 percent) suggest that a potential 289 first molars were protected from dental caries.

Significance: Dental and dental hygiene institutions have the opportunity to become involved in programs that benefit their communities and have a significant impact on the oral health of the citizens in those communities.

22. Dental Postbaccalaureate Program
H. Eugene Brooks, University of Colorado

Track: New Program
Many potential students have skills and life experiences that would bring rich academic and social diversity to the School of Dentistry. The rejection of this applicant pool represents a significant loss to the university and, more importantly, to the populations we ultimately serve. A growing body of evidence suggests that the diversity of the United States, and especially that of large urban centers like Denver, is increasing and will continue to do so for the coming century. That diversity places growing, changing, and more complex demands on the system of oral health services in this country. We have started a dental postbaccalaureate program at the University of Colorado Dental School that offers an excellent mechanism for allowing these students
to demonstrate the academic improvement necessary for acceptance into the dental program.

Significance: Significant outcome disparities continue to characterize vulnerable populations such as the visible minorities that make up so much of that diversity. In response, most professional health care workforces are increasingly talking about inclusivity as an important component of the overall quality of the system. They are undertaking significant efforts to identify, attract, and retain a broader diversity of workers and to reduce and eliminate discrimination and disparities among those who receive health care services.

23. The Simulation Laboratory Comprehensive Care Patient
Charles Hill, University of Nevada, Las Vegas
Track: New Program
Preparing students to treat patients in a dental school clinic requires many things. Combining techniques and skills learned throughout first-year preclinical simulation laboratory courses should enhance knowledge of comprehensive dental care planning and delivery. In the preclinical simulation laboratory, a typodont was introduced to seventy-six second-year predoctoral dental students at the University of Nevada, Las Vegas, School of Dental Medicine. Simulated carious lesions in multiple teeth combined with fractures and edentulous spaces were restored over the course of two trimesters. Operative dentistry, crown and bridge, dental materials, and diagnosis and treatment planning skills were integrated into the typodont exercise. To further simulate the clinic setting, typodonts were available only during assigned class periods of four hours per week for eighteen weeks. Electronic dental records were utilized to document the progression of treatment. Necessary faculty authorizations, progress notes, and grading were completed each class period using the same dental software utilized in the school’s clinic. Testing student knowledge regarding certain aspects and concepts in the comprehensive care of a dental patient occurred two times during the exercise. Results were compared to measure knowledge gained from the experience of reconstructing a simulated patient in a manner and sequence similar to a live patient.

Conclusions: The experience of utilizing a typodont that simulates a comprehensive care patient allowed students to increase their knowledge in the planning and execution of treatment in preparation for clinical patient care. Integration of information and skills learned from first-year preclinical courses and utilization of the electronic dental record allowed the preclinical setting to provide a valuable learning experience for students. The simulation laboratory comprehensive care patient exercise will continue to be implemented and further enhanced for future student learning.

24. Integrating Productivity from a New Outreach Program into an Operative Dentistry Clinical Curriculum
Daniel Boston, Temple University; Klara Sitzamer-Alperstein, Temple University; Ivonne Ganem, Temple University; Lionel Yearwood, Temple University
Track: New Program
A diverse clinical outreach program, partially supported by the Robert Wood Johnson Foundation’s Pipeline, Profession, and Practice: Community-Based Dental Education program, was instituted for senior dental students to enhance their understanding of the oral health needs of the underserved. Because these experiences provided clinical education in operative dentistry within comprehensive care, it was decided to fully integrate them into the existing restorative dentistry clinical curriculum. However, the effect of this change on restorative dentistry educational outcomes was initially unknown. Calibrated outreach faculty members approved records of individual operative dentistry procedures. These records were entered into a separate database that was subsequently merged with a database of school-based clinical procedures. All competency exams were completed during school-based patient care. Per student productivity for school-based and outreach patient care was compared to productivity for the most recent year that did not include outreach activity, overall and by procedure classification, and also for the group that failed at least one competency examination versus those who passed all examinations on the first attempt. Similar data and other outcomes measures (passing competency exams, passing licensing exams, completion date) were compared between groups (N=5) of highest-performing students quantitatively, overall and in outreach activities, and for similar groups (N=5) of lowest-performing students.

Results: Overall, 14 percent of clinical activity was performed at outreach sites, including composite resin restorations (20 percent), amalgam restorations (11 percent), and miscellaneous procedures (6 percent). Including outreach, overall clinical activity was 10 percent higher per student compared to the most recent year that did not include any outreach activity. However, school-based clinical activity decreased by 5 percent. For the group of students who failed at least one competency examination on the first attempt (19 percent), there was a minimal decrease in productivity compared to the group that passed all examinations on the first attempt (2 percent less overall productivity and 6 percent less outreach productivity). For both groups of highest performing students quantitatively, there were no licensing exam failures and no differences in competency exam pass rates or completion dates. For the groups of lowest performing students quantitatively, differences were found in licensing exam pass rates, competency exam pass rates, and completion dates, with the lower outcomes occurring in the group with the lowest overall productivity versus the group with the lowest outreach productivity.

Conclusions: Operative dentistry clinical activity increased overall with the inclusion of outreach activity. Outreach clinical activity replaced and augmented an otherwise slight decrease in school-based activity. No differences in outcomes were detected between overall high-performing and outreach high-performing groups. However, outcomes for the overall low-performing group were lower than for the outreach low-performing group and were lower compared to both high-performing groups, indicating that, at least for these extreme groups, better outcomes were associated with higher levels of overall performance.

Significance: Integration of outreach clinical activity into an operative dentistry clinical curriculum can increase overall clinical experience and contribute to better educational outcomes.

25. Student Preferences for Teaching and Learning with e-Technology
Ann McCann, Baylor College of Dentistry; Robert Hinton; Emel Schneiderman; Hoda Abdellatif; Susan Roshan; Ibtisam Al-Hashimi
Track: New Program
Members of the Planning and Assessment Committee conducted a focus group with four dental students elected as e-technology class representatives. They were asked to identify the critical issues with using electronic technologies for instruction, learning, and communication at the Baylor College of Dentistry. With this information, the survey was created with Inquisit software and pilot-tested. The survey requested information about level of experience...
with computers, digital equipment used, the frequency of using college resources and their effectiveness, preferences for learning in various environments, the need for standardization of e-course materials, and preferred modes of communication. IRB approval was received, and the survey was administered online in May 2008 to all dental and dental hygiene students.

**Results:** There was an 86 percent response rate (n=366/432). The students rated themselves as average (61 percent) or experienced users (34 percent).

**Conclusions:** These results and others indicated that some of the college’s strategic initiatives should move faster and some should be changed. Those needing to move faster included development of e-course materials such as lectures recorded with Camtasia, use of Blackboard for centralizing e-resources and posting grades, and faculty training. Those needing to change direction included the forwarding of email, adding wireless network hot spots, and simplifying external access to the network.

**Significance:** Planning has begun at the college to use these results for accelerating the development of e-course materials, centralizing e-resources, and modifying the e-infrastructure. The outcomes should be enhanced student learning and performance through increasing the options for individualized instruction, study strategies, and course remediation.

### 26. Teaching Basic Life Support to Health Care Providers in a Large Dental School

Beverly McClure, The Ohio State University

**Track:** New Program

Staff, students, and faculty are considered health care providers (HCP) and need to be certified in Basic Life Support (BLS) every two years according to the American Heart Association (AHA) guidelines. Training and retraining are challenges in a large dental school. New staff and faculty members are employed throughout the year, and new classes of students need to be trained as they enter school and progress through their careers. The college has the responsibility of training all clinical employees and students in BLS skills for HCP along with teaching emergency protocol. While the AHA guidelines have changed for bystanders, the guidelines for HCP remain the same. Bystanders are instructed to give compressions only, while HCP must be proficient in adult, child, and infant compressions as well as breathing and lifesaving techniques. A new program was developed so that the college family is trained in a timely and hopefully enjoyable manner. Dental students rotate training every two years in June, while dental hygiene students are trained in January and the dental faculty and staff rotate training in December following final exams. Each college division has at least one person who serves as a BLS instructor, so it is the responsibility of the division to train a new hire on an individual basis. A combination of a video with timed hands-on experience and instructor-focused group training is utilized. The college BLS coordinator manages the video, with the hands-on practice concentrating on compressions and breathing. The instructors teach the other skills in small groups. A written test must be passed with an 85 percent to earn certification.

**Results:** A six-question Likert survey was given to the dental students (N=91) following the experience in June 2008. One hundred percent of students either strongly agreed or agreed that the BLS training increased knowledge of BLS standards and the BLS instructor facilitated their learning and respected their needs as learners. A student commented, “Overall, a great and organized experience; you get an A+.“ The same survey was given to faculty in December 2007 (N=59). One hundred percent of the faculty either strongly agreed or agreed that the BLS training was relevant to their practice, met their educational needs, and increased their knowledge of BLS standards. Faculty comments were more numerous and included the following: “Was good to have the video,” “Very effective refresher,” and “Sequence of video and then demonstration was very good.”

**Conclusions:** The current teaching method of BLS techniques to the college family appears to be well received, and the coordinator will continue utilizing this teaching format.

**Significance:** This program could be beneficial to other dental schools teaching BLS techniques to staff, faculty members, and students.

### 27. Implementation of Smoking Cessation in Dental Clinics: An Educational and System Change Approach

Geera Butala, New York University; Donna Shelley

**Track:** New Program

According to the 2008 U.S. Public Health Service Tobacco Use Treatment Guidelines, there is strong evidence that screening, brief intervention, and pharmacotherapy can produce significant and sustained reductions in tobacco use (Fiore 2008). Despite evidence of efficacy, adoption of these guidelines in general practice remains low (Albert 2002, Thorndike 2007). A population-based sample of dentists and dental hygienists in New York state found that only 12 percent of dentists and 21 percent of dental hygienists provided tobacco use counseling and only 2 percent of dentists and 4 percent of dental hygienists were offering alcohol abuse counseling (Cruz 2005). Guideline implementation is affected to a large degree by practice environment; therefore, it is not surprising that interventions focused entirely on provider behavior change have not led to adoption of research-based interventions. In fact, past studies confirm the need to develop and test interventions that reorganize the practice environment to prompt providers to adhere to evidence-based guidelines and to delegate the time-consuming steps of counseling and arranging follow-up, particularly in complex urban community health settings serving minority populations. The dental visit presents an important opportunity to address tobacco use; therefore, New York University College of Dentistry recently launched an initiative to increase adherence to the Tobacco Use Treatment Guidelines by implementing several organizational changes.

**Results:** These changes include the following: 1) a new chart for a new chart system and tobacco use treatment protocol, 2) faculty and student education, 3) implementation of a free nicotine replacement therapy (NRT) protocol and a system for tracking provision of NRT, and 4) implementation of a referral system that links patients to the state quitline and a local cessation service. In the first month the system was implemented, referrals to smoking cessation services increased sixfold. We will present six-month outcome data, including pre- and post-screening, referral rates, and distribution of NRT.

**Conclusion:** This program offers students a model for tobacco use treatment that can extend to their future practice.

**Significance:** This program may support implementation of this clinic-based tobacco use treatment model in dental colleges throughout the United States.

### 28. A Clinical Program to Acclimate New Students to the Clinic Without Formal Orientation

Barbara Smith, New York University; Mark Wolff; Arthur Schackman, New York University

**Track:** New Program

This program could be beneficial to other dental schools teaching BLS techniques to staff, faculty members, and students.
In most dental schools, students complete significant preclinical education and basic science education prior to entering the clinic. Students are introduced to the clinic through a formal orientation process and begin independent patient care with considerable uneasiness about patient interaction and clinical processes. This program of immersion into the clinic for two and a half hours a week for five months prior to independent patient care was designed to eliminate the need for formal orientation and improve student comfort with patient relationships and clinical procedures. Ten incoming sophomore students were paired with senior students to learn patient communication, treatment planning and presentation, paperwork processes, clinical procedures, faculty interaction, and time management.

Results: The program generated positive responses from both the sophomores and the seniors. Sophomores said it was beneficial because they felt more comfortable and prepared when entering the clinic.

Conclusions: 1) Students could be made to feel more comfortable in the clinic environment; 2) participants were more confident in communicating with patients, peers, and faculty; 3) positive outcomes of this orientation on these participants can be seen four months after entering clinic; and 4) participants said they would like to serve as future mentors to incoming students.

Significance: This immersion program assists students in understanding their preclinical training and eases the progression into the clinical environment.

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Presented in Block 2, Monday, March 16, 1:00-2:30 p.m.

Poster Presentations


Pouran Famili, University of Pittsburgh; Judith Gallagher, University of Pittsburgh; Linda Kelly, University of Pittsburgh; Elizabeth Short, University of Pittsburgh; M. Abdus Sattar, University of Pittsburgh; Patricia Inks, University of Pittsburgh

Track: Educational Research

University of Pittsburgh IRB # 0512107 was designed to utilize prerecorded video technology and powered toothbrushes to improve patient compliance and gingival health. Subjects given standard verbal brushing and flossing instructions were compared to patients receiving the same instructions via video presentation. The instructional video (DVD) included the same directions as the verbal presentation. Gingival health, using probing depth charts and plaque index completed before instructions, was compared to the same data collected after the instructions and six weeks of subject self-practiced home care. Subjects were randomly selected to receive manual toothbrushes or powered brushes. A total of 137 subjects were enrolled, and 114 subjects completed (85 percent). Subjects were divided into four groups using manual vs. powered brushes and verbal vs. video instructions. Data was analyzed with Stata 9.

Results: For subjects completed, the average initial plaque was 65.4 percent vs. recall plaque at 52.46 percent. The average initial bleeding index was 2.09 percent vs. recall bleeding index 0.98 percent. Average initial pocket depths were 2.01 mm vs. recall pocket depths at 1.83 mm. Group B (using manual brushes with verbal instruction) showed the greatest improvement in plaque control, with an average 21.05 percent decrease among those subjects who completed the study. The remaining groups all showed improvement, with plaque control ranging from a 7.87 percent average decrease in Group C (using powered brushes, receiving verbal instruction) to a 12.51 percent average decrease in Group A (the control set, using manual brushes, receiving no instruction). Since the data were not normally distributed, a nonparametric test (Kruskal-Wallis one-way analysis of variance) was performed. Statistical results showed no significant differences in plaque change due to the different interventions of toothbrushing technique (p=0.05205), but our clinical recorded data showed that clinically the powered toothbrushes were more effective in removing plaque and in improving recorded plaque scores.

Conclusions: Use of available newer technology (video, DVD) in the delivery of patient education as well as for plaque removal (powered brushes) is not significantly more effective in improving gingival health. Powered brushes are more effective than manual brushes among most subjects tested in lowering plaque index scores. Overall differences were not statistically significant. The newer patient education technology is as effective as the standard hygienist-delivered-in-person, verbal method of instruction, but not substantially or significantly more so.

Significance: Millennial learners are tech-savvy and tech-competent—a good thing in a world of online charting and e-curricula. These investigators embrace new media and enthusiastically support the use of mass media and advertising campaigns as policy and community interventions to make oral health care and information more accessible, promoting lifestyle-related efforts like media campaigns and public service announcements encouraging brushing and flossing, and supporting a low-sugar, high-calcium, and Vitamin D-fortified diet. Utilizing new media to increase the health literacy of the public, one of the goals of the U.S. surgeon general’s call to promote oral health, is practically uncharted territory. But interestingly, from the point of view of these dental educators, the value of a thorough, reinforced, and empathetic, standard hygienist-delivered-in-person oral hygiene instruction in brushing and flossing remains undisputed.

30. Enhancing Part II Score Reliability of the National Board Dental Examination Through the Use of Generalizability Theory

Tsung-Hsun Tsai, American Dental Association; Laura Neumann, American Dental Association; Anne Koch, American Dental Association; Barry Grau, American Dental Association; Gene Kramer, American Dental Association

Track: Educational Research

In this study, sources of error were defined. Different measurement conditions were classified with combinations of the number of patient cases and the number of items per case. The acceptable values of error of variances and examination score reliability coefficients for different...
conditions were identified based on generalizability theory (Brennan 2001). One of the National Board Dental Examination Part II forms with 400 stand-alone items and 100 case-based items was used. The data source was responses from 1,266 candidates who were enrolled in U.S. accredited dental schools taking one of the examination forms for the first time in 2007. Overall, results suggested that using more patient cases may lead to a greater increase in the Part II examination score reliability than using more items per case.

31. Predictors of Success in Dental Hygiene Education: A Follow-Up Study

Sue Tucker Ward; Marie Collins; Ana Thompson; Mary Downey

Track: Educational Research

In 2002, a six-year review of dental hygiene graduates from the Medical College of Georgia was conducted. Two models were developed to predict success in dental hygiene education. Success was defined in terms of National Board Dental Hygiene Examination (NBDHE) score and dental hygiene grade point average (GPA) at graduation. The purpose of this follow-up study was to determine if a relationship exists between the predicted success (using 2002 models) and the actual success of entry-level baccalaureate degree students who graduated the following six years in the classes of 2002 to 2007.

Results: High correlation ($r=581, p<0.05$) was found when using the established Model 1 to predict dental hygiene GPA at graduation, and moderate correlation ($r=465, p<0.05$) was found when using the established Model 2 to predict NBDHE scores.

Conclusions: The authors concluded that incoming GPA and total SAT program score remain useful in predicting the success of students. However, when substituting incoming GPA with dental hygiene GPA at the end of the first year, even stronger correlations resulted in Model 1 ($r=957, p<0.01$) and in Model 2 ($r=694, p<0.01$).

Significance: Based on these results, recommendations were made to keep current admissions criteria, to implement a formal remediation program after first year, and to encourage earlier preparation for the NBDHE.

32. Comparison of ADA Survey of Allied Dental Education Dental Hygiene Data to One Dental Hygiene Program

Eva M. Lupovici, New York University; Rosemary Hays, New York University; Lisa Stefanou, New York University; Cheryl Westphal, New York University

Track: Educational Research

The results of the last released ADA Survey of Allied Dental Education on dental hygiene were compared with a large dental hygiene program to assess the differences in age, gender, citizenship, race/ethnicity, highest level of education completed, financial assistance, employment history, and postgraduation occupation. The assessment results could be used as potential strategy for future recruitment of students to the program. The major differences in the survey and program results are as follows. Sixty-eight percent of the survey respondents and 62 percent of the program graduates were twenty-nine years or younger. Of these, the survey reported 36 percent were age twenty-three or younger, while 48 percent of those in the program were age twenty-four to twenty-nine. In the survey, 36 percent of the female graduates were age twenty-three or under, and 38 percent of the males were twenty-four to twenty-nine years old, as compared to the program in which 50 percent of the females were twenty-four to twenty-nine years old and 50 percent of the males were age forty or over. In the survey, 82 percent of the graduates were white, non-Hispanic and 3.4 percent black, non-Hispanic compared to the program’s 44 percent white, non-Hispanic and 22 percent black, non-Hispanic. The survey reported that 96 percent of graduates were U.S. citizens and 5 percent Canadians, as compared to the program, which had 68 percent and 4 percent, respectively. The most frequently reported highest level of education completed by first-year students in the survey was two years of college, reported by 30.7 percent, while the program had 24 percent who had earned a baccalaureate degree. In the program group, 100 percent of those requesting assistance received aid as compared to 84.3 percent of those in the survey. The postgraduation occupation data reported that 75 percent of graduates in the survey were employed in private practice and 1.1 percent continued education toward an advanced degree, as compared to the program’s 70 percent and 10 percent, respectively, in those categories.

Results: The results of the assessment demonstrated that there were differences between the findings of the ADA Survey of Allied Dental Education in dental hygiene and one large dental hygiene program. Conclusions: There were differences in all categories assessed. The program students and graduates were older, enrolled in the program with a higher level of education, and more diversified in ethnicity/race and citizenship status.

Significance: The results of the ADA Survey of Allied Dental Education could be used by any dental hygiene program to compare similarities and differences and use the findings to plan future student recruitment strategies.

33. Integration of Curricular Elements to Demonstrate Outcomes in Critical Thinking

Joyce Hudson, Indiana University; Lorinda Coan

Track: Educational Research

Faculty members recognize and acknowledge that it is important to develop critical thinking skills in students, but designing purposeful assignments measuring attainment of effective critical thinking skills can be problematic. The purpose of this project was to assess the critical thinking skill sets learned by dental hygiene students during a course in evidence-based practice and implemented in a preventive dentistry course. Students were given an assignment in the preventive dentistry course (taught concurrently with the evidence-based course) investigating the validity of manufacturers’ claims for dental products. Using skills learned in the evidence-based course, students demonstrated critical thinking by meeting the objectives of the assignment. The project also required students to develop a PowerPoint presentation and poster to present their findings to the class and to display in the clinical reception area for patient use. Using the critical thinking assessment questions found in the NSSI survey, student and faculty surveys were developed to assess the attainment of the skills described above. Upon completion of the project, students were asked to complete the survey. Faculty members viewed the PowerPoint presentations and posters and were then asked to complete the survey.

Results: Survey results revealed that all faculty members believe the assignment showed evidence of critical thinking based on the NSSI criteria. All students and faculty demonstrated similar critical thinking by meeting the objectives of memorizing and synthesis. Of those responding, 62.5 percent of the students and 20 percent of the faculty believed the assignment required some or very little memorization; 50 percent of the students and 20 percent of the faculty believed the assignment required some or very little synthesis and organization of ideas and information into novel interpretations; and 90 percent or greater of all faculty and students agreed the assignment developed skills in evaluating literature, drawing conclusions, and disseminating findings.

Conclusions: Development of assignments to purposefully implement concepts throughout the curriculum is an effective way to demonstrate outcomes in critical thinking.
34. Promoting Faculty Development in Teaching Critical Thinking Skills
Gail Mitchell, University of Florida; Linda Behar-Horenstein

Track: Educational Research
Faculty development has become an increasingly important component in professional education. Practical and effective programs are vital to individual and institutional success in education; however, there is little evidence to support faculty behavior change as an outcome of faculty development programs. The objective of this study was to describe if and how faculty would be able to infuse critical thinking skills into instruction. Seven faculty members from the University of Florida College of Dentistry and one faculty member from another Health Science Center college participated in six weekly (two-hour) faculty development sessions in spring 2007 that focused on enhancing critical thinking skills in instruction. Kaufmann’s and Rachal’s principles of andragogy were used to design the sessions. Participants used learning journals to respond to four instructor-led prompts and provided one peer-reviewed presentation. Using qualitative methods, eight themes emerged: teaching goals, critical thinking, awareness of learners, planned instructional change, teaching efficacy, self-doubt, external challenges, and changes made.

Results: Overall, five of eight participants were judged able to incorporate critical thinking skills at a mean level of 3.0 or higher on a five-point scale in their instructional lessons using Paul and Elder’s behavioral definition of critical thinking skills.

Conclusions: Providing site-based faculty development opportunities that cause participants to reason through learning journals, peer presentations, and group discussion demonstrated incorporation of critical thinking concepts in 63 percent of this cohort group’s presentations.

35. Examining Trends in Patient Care at Dental Schools
Matthew Mikkelsen; Jon Ruesch; Adriana Menezes

Track: Educational Research
This study uses data from the American Dental Association’s Survey of Dental Education, completed annually by all U.S. dental schools to maintain accreditation from the Commission on Dental Accreditation. Schools report the most recent information available on various elements of their predoctoral dental education programs. We analyzed data on patient care at dental schools, where available, between 1985 and 2006, including chairs available to programs, patient visits, clock hours of instruction, and expenditures and revenue for patient clinics. In order to control for changes in the number of dental schools each year within this time, per school averages are analyzed if and how faculty would be able to infuse critical thinking skills into instruction. Seven faculty members from the University of Florida College of Dentistry and one faculty member from another Health Science Center college participated in six weekly (two-hour) faculty development sessions in spring 2007 that focused on enhancing critical thinking skills in instruction. Kaufmann’s and Rachal’s principles of andragogy were used to design the sessions. Participants used learning journals to respond to four instructor-led prompts and provided one peer-reviewed presentation. Using qualitative methods, eight themes emerged: teaching goals, critical thinking, awareness of learners, planned instructional change, teaching efficacy, self-doubt, external challenges, and changes made.

Results: Overall, five of eight participants were judged able to incorporate critical thinking skills at a mean level of 3.0 or higher on a five-point scale in their instructional lessons using Paul and Elder’s behavioral definition of critical thinking skills.

Conclusions: Providing site-based faculty development opportunities that cause participants to reason through learning journals, peer presentations, and group discussion demonstrated incorporation of critical thinking concepts in 63 percent of this cohort group’s presentations.

Conclusions: The results suggest that a greater amount of the patient care experience over the past two decades has been obtained by dental students at facilities outside of the dental school. Further investigation would help understand what these trends mean for dental education.

36. Dental Students’ Perceptions, Understandings, and Attitudes Towards Academic Misconduct in Dental School
Michael Rowland, The Ohio State University; Kanokraj Srisukho, The Ohio State University

Track: Educational Research
The issue of academic misconduct has been well documented in the literature. Research reveals that academic misconduct by students occurs at all levels of the educational system, from high school to undergraduate, graduate, and professional education. Much of the health professions literature regarding academic misconduct has focused on medical, pharmacy, and nursing schools. Reports of academic misconduct in dental schools within the past few years have seen increased attention to this issue among dental educators. Ultimately, reported acts of academic misconduct in dental schools could have a negative impact on the public’s perceptions and trust of members of the dental profession. For this study, surveys were distributed to a class of 104 second-year dental students enrolled at a Midwestern dental school. Of 104 surveys distributed, eighty-six (83 percent) were completed and returned; 62 percent of the respondents were male and 38 percent were female. The survey contained eleven questions regarding academic misconduct and two optional questions requesting gender and grade point average.

Results: Fifty-six percent of the respondents indicated the faculty is very concerned about acts of academic dishonesty, yet 65 percent of the respondents indicated administrators are very concerned. Only 41 percent of the students themselves were very concerned about these acts, while 48 percent indicated their level of concern about academic dishonesty as being minimal and 62 percent of the respondents indicated their fellow classmates also are minimally concerned about acts of academic dishonesty. Fifty percent indicated they would not report cheating of their classmate; 34 percent were somewhat likely to report. Only 5 percent of the respondents indicated that they would definitely report cheating of their classmate to a faculty member. Thirty-seven percent were confident that the administration would immediately take action once they had received a report of cheating, while 35 percent were somewhat confident. Forty-five percent of the respondents agreed that the majority of professors discuss rules of academic integrity on the first day of class. More than half of the respondents indicated that more than half of the respondents indicated that they do not know what constitutes academic misconduct in dental school, while 9 percent were unsure and 28 percent indicated “I think so” as an answer. One percent of the respondents indicated that they do not know what constitutes academic misconduct in dental school. When asked how likely they would be to cheat if they saw their peers cheating, 83 percent indicated that their likelihood to cheat will be decreased if they knew they would be dismissed from dental school because of cheating. Seventy-nine percent responded that it would not affect their likelihood to cheat even if they knew they would not be caught.

Conclusions: Given the recent increased attention to breaches of academic honesty in U.S. dental schools, academic misconduct must be thoroughly discussed with faculty, administrators, and students so all agree on what constitutes academic misconduct, and the importance of maintaining academic integrity must be stressed.

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37. Tobacco-Dependence Treatment in a Dental School: A Four-Year Analysis
Sara Gordon, University of Illinois at Chicago; Jill Loewen; Dana Villines; Julie Vecchio; Zainab Mackie

Track: Educational Research
The University of Detroit Mercy School of Dentistry implemented tobacco-dependence treatment services in 2002, and the students have been surveyed annually about the impact the program has had on their patient care and personal tobacco use habits. This is an analysis of that data from 2003 to 2006. All students in second-year dental hygiene (DH) and third- and fourth-year dentistry (D.D.S.) classes are required to complete an annual online survey about their experience and attitudes regarding tobacco dependence treatment.

Results: One hundred ten DH students and 591 D.D.S. students completed the survey (100 percent response rate). On average, DH students reported that they advised 53 percent of their smoking patients to quit smoking and that 60 percent of these patients expressed an interest in quitting. D.D.S. students reported that they advised 77 percent of their smoking patients to quit smoking and that 67 percent of these patients expressed an interest in quitting. Both DH and D.D.S. students reported they only record this information in the patient’s record “sometimes.” When asked whether they feel better prepared to help a patient quit smoking (on a scale of “strongly agree to strongly disagree”), DH students indicated, on average, that they agreed, while D.D.S. students responses fell between “neutral” and “agree.”

Conclusions: Although D.D.S. students are more likely than DH students to advise their patients to quit smoking, neither group is completely compliant in this regard, and neither group consistently documents this behavior in the patient record. DH students express more confidence in their ability to help a patient quit smoking.

38. Using Exit Surveys for Institutional Assessment
Thomas Taft, Marquette University; Frederick Sutkiewicz

Track: Educational Research
Academic institutions today must regularly assess their outcomes either to provide information to accrediting agencies or for internal evaluation. Gathering student perceptions of their education is one element commonly included. Recently, senior students have expressed concerns of misuse of their time by requiring that they complete multiple exit surveys. These concerns led to the current investigation. This study reviewed the American Dental Education Association’s senior survey in comparison to a local senior exit survey. Qualitative inspection of the two surveys indicated that the primary overlap was in the area of curriculum effectiveness. Chi-square analysis on several dental disciplines was run to determine whether the two surveys crossed validated student perceptions in these curriculum areas. Further analysis involved a qualitative judgment of the data generated by each survey. Results of the chi-square analysis indicated no significant differences between student perceptions of the sample curriculum areas on the two surveys.

Significance: The significance of this study is that the need for multiple outcome surveys is important to ensure that all areas of interest are evaluated.

39. Quality Control and Productivity of Prosthodontic Procedures: Four-Year Data
Robert Meador Jr., University of Alabama at Birmingham; Perng-Ru Liu; Lance Ramp

Track: Educational Research
This ongoing investigation will assist in monitoring trends in the quality control of dental prostheses fabricated in the dental school setting. Recently, the school has incorporated patient care coordinators to facilitate student appointments and monitor student progress and compliance with dental school expectations. In previous years, the school has required metal framework try-in for all D3 fixed units prior to the application of porcelain. Recently, this requirement was modified to include fixed partial dentures (FPD). In addition, application of porcelain to fixed units has been completely outsourced to local commercial laboratories. Studies such as these can assist in monitoring the usefulness of such measures. A quality control form previously described was used to identify three primary sources of error. These error sources and productivity have been tabulated for each class since 2005. Sources of error in dental classes D3 and D4 for the categories of single crowns, FPDs, and cast removable partial dentures in the 2004–09 graduating cohorts were identified as being due to student error (SE), dental laboratory error (DLE), and other (O). Sources of error were normalized across class and category using the remake rate determined by dividing the number of remakes by total prostheses fabricated in that category. These data were analyzed with multiple ANOVA and Fisher’s PLSD post hoc test (α=0.05).

Results: Multiple ANOVA comparing sources of error between dental classes revealed that overall there was no difference in error rate between the D3 and D4 classes (p=0.34). SE was the greatest source of error (p≤0.001) for D3 and D4. For both D3 and D4 classes, the highest remake rate was seen for FPDs. D3 and D4 remake rates for FPDs were 9.6 percent and 10.6 percent, for cast removable partial dentures (RPDs) 8.0 percent and 5.0 percent, and for single crowns 7.3 percent and 6.9 percent, respectively. Additional data indicated a slight downward trend in productivity from 2006 (10 percent for single crowns and 9 percent for RPDs). Additionally, there has been an increase in DLE and O category errors.

Conclusions: Since 2006, the number of completed prosthodontic procedures (single crowns and RPDs) has decreased. In addition, DLE and O errors have exhibited an increased trend, although they were not noted to be statistically significant. SE remains the predominant error source, with the FPD procedure exhibiting the highest remake rate.

Significance: These data demonstrate the need for development of strategies designed to reduce remake rates, particularly in the area of FPD. In addition, an investigation is warranted to determine if the decreased production is due to recent administrative changes, the economy, or both.

40. Examining the Stability of Candidate Performance and Item Difficulty for the Dental Hygiene Examination
Chien-Lin Yang, American Dental Association; Laura Neumann, American Dental Association; Gene Kramer, American Dental Association

Track: Educational Research
The purpose of this longitudinal study is to employ the repeated measures design to examine the stability of candidate performance and test difficulty for the National Board Dental Hygiene Examination. Candidate responses for the same examination offered in spring and winter administrations from 2005 to 2007 were analyzed. The measures of candidate performance included the raw scores of 200 stand-alone and 150 case-based items, as well as the standard score converted from raw score based on the 350 items. Item difficulty refers to the Rasch-based calibrations associated with each item. T-tests were used to examine the stability of candidate performance, as well as differential item functioning (DIF) and displacement value for the item difficulty. Education background and testing history were also used in this study to classify the dental hygiene candidates into four study groups in terms of five general groups, five first-time takers, five re-applicants, and five re-applicants. Results: For candidate performance, the results showed that only
41. Student Perceptions of the Impact of e-Portfolio Development on Learning in an Online Graduate Dental Hygiene Program

Linda Boyd, Idaho State University; Ellen Rogo

**Track:** Educational Research

The multimedia e-portfolio is a possible solution to the dilemma faced by health professions education in monitoring student competence both for program outcomes and for accreditation purposes. Planning for an e-portfolio requires a clear vision of the desired outcomes. In a standards or competency-based portfolio, students are responsible for selecting appropriate samples of their work to demonstrate competence in outcomes for one or multiple courses. The process of selecting work samples engages students in self-assessment and encourages reflection and critical thinking. This study used a case study approach with qualitative data collected from student surveys. A convenience sample of graduate dental hygiene students (n=50) enrolled in online courses was asked to develop an e-portfolio to demonstrate learning outcomes in six graduate-level courses. Each course provided evaluation rubrics at the beginning of the course to inform students of expectations and for self-assessment. Students were provided with feedback during the process by both peers and faculty. At the conclusion of each course, students completed a survey anonymously as part of the course evaluation process. A series of questions were asked, and responses were analyzed using a content analysis approach. Categories were identified, and key words associated with these categories were utilized to code the text and sort it into categories.

**Results:** The response rate to the survey was 80 percent (n=40). Eighty percent (n=35) of students reported a positive experience with e-portfolio development indicated by comments such as “easy to work with,” “appeals to my creative nature,” and “convenient way of organizing a lot of material into a polished final project.” Thirty-five percent (n=14) of respondents reported some frustration with developing the e-portfolio, but only 12.5 percent (n=4) reported an overall negative experience. Examples of these comments included: “intimidating at first,” “a bit of a learning curve,” and “frustration with website due to technical problems.” The main challenges encountered were problems with the e-portfolio system (50 percent) and issues with technology such as the cost of videotaping and the uploading of video into e-portfolios (17.5 percent); 5 percent (n=2) wanted more detailed directions or samples of what should be used. Thirty-five students (87.5 percent) reported development of the e-portfolio had a positive impact on their learning with comments such as “enhanced learning by enabling sharing with peers . . . learning through reflection and feedback was possible” and “requires reflection in putting together the actual portfolio, a type of learning that promotes critical thinking.” Five percent (n=2) were not sure if it had an impact on their learning, and 7.5 percent (n=3) reported it had no impact.

**Conclusions:** The need for more advanced computer skills for the use of multimedia, including digital photography and video clips, presented a challenge that in many cases created additional student stress and anxiety. Therefore, adequate computer technology training and support are essential for the successful implementation of e-portfolios into courses and curricula. However, despite the technology challenges, the outcomes of this study suggest that the e-portfolio has potential to enhance learning and develop self-assessment and critical thinking skills in graduate dental hygiene students.

42. The Fidelity of Model Community-Based Clinical Dental Education Programs in Rural Settings

Sheila Stover, Marquette University; Frederick Sutkiewicz; William Lobb

**Track:** Educational Research

While Pipeline program schools have been important pioneers in promoting clinical dental education programs, non-Pipeline schools are similarly exposing their students to community-based dental education programs. Marquette University School of Dentistry (MUSoD) has established three extramural dental sites in rural locations to work with underserved populations. Over the last five years, these outreach programs have provided intensive clinical educational experiences for D3 and D4 students, while providing more than 20,000 underserved patients access to dental care with over 30,000 procedures performed. Students provide an overall assessment of each site following their experience on a Block Rotation Survey and also rate the site, based on organization, clarity of goals, relevance of experience, availability of supervision, patient availability, placement of rotation in curriculum, and time efficiency. The consistency of the ratings between sites over time is necessary to document the fidelity of the outreach program operations. Student ratings of the clarity of goals for each site were highly correlated with the ratings of the site’s organization (r .78), relevance of experience (r .63), and availability of supervision (r .62).

**Results:** An analysis of evaluations between sites and over time revealed a high level of consistency for the three rural outreach programs with no statistical differences (p> .05) identified between sites over time on any Block Rotation Survey variable.

**Conclusions:** The fidelity of outreach program goals and operations may serve as the cornerstone for shaping Marquette University dental students’ perceptions of the site experience and value (e.g., in the 2008 American Dental Education Association senior survey, 80 percent of MUSoD students reported being prepared to well prepared in adaptive treatment planning for low-income populations; 83 percent of MUSoD students rated extramural clinical experiences as positive to very positive; and 76 percent of MUSoD students reported extramural clinical experience improved their ability to care for racially, ethnically, and culturally diverse groups)

**Significance:** Marquette University School of Dentistry utilizes the comprehensive care model for clinical education. Flexibility in the dental school curriculum, including clinical care time, is important to allow students time in community settings. Outreach programming must also be flexible to allow students adequate time to serve their patients at the dental school. Fidelity between community-based experiences creates flexibility in scheduling because not all students need to visit each and every community partner dental clinic. Community-based experiences designed with similar goals, objectives, and outcomes help to support curricular flexibility both at the main campus and in outreach programming, while providing students with multiple positive community-based experiences.

43. When Students Call for More Clinical Experience in Elder Care: Impact of Geriatric Education on Student Attitudes and Elderly Patient Care

Sandra Challiman, University of Kentucky; Pamela Stein, University of Kentucky; Robert Henry, U.S. Department of Veterans Affairs

**Track:** Educational Research

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A convenience sample of graduate dental hygiene students (n=50) enrolled in online courses was asked to develop an e-portfolio to demonstrate learning outcomes in six graduate-level courses. Each course provided evaluation rubrics at the beginning of the course to inform students of expectations and for self-assessment. Students were provided with feedback during the process by both peers and faculty. At the conclusion of each course, students completed a survey anonymously as part of the course evaluation process. A series of questions were asked, and responses were analyzed using a content analysis approach. Categories were identified, and key words associated with these categories were utilized to code the text and sort it into categories.

**Results:** The response rate to the survey was 80 percent (n=40). Eighty percent (n=35) of students reported a positive experience with e-portfolio development indicated by comments such as “easy to work with,” “appeals to my creative nature,” and “convenient way of organizing a lot of material into a polished final project.” Thirty-five percent (n=14) of respondents reported some frustration with developing the e-portfolio, but only 12.5 percent (n=4) reported an overall negative experience. Examples of these comments included: “intimidating at first,” “a bit of a learning curve,” and “frustration with website due to technical problems.” The main challenges encountered were problems with the e-portfolio system (50 percent) and issues with technology such as the cost of videotaping and the uploading of video into e-portfolios (17.5 percent); 5 percent (n=2) wanted more detailed directions or samples of what should be used. Thirty-five students (87.5 percent) reported development of the e-portfolio had a positive impact on their learning with comments such as “enhanced learning by enabling sharing with peers . . . learning through reflection and feedback was possible” and “requires reflection in putting together the actual portfolio, a type of learning that promotes critical thinking.” Five percent (n=2) were not sure if it had an impact on their learning, and 7.5 percent (n=3) reported it had no impact.

**Conclusions:** The need for more advanced computer skills for the use of multimedia, including digital photography and video clips, presented a challenge that in many cases created additional student stress and anxiety. Therefore, adequate computer technology training and support are essential for the successful implementation of e-portfolios into courses and curricula. However, despite the technology challenges, the outcomes of this study suggest that the e-portfolio has potential to enhance learning and develop self-assessment and critical thinking skills in graduate dental hygiene students.
An aging America is upon us as witnessed by more elders, more living longer, and more presenting as unhealthy adults due to lack of care or access to health care and increased disability. Despite efforts, geriatric dentistry remains alarmingly understaffed, with sufficient training lacking in most dental practitioners. Additional curricular change and innovation are vital to meeting the needs of this population. Based on a statewide survey, a questionnaire was designed to compare first- and fourth-year student perceptions of elder needs and to solicit input on preparing future dentists to deliver geriatric dental care. First-year (n=54) and fourth-year (n=54) dental students completed a fifteen-question survey providing geriatrics professors with a view of the knowledge and understanding about the severity of edentulous patients, reported problems of dental care, jaw and teeth pain, chew and denture fit, barriers to care, and recommendations for improvement of elder care services. Both student groups recognized that geriatric dentistry requires specialized skills and a deepened understanding of particular treatments and treatment difficulties, patient communication and management needs, and the complications of systemic disease. A greater challenge exists for raising awareness, patient education, and motivating elder patients. Student knowledge of elder patient needs paralleled those expressed by elder patients. Secondly, to develop new strategies to promote advocacy and interest in treating an aging population, students were asked in an open-ended question: “If you could create the ideal course or clinical experience to prepare you to treat geriatric patients in practice, what would that be?”

Results: The results varied among the groups, with first-year students wanting more lecture time (16 percent), more observation (40 percent), and opportunities to talk with elders about care and patient needs (18.5 percent). A majority of the fourth-year students (53 percent) asked for increased clinical experience through required Department of Veterans Affairs rotations, mobile clinics for nursing homes, and volunteer work to free clinics. Other suggestions included a week-long “geriatric boot camp,” geriatric patient days in the student clinics, and changing elective geriatric rotations to required. Students were motivated and action-oriented as they requested practice-based solutions to treating more elders. Surprisingly, responses did not include technology-based instruction such as simulations, cases, online courses, or web-based solutions.

Conclusions: In this study, dental students confirmed that early exposure to course material made a positive impact on their knowledge and comfort level, but upper-level students wanted to expand their experiences through increased clinical experience and other mandatory or voluntary student rotations. Curriculum committees, task forces for reform, interprofessional teams, and dental school administrators should take notice of these student-generated suggestions for evidence-based teaching.

Significance: Students were found to be knowledgeable and motivated to serve elder patient populations but desired significantly more clinical time. Imagination, high tech teaching solutions, and consideration of millennial students’ learning styles must be further examined to assist in decompressing the curriculum while supporting this need.

44. Evolution of an Assignment: A Dose of Reality and a Splash of Creativity
Laura MacDonald, University of Manitoba; Dianne Gallagher
Track: Educational Research
The School of Dental Hygiene, University of Manitoba (SDH/UM) employs authentic learning and assessment. A dental hygiene employment and practice management experience was designed to partially fulfill the SDH/UM competencies related to professional standards and governance, communication, and management skills. It involved student interviews with a practicing dental hygienist; a seminar on employment issues/expectations; and a workshop on the four concepts of dental hygiene (client, oral health/health, environment, and dental hygiene actions) (Darby & Walsh 2003), concluding in a written assignment reflecting the whole experience. Succeeding versions of the assignment evolved based on the breadth and depth of the student’s submission. Wanting a more scholarly approach to the assignment’s evolution, permission was requested from the students for their assignment to be critiqued for accuracy and relevance to its purpose. The instructor critiqued the assignment and also secured an external critique. A compare and contrast of one generation of the assignment to the next was based on the following criteria: incorporated changes resulted in broader and deeper student reflections, and changes better exposed students to the domain of thinking within the profession. The study has a threefold purpose: 1) analyze, by generation, students’ written submissions regarding how well the assignment itself guided their learning; 2) assess the effectiveness of the process in helping students develop professionally; and 3) provide an instructor self-critique of the assignment’s authenticity.

Results: Three years of data collection resulted in 25 percent per year of the student body submitting their assignment for study critique. Each year, the assignment evolved, thus producing three generations of the assignment. Analysis reveals the following in context of the SDH/UM competencies: 1) students are able to construct interviews based on the four dental hygiene concepts, 2) with each generation of the assignment, improvements resulted in higher levels of student reflections, and 3) the teaching of theory and practice was markedly improved as evidenced by the richness of student responses on the assignment over the three years. Given the response rate, these results may not fairly represent the actual learning outcome, but they did result in the continuing evolution of the learning experience, giving the instructor insights derived by the scholarly critique. The students formulated interviews based on the dental hygiene theoretical concepts, reflected on the learning events based on these concepts, and related them to their growing understanding of dental hygiene practice. The instructor committed to scholarship in teaching and reaped the benefits of creating an authentic learning experience and evaluation of student learning.

Conclusions: Bridging dental hygiene theory with practice and being mindful of scholarship in teaching, being simultaneously realistic and creative, resulted in the evolution of an authentic assignment that meets the SDH/UM competency requirements.

Significance: The evolving assignment has resulted in orienting the student to the reality of practice and did so using a creative process, enhancing imagination, and achieving learning. Educators are invited to critique the line of reasoning of the assignment’s evolution, considering its implications and relevance to their profession.

45. Applying a Path Analysis to Understand Relationships Between Performance Measures in Dental School
Frederick Sutkiewicz, Marquette University; Thomas Taft, Marquette University
Track: Educational Research
The journey in dental education is marked by both cognitive and academic measures beginning with admission, such as undergraduate GPA and DAT scores, and ending with National Board Dental Examination (NBDE) Part II and cumulative GPA in dental school. Along the trail, students take the NBDE I and mock board exams and receive course grades to measure their performance. The current study applies a path analysis to understand the relationships among these cognitive/academic measures during the course of a student’s journey through dental school. The analysis involved cognitive/academic
markers from graduating classes 2004–08. The relationships between the variables are described using path coefficients, which provide a measure of the type and strength of relationship between each variable. 

**Results:** The path analysis revealed that undergraduate science GPA, total GPA, and DAT total science and academic average scores start as strong predictors, in the R .45 or greater range, of D1 first semester GPA. The strength of the relationship between DAT and dental school GPA fades during subsequent semesters, while the relationship between undergraduate and dental school GPA remains fairly constant. GPA in dental school was linked to future GPA in subsequent semesters, e.g., sophomore GPA: junior GPA (R .684). Not surprisingly, NBDE Part I correlated highly (R .68) with a mock board Part I exam. When D1 fall semester GPA is added to the model, R increases to .820, and the path to NBDE Part I becomes clearer. NBDE Part II total score was best predicted by Part I performance (R .723), although D2 GPA (R .56) provided an alternative and still well-defined path to NBDE Part II.

**Conclusions:** Utilizing a path analysis procedure can assist in elucidating the relationships among cognitive/academic measures in dental school. 

**Significance:** The application of path analysis to dental education can assist in establishing a more in-depth understanding of the relationships among cognitive and academic measures in dental school.

### 46. URM Student Use and Perceived Effectiveness of First-Year Support Services

Dorothy Burk, University of the Pacific; Daniel Bender

**Track:** Educational Research

A survey was administered to the first-year class in the spring of 2008 (non-URM, n=124; URM, n=16; response rate=98 percent). Respondents were asked to rate the severity of each of twelve problems (1=not a problem, 4=severe problem) and to identify and rate the effectiveness of any support service used to address the problem (1=not at all effective, 4=very effective). Race/ethnicity responses were recoded into a categorical variable (URM, non-URM). Data were analyzed with SPSS 16.0.

**Results:** Results revealed generally low mean severity ratings for both groups. The most and least severe problems were identical in both groups. The mean for URM students ranged from 1.44 for “financial problems” to 2.69 for “personal disappointment with performance”; for non-URM respondents the range was 1.31 to 2.25. URM students ranked “study skills” (M=2.31) and “low didactic performance” (M=2.18) as the next most severe problems and were significantly more likely than non-URM students to rate those problems as severe (t=2.53, p<.05; t=2.175, p<.05, respectively). Non-URM students ranked “low technique performance” and “self-doubt” as second and third in severity (M=2.21 and 2.17, respectively). Both groups reported heavy use of peers, but URM students were significantly more likely to consult a peer to help with a problem (chi-square=4.17, p=.04). For the three most severe problems identified by URM students, mean effectiveness ratings for classmates, Big Sibling, and upper class students were 3.0, 2.67, and 2.5 respectively for “disappointment with performance”; 2.88, 2.0, and 2.8 for “study skills”; and 3.6, 2.5, and 3.3 for “low didactic performance.” Members of both groups who used professional resources (advisor, course director, psychologist) generally found them effective.

**Conclusions:** First-year African American, Hispanic, and Native American/Alaska Native students in this sample, like their non-URM classmates, reported having severe problems with personal disappointment, but were significantly more likely to report severe problems with study skills and low didactic performance. Both groups appeared to rely heavily on peers for help and found them to be effective, although URM students were more likely to consult a peer for any problem. Results suggest that some URM students may be less prepared for the academic rigor of dental education and that schools should consider having peer advisement systems in place to help this group.

### 47. Utilization of Tegrity in a Blended Dental Hygiene Course

Marsha Black, University of Missouri–Kansas City; Kimberly Bray, University of Missouri–Kansas City

**Track:** Educational Research

Tegrity is a course capture system that can be used to record lectures in the classroom, giving students the opportunity to review them again. The tech developer for Tegrity reported that usage of the classroom capture system hit record levels in 2007, capturing 325,000 hours of faculty lectures on its servers in a twelve-month period. Tegrity recordings capture both audio and visual class presentation material and by means of full integration with Blackboard students can either download content to an iPod or simply view recordings on their personal computer. The simultaneous presentation of auditory stimulus (presenter voice recording) and visual stimulus (PowerPoint, document camera, video, etc.) is consistent with the modality principle of multimedia learning theory. Research by Mayer (1998) and others demonstrates verbal information is better remembered when accompanied by a visual image. Access to recordings allows students to review the material at their own pace or time and as many times as needed. The typical use for Tegrity is the recording of synchronous class content for later review; however, in this case, the technology was applied for asynchronous recording of course content in a second-year summer undergraduate dental hygiene course. The course lectures were recorded from a remote site and loaded onto Blackboard. Synchronous classroom activities were maintained; however, the recordings allowed for use of varied instructional methods and additional content during class time.

**Results:** A student satisfaction survey was conducted, which yielded an 85 percent response rate (n=28), and reports were compiled from Tegrity and Blackboard regarding usage. The prevalence of Tegrity use for viewing recordings more than once varied between 33 percent and 53 percent depending on the lecture content. Blackboard indicated students viewed the course content in late afternoon to early evening. Survey responses revealed Tegrity aided in the retention of the course material (79 percent), increased their impact in their success in the course (58 percent), and did not increase the time spent studying for the class compared to non-Tegrity courses (63 percent); students also indicated having the instructor on video (webcam) was helpful (50 percent). In addition, the survey revealed that students who previously used voice-narrated lectures (PowerPoint presentations with recorded narration per slide) in classes preferred Tegrity.

### 48. Case-Based Teaching in the Simulation Laboratory

David Glotzer, New York University; James Kaim; Mark Wolff; Kenneth Allen

**Track:** New Program

The student response to case-based teaching using a simulated patient has been overwhelmingly positive. Students come to class with a treatment plan fully developed. Using the “patient” information posted on Blackboard, the students are encouraged to work in small groups as they develop the ideal, and alternate, treatment plans. They are required to include preventive strategies, including home protocols that they expect their “patient” to follow. Students have to justify the surgical treatment and make decisions on the type of restorative
material. The depth of the cavity preparations, as dictated by the radiographs provided, requires decisions to be made about the need for and type of liners and bases. The discussion of a particular case is held at the end of the laboratory session, after “treatment” has been completed. Students participate in a dialogue on the impact of medical history, influence of past dental experience, selection of materials, and preparation design. In addition, the faculty has been energized by this approach, when they see students more involved in their sessions. The faculty plays a critical role in implementing this program. Each group of approximately sixteen students has an assigned faculty member who has been briefed on the “case of the day.” Ideal and alternative treatment plans are discussed with the students who then provide “treatment” to the simulated patient.

49. The Rural Oral Health Fellowship Program: A Field Report
William Lobb, Marquette University; Frederick Sutkiewicz; Sheila Stover
Track: New Program
The Rural Oral Health Fellowship Program (ROHFP) is a one-year postgraduate program sponsored by Delta Dental of Wisconsin. This program was developed in 2007 to continue the clinical education of recent dental school graduates by providing them with clinical experiences in more rural areas of the state of Wisconsin. Building on the prior development of clinical experiences and skills, this program exposes fellows to problems associated with access to oral health care in rural communities including an understanding of the oral disease burden within these communities. During a two-year period, four graduates of Marquette University School of Dentistry have served as fellows in rural areas in Wisconsin, where they were often the only dentist or health care worker in a region. The fellows treated over 1,400 unique patients in 2,850 visits for services that may not have otherwise been performed, as all of the patients served in this fellowship program were Medicaid recipients or had incomes within the 200 percent of poverty according to federal guidelines. In the inaugural class, one fellow remained in a rural part of Wisconsin to practice, while the other returned to the fellow’s home state to practice. The current fellows in this program are both Wisconsin residents who have expressed a strong interest in selecting a rural practice location upon completion of the program. All fellows concur that the experience assisted in their ongoing development of clinical skills, professional attitudes, and patient management. The fellows also gained experience managing the oral health care needs of a broad spectrum of age groups and clinical case types involving simple to complex cases.

Conclusions: For Marquette University School of Dentistry, the fellowship program reflects a natural extension of the urban and rural outreach programming experienced by predoctoral dental students. This fellowship experience serves to promote a greater appreciation for qualities associated with empathy, respect for others, and social justice within these young dentists.

Significance: This unique program extends the clinical skills, related knowledge, and professional attitudes useful to prepare new graduates to practice in rural areas. This program also extends the service capacity of rural-based clinics.

50. Creation of a Case-Based Library for Prosthodontics Education
Ival McDermott, University of Medicine and Dentistry of New Jersey/New Jersey Dental School; Renee Varghese
Track: New Program
Case-based educational materials are finding increasing application in all levels of medical and dental education. Case-based learning experiences for students are meaningful, realistic, challenging, and, most importantly, fun! Case-based learning experiences that include opportunities for independent diagnostic fact-finding, problem solving, and evaluation of alternative solutions will prepare students well for the real-life situations they will face in actual patient care. With the use of electronic media, the opportunities to present students with case-based assignments and testing can be limitless. Many schools and commercial companies have begun amassing case-based materials; even regional and national testing agencies are increasingly relying on case-based materials to test dental students’ readiness for practice. At UMDNJ/NJDS in 2006, a sophomore technique course, Interdisciplinary Restorative Dentistry, was reorganized to change its focus from laboratory procedures to prosthodontics treatment planning and decision making. The course was changed to incorporate three cases from the nascent Case Library, and students were divided into groups to work together with a faculty mentor to develop PowerPoint presentations, in which they discussed every aspect of their decision making process and presented diagnostic wax-ups of proposed restorations. In subsequent years of the course, more patients were added as the library grew, and both midterm and final examinations were designed around library patient materials, with students using their own laptops in a testing environment, answering multiple-choice questions concerning diagnostic and treatment planning, and assessing potential treatment modalities for the standardized patient presented.

Results: Student course reviews were enthusiastically positive concerning the case-based projects. Student evaluations for both the course as a whole and for its midterm and final examinations will be presented. Evaluations by other faculty members will also be presented, as other faculty members using the library are asked to submit written evaluations of these materials and suggestions for their improvement.

Conclusions: Case-based educational projects improve teaching, learning, and testing in many areas of dental education. They especially add relevance, reality, and interest to the teaching of preclinical disciplines in which students do not have the clinical experience needed to guide decision making or to visualize techniques and procedures.

Significance: Case-based education and testing will become more prevalent with increasingly available digital technology. Discussion about the elimination of live patient participation in testing is also ongoing and gaining in significance; this is an area in which case-based materials will become even more significant. The process of amassing and organizing case-based materials for educational use is complex, especially due to strict adherence to privacy policies in the health professions. This project presents an approach that has been successful at UMDNJ/NJDS.

51. The Geriatric Caregiver Oral Health Training Program
Donna Warren-Morris, University of Texas Health Science Center at Houston; June Sadowsky, University of Texas Health Science Center at Houston
Track: New Program
The Geriatric Caregiver Oral Health Training Program is unique. First, it is an interdisciplinary project at the University of Texas Health Science Center at Houston led by three principal faculty: Dr. Nancy Bergstrom, director of the UT School of Nursing Center on Aging; Dr. June Sadowsky, assistant professor, Restorative Dentistry; and Ms. Donna Warren-Morris, associate professor, Department of Periodontics and Dental Hygiene. Second, the program involves the
education of nursing, dental, and dental hygiene students, certified nursing assistants, home health aides, and family caregivers of the elderly. Rarely is a teaching program aimed at such a diverse group of learners.

Results: Comparisons of the results of pre- and posttests given to the nursing aides showed a substantial improvement in their knowledge relative to oral health.

Conclusions: The teaching and learning environment at the University of Texas Health Science Center at Houston has improved as a result of the collaboration of nursing and dentistry and the development of this educational program. Faculty members use these materials to teach students and other health professionals. Nursing and dental hygiene students use these materials in the community when they go into area nursing homes and hospitals to give in-service presentations. Dental hygiene students have used the video as part of their community service-learning projects in spring 2008 in eleven Houston-area nursing homes. They reported it to be a beneficial teaching tool that kept the interest of certified nursing aides during the in-service training.

Significance: There is a nearly universal lack of knowledge and skills related to oral hygiene and oral health care offered and available to elderly persons being cared for in nursing facilities and in the community. This program aimed at caregivers offers evidence-based information in an easy-to-use/understand format.

52. Multimedia Learning Tool to Teach Standardized Gathering and Recording of Clinical Data in the Predoctoral Clinic

Ulla Brit Arvidson Buffano, University of Maryland/Baltimore College of Dental Surgery; Julie Gilliam

Track: New Program

Students often find discrepancies between what was taught about gathering and recording clinical data in the preclinical years to what is expected by faculty in the clinic. Furthermore, full-time, part-time, and volunteer faculty may have differing opinions based on their own clinical experience. The lack of standardization can be confusing and frustrating for both students and faculty; therefore, a need for increased knowledge about correct data recording at a patient’s work-up visit was perceived. Considering that most of our students are Millennials, used to multitasking, wanting immediate feedback, and preferring to learn on their own time, a new approach was necessary to make this learning and standardization process successful. The objective of the MDMT was to give students and faculty the knowledge needed to standardize data gathering and recording at a patient’s initial visit. The MDMT is built around the work-up data sheets, the odontogram codes, and the final treatment planning form. Faculty from seven disciplines provided information for seven diagrams, fifteen short flash videos, several images, and text boxes. Six months after the students were introduced to the MDMT in the clinic, they evaluated each section on a scale from 1 (not helpful) to 5 (very helpful). The students in the class of 2010 also reported their own use of the MDMT and how often the faculty refer to it.

Results: Student participation in the six-month evaluation was 83 percent (n=102) for the class of 2010/juniors and 40 percent (n=46) for the class of 2009/seniors. The unannounced evaluations were given during scheduled class time. Faculty members had been given an introduction to the MDMT and a link to access it and were asked to look at it in detail on their own.

Conclusions: The senior and junior dental students were very positive about the MDMT. The most favorably reviewed sections by juniors (>70 percent positive) were Head and Neck Examination, Diagnostic Testing, Periodontal Examination, and Treatment Planning Form. The sections Charting of Radiographic Findings and Occlusal Examination received the lowest scores by juniors and would benefit from improvement. The seniors had ten months’ experience with data gathering and recording in the clinic before they were introduced to the MDMT. Even though they were expected to find the MDMT less helpful than the junior students, seniors’ mean scores were sometimes higher, sometimes lower, or the same. Surprisingly, none of the seniors scored any section of the MDMT as not helpful. An explanation may be that the seniors had experienced ten months in the clinic without the MDMT and being frustrated with the lack of standardization, while the juniors had never examined patients in the clinic without access to the learning tool and did not realize what difference the MDMT has made in increasing standardization. Treatment planning faculty should discuss whether students will be required to pass a competency examination evaluating their knowledge of the information in the MDMT after their first months in clinic. In addition, in-service training for faculty should be considered in order to improve correct use of the information from the MDMT in the clinic.

53. Clinical Outreach: Seven Years of a Self-Sustaining Model

Mark Fitzgerald, University of Michigan; Wilhelm Piskorowski

Track: New Program

Financial data collected from a two-year trial funded by outside grants and organizations lead to a win-win negotiation process with a local FQHC (federally qualified health center) to develop a contract that allowed students to provide service in their clinic in exchange for reimbursement to the school by the FQHC sufficient for covering all associated costs. The contract developed has been used with minor modifications for seven years with seven state FQHCs. Recently, this contract has been accepted as a universal contract with three other organization types: CDCs (community dental clinics), IHS (Indian Health Service) clinics, and private practices.

Results: The self-sustaining contracts with seven FQHCs have resulted in win-win-win-win outcomes: win for the underserved communities, which experienced increased access to care; win for the FQHCs, which experienced increased and more consistent productivity; win for the students, who increased their clinical skills and broadened their experience base; and win for the school in the form of predictable and continuing full coverage of all program costs. Additionally, demands for student participation in existing sites and other sites have increased. This increased demand has resulted in doubling the weeks of student participation. Overall, student productivity has increased. Clinic availability and thus clinic opportunities have increased for D2s and D3s because D4s are out on rotations. Finally, FQHCs have noted a significant increase in recruitment of recent graduates as practitioners, thus helping them solve a chronic human resource problem.

Conclusions: A self-sustaining model that adds value to the service of the underserved, the participating clinics, dental students’ clinical education, and their school has been developed and demonstrated to be successful over the past seven years.

Significance: Models such as this can be used to increase service to the underserved and increase the value of students’ clinical educational experiences without requiring grant or school funding, thus improving the value of dental education without increased cost.

54. The Spider Chart: An Educational Tool for Teaching Dental Students Caries-Risk Assessment

Negar Nasseriopour, Boston University; Frederic Hains; Anuradha Deshmukh; Takanari Miyamoto; George Kelcher; Judith Jones

Track: New Program

The Spider Chart is a visual tool designed to simplify the calculation of caries risk in young children. It has been used in the United States for several years, but its application to dental education has not been widely reported. This presentation describes the development and use of the Spider Chart in an educational setting.

Results: The Spider Chart has been shown to be an effective tool for teaching dental students how to assess caries risk. Students who were trained using the Spider Chart had significantly higher scores on a posttest compared to those who were not trained.

Conclusions: The Spider Chart is a useful educational tool for teaching dental students how to assess caries risk in young children. Further research is needed to determine the long-term impact of using the Spider Chart in dental education.
After Boston University IRB approval was obtained, the project surveyed dental students who had completed treatment planning course and calibration in caries-risk assessment (CRA) in the academic year 2007–08. The surveys were uploaded on the CourseInfo website for students to download and print. Data were entered, cleaned, and analyzed using Microsoft Excel 2003.

**Results:** The response rate was 68 percent (78/114). The respondents belonged to the D.M.D. ’08 class and included 56 percent males and 44 percent females. A majority (93 percent) of the students responded that the components of the spider chart were easy to measure. Seventy-four percent of the students responded that the spider chart was useful for carrying out CRA on patients, whereas 88 percent said that the cariogram was useful. While 22 percent responded that they needed more education on using the spider chart, 18 percent said that they needed more education about the cariogram. Most (81 percent) of the students responded that the spider chart was an important educational tool, and 90 percent agreed that the cariogram was an important educational tool. Most (90 percent) of the students responded that the combination of lectures and laboratory exercises was useful in carrying out CRA on their patients, followed by 88 percent who agreed the laboratory exercises were useful, 86 percent who agreed that the clinical exercises were useful, and 76 percent who responded that the lectures were useful in conducting CRA.

**Conclusions:** The results indicate that the BU spider chart was deemed as a useful educational tool and easy to use as the cariogram. The incorporation of CRA within the curriculum will add valuable insight as to a patient’s risk for disease.

**55. Reducing the Failure Rate on Licensing Examinations by Improving Faculty Performance**

James Kaim, New York University; Mark Wolff; Kenneth Allen; David Glotzer

**Track:** New Program

At New York University, we were faced with a problem that was clearly identified during the 2007 spring North East Regional Board (NERB) examination. Seventy-four percent of all the failures were caused by the students’ inability to recognize and remove infected dentin. Immediately after obtaining these results, an initiative was launched by the Department of Cariology and Comprehensive Care. This new protocol required all operative surgical procedures to be independently evaluated by two faculty members whose primary task was to evaluate caries removal. This new protocol was not initially well received by the faculty as they felt it was an embarrassment to their clinical skills and expertise. The department chair met with the faculty members, individually and in groups, to explain the purpose and reason for this change. What developed in a short period of time was a more collegial atmosphere, with faculty members welcoming the opportunity to discuss issues and learn from each other. This mirrored the Board examinations, on which multiple examiners, usually three, are required to independently evaluate preparations and restorations.

**Results:** Our new clinical protocol resulted in a 69 percent reduction in the failure rate on the spring 2008 examination. The feedback from NERB has proved to be a valuable independent resource to access not only our students’ performance but indirectly to evaluate our faculty teaching as well.

**Conclusions:** Using multiple faculty members to evaluate the same clinical preparation is an effective way to teach clinical excellence and subsequently increase performance on standardized licensing examinations.

**56. Conversion from Patient-Based to Case-Based Competency Examinations in Periodontics**

Lewis Claman, The Ohio State University; Binnaz Leblebicioglu; Dimitris Tatakis; Angelo Mariotti; Hua-Hong Chien; Purnima Kumar

**Track:** New Program

All full-time periodontology faculty members at The Ohio State University constructed a case-based examination in periodontics. Each person constructed questions pertaining to a different case. The faculty met as a group to discuss the questions. As a trial, starting students in advanced training in periodontics took the actual examination. The final version had sixty questions on seven cases. For each case, patient history, clinical photographs, radiographs, and clinical charting were provided. To prepare students for the online format and types of questions, a sample case was uploaded on the university website, Carmen, for predoctoral student viewing. Additionally, a review lecture was given three weeks prior to the examination. The examination was administered online at four different computer laboratory locations. The start time was coordinated, with students accessing the examination through a secure password. The mean student score for the exam was 81 percent (range: 65 to 92 percent). Item analysis showed that, for individual questions, correct responses ranged from 13 percent to 100 percent. Item analysis also indicated that only one question had a negative discrimination index. A confidential online student survey (35 percent participation rate) found that 72 percent of the students felt prepared for the exam, 66 percent thought the sample case helped in preparation, 73 percent thought the exam was fair, and 74 percent felt it would be helpful in upcoming board examinations. Eighty-six percent found the exam was intellectually stimulating, and 94 percent preferred the case-based to a patient-based exam, while only 50 percent of the students felt the exam encouraged them to review didactic material. Several students were critical of inconveniences made necessary for exam security. The faculty strongly felt that test construction was a worthwhile endeavor and were in favor of repeating it. Total faculty time devoted to test construction and administration was seventy-five to 100 hours.

**Conclusions:** 1) Despite logistical problems, students were accepting of the case-based examination format, were challenged by the questions, and preferred it to a patient-based exam; 2) the online case-based competency examination in periodontics was a worthwhile endeavor for the faculty, providing the additional benefit of calibration of periodontal concepts; and 3) the case-based competency examination should be continued.

**Significance:** 1) The case-based examination format is an excellent strategy for assessing fourth-year student knowledge in periodontics; 2) the examination helps prepare students for regional/national board examinations and for diagnostic information/judgment needed for general dental practice; and 3) group test construction is a worthwhile method for faculty calibration of periodontal and testing concepts.

**57. Teaching Evidence-Based Practice Skills to the Clinical Faculty and Predoctoral Dental Students**

Andrew Schenkel, New York University; Mark Wolff

**Track:** New Program

Much confusion exists regarding evidence and its use in clinical practice. It has almost gotten to the point that we all have our own definition of what evidence-based practice (EBP) is and how we apply it. Although most dentists claim to practice evidence-based dentistry, EBP skills are not typically utilized by most clinical faculty, making teaching these skills to predoctoral students even more challenging.
These skills are not easily understood by either the faculty or the students. This presentation will describe and illustrate a simplified, effective approach to EBP and will illustrate a simplified, efficient method of searching the scientific literature and easily obtaining the highest level of evidence available. All approaches to EBP start with the formulation of a PICO question that delineates the Population (Patients), the Intervention, the Comparison, and the Outcome to which we are looking for the answer. While formulation of this question is intuitive to some, most people need coaching and practice before being comfortable with this format. Formulation of the PICO question is the first step necessary towards outlining our search parameters. Obtaining the answers used to be a long and tedious process of searching and reviewing large numbers of articles—not something typically done by dentists in clinical practice or faculty members teaching on the clinic floor. Now, using this approach, the answers can be acquired quickly and easily by obtaining and reviewing the few articles representing the highest level of evidence available. As students will typically go to Google for answers, these techniques are effective to allow them to easily search beyond Google into the professional literature.

**Results:** Students are able to formulate PICO questions and effectively answer those questions by obtaining the highest level of evidence available in the scientific literature quickly and efficiently.

**Conclusions:** An efficient and simple method of obtaining answers to clinical questions will go a long way towards moving the profession in the direction of becoming more scientific in our approach to clinical decision making.

**Significance:** EBP will only be possible if it is efficient and user-friendly. This approach will make it possible to quickly obtain answers to clinical treatment decisions.

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**Student Poster Presentations**

**58. Dental Hygiene Students’ Knowledge of Genetics in Dentistry: Baseline Measures**

Amy Coplen, University of Michigan; Christine Klausner; Wendy Kerschbaum; Carole Ann Murdoch-Kinch; Lynn Johnson

**Track:** Educational Research

Contributions of hereditary factors to the development of common oral disorders are gaining increasing awareness as well as the implications of systemic genetic diseases on oral health care. Dental professionals should be prepared to discuss genetic factors and the impact of genetic disorders on oral health. To this end, a series of web-based case simulations were developed to educate students on genetics in dentistry. An instrument to test students’ knowledge of genetics was developed in consultation with a geneticist and pilot-tested with dental students. The instrument included case scenarios with genetic components and definitions of genetic terms. Data were collected from entering dental hygiene (DH) students on the first day of class and senior DH students in their final semester. Responses were entered into SPSS 16.0, and comparisons were made between the two levels of students using independent sample t-tests. Responses were entered into SPSS 16.0, and comparisons were made between the two levels of students using independent sample t-tests. Responses were entered into SPSS 16.0, and comparisons were made between the two levels of students using independent sample t-tests.

**Results:** Senior DH students averaged a higher total score (54 percent) than entering DH students (48 percent). This difference was not statistically significant. Entering students did slightly better than seniors on the definition section of the exam, with scores of 45 percent and 42 percent, respectively. Seniors did significantly better than entering students on the case scenarios section of the test (p=.013), with scores of 63 percent and 51 percent, respectively. Senior students scored significantly higher than entering students on specific case scenarios relating to periodontal disease, ectodermal dysplasia, and Down syndrome.

**Conclusions:** Both entering and graduating dental hygiene students scored low, less than 55 percent, on an exam in a program with no formalized genetics content. A genetic curriculum using web-based case simulations will be implemented in the fall of 2008 at the University of Michigan with dental hygiene students. Ongoing assessment will be conducted.

This project is supported by NIH/NIDCR grant #5R25 DE015350-02.

**59. Construction and Validation of the Dentist’s Values Scale**

Angela Langille, Saint Mary’s University; Victor Catano, Saint Mary’s University; Thomas Boran, Dalhousie University; Donald Cunningham, Dalhousie University

**Track:** Educational Research

During the dental admissions process, decision makers focus on determining which applicants will most likely become competent practitioners. As such, the admissions procedure may benefit from the inclusion of a reliable, valid tool that can be used to assist in predicting the degree to which applicants are likely to become successful students and practitioners. One factor that is related to success in the dental profession is values. However, systematic research on the values of dentists is lacking. Therefore, we developed a measure of dentists’ values and validated it using a national sample of Canadian dentists. Exploreratory factor analysis results indicated five overall factors: altruism, personal satisfaction, conscientiousness, quality of life,
and professional status. Confirmatory factor analysis indicated the five-factor model was a good fit. We also administered the measure to a sample of dental students to determine the relationship between dentist and student values. With the exception of personal satisfaction, t-tests suggested that there were no differences between values of dentists and dental students.

**60. Evaluation of a Mini Dental Implant Course: A Solution for Oral Health Disparities in Appalachia?**

Mark Richards, West Virginia University; Stephen Fragale, West Virginia University; Richard Crout, West Virginia University; Larry Schoonover, private practice; Chad Boustany; Stan Wearden

**Track:** Educational Research

The use of dental implants to retain overdentures has become the standard of care in dentistry. Recently introduced mini dental implants (MDIs) have been shown to retain complete dentures at a greatly reduced cost. The use of MDIs on the low-income population of Appalachia could have a significant impact on improving the oral health disparities noted in this group.

**Results:** West Virginia dentists (N=60) attended a one-day workshop on MDIs and were asked to complete coded pre- and post-course questionnaires evaluating knowledge transfer. Forty-eight (80 percent) completed the pre-course questionnaire, and forty-one (85.4 percent) filled out the post-course questionnaire. With the exception of one dentist, all were general dentists with a median year of graduation of 1985. Although prior to the course, fifteen of the forty-eight dentists (31 percent) had placed dental implants, 60 percent did not feel they had the necessary knowledge. However, comparing the pre- and post-course questionnaires revealed an increase in understanding of the anatomy and biomechanics (p=0.02), indications/contraindications (p<0.001), case selection/case planning (p<0.001), and four-step MDI surgical protocol (p<0.05) so that the attendee could place the MDI. When asked if there would be interest in participating in an MDI study, twenty-seven (65.8 percent) of the dentists agreed to be contacted.

**Conclusions:** A one-day continuing education course in MDIs appears to have been very successful in transferring knowledge, according to 90 percent of the dentists’ responses on a post-course evaluation. The results of the course evaluations indicate a high interest by West Virginia dentists to begin placing MDIs for their patients.

**Significance:** Randomized clinical trials have confirmed improved mastication and health benefits of implanted retained complete dentures over conventional dentures. The cost of conventional size dental implants has prevented their routine use in low-income areas. Mini dental implants (MDIs) have been shown to successfully retain complete dentures at a greatly reduced cost. The use of MDIs on the low-income population of Appalachia could have a significant impact on improving the nutrition and the oral health disparities noted for this group. West Virginia leads the country in senior citizens who have lost their teeth, at 44 percent compared to the national average of 22 percent. Loose-fitting dentures may be partially responsible for some of the nutritional problems that are prevalent in this group.

Little research has been done to investigate the use of MDIs in rural populations like West Virginia. The results of this survey and course evaluation indicate a high interest by West Virginia dentists to begin placing MDIs for their patients and their willingness to be contacted to participate in a study involving the placement of MDIs. Clinical studies in rural West Virginia, currently planned with mini dental implant companies, will hopefully demonstrate improved mastication and health for these patients. Implant placement in the many edentulous patients in West Virginia could greatly improve the ability of these citizens to masticate, resulting in improved nutrition and overall health of this population.

**61. Dental Instruments: Does One Size Really Fit All?**

Elizabeth Kao, West Virginia University; Valerie Perrine; Heather Ayers; Amber Bauer; Erdogan Gunel

**Track:** Educational Research

With the increasing number of females in the dental profession, those with smaller hands have reported difficulty aspirating with a conventional syringe and adapting to conventional extraction forceps and experiencing discomfort in operating large and heavy handpieces and fatigue working repetitively with thin-handled instruments. Limited research has been done comparing the overall comfort and control of dental instruments of conventional or petite size. The goal of this study was to compare the hand size of the operators and their instrument preference as far as comfort of adaptation and control. One hundred one second-, third-, and fourth-year dental students and faculty members participated in the study. Two sets of experiments with five manikin stations each were set up to simulate usage of selected dental instruments in patient position. The participants were randomized in the station assignment and order of the procedure. The conventional or petite instruments in each experimental set were randomly assigned as A or B. Each participant injected in meat (simulating a mandibular block) with a conventional Cook-Waite syringe or Septodont Petite syringe. Simulated extraction motions were performed on manikin teeth mounted in the typodont sockets with polyvinylsiloxane putty. Simulated calculus deposits were removed from teeth with sickle scalers. Mirrors and explorers were used to view and detect marked areas on tooth preparations, and handpieces were used to excavate premarked areas on teeth. Participants’ hand sizes and glove sizes were recorded. After completing the procedure at each station, the participants answered a questionnaire containing four to six questions on a Likert scale. One-way ANOVA and Tukey-Kramer tests were used to analyze the participant’s instrument preference and relationship to hand size (p<0.05).

**Conclusions:** One size instrument does not fit all hand sizes and dental procedures to be performed. Participants with smaller hands experience more comfort and control in performing anesthetic delivery and extraction with petite instruments. Instruments with larger handles are more favorable for dental examination and periodontal procedures, and a lighter and slimmer body handpiece is more favorable in performing operative procedures. The addition of different size instruments may be helpful in learning clinical procedures in a dental school setting.

**Significance:** The results of the study can guide dental professionals, educators, and manufacturers in selection and manufacturing of instruments of proper size and weight in order to decrease work-related musculoskeletal fatigue and improve comfort, control, and work efficiency.

**62. Usage Patterns of Web-Based Teaching Modules by Dental Students**

Allison Cavenaugh, University of North Carolina at Chapel Hill; Lorne Koroluk

**Track:** Educational Research

Web-based teaching modules have been used as adjuncts to traditional textbooks for self-directed learning. However, there is a lack of evidence concerning the utilization patterns of online resources in these settings. This study investigated the time and frequency of module utilization by dental students and the relationship between module utilization and examination performance in a growth and development course. The course is divided into four units (A, B, C, D) with unit examinations and a final examination. Students accessed the orthodontic online teaching modules with a user name and password. This log-in protocol was used to record the date and time when a student accessed the modules. The date of each log-in was categorized
as 1–3 days, 4–6 days, and >6 days before each examination. Each student could access the modules multiple times. The final examination was comprehensive, covering all course material from all four units. The relationship between final examination scores and module usage was analyzed.

Results: The total number of times logged in for each student during the entire course was significantly correlated with his or her final examination grade (Spearman correlation r=0.26, p=0.02). The percentage of students who logged in at least once for each unit was as follows: 1–3 days, Unit A 85.0, Unit B 96.3, Unit C 97.5, Unit D 71.3, Final 93.8; 4–6 days, Unit A 95.0, Unit B 55.0, Unit C 50.0, Unit D 45.0, Final 0.0; >6 days, Unit A 46.2, Unit B 0.0, Unit C 17.5, Unit D 32.5, Final 0.0. Fewer students accessed the modules early as the course progressed, the majority waiting until 1–3 days before the examinations.

Conclusions: The use of online teaching modules can positively affect performance in dental school courses. The majority of students waited to access the teaching modules a few days before the examinations.

Significance: Data on student usage patterns of online teaching modules would be beneficial in planning student self-study times, designing courses with online materials, and planning curriculum revisions. If online modules are to be used in lieu of dedicated lecture times, students must be given adequate time to review the course material, but the rigors of dental school may force them to delay accessing the material.

63. The Effect of a Dental School Simulation Course on Dental Knowledge
Nathan Hawley, University of Nevada, Las Vegas; Jared Dye; Marcia Ditmyer
Track: Educational Research

Participants completed a twenty-five question pretest-posttest measuring knowledge of the dental profession, waxing, taking impressions, amalgam Class 1 (M=3.64 of 4), and dental profession (M=3.27 of 4). Posttest results found the strongest areas of dental knowledge were dental anatomy (M=3.69 of 4), anatomy (M=2.06 of 4). Posttest results found the strongest areas of dental knowledge improved were dental anatomy (M=3.69 of 4), of lecture and hands-on activity. Tests were subsequently graded and differences between means from pretest to posttest.

Results: A total of 266 undergraduate students from thirty-four colleges and universities participated in the study. Pretest results found the strongest areas of dental knowledge were in amalgam Class 1 (M=2.22 of 4), dental profession (M=2.16 of 4), and dental anatomy (M=2.06 of 4). Posttest results found the strongest areas of dental knowledge improved were dental anatomy (M=3.69 of 4), amalgam Class 1 (M=3.64 of 4), and dental profession (M=3.27 of 4). Dental knowledge areas that showed the most improvement were dental anatomy (40.9 percent increase; 51.4 percent to 92.3 percent correct), impression taking (39.2 percent increase; 27.6 percent to 66.8 percent correct), and waxing (38.2 percent increase; 28.9 percent to 67.0 percent correct). The average score in every dental knowledge category was significantly correlated with his or her final examination grade (Spearman correlation r=0.26, p=0.02). The percentage of students who logged in at least once for each unit was as follows: 1–3 days, Unit A 85.0, Unit B 96.3, Unit C 97.5, Unit D 71.3, Final 93.8; 4–6 days, Unit A 95.0, Unit B 55.0, Unit C 50.0, Unit D 45.0, Final 0.0; >6 days, Unit A 46.2, Unit B 0.0, Unit C 17.5, Unit D 32.5, Final 0.0. Fewer students accessed the modules early as the course progressed, the majority waiting until 1–3 days before the examinations.

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64. The Portrayal of the Dental Profession on a Video-Sharing Website (YouTube)
Michael Kelly, University of Connecticut; Edward Tibodeau
Track: Educational Research

Video-sharing websites such as YouTube allow users to post, view, and comment on videos of any topic, including content related to dentistry and the dental profession. Dentistry-related keywords were searched on the YouTube website by relevance, and the number of videos posted per keyword was recorded. The total views of the most popular video per keyword were also noted. In addition, the keyword “Dentist” was used to evaluate video content in fifteen specific search categories such as “comedy,” “education,” and “entertainment.” The image of how the dental profession was portrayed on the site was evaluated by viewing the first twenty video results for the keyword “Dentist”; results were recorded as positive, negative, or neutral. In addition, demographics of both dentists and patients portrayed in the videos were observed. Videos used as a means of advertising or for informational purposes were counted.

Results: For the twenty-six keywords searched, the number of videos posted on the site ranged from four to 51,300. The number of times the most popular video for a given keyword was viewed ranged from 997 to 6,038,298. Among all search categories, the keyword “Dentist,” when sorted by relevance, produced 14,800 video results. A search for the keyword “Dentist” in specific search categories such as “education,” “science & technology,” or “comedy” resulted in approximately 1,000 to 4,000 videos each. Of the top twenty video results for the keyword “Dentist” across all search categories, one portrayed dentistry in a positive manner, seventeen were negative, and two were neutral. None of the first twenty videos were advertisements or informational. Of the nineteen dentists portrayed in those first twenty video results, nine were white males over the age of fifty, nine were white males under the age of fifty, and one was a white female under the age of fifty. No white female dentists over the age of fifty or minority dentists of any age were portrayed. By limiting the search to a specific subcategory such as “education” or “science & technology,” the percentage of videos portraying the dental profession in a positive manner increased to as much as 60 percent. Other search categories such as “comedy” or “entertainment” contained very few, if any, videos portraying dentistry in a positive way. The “education,” “science & technology,” “news & politics,” “people & blogs,” and “how to & style” search categories contained large numbers of informational and advertisement videos. Across all categories, most dentists portrayed in the videos were white males, with very little, if any, representation of female or minority dentists. The patients seen in the videos were generally white males and females of all ages, with little minority representation.

Conclusions: Millions of people are exposed to images of dentistry in videos on YouTube, and many of these videos portray dentistry in a negative context. At the current time, YouTube contains a collection of videos portraying dentistry in a predominantly negative way and may help perpetuate many of the negative stereotypes often associated with the profession.

65. Dental Education About Special Needs Patients: A National Survey
Meggan Krause, University of Michigan; Lauren Vainio, University of Michigan; Samuel Zwetchkenbaum, University of Michigan; Marita Inglehart, University of Michigan
Track: Educational Research

The objectives of this study were to explore the extent to which dental schools cover the treatment of special needs patients, how they present this material and assess learning outcomes, and which challenges and intended future changes they report. Recruitment emails were sent to the deans of fifty-six U.S. and ten Canadian dental schools. Twenty-one programs responded (response rate: 32 percent). The number of students in the programs ranged from thirty-two to 176 students per year (mean=75; SD=41).
Results: While 91 percent of the programs reported that they cover this topic in their clinical education, 67 percent offered a separate required course about special needs patients. The clinical education offered varied widely. Only 38 percent of the programs had a special area in the school to provide care for these patients. These areas had between five and twenty-two chairs and were funded and staffed quite differently. Most programs covered the treatment of patients with more prevalent impairments such as developmental delays (91 percent), motion impairments (86 percent), and hearing impairments (81 percent). However, some special needs were addressed less frequently (example: closed head injuries: 48 percent). Outcome assessments were most frequently done with written exams (91 percent), while OSCEs (14 percent) and standardized patient experiences (5 percent) were used less frequently. A total of 77 percent of the programs planned to make changes to their educational efforts over the next three years, with 38 percent planning to increase clinical experiences and 29 percent extramural experiences. The most commonly reported challenge concerning covering this material was curriculum overload (57 percent).

Conclusions: This study explored the status quo in U.S. and Canadian dental school programs concerning education for diagnosis and treatment of patients with special needs. Based on these findings, it can be concluded that the programs surveyed so far vary widely in their educational efforts as well as in their plans of changes over the next three-year period.

Significance: A new accreditation standard requires dental schools and dental hygiene programs to prepare their graduating seniors to be able to diagnose the treatment needs of patients with special needs. This study explores the degree to which dental schools comply with this standard.

66. Effects of MBTI Type, Self-Efficacy, and Test Anxiety on Dental School Students’ Achievement
MinSeong Chae; Sukjin Hong
Track: Educational Research
Two hundred seven dental school students were asked to respond to the MBTI GS form, self-efficacy scale, and test anxiety scale. Pearson’s correlation, MANOVA, independent-sample t-tests, and stepwise multiple regression analysis were conducted to test research hypotheses.

Results: First, in the MANOVA of academic self-efficacy on MBTI type, there was a significant difference between extraversion-introversion type. But the rest of the MBTI types didn’t show any difference. Second, in the MANOVA of test anxiety on MBTI type, there wasn’t any significant difference of personality preference and test anxiety on academic achievement. Third, in the independent-sample t-test of students’ academic achievement and MBTI type, the thinking-feeling, judging-perceiving MBTI type showed significant effects on students’ academic achievement. Fourth, in the stepwise multiple regression analysis of academic self-efficacy, test anxiety, and students’ academic achievement by MBTI type, the results showed that, in the extraversion type, worry has a significant influence on academic achievement. In the introversion type, self-regulated efficacy, which was a subscale of self-efficacy, had significant influence on academic achievement. In the sensing and thinking type, worry and self-regulated efficacy had significant influences on academic achievement. In the judging type, confidence and worry had significant influence on academic achievement. Lastly, in the perceiving type, confidence had significant influence on academic achievement.

Conclusions: As a result, MBTI type indicator is useful because medical and dental specialists could use this data for academic achievement, communication with patients, and decision making.

67. Color Deficiency Among Dental Students
Andrew Levy, New York University; Kenneth Allen
Track: Educational Research
Color deficiency, commonly called color blindness, may affect dental students in their color matching and shade differentiation. To determine the incidence of color deficiencies, the Ishihara’s Tests for Colour Deficiency were administered to 200 volunteers who were currently enrolled students at New York University College of Dentistry (NYUCD). Volunteers from the NYUCD classes were recruited both by a listserve email to the class and a posting on the student website. They were asked to participate in an “anonymous survey of color deficiency amongst dental students.” After completing an IRB-approved consent form, the research subjects were asked to complete a demographic questionnaire that included gender, ethnicity, and age. The Ishihara’s Tests for Colour Deficiency was then administered by a trained member of the research team. The Ishihara test identifies only those who are red-green color blind or totally color blind. This includes up to 99 percent of those who are color blind. It does not identify those who are blue-yellow color blind.

Results: Of the 200 NYUCD dental student volunteers, 7 percent of males were color deficient, and no females were color deficient. This is not a statistically significant variation from the general population. When comparing research subjects who were color deficient vs. those without a color deficiency, gender, age, and ethnicity were not statistically significant predictors.

Conclusions: There is no difference in the incidence of color blindness amongst dental students when compared to the general population.

Significance: This study demonstrates that there are color deficient students enrolled in NYUCD. Further studies will have to be conducted to determine if shade matching abilities and training vary for color deficient students when compared to those with normal color vision.

68. A Study of an Urban Dental School Patient Population
David Feller, University of California, Los Angeles; Michael Shoff, University of California, Los Angeles; Ben Freed, University of California, Los Angeles
Track: Educational Research
It is well established that the patient-doctor relationship is supremely important in the quality and continuity of treatment. To improve communication and develop this relationship, it is important for the health care professional to comprehensively understand one’s patients. This study examines three issues in a dental teaching clinic: student-patient relationships, patient demographics, and characteristics of patients who miss appointments. A twenty-four item Likert survey was administered to 125 patients in the UCLA General Clinic in accordance with UCLA IRB guidelines. Questions included general satisfaction, basic demographics, anxiety, and perceived cost of treatment. Statistical analysis was performed using Stata 8.2. Bivariate analysis was done with chi-square and Fisher’s exact test. Significance value was set at 0.05.

Results: Surveys were received from ninety-seven patients (return ratio of 78 percent). Key findings included the following. Patients who believed that students did not avoid unnecessary expenses were more likely to feel that too many students were involved in their care, were generally less satisfied, and often had a language barrier. Patients who were more likely to miss an appointment believed that their students should do more to reduce pain and also had a language barrier. Finally, the demographics of the patient base at UCLA have been relatively consistent over the last decade, specifically in terms of age, educational attainment, distance traveled for care, mode of travel, and method of payment for care.
Conclusions: Impressions of the clinic and acceptance of student care seemed to be linked to patients’ perceptions of students’ awareness of the economic situation and the students’ cross-cultural communication skills.

69. Retrospective Study of Temperament Traits in a Midwestern Dental School
Jaren May, University of Oklahoma
Track: Educational Research
This was a retrospective study of collected data from the last decade of temperament types of dental students at a midwest dental school. The data were collected and then compared to the general population as well as research from other dental schools to determine whether certain temperament traits have a predilection for dentistry. Temperament traits may determine the way students gather and process information, so it therefore may be helpful in actively applying methods that optimize learning in the classroom. The Jungian Typology Test, a temperament type indicator based on the theories of Jung and the Myers-Briggs Type Indicator, was used to assess the temperaments and learning styles of dental students. The sample included 326 students, which represented a participation rate of approximately 80 percent. The frequency of each temperament trait was compared against the percentage reported for the general population.

Results: The results indicated a higher ratio of introvert traits (46.6 percent), judging traits (88.7 percent), and intuitive traits (49.7 percent) when compared to the general population. The judging trait is found in approximately 50 percent of the general population, and the introvert and intuitive traits are each identified in about 25 percent of the same group. Other studies also had a larger percentage of intuitive and judging types than is represented in the general population.

Conclusions: Compared to the general population of the United States, a larger number of introverted, intuitive, and judging temperament types may be attracted to dentistry. Dental education, through large participation lectures, allows introverts an adequate comfort zone, while extroverts thrive on developing interpersonal relationships in clinical settings. Although thinking students tend to prefer facts, memorizing a syllabus may not be the best way to reach intuitive students. An increase in class discussion on the theory behind the facts may help these students to better retain the information they are learning. The predominance of judging characteristics is not a surprise as such personality types prefer closure and adherence to deadlines, which are necessary in dentistry. Other studies claimed to find a predominance of thinkers. When compared to the general population (25 percent intuitive), however, the occurrence of intuitive traits in this sample was higher than expected: 29.9 percent to 43.5 percent. It may be that the intuitive types represent the future teachers and researchers of dentistry. As dentistry is struggling to fill faculty positions, this would be a welcome trend.

Significance: The differences found in certain temperament traits may indicate characteristics of those who are attracted to the dental profession. These results may also be useful in determining the best approach or teaching style for faculty to use when teaching dental students because temperament traits indicate the way in which individuals gather and process information.

70. Patients Presenting to NYUCD with Undiagnosed and Undertreated Hypertension
Debra Ferraiolo, New York University; Miriam Robbins; Silvia Spivakovsky; Analia Veitz-Keenan; Dennis Pham
Track: Educational Research
Uncontrolled high blood pressure is associated with high morbidity and mortality as it can lead to stroke, heart attack, heart failure, and/or kidney failure. Approximately one-third of Americans have undiagnosed high blood pressure. About 73 million Americans age twenty years and older have hypertension. Of these, only half of those in the twenty to thirty-nine-year range are aware. Thirty-five percent of these are treated, and only 25 percent controlled. Three-quarters of those aged forty years and over are aware of their hypertension, approximately two-thirds have been treated, and only an average of 37 percent controlled. One-third are unaware, and one-third have not seen a doctor in over five years. The dental setting can be used as a setting for screening patients at risk for hypertension. There is a subset of people who will see a dentist to seek out dental care rather than a doctor for health care treatment. The recording of blood pressure at a dental visit can act as the catalyst to the patient’s diagnosis and subsequent treatment. Evaluation of patients in regard to hypertension was based on the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) hypertension classification. The study involved a retrospective chart review. Dental charts were reviewed immediately following the admissions appointment. Baseline blood pressure taken at the time of the appointment was recorded and staged based on the JNC-7 categories. Stage I and Stage II are defined as systolic/diastolic pressure of 140–159/90–99 mmHg and >160/>100 mmHg respectively. Patients taking antihypertensive medications were recorded also. The total number of subjects within the prehypertension, Stage I, or Stage II category was divided by the total number of subjects reviewed and percentage calculated.

Results: Of the 169 dental charts reviewed, sixty-three subjects (37.28 percent) had prehypertension. Of these sixty-three, forty-nine subjects (77.78 percent) were not on any antihypertensive medications. There were twenty-three subjects (13.61 percent) in Stage I category; of these, sixteen subjects (69.57 percent) were not on any antihypertensive medications. There were ten subjects (5.92 percent) in the Stage II category; of these, seven subjects (70 percent) were not on any antihypertensive medications.

Conclusions: The study indicates that a significant number of subjects presenting to the NYU College of Dentistry Clinic have undiagnosed or inadequately treated hypertension. Thus, it is vital for the dentists to take baseline blood pressure to monitor and refer these patients to an appropriate health care professional in order to prevent the sequela of hypertension.

71. Dental School Simulation Course Participants’ Perceptions and Knowledge: One-Year Follow-Up Study
Nathan Hawley, University of Nevada, Las Vegas; Marcia Ditmyer
Track: Educational Research
Attendees completed pre-course and post-course evaluations and a twenty-five question pretest-posttest covering several knowledge areas. Participants received various lectures and participated in several hands-on activities in the course. One year later, participants were asked to complete a web-based survey that mirrored the pre- and post-course evaluations and pretest/posttest.

Results: Of the original 142 participants who had valid emails, forty-one completed the survey (response rate of 29 percent). In the follow-up survey, 63.4 percent (n=26) reported the host school was their first choice of dental schools at pre-course, and 65.9 percent (n=27) reported the school was their first choice at post-course. Results were similar to previously collected data (65.5 percent and 76.8 percent, respectively). Additionally, 73.2 percent (n=30) reported the host school among their top three choices of dental schools pre-course, while 90.2 percent (n=37) did so post-course—again, similar to previously collected data (93.7 percent and 98.6 percent, respectively). Over 97 percent (n=40) reported that participation increased their desire to attend the host school, while 87.8 percent (n=36) felt participating made them a better applicant. Of the twenty-three (56.1
percent) who applied to dental school in 2007–08, all reported the course affected their decision of where to apply. Five (13 percent) were accepted to the host school, with four (10 percent) actually matriculating. The mean score on the knowledge test was 13.4, which significantly differed from the original pretest (M=10.4) (t=6.5).

Conclusions: One year after participating, respondents felt that their experience made them a better applicant and assisted in their decision of where to apply to dental school. More students considered the host school their number one choice post-course than pre-course, and more respondents considered the host school in their top three choices post-course than before. Four out of five who were ultimately accepted to the host school chose to attend. Students demonstrated some retention of the dental knowledge they gained during the course, scoring significantly better on the follow-up than on the original pretest. Conversely, students' scores on the follow-up dropped significantly from their original posttest scores, demonstrating that some of the gained knowledge had been lost.

72. Effects of “Preview to Dentistry” Course for Undergraduate Students on Knowledge and Perceptions
Kris Smith, University of Nevada, Las Vegas; Nathan Hawley, University of Nevada, Las Vegas; Aaron Bjamason; Victor Sandoval

Track: Educational Research
At the beginning of the course, participating students completed a twenty-three-item survey. The survey contained questions intended to ascertain the students' commitment to dentistry, their knowledge of the dental profession, and demographic information. On the last day of the course, the same survey was administered.

Results: Twenty undergraduate students participated in this study. When the course began, 85 percent (n=17) were very committed to pursuing a career in dentistry, while at the conclusion of the course 95 percent (n=19) were very committed. At the first class session, 65 percent (n=13) of participants felt they had the necessary information to prepare successfully for dental school, and at the final course session 90 percent (n=18) of participants felt the same.

Conclusions: Most students who participated in the course were very committed to dentistry before the course began, with no significant difference at the conclusion of the course. More students felt they had the information they needed to successfully prepare for dental school after participating in the course, and more students felt very confident in their ability to matriculate into dental school after the course. The course did not appear to affect participants' knowledge of the dental profession.

73. Growth in Critical Thinking Skills Associated with Problem-Based Learning
Rachael Revell, University of Iowa; Michael Finkelstein; Teresa Marshall; Marsha Cunningham

Track: New Program
Problem-based learning (PBL) is an instructional method used to facilitate development of critical thinking skills at the University of Iowa College of Dentistry. The objective of this study was to quantify the growth in critical thinking skills following introduction to PBL. First-year dental students completed a pretest to quantify baseline critical thinking skills during orientation. Students were then introduced to the PBL process and attended a lecture on the concepts and principles of critical thinking. Students participated in a three-session PBL case focused on the amalgam controversy. Students subsequently completed an exam assessing critical thinking skills, which also served as a posttest. Similar questions from the pre- and posttests were compared to identify growth in critical thinking. The pre- and posttests were evaluated by one expert faculty. A 1 to 5 scale was used to score the standards of critical thinking applied to the elements using guidelines developed by Drs. Richard Paul and Linda Elder (www.criticalthinking.org).

Results: Seventy-five students (94 percent) participated in the study. Mean student scores improved from 1.61 ±0.39 to 2.37 ±0.53 (p<0.001) on items ascertaining the students' ability to ask questions and their rationalization of need for knowledge. Mean student scores also improved from 1.49 ±0.28 to 2.01 ±0.70 (p<0.001) on items ascertaining the students' ability to critique sources of information.

Conclusions: First-year dental students demonstrated significant growth in critical thinking skills following introduction of inherent critical thinking concepts and principles and active engagement in the PBL process.

Significance: PBL is an effective educational method to develop critical thinking skills among first-year dental students.
Poster Presentations

74. Underreporting of Bloodborne Exposures in a Dental School Clinic
Eve Cuny, University of the Pacific; Jeffrey Kirk; Terry Hoover
Track: Educational Research
A survey was used to collect data over a two-year period. Students were asked to report how many bloodborne exposures they experienced in each year of dental school and the number of those exposures that really needed to be reported.
Results: Survey results indicate that students failed to report up to 66 percent of exposure incidents despite education regarding the need to report such injuries. The institution introduced numerous interventions to attempt to increase the rate of reporting among the students. The investigators then repeated the survey with the same students the following year. The follow-up survey indicates that those efforts resulted in a decrease in underreporting from 66 percent to 21 percent in one year. This dramatic increase in reporting may be a result of the numerous interventions.
Conclusions: The scientific literature and this survey support the theory that bloodborne exposures are widely underreported. Continual education, easy access to follow-up, and other interventions may be effective in reducing the rate of underreporting.

75. Assessing the Impact of MedEdPORTAL and Its Potential for You
Karen Novak, University of Kentucky; Sue Sandmeyer, American Dental Education Association; Laura Siaya, American Dental Education Association
Track: Educational Research
To date, MedEdPORTAL has been “marketed” through a series of presentations at ADEA meetings, distribution of brochures and flyers, and ready-made PowerPoint presentations to designated ADEA MedEdPORTAL volunteer advocates. The goal of this project is to assess how successful these initial strategies have been in disseminating information about and promoting the use of MedEdPORTAL. In addition, this project will gather ideas on how to better promote, disseminate, and assist faculty with using the tool. To date, two focus groups were conducted at the CCI Liaisons’ meeting in June 2008. Questions developed by the ADEA Center for Educational Policy and Research and Division of Knowledge Management were administered by a professional focus group leader. Additional focus group interviews are planned, as well as an evaluation to assess both the utilization and the impact of MedEdPORTAL.
Results: The initial data collected indicate that the ADEA presentations, ready-made PowerPoint presentations, and workshops given by individual faculty at various institutions were most effective in disseminating information. Therefore, similar efforts should be continued as part of the marketing plan. We expect that data collected at future focus groups and input from Annual Session poster presentation attendees will provide an even richer array of ideas for additional marketing strategies.

76. Examining the Previous Training and Educational Experiences of Advanced Placement Dental Students
Morey Gendler, New York University
Track: Educational Research
Twenty-five students from the New York University College of Dentistry (NYUCD) enrolled as D3 or D4 advanced placement dental students were surveyed during the fall 2007 semester. Students completed a questionnaire seeking information about their previous dental school training and educational experiences. Questions ranged from determining the country in which the advanced placement student was trained to specifically the number and type of procedures rendered, as well as questions comparing their prior training to their current training at NYUCD.
Conclusions: Based upon the students’ responses on the survey, indicate that there is a wide range in the clinical experiences of advanced placement students. Many have a good to excellent background in exodontia, complete dentures, and operative dentistry. There is limited training with fixed prosthetics and implants. Many schools appear to not have minimal disciplinary requirements. Most students rated their current education at NYUCD as being better or much better than their previous school. Gaining this knowledge will allow clinical directors and faculty members to continue the development of the students’ critical thinking and clinical performance and proficiency by building upon their previous training and experiences.

77. Preparing Dental Students from Underrepresented Groups for Leadership Roles
Sheila Price, West Virginia University; Richard Crout, West Virginia University; Elliot Shulman, West Virginia University; Stanley Wearden, West Virginia University; Elizabeth Gonzalez, West Virginia University
Track: Educational Research
Diversity in leadership is essential to address oral health disparities among a diverse U.S. population. Dentists are often tapped for leadership roles in their communities and dental organizations, usually with limited formal leadership preparation. The literature indicates the importance of fostering leadership from within dental schools. A leadership development workshop (LDW) was therefore conducted at West Virginia University for dental students from underrepresented (underrepresented minority and low-income) groups to foster their leadership interests and potential. All enrolled underrepresented students (N=27) were invited to attend the LDW. Of the twenty-seven, fourteen (51.8 percent) accepted, agreed to participate in an IRB-approved evaluation of the program, and completed a numerically coded baseline survey before the program began. After a series of interactive learning components, the students completed a program evaluation and postworkshop survey, also coded, for purposes of individual comparisons. The instruments ascertained participants’ leadership experiences, interests, and attitudes as well as their evaluation of the program’s usefulness. Presentations on leadership were given by leaders in organized dentistry, dental education, and other academic disciplines.
Results: Data were analyzed by Wilcoxon ranked test. The LDW had a very favorable overall rating of 4.54 on a five-point Likert scale. All respondents indicated they would recommend this program to other students (p=0.001). In the postworkshop survey, respondents again felt the LDW had increased their knowledge of leadership roles and also believed the knowledge gained would be of value to other students (p=0.03).
Conclusions: Developing leadership skills among underrepresented dental students could positively aid in reducing oral health disparities as these individuals progress in their dental careers. Because of the small number of program participants, future leadership development programs should be made available to and evaluated by more students to complement these findings.
Significance: The West Virginia University School of Dentistry has been one of the fifteenth U.S. dental schools participating in the
Robert Wood Johnson Foundation Pipeline, Profession, and Practice: Community-Based Dental Education program, which commenced in 2002. Through our Pipeline initiative, we focused on the recruitment and retention of underrepresented minority (URM) and low-income (LI) students. With the Pipeline efforts we were able to increase our number of URM and LI students. For example, in 2002 the school had zero URM students. By comparison in 2008, URM students comprise 12 percent of the first-year dental class. Subsequent to the five-year Pipeline initiative, the School of Dentistry was awarded a one-year Transition Supplement Grant from the Robert Wood Johnson Foundation. This grant has allowed us to implement additional URM/LI student retention and support services. The leadership development workshop described in this abstract is one example of how we are cultivating underrepresented students’ seamless transition from dental student to dentist.

This project was funded by a grant from the Robert Wood Johnson Foundation.

78. Traditional vs. Hybrid Problem-Based Learning: Dental Students Apply Basic Science to Clinical Cases
Amber Callis, Baylor College of Dentistry; Ann McCann; Emet Schneiderman; Ernestine Lacy; David Hale; William Bahler

Track: Educational Research
Students from two accredited U.S. dental schools were the sample for this investigation. One school utilizes a traditional curriculum (TC) and the other implements a hybrid problem-based learning (PBL) curriculum. Third-year dental students at both dental schools were invited to participate in the study (n=172). The students were randomly sampled, but to gain a sample sufficient in size to ensure 80 percent statistical power, all students in the third-year class were ultimately invited to participate. Participants completed a case booklet that contained two clinical scenarios followed by a series of open-ended questions. A scoring rubric was used to assess student performance. The principal investigator developed the clinical scenarios and scoring rubric. The instrument was pilot-tested with graduate students at Baylor College of Dentistry. IRB approval was received, and the case booklets were administered to students between April and June 2008. ANCOVA was first used to test for, and adjust if necessary, for pre-existing differences between the two groups of students, using predental grade point averages (GPA) and Dental Admission Test Academic Average (DAT AA) scores as measures of aptitude. ANCOVA, Student’s t-tests, and Mann-Whitney U-tests were then used to test whether the groups differed in their performance on clinical scenarios.

Results: A total of seventy-one students participated: forty in the TC group and thirty-one in the PBL group. The mean GPA scores were 3.48 for TC students and 3.47 for PBL students. There was no statistically significant difference. The mean DAT AA scores were 19.20 and 18.10 for the TC and PBL groups, respectively, and were statistically significant (p<0.002). Performance on the clinical cases was analyzed while adjusting for DAT AA scores with ANCOVA. Students could score up to twenty-seven points total on case I. PBL students performed significantly (p<0.002) better overall on case I, with a mean score of 16.53 for TC and 18.71 for PBL participants.

Conclusions: These results indicated that in some ways students in a hybrid PBL curriculum may be better at applying basic science knowledge to clinical scenarios—specifically, hypothesis generation, communication, and some basic sciences. While traditional curriculum students did receive significantly higher scores in the areas of neurology and science comprehension for case II, they did not significantly outperform the hybrid PBL students in overall performance on the case.

Significance: Dental schools can use these results to validate the use of some form of problem-based learning in the predoctoral curriculum. With the increasing popularity of evidence-based dentistry and a need to reform the predoctoral curriculum, problem-based learning techniques allow students to apply and relate the basic sciences to realistic clinical situations. Students could also show the benefit of increased ability to generate hypotheses relating to clinical problems and communicate these to other health care professionals.

79. Personality Styles of Graduates and First-Year Students Who Chose the Dental Hygiene Profession
Judy Kreisman, New York University; Eva Lupovici, New York University; Cheryl Westphal, New York University

Track: Educational Research
A survey was administered to fifty-seven graduates (Gs) and forty-seven first-year students (1Ys) of a dental hygiene program using I-Speak Your Language: A Survey of Personal Styles to obtain a profile of each group that chose to enter the dental hygiene profession based on four major personal styles. The survey results identified the primary personal style of each individual and are based on the theory developed by Carl Jung. The survey is designed to measure individual primary personal style and associated styles of behavior. The four major styles are Intuitive (I), Thinker (T), Feeler (F), and Senser (S).

Results: The results of the survey indicated that under favorable conditions 37 percent of the Gs and 38 percent of the 1Ys were F, who place high values on human interaction. They seek and enjoy the stimulation of contact with others and typically try to understand and analyze their own emotions and those of others. There were 28 percent Gs and 26 percent 1Ys who were S, who place high value on action and thrive on getting things done here and now without unnecessary time-consuming deliberations. They want to implement whatever they believe should be done. There were 25 percent Gs and 23 percent 1Ys who were T, who place high value on logic, ideas, and systematic inquiry. They find satisfaction in identifying a problem, developing a variety of possible solutions, and use the most logical systematic approach to problem solving. Finally, 10 percent of the Gs and 13 percent of the 1Ys were I, who place high value on ideas, innovation, concepts, theory, and longitudinal thinking. They tend to be more stimulated and personally rewarded by effort in problem solving, rather than in implementing solutions.

Conclusions: The survey results indicate that there is a similar primary personal style of graduates and first-year students who chose to enter the dental hygiene profession. The most frequent personal style found for both groups is the Feeler—those who value human interaction, which is essential to the practice of dental hygiene. There was no significant difference in the primary personal style of graduates and first-year students of a dental hygiene program.

Significance: The survey can be used by career counselors to assist individuals in selection of a future educational career.

80. A Self-Assessment Educational Module for Dental Hygiene Curricula
Sarah Jackson, Eastern Washington University

Track: Educational Research
The literature on self-assessment presents substantial evidence regarding the positive impact of self-assessment on practitioners and quality care. Related dental hygiene research documents a need to enhance curricula; however, no published curriculum module exists to effectively teach self-assessment. The purpose of this study was to explore the impact of a self-assessment educational module for dental hygiene curricula designed using published research and adult learning principles. This self-assessment module was implemented with thirty-three junior dental hygiene students. A one-group,
pretest-posttest design was employed using a two-part pretest and three-part posttest. Results using the Mann-Whitney test indicated the educational module was effective.

81. Reasons for American Indian College Students to Attend College: Implications for Recruitment
Naty Lopez, University of Minnesota
Track: Educational Research
Focus groups and interviews were conducted among American Indian students enrolled on two campuses of a public university in the Midwest. With the students’ consent, tapes of interviews were transcribed, and identifiers removed from transcripts. Responses were categorized into themes for analysis. Thirty-American Indian college students (of which 10 are in the lower ability group, aged eighteen to forty-four and representing twenty-one tribes from six states participated in the study. Sixty-seven percent grew up on a reservation, and 50 percent are first-generation college students; 30 percent have one or both parents currently pursuing postsecondary education.

Results: The students’ overarching reason for going to college is to improve their lives as college is seen as a way out of the reservation lifestyle characterized by alcoholism, drugs, and poverty. Another dominant theme is their desire to return to the reservation and make changes in the lives of their people. Most students feel they are not prepared for college and face difficulties with large classes and remote professors, besides being burdened with financial problems and a sense of being different on campus. Mothers and grandmothers are the primary encouragers of students to attend and remain in college; friends from the reservation generally alienate them. American Indian resource centers on campus provide a sense of belonging and support and are referred to as the “bigger family.” A majority have found a sense of identity and meaning in courses in American Indian culture and language.

Conclusions: For American Indian college students, college is seen as a door that leads to a better life, but success is both personal and collective. Financial support, smaller classes, personal attention from faculty, and a supportive campus group make a college education attainable.

Significance: These factors are important considerations in developing pipeline and recruitment programs for this group of students.

82. Examining the Impact of Item Formats on Candidate Performance of the NBDE Part II
Chien-Lin Yang, American Dental Association; Laura Neumann, American Dental Association; Gene Kramer, American Dental Association
Track: Educational Research
A total of 2,090 candidates who took various computer-based National Board Dental Examination (NBDE) Part II administered in 2007 and 2008 were chosen to examine the impact of item formats on candidate performance in terms of candidate ability. In this study, item formats refer to 1) the items being administered as discipline-based items or as case-based items, and 2) items being administered as case-based items with or without radiographs embedded. The percent correct of each item, the P value derived from classical test theory, was the measure of candidate performance on each test item. A candidate's total raw score correct was used to determine the candidate ability level. Two hypotheses were examined in this study. The first hypothesis is that there is no performance difference for low- and high-ability candidates between stand-alone and case-based items. The second hypothesis is that the candidates in the higher ability group have better performance in the case-based items, radiograph case-based items, and non-radiograph case-based items than those in the lower ability group.

Results: A significant performance difference was found between stand-alone and case-based items for higher ability candidates. Higher ability candidates performed better than lower ability candidates on the entire case-based items, on the radiograph case-based items, and on the non-radiograph case-based items. The overall study results supported the second hypothesis but rejected the first hypothesis for higher ability candidates. This study suggests that candidate ability, not the difference of item format, was a prominent factor that seems to determine the candidate performance in the Part II examination.

Conclusions: The overall study results supported conclusions that 1) the candidates in the higher ability group have better performance in the case-based items, radiograph case-based items, and non-radiograph case-based items than those in the lower ability group, and 2) there is a performance difference for only high ability candidates.

Significance: This study suggests that candidate ability, not the difference of item format, was a prominent factor that seems to determine candidate performance in the Part II examination.

83. Evaluation of Illumination During Ultrasonic Instrumentation
Michele Carr, The Ohio State University; Wendy Moore
Track: Educational Research
Ergonomics has come to the forefront of 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 purpose of this study was to determine if dental hygiene students felt the addition of an ultrasonic light enhanced visibility and ergonomics and improved overall effectiveness of ultrasonic scaling. Senior dental hygiene students utilizing the ultrasonic in clinic were given a Cavitron Steri-Mate light attachment to use for the clinic session and were asked to complete a ten-question, five-point Likert scale survey at the end of the clinic session (5=strongly agree; 1=strongly disagree).

Results: Of the twenty dental hygiene students who completed the survey, 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=3.55, 2.55, and 2.12, respectively; standard deviation=3.45, 3.55, and 2.12, respectively). Only 25 percent of the subjects 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; standard deviation=3.16 and 3.5).

Conclusions: This study found that dental hygiene students felt the addition of illumination during ultrasonic scaling enhanced visibility in the clinical working area and allowed for improved ergonomics. However, the students felt illumination did not improve the effectiveness of their ultrasonic scaling.

Significance: Illumination during ultrasonic procedures should be incorporated into clinical teaching and practice due to its improved effectiveness on visibility and ergonomics.

84. Inclusion of Non-Academic Criteria in Dental School Admissions
Naty Lopez, University of Minnesota; Karl Self
Track: Educational Research
The self-designed instrument used DAT scores, GPA, interview ratings, and nonacademic factors. Each category was assigned a weight to arrive at a total score of 100 points. Non-academic factors derived from the AADSAS application include volunteer work, extracurricular activities, work experience, rural background, underrepresented minority, second language skill, essay, and first generation background. The instrument was pilot-tested on all 2007
and 2008 completed applications submitted to the school in the AADSAS database. All identifiers were removed. Pre-interview score (75 points) and total score were calculated. Applicants were categorized whether they were interviewed or not to determine the sensitivity and specificity of the instrument.  

Results: A total of 1,922 completed applications were reviewed (58 percent males, 12.7 percent rural background, 21.7 percent first generation, 37.56 percent minorities, and 56.55 percent with second language skills). For 2008 applicants (n=960) the total score of the Early Decision Program applicants (EDP) is higher than all accepted applicants (EDP=71/100, Accepted = 67/100); females scored higher than males. However, in non-academic criteria the EDPs scored the lowest compared to the accepted group, and the minorities scored the highest in this category but the lowest in the three other categories. Results of the 2007 pool showed similar patterns. Using a cut-off score of 50 to select applicants offered an interview, specificity and sensitivity test results (98 percent/43 percent) show that the instrument is able to predict those who were not offered an interview but not those who were offered an interview.  

Conclusions: The instrument forces a more rigorous consideration of non-academic factors in the selection of applicants. The inability of the instrument to predict those offered an interview could be attributed to a heavier emphasis on quantitative factors in the selection of applicants in past admissions. Further studies using the instrument to evaluate applicants are needed to establish validity and reliability of the instrument.  

85. Computer Simulation for Learning and Practice of Preclinical Cavity Preparations Using Z-Brush  
Patricia Bauer; University of Michigan; Mark Fitzgerald; Stephen Bayne; Sharon Grayden; Eric Maslowski  
Track: Educational Research  
Numerous expensive and elaborate simulation systems have been explored over the past ten years to develop and refine student psychomotor skills. Only a few dental schools have fully adopted simulation technologies. There has been very little published evidence of the benefits of these systems beyond traditional teaching methods (e.g., pole-and-stick or standard manikin). Dental schools find it difficult to justify the hefty cost associated with both the initial purchase and maintenance without substantial evidence of enhanced learning or significant time efficiencies in the teaching process. A pilot study was conducted to evaluate the impact of using a computer-based 3D-sculping program (Z-Brush, V3.1, Pixologic) to simulate cavity preparations prior to actual typodont tooth preparation in a preclinical laboratory. Learning was assessed for test LCS and control groups for both computer-based preparations and subsequent in-lab preparations for outline-form precision (0.1 mm increments) for inciso-gingival (I-C), mesio-distal (M-D), and or facio-lingual (F-L) dimensions. In-lab F-L results served as a negative control. Preparation dimensions among groups for each dimension were compared by one-way ANOVA (p<0.05).  

Results: For the LCS group the computer pre-lab and subsequent in-lab results were statistically equal. For LCS in-lab versus the control in-lab, I-C was better (p=0.03), M-D was not different (p=0.09) and was ideal, and F-L (the unsimulated dimension) was not different (p=0.48) as expected. Of interest was the fact that all students who used the Z-Brush computer exercise had final cavity preparation dimensions on their plastic tooth prepared in the lab that were closer to ideal in an I-C, M-D, and F-L direction than the cavity preps on plastic teeth of those students who had not participated in the Z-Brush computer exercise.  

Conclusions: Pilot data demonstrated measurable gain in cavity preparation quality using this Z-Brush and generated enthusiasm for further investigation.  

Significance: The global advantages of this type of approach are acceleration of preclinical learning processes, reduction in average time required in preclinical lab, and ease of analysis of learning patterns of different students. The specific advantages of this low-cost simulation with a computer program are its simplicity of design, very low cost, ease of access, and opportunity for rapid student feedback. Hardware requirements include only a CPU or laptop computer, a monitor, and mouse, which almost every student already owns. Software costs (~$500) are far less than the thousands of dollars other approaches on the market currently cost. Finally, reduction in the learning time and practice needed for student competence facilitates a more rapid transition from lab to clinic and increases the time available to students for patient care experiences.  

86. Trends in Learning Styles of At-Risk Students  
Margaret Coleman; Judy Kwapis-Jaeger  
Track: Educational Research  
The lock-step nature of a dental hygiene curriculum does not allow much flexibility for the at-risk student. Educators have struggled to develop programs to identify these individuals early and to retain them. The purpose of this study was to assess if differences existed in the learning styles between students deemed at-risk (as defined by students placed on a modified curriculum in order to complete the program) and those students enrolled in the program who graduated in the stipulated time. The Myers-Briggs Type Indicator (MBTI) was administered over a ten-year period (1998–2008) to students (n=316) during the first semester of class. Ten students were placed on a modified curriculum for academic reasons and/or personal reasons during that time frame. The MBTI data were analyzed using frequency distribution and chi-square analysis.  

Results: Personality types were identified, and strengths of individual preferences were reported. Respondents who were placed on modified schedules were proportionally represented in the same commonly occurring personality types as the larger group. Further analysis revealed strong to moderate preference scores in at least two of the four functions that may affect adaptation to least preferred learning styles.  

Conclusions: Teaching modalities must be addressed to meet the needs of the at-risk student. Strategies that facilitate learning may include the modified curriculum itself, monitoring, peer learning style mentoring, aggressive counseling and advising, and other techniques to make these students educationally successful.  

Significance: The importance of this study was to retain students for their well-being as well as the institution’s.  

87. A Comparison of MBTI Learning Styles Between Graduates and Withdrawals from a Dental Hygiene Program  
Judy Kwapis-Jaeger; Margaret Coleman  
Track: Educational Research  
Dental hygiene programs have struggled to identify applicants who will prove to be successful graduates. Various criteria have been utilized in the selection process. Withdrawals by admitted applicants cost both the student and the institution. Does the learning style of applicants increase their ability to successfully complete the program? The purpose of this study was to assess if differences existed in learning styles between graduates of a program and those individuals who were admitted to that program but withdrew prior to completing it. The term “withdrawal” will be defined as anyone who left the program or took a leave of absence for a period of one year. The Myers-Briggs Type Indicator (MBTI) was administered over a ten-year period (1998–2008) to students (n=316) during the first semester of class. The MBTI data were analyzed using frequency distribution...
and chi-square analysis. Personality types were identified and strength of individual preferences reported for the graduates (n=290) and for those who had withdrawn (n=26).

Results: Data indicated that those who withdrew reported very strong to strong preference scores in at least two of the four functions that may inhibit the use of less preferred preferences to adapt to other ways of learning. Of the reported MBTI personality preferences of all respondents, the least populated preferences tended to show the highest proportional withdrawals.

Conclusions: Intervention strategies, such as peer learning style mentoring, aggressive counseling, and advising, especially to those different from the common profile, may need to be implemented to keep these students retained and viable.

Significance: It is in the best interest for a student and the institution to retain enrolled students.

88. Learning Experiences of Pediatric and General Practice Residents During Simultaneous Rotation
Timothy Durham, University of Nebraska; Fouad Salama, University of Nebraska; David Marx, University of Nebraska

Track: Educational Research
A survey was created to assess the perceptions of pediatric dental and general practice residents about their learning experiences during an elective rotation of general practice residents to the operating room with the pediatric dental residents. Surveys provided information on respondent demographics (gender, age, postgraduate program), satisfaction with education experiences, recommended changes, likes/dislikes about experiences, desire to have additional training, estimations of contact hours, curriculum preferences, and comfort level with treatment procedures. The survey was distributed at the end of one of the weekly classes to all current pediatric dental and general practice residents at University of Nebraska Medical Center College of Dentistry postgraduate programs. Responses to the survey were tabulated, and the average and percent of frequency distributions for responses to each item were computed.

Results: Satisfaction with education experiences produced a 1.9 average equating to “Somewhat Satisfied.” The general practice residency was 100 percent in agreement with changing the experiences, while the pediatric cohort was at 28.57 percent. With respect to subject areas and inclusion in the curriculum, both cohorts displayed variability. Respondents were asked to respond yes or no for inclusion in the curriculum. With respect to adolescent care curriculum, pediatric residents displayed equal to or greater than 50 percent response rates for inclusion in the curriculum for treatment planning (62.5 percent), dietary practices (50 percent), traumatic injuries (87.5 percent), cosmetic dentistry (62.5 percent), orthodontic care (75 percent), disease prevention (62.5 percent), tobacco education (62.5 percent), management of psychological/social needs (87.5 percent), and transitioning into adult care (50 percent). With respect to their pediatric curriculum, general practice residents displayed equal to or greater than 50 percent response rates for preventive/early intervention (66.67 percent), restorative procedures (66.67 percent), pulpal therapy (100 percent), caries as an infectious disease (66.67 percent), space maintenance (100 percent), behavioral management (100 percent), oral habits and orthodontic problems (66.67 percent), and development of the dentition (66.67 percent). Comfort level in performing clinic care also showed variation between the two groups. In performing treatment on adolescents, pediatric residents displayed greater levels of comfort in doing all or some of the care in fifteen of the twenty targeted areas. Pediatric residents were more inclined to refer some or all of the care for extractions of third molars, periodontal diseases, permanent crowns, endodontic therapy, TMJ-related procedures, and orthodontics. In performing care on pediatric patients, general practice residents displayed greater levels of comfort in nine of ten targeted areas. General practice residents were more inclined to refer for orthodontic care.

Conclusions: 1) Both sets of residents valued the experience of working together in the care of a common patient population—special needs adults; such interactions foster collaboration; 2) general practice residents saw a greater need to have both didactic and clinical experiences in their curriculum beyond the OR setting than the pediatric residents; this would suggest that the general practice residents see a greater value in having these experiences in preparation for their future practices; and 3) pediatric residents showed a greater lack of comfort when dealing with treating the adolescent with respect to the permanent dentition and the associated psychosocial needs and issues of the population.

89. Perceptions of Dental Students Regarding the Curriculum During the First Two Years of Dental School
Mary Lynn Froeschle, University of Nebraska; Fouad Salama, University of Nebraska; David Marx, University of Nebraska; Faika Abdelmegid

Track: Educational Research
The subjects consisted of all forty-seven fourth-year and forty-five third-year dental students during the 2008–09 year. A paper and pencil questionnaire was developed to cover two areas: 1) rating of time devoted to areas of instruction of all courses taken during their first and second years, and 2) opinion on the use of computer-assisted learning, online education, and problem-based learning, as well as integration of the basic, behavioral, and biomaterials sciences with the clinical curriculum. Students were asked to rate the amount of time devoted to areas of instruction as “inadequate,” “appropriate,” or “excessive.” Students were asked about their opinion on the use of computer-assisted learning, online education, and problem-based learning, as well as integration of the basic, behavioral, and biomaterials sciences with the clinical curriculum with questions in a yes/no format.

Results: Fifty-three surveys were returned for a response rate of 61 percent. In general, students agreed with the time devoted to areas of instruction, use of computer-assisted learning, online education, and problem-based learning. Junior dental students and senior dental students differed significantly in their rating of time devoted to areas of instruction for five courses: Dental Anatomy, Occlusion, Ortho Techniques Lab I, TM Disorders/Orofacial Pain, and Clinical TMD. Some students prefer to have Dental Materials late in the curriculum, mandatory clinic time during the first two years of dental school, more video demonstrations for clinical procedures, and more use of Blackboard for class notes and correspondence.

Conclusions: As junior and senior dental students reflect on their first two years of dental education, they feel their time devoted to specific areas of instruction and the instructional method were appropriate for most subjects. Students’ feedback regarding subject content and educational methods could reveal insight toward potential curricular change.

90. Using Admission Criteria to Predict Performance on the National Board Dental Hygiene Examination
Denise Kissell, Ohio State University; Michele Carr

Track: Educational Research
A minimum score of 75 on the National Board Dental Hygiene Examination (NBDHE) is required for dental hygiene licensure, and the 11 percent failure rate (2007) prevents many students from entering their clinical career. Improving admission criteria can result in successful students both within the dental hygiene curriculum and on the NBDHE. The purpose of this study was to identify admission
criteria trends among the baccalaureate dental hygiene programs and determine if poor NBDHE performance can be predicted by grades in microbiology and physiology courses or ACT scores. Admission requirements were collected for the forty-six traditional baccalaureate programs to determine prerequisite trends. Transcripts and NBDHE results from the 378 Ohio State University (OSU) dental hygiene students graduating from 1996 to 2008 were evaluated for a relationship between NBDHE scores and performance in microbiology and physiology and on the ACT. This study included 282 (r=0.282) transcripts with ACT scores, 331 (r=0.331) with microbiology grades, and 307 (r=0.307) with physiology grades.

**Results:** Microbiology, physiology, and ACT scores were prerequisites in 66 percent, 70 percent, and 35 percent of the programs, respectively. Among the OSU students, comparing NBDHE scores with performance in microbiology and physiology and on the ACT yielded mixed results. There was not a significant relationship between below average scores on the ACT and the NBDHE. Among the seventy-three students with NBDHE scores below 80, 45 percent received C-, D, or E in microbiology and 26 percent received C-, D, or E in physiology. Of the 114 students who achieved NBDHE scores above 85, only 4 percent in microbiology and 7 percent in physiology received a C-, D, or E.

**Conclusions:** A lack of a correlation between ACT and NBDHE scores supports past studies. The relationship between below average grades in microbiology to low NBDHE scores indicates that microbiology may be an appropriate prerequisite for a dental hygiene program in order to admit students who can pass the NBDHE and become licensed hygienists.

91. Using Advanced Internet Technology for Teaching Practice Management to Dental Students

Antonio Furino, University of Texas Health Science Center at San Antonio; Scott Stafford

**Track:** New Program

Dental practice-management education is an important but difficult task for dental school educators because lower priority must be placed on nonclinical topics in crowded dental curricula. This poster describes a new program for developing skills in dental practice operation and administration. The program has been tested in the classroom, and preliminary evaluations are encouraging. The website contains all the educational material traditionally used in class lectures with enhancements and linkages possible only on the Internet. Bulletin board announcements are posted, and notes and tests are taken online, with grades fed back to students immediately after submission. The curriculum may be completed totally online or complemented with classroom workshops and discussion sessions. Additionally, the students' interactive learning experiences produce professional-looking printable documents such as a strategic personal/professional plan, a dental practice plan, and curriculum vitae.

**Conclusions:** This new approach of interactive web-based teaching allowed the attainment of higher level and greater depth competencies in dental management, dental economics, practice policies, and strategic decision making than has been previously possible using traditional classroom lectures. Students show greater motivation than before to acquire the targeted competencies. The program is capable of producing system's utilization data for research in teaching and learning efficiency and effectiveness.

92. Teledentistry: Digital Data Submission for Dental Examination to Prescribe Dental Hygiene Services in Underserved Communities

Fred Summerfelt, Northern Arizona University

**Track:** New Program

Utilizing technologies that currently exist, it is possible to digitally transmit all diagnostic data that dental hygienists are board-certified and licensed to obtain for diagnosis and prescription of dental hygiene services. Teledentistry would broaden the scope of dental hygiene practice to allow properly trained dental hygienists to provide service to new "patients of record" in underserved communities. The efficacy of teledentistry is being evaluated in the Northern Arizona University Dental Hygiene Clinic. Students acquire and digitally transmit all diagnostic data to the faculty dentist. The faculty dentist, seated at a computer across the hall, receives the digital diagnostic data, including the dental hygienist's diagnosis, makes a dental diagnosis, prescribes preliminary dental hygiene treatment and appropriate referrals, and then reexamines the patient in person to ensure accuracy of the digital diagnosis. Finalized dental hygiene services are then prescribed by the dentist and provided by the student; appropriate referrals are made.

**Conclusions:** Outcomes of the teledentistry project will determine if a dentist can effectively diagnose and prescribe initial dental hygiene treatment for patients at a distance. Success of the initial teledentistry project will lead to field trials as students participate in summer externships.

93. Meeting Patient Expectations in Esthetic Treatment

Denise Estafan, New York University

**Track:** New Program

Creating consistency in teaching esthetic smile design presents a challenge with 700 predoctoral students. All predoctoral students learn diagnostic wax-ups in preclinical. Here is an important method of applying their knowledge. At the initial visit, the student will present with the patient, and his or her esthetic concerns are discussed with some possible treatment solutions. The patient is asked, "If there is anything you could change about your smile, what would it be?" We all know that the patient's perception of a desired look may not be attainable. Diagnostic casts have been mounted on a semi-adjustable articulator, which allows us to analyze the patient's occlusion. A desired shade is chosen with patient input. Between the first and second visits, a diagnostic wax-up is done by the predoctoral student to simulate the planned restorations. At the second visit, an alginate impression is taken of the wax-up. The alginate matrix is filled with Luxatemp (a self-cure flowable composite) and applied to the patient's unprepared teeth. The result simulates a smile that serves two functions. First, it allows the patient to preview his or her new smile and evaluate shade and shape of the teeth. Secondly, it allows the student and faculty member to analyze phonetics, midline, anterior guidance, symmetry, and axial inclination of the teeth, and apply the "Golden proportion." A lack of a correlation between ACT and NBDHE scores supports past studies. The relationship between below average grades in microbiology to low NBDHE scores indicates that microbiology may be an appropriate prerequisite for a dental hygiene program in order to admit students who can pass the NBDHE and become licensed hygienists.

**Conclusions:** This method greatly reduces the number of cases in which the patient's expectations are not met. It is successful in the majority of cases and increases patient confidence and satisfaction. At the same time, it helps translate to the dental laboratory the desired result, which increases the patient's satisfaction with the result.

94. Plant the Seed: Providing Opportunities for Peer Teaching

Maureen McAndrew, New York University; LeeAnn Clark, New York University

**Track:** New Program

Twenty-four third-year students took part in a year-long course, the Selective in Teaching Skills, from September 2007 to May 2008. Participants are required to teach one session per week in the first-year simulation course emphasizing dental anatomy and operative dentistry techniques. In addition, they were also required to participate in teaching skills seminars, reflection papers, journal readings, and
a final project for the first time this year. At the conclusion of the course, students were asked to complete a survey. Twenty-one of the twenty-four participants compiled. All twenty-one respondents indicated that they strongly agreed that the course provided a good exposure to teaching. Eighteen said they would highly recommend the course to their second-year peers, and three said they would moderately recommend it. Twelve said they would highly consider teaching in the future (either full- or part-time), and nine said that they would give it moderate consideration. Sixteen gave the course overall an excellent rating, and five rated it as very good. Conclusions: The surveys strongly indicated student satisfaction with the program. More importantly, the surveys indicated that the experience persuaded the participants to consider full- or part-time teaching in a dental school or hospital setting.

95. Preparedness in the Preclinical Laboratory: The Need for Improvement
Kenneth Allen, New York University; Mark Wolff; David Glotzer; James Kaim
Track: New Program
The faculty frequently reported that, despite presentations prior to a laboratory session, the level of students’ didactic knowledge or review of the material for that specific procedure was frequently insufficient. It was expected that prior to the laboratory the students had reviewed the material. In fact, in many cases that was not true. A pilot program was instituted during the summer orientation program for the Advanced Placement students in the Class of 2011. Completion of this program allows these students to be integrated among the traditional students when they begin their second academic year. Since this group presents with such a diverse background in both their didactic knowledge and experience, it was necessary to ensure that students were fully prepared for each laboratory session. Using Blackboard, the didactic information was provided to students prior to each session. Students were able to access this material several days prior to each laboratory. At the beginning of each laboratory session, students were given a Scantron-graded, ten-question, multiple-choice quiz that contained questions pertaining to that day’s procedures. Also included in the quiz were questions testing the students’ knowledge of procedures performed during prior sessions. Using the fast turnaround time for Scantron grading, we were able to quickly identify weaker students, analyze questions to see where informational deficiencies existed, and virtually eliminate the need for extended introductory remarks during the laboratory session.
Results: Faculty reaction to this new protocol was enthusiastic when contrasted to previous years, as they reported that they no longer had to repeat the same information to nearly every student in their row. During the three-week course, there was a gradual improvement in the class average for the quizzes and an improved average on the final examination. During the three-week course, there was a gradual improvement in the class average for the quizzes and an improved average on the final examination. The faculty frequently reported that, despite presentations prior to the laboratory, the students had reviewed the material. In fact, in many cases that was not true. A pilot program was instituted during the summer orientation program for the Advanced Placement students in the Class of 2011. Completion of this program allows these students to be integrated among the traditional students when they begin their second academic year. Since this group presents with such a diverse background in both their didactic knowledge and experience, it was necessary to ensure that students were fully prepared for each laboratory session. Using Blackboard, the didactic information was provided to students prior to each session. Students were able to access this material several days prior to each laboratory. At the beginning of each laboratory session, students were given a Scantron-graded, ten-question, multiple-choice quiz that contained questions pertaining to that day’s procedures. Also included in the quiz were questions testing the students’ knowledge of procedures performed during prior sessions. Using the fast turnaround time for Scantron grading, we were able to quickly identify weaker students, analyze questions to see where informational deficiencies existed, and virtually eliminate the need for extended introductory remarks during the laboratory session.

96. Imagine Teaching Single-Visit Ceramic Restorations Using CAD/CAM Technology
Andrew Schenkel, New York University; Denise Estafan, New York University; Mark Wolff
Track: New Program
Use of CAD/CAM in dentistry is becoming more and more mainstream every day. Teaching this technology in the clinics and in simulation gives us the opportunity to emphasize the importance of marginal fit, contact, occlusion, anatomy, and shade selection. Students learn what can and cannot be accomplished using CAD/CAM. We will present an overview of the use of the CEREC technology to fabricate the various restorations as taught to our second-year D.D.S. students in simulation at New York University College of Dentistry. Our emphasis is on how to teach the use of this technology to the large numbers of students typically found in the simulation courses taught in the majority of dental schools. Our program includes methods of providing these ceramic restorations to our large numbers of clinic patients utilizing a minimum number of CEREC units. Students are required to prepare and fabricate restorations in both simulation and in clinic for their patients. In this presentation, we will emphasize what can be accomplished using this technology to conserve as much natural tooth structure as possible in planning and providing high-quality restorative procedures.

97. Utilization of Mock Board Exams to Prepare, Prompt, and Predict
Jane Gray, University of Oklahoma
Track: New Program
Dental hygiene programs endeavor to prepare their students to be successful on the National Board Dental Hygiene Examination (NBDHE). They encourage students to master content during their coursework and review prior to taking the exam. This dental hygiene program provides an opportunity to the senior dental hygiene students to participate in a mock written exam in January prior to their March NBDHE. The exam parallels the same format as the NBDHE, with 200 multiple-choice, stand-alone questions and ten case studies with fifteen questions per case. The content domains mirror the NBDHE. The test was administered to forty-four students in 2007 and forty in 2008 for a total of eighty-four students. The mean score for the mock exam was 74.8, and the mean score for the NBDHE was 85.1. The students were surveyed following the exam to provide feedback regarding their study habits, impressions of exam questions, and effects of taking the mock board.
Results: Statistical analysis was performed using the t-test on the scores of the mock exam and the NBDHE. A t-test resulted in t=12.2 (df=81). The two-tailed P value was less than 0.0001 for the exams. By conventional criteria, this difference is considered extremely statistically significant, indicating its predictive properties. Student comments on surveys indicated that students were not prepared to take the mock exam, were motivated to study more prior to the NBDHE, and felt the mock board was a worthwhile endeavor and should be required for future students.
Conclusions: Administration of the mock board provided motivation and feedback on weak content areas to students preparing for the NBDHE. It also served as a strong predictor for the results on the NBDHE.
Significance: Mock board exams can be a useful educational tool to motivate students to study and predict their success on the NBDHE.

98. Faculty Role Model Clinical Experience Program: A Mechanism for Shaping the Oral Health Practitioner for Tomorrow
Jane Halaris, University of Detroit Mercy; Kathleen Neveu
Track: New Program
The surveys strongly indicated student satisfaction with the program. More importantly, the surveys indicated that the experience persuaded the participants to consider full- or part-time teaching in a dental school or hospital setting.
Provision of dental hygiene care in any clinical environment is stressful, as patient care protocols and procedures are very complex. Working in teams of two dental hygiene students, care was provided to one patient under the guidance of one dental hygiene faculty member at the University of Detroit Mercy (UDM) School of Dentistry. Students were mentored through all phases of the patient care process, providing a one-on-one teaching-learning opportunity paced to meet each individual student’s skill and confidence level. The objectives of the faculty role model (FRM) program are to 1) acquaint the dental hygiene student with patient care protocols of the UDM dental clinic; 2) reduce student anxiety during the clinical patient care appointment; and 3) reinforce and/or increase faculty knowledge of clinic protocols and resources. A ten-clock hour activity was conducted that involved one clinic session (three hours) of review of clinical protocols and patient chart contents, two three-hour patient care appointments, and a one-hour post experience after action review group session. The program included student and faculty preparation workshops. The FRM program took place in the third semester (winter term) of the dental hygiene curriculum. Regularly scheduled clinic faculty members and faculty volunteers served as role model faculty.

**Results:** Upon completion of the program, 92 percent of the students (n=26) agreed or strongly agreed that they gained a better understanding of the dental hygiene appointment, while 80.7 percent of the students agreed or strongly agreed that they gained a better understanding of clinic protocols. One hundred percent of the students agreed that they felt more confident as a result of the program. All faculty (n=6) agreed or strongly agreed that the program enabled the students to feel more confident.

**Conclusions:** Initial investigation of the FRM program by faculty and students revealed that the program may indeed contribute to the confidence level of students. Additionally, it appears that the program serves as a good mechanism for gaining a good understanding of clinic protocols and the dental hygiene appointment. Future evaluation of the program will allow new insight into how best to conduct the program.

**99. The University of Detroit Mercy/Henry Ford Health System School-Based Program: Increasing Oral Health**

Kathi Shepherd, University of Detroit Mercy; Vinod Mistryala; Mert Aksu; Gail Stewart

**Track:** New Program

In spring 2008, a partnership between the University of Detroit Mercy (UDM) School of Dentistry, Henry Ford Health System, and State of Michigan Department of Community Health designed a program for children identified as having high disease rates and lack of access to dental care enrolled in eight city of Detroit public elementary schools. The objectives were to 1) increase oral health prevention services, 2) ensure restoration of active disease for children, and 3) reduce disparities through the provision of a dental sealant program. The program is facilitated on-site by a community oral health coordinator employed by the Henry Ford Health System. Three licensed PAs for 161 dental hygienists were hired with University of Detroit Mercy faculty status to provide preventive oral health care in the eight designated elementary schools. After being calibrated by the Department of Pediatric Dentistry faculty, the team of dental hygienists performed a screening, prophylaxis, sealants, and fluoride varnish on each child upon obtaining parental consent. Pre- and post-oral health education tests were administered to assess acquisition of knowledge utilizing chairside laptop computers. Children are referred to the UDM School of Dentistry for restorative and other necessary care utilizing a SEALS classification system. Assurance of appointment attendance is tracked by way of a web-based axilum crystal reporting mechanism.

**Results:** To date 417 children have been treated by the team of dental hygienists. Twenty percent of the children have had appointments at the School of Dentistry. Phase one student involvement has occurred through a formal observation requirement. Phase two will involve both dental and dental hygiene students rendering care with faculty supervision on-site in the schools.

**Conclusions:** Although continued program evaluation is currently being conducted, initial results after five months reveal an increase in the amount of oral health services provided for the designated population. The program thus far has provided an avenue for the dental hygiene faculty to work with families and agencies to raise awareness of the impact of oral health. The initial phase of the program has also revealed that this program may serve as a means to assist parents in the navigation of the health care system and overcome barriers that prevent them from accessing and benefiting from health services.

**Significance:** The partnership described can serve as a model for increasing access to oral health care not only elsewhere in the state of Michigan but also in other states.

**100. Operatory Design for Optimized Clinical Learning**

Cheri Porth, University of British Columbia; Lance Rucker

**Track:** New Program

The University of British Columbia (UBC) began operation in its new Oral Health Centre in 2006. This state-of-the-art facility was designed not only to be patient-centered and EPR-based, but also to meet specific concerns for optimal ergonomics. All “preclinical” psychomotor and clinical skills education at UBC has been performed directly in clinic operatories for over ten years, placing additional demands on design to allow ready transition of operatories between patient care and clinical simulation. The new design is obliquely pentagonal, with the majority of its 81.75 sq. ft. available to the clinician at the head of the chair. The foot of the chair is positioned towards the apex of the operatory, with ample room beside the chair for patient access. The new operatories have an interlocking layout, which permits teaching bays to be allocated into smaller or larger teaching pods, as needed for specific educational needs. The new operatory conveys a sense of luxurious space, with ample room for instructors, assistants, or observers to move in and out of the operatory without disturbing the chairside activity. A computer workstation is located in each operatory for ready access to the EPR. An additional computer monitor is poised chairside at eye level, for ready reference to digital radiographs, other EPR information, online references, etc. Layouts of traditional rectangular teaching operatories invariably produce much waste of space around the patient chair and are often set up in a way that impedes ready instructor access to the operating student.

**Results:** Movable overlays of 3-D graphics of each operatory clearly demonstrate the comparative space and efficiency of this new clinic design. Clinical instructor and student evaluations of the new design are summarized in survey results, and comparative dimensions of operatories are summarized in a table format.

**Conclusions:** In order to create a favorable clinical learning environment, special attention must be paid to the usage of space in operator design.

**Significance:** An operatory layout that is well designed in terms of functional space and equipment placement can contribute to an enhanced educational experience.
Student Poster Presentation

101. Replication of Typodont Master Crown Preparations for Use in Dental Education Using Computer-Aided Scanning and Milling
Nicholas Smith, University of Iowa; Steven Armstrong; Jeffrey Millet

Track: New Program
Efficient and inexpensive production of faculty tooth models while maintaining direct control of model details would be a valuable asset to dental educators. Currently, there is a need to replicate typodont teeth for use in preclinical laboratory/simulation clinic settings and as visual guides for direct patient care. The purpose of this program is to develop a protocol that will use a CAD/CAM approach to replicate, with accuracy and efficiency, ideal crown and restorative preparations for use in a dental education setting. An intact dentiform tooth (KaVo, Lake Zurich, IL) is first carefully aligned and mounted in a one-inch phenolic ring using a custom holding device and acrylic resin. The “master” preparation is then positioned into the mold, and using a table-top all-in-one scanning and milling device (Modela MDX-15, Roland DGA Corp., Irvine, CA), a 3D model is captured with a touch sensor and associated software. This 3D model is then imported into milling software (Modela Player 4), where customization of the model is completed, and milling parameters are set. Once the tooth model is milled, an intact dentiform tooth is then exchanged, and milling is repeated until the desired number of models is fabricated.

Results: This process has produced ninety replications of an “ideal” preparation that were used as teaching aids in conjunction with ninety all-ceramic crowns (Everest, KaVo) to allow second-year students a hands-on opportunity to simulate an all-ceramic crown delivery appointment with custom ceramic characterization. Additionally, approximately 900 simulated full coverage crown preps for use as dental anatomy waxing pegs have been produced for use by first-year dental students.