

# CLL Poster Session

## **A Comparison of School Dental Examination Data in Illinois: Beneficial for Public Health Programming and Surveillance**

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(Southern Illinois University Carbondale)

**Purpose:** In most states, local oral health data is not readily available for agencies to utilize to justify public health programming. Illinois requires dental examinations for entry into kindergarten, second and sixth grades employing the Association of State and Territorial Dental Director's basic screening survey format. The purpose of the study was to document access to care and other oral health issues in the southernmost 16 counties in Illinois by comparing the Southern Illinois results of school dental examination data with statewide dental examination data.

**Methods:** A retrospective review of existing data was conducted from results of 2011 Illinois school dental examinations. The statewide data was accessed from the report of dental compliance and dental health status compiled by the Illinois State Board of Education (ISBE) Division of Data Analysis and Progress Reporting. Dental exam data for schools from the lower 16 counties was accessed for the same year from the ISBE website and transferred to Excel spreadsheets. Descriptive results for the various components of the dental examinations reported from the lower 16 counties were compared to statewide data.

**Results:** Compliance for dental examinations for the state was 77.8% (n=454,282) and in the southern 16 counties was 78.4% (n=11,204). A larger proportion of Southern Illinois children required waivers for dental examinations (2.56%, 288) representing significant access to care barriers. Children requiring waivers for the remainder of the state was 0.71% (2,862). Sealant use in Southern Illinois school children was comparable to statewide use, and even higher than statewide in sixth grade children. Results for untreated decay were higher by approximately 8% for all 3 grades of Southern Illinois children compared to statewide data. There was little difference in treatment urgency between the 2 groups. The "unknown" category of data (neither "yes" nor "no" was marked on the form) was much higher for all of the oral health indicators among Southern Illinois children than the rest of the state.

**Conclusions:** In an age of increased competition for scarce resources, health data drives public health programming. Information gained from the mandatory school dental examinations is valuable for documenting oral health status, access to care and unmet dental needs in states' low access areas. Results from this study can be used to leverage resources for the implementation of public health programs. Calibration exercises for dental providers can be justified from the results as better data collection can result in better surveillance.

**Funding Source:** SIUC-Undergraduate Assistant award.

## **Formative and Summative Clinical Assessment: The Student Perspective**

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(Massachusetts College of Pharmacy and Health Sciences University/Forsyth School of Dental Hygiene)

**Purpose:** The purpose of this study was to explore dental hygiene students' perspectives on the method of daily clinical grading versus formative feedback and summative (comprehensive patient case competency, CPCC) assessment which is used in other health care disciplines.

**Significance:** A literature search revealed a limited number of studies of clinical assessment methods used to assess student competency. The most common methods discussed were daily clinical grading and fulfillment of patient requirements. However, it remains unclear this is an effective approach for ensuring competency.

**Methods:** Based on the literature a BSDH program developed a method of formative and summative assessment (CPCC) for clinical curriculum. A survey was developed to gather student perspectives on the change from daily clinical grading to formative/summative assessment. The survey was distributed to a convenience sample of dental hygiene students (n=48) at the end of fall and spring semesters, anonymous, and conducted in an online survey tool.

**Results:** The response rate was 100% (n=48).

Responses to the following statements were as follows: "I felt like formative feedback allowed for more collaboration with clinical faculty than the daily grading format," 98% (n=47) agreed/strongly agreed. "Formative feedback encourages me to ask questions to enhance my learning," 98% (n=47) agreed/strongly agreed. When asked about summative assessment in the form of patient care competency (CPCC), 98% agreed/strongly agreed; "Summative CPCCs were an appropriate method to evaluate my abilities to provide evidence-based dental hygiene care." The main advantage cited: "I feel like formative feedback opened more doors for questions and hands-on help from clinical instructors and there was less pressure so it was easier to ask faculty questions regarding patient care and know what's expected of you before being graded." Overall, 83% (n=40) preferred the formative/summative assessment versus 15% who preferred daily grading.

**Discussion:** Upon initial implementation of the change in grading format students felt uncomfortable asking questions because they were used to "losing points" in the daily clinical grading system. Students quickly came to value the opportunity to ask questions to learn and improve their patient care skills prior to summative assessment.

**Conclusion:** Based on student comments daily grading makes them reluctant to ask questions which is a necessary part of learning. Finding a balance between creating a safe environment where students can learn and assessing competence to ensure graduates can provide quality care is challenging, but this small study suggests formative and summative assessment system may facilitate student learning.

### **Supplemental Instruction through Distance Education: An Innovative Hybrid Project Using Wimba Online and Tablet Technology**

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(University of Missouri-Kansas City, School of Dentistry)

**Problem Statement:** It is critically important dental educators strive to increase admissions of diverse candidates to both dental and dental hygiene school in order to more closely mirror the rapidly changing demographics of our nation.

**Purpose:** The purpose of the Admission Enhancement Program (AEP) is to assist culturally diverse candidates to enrich their application and subsequent admission to dental school.

**Methods:** The UMKC School of Dentistry (UMKC-SOD) partnered with the UMKC Center for Academic Development (CAD) and Supplemental Instruction (SI) to pilot the AEP. A total of 12 candidates were admitted to the 8 week hybrid summer program. The program utilized both on-site enrichment experiences at the SOD and online distance education. Shadowing a dental student, hands-on lab activities and career exploration seminar activities were among the onsite enrichment experiences students were given. A central focus was to strengthen foundational knowledge in math, chemistry, organic chemistry and biology in preparation for the Dental Admission Test (DAT). Topics were presented as 2 week online modules. Daily interactive sessions between UMKC AEP students and SI Leaders were delivered through distance education. Students benefited from 24/7 (asynchronous) access to academic content and remained "in touch" with UMKC faculty, staff and each other, no matter where they lived. The peer-led SI sessions were held in a live (synchronous) online classroom. Readings, concepts, homework assignments, issues of confusion and complex problems were reviewed and aided by writing tablet technology to deepen engagement and learning of materials. This innovative program represents UMKC's effort to utilize internationally recognized SI learning strategies through distance delivery, and the opportunity to use state-of-the-art tablet technology to enhance instruction in math and science.

**Results:** Students completed a survey at the conclusion of the AEP which incorporated all programmatic details. Outcomes suggest students and SI Leaders viewed the online SI format and the tablet technology favorably (45.5% to 81.8%). Additionally, 85.7% of students were accepted to dental school. All students indicated the AEP helped them learn new skills for dental school preparation. Year two of the AEP reviewed all outcomes data and implemented changes to enhance the goals and mission of the program.

**Conclusions:** This project has the potential to stimulate others in the academic community to consider online SI instruction and writing tablet technology to enhance learning skills and could be a model applied to dental hygiene to aid in increasing diversity in those programs.

Funding for this project was provided by the Missouri Legislature.

## Smiles for a Lifetime: Direct Access to Preventive Care for Head Start Children

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During the 2004/05 school year, only 55% of preschool children registered in Washtenaw County Head Start (WCHS) received a required dental exam and preventive care. Of those children, 46% were identified as needing follow-up care. However, fewer than half received treatment. In 2006, WCHS received a grant to hire an Oral Health Coordinator (OHC). Subsequent discussions between the OHC and a dental hygienist friend initiated the idea of a fluoride varnish program.

The Smiles for a Lifetime program, implemented during the 2007 to 2008 school year, offered free dental screening and fluoride varnish application to all children enrolled in all 6 WCHS sites across the county. Program objectives included: 2 on-site visits (at the start and end of each school year), application of fluoride varnish and "flashlight" screening exam, and a referral for needed treatment and support to establish a dental home. One or more staff members or teachers at each WCHS site discussed need for follow-up care with each child's parent/guardian to assure that a dental home was identified and treatment was received.

Key aspects of program implementation include the use of Michigan's PA 161 (direct access) law and development of dedicated RDH teams. A second visit to classrooms in April allowed teams to identify children who had not yet received care for needs noted during the first screening in October.

Relationship building and engagement of administration, staff and teachers at each WCHS site were important components of the success of the program. Teacher support was identified as key to increasing the return of positive permission forms as well as providing assurance that needed follow-up care was discussed with a parent/caregiver. Providing information and reassurance to local dentists was important to avoid misunderstanding of the goals and scope of the program.

Program data indicate that the Smiles for a Lifetime program provided more than 5,000 oral screenings and fluoride varnish applications between 2007

and 2012. An increased number of positive permission slips returned after the first year of the program indicate success in increasing the number and percent of WCHS children who received fluoride varnish. Compliance with referral is difficult to assess, but anecdotal evidence indicates that twice-yearly interaction with RDH teams increased awareness and encouraged staff to provide follow-up for the more than 500 children identified as needing restorative care.

Funding Source: Year 1 funding: Washtenaw District.

## Knowledge and Attitudes Towards People With HIV and Willingness to Conduct Rapid HIV Testing: A National Survey of U.S. Dental Hygienists

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\*Winnie Furnari, RDH, BS, MS, FAADH;  
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**Problem Statement:** In the U.S., an estimated 21% of people living with HIV/AIDS do not know their positive status. Expanding rapid HIV testing in the dental setting may increase the number of individuals aware of their HIV status and can begin medical care and social support services.

**Purpose:** Expanded rapid HIV testing initiatives are needed outside the routine medical setting. The dental setting is a logical choice since almost two thirds of Americans see a dental provider each year. This study aimed to determine knowledge of HIV, attitudes toward people living with HIV and willingness to conduct rapid HIV testing among dental hygienists.

**Methods:** Practicing dental hygienists were recruited to complete a cross-sectional survey. The survey included 13 questions assessing knowledge and attitudes. Surveys were administered online using Campus Labs, and were collected from September to December 2011.

**Results:** Subjects were first assessed in terms of mean knowledge test score. Individuals who answered 75% or more of the questions correctly were placed into a category of "high test scorers," while those who answered less than 75% of the test questions correctly were placed into the "low score" group. Associations between groups were tested using a chi-square statistic for categorical variables and a t-test for continuous variables. Attitudes were measured as scores on a 3 point Likert scale, and

were analyzed as categorical variables. Age, gender and race-adjusted odds ratios and their 95% confidence intervals were estimated using unconditional logistic regression models. Statistical significance was assessed using a 2-sided test at the  $\alpha=0.05$  level for all studies.

**Conclusions:** Increased knowledge about HIV is associated with an increased comfort level in working with medically compromised patients, and in counseling about sexual HIV prevention methods. This study demonstrates a majority of the high scoring knowledge group indicated that they would be willing to conduct HIV rapid tests.

Those with high test scores were more likely than those with low test scores to feel comfortable counseling about sexual HIV prevention. The groups did not differ in their willingness to be trained to perform HIV testing. This indicates a need to offer supplemental access to HIV education and training in dental hygiene curriculum and post-graduate continuing education. The study supports the NDHRA priority area, Health Services Research. It was approved by the Long Island University Institutional Review Board.

Funding for this project was through Long Island University Health and Wellness Institute.

### **The Dental/Mental Connection – Dental Care as Integral to Mental Health Care**

\*Patricia E. Doyle, RDH, BS, FADPD  
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The 2 goals of this program are to illustrate the critical relationship of oral health care service delivery to mental health care patient outcomes and to deliver relevant education and training to mental health case managers, their clients and dental professionals to develop mutual awareness and the ability to advocate successfully for oral health care service delivery to mental health clients.

While oral health problems occur more frequently among mental health clients than the general population, access to oral health care for this demographic is far more problematic. This program is important because it presents a practical model for building understanding and trust among mental health patients, case managers and dental professionals for the purpose of increasing oral health care service delivery to mental health clients, and it documents the success achieved by integrating service delivery for dental and mental health care.

Mental health clients in the program are people with chronic or severe persistent mental illnesses who receive disability support and are served in community mental health systems.

The model has 3 elements: client-centered intake and assessment, coordination of initial and ongoing oral health care, and creative approaches to resource development. It takes a 1:1 approach to clients, emphasizing the need for respect of individual life circumstances as the foundation for successful treatment.

Program training presents education about these issues and explores successful resolutions. Issues include:

- Oral pathology, including gum disease, tooth decay, and dental treatment needs
- Psychotropic medications
- Smoking, substance abuse, and other habits
- Dental fears and phobias
- Special management considerations
- Financial barriers
- Education and training focusing on the interrelation of dental and mental health

The program is not site dependent and can be easily replicated. Training for mental health case managers, clients and dental professionals can be delivered in person or online. Pre- and post-training questionnaires measure changes in participants' oral health awareness and understanding.

A dental hygienist who volunteered 1 day/week saw about 30 new patients a year and coordinated 150 appointments. Thirty-four percent completed their treatment plans which included preventive, restorative, and surgical services. This is a small program that offers dental hygienists the opportunity to make a big difference in the lives of people who are mentally ill.

### **ADHA Hyposalivation with Xerostomia Screening Tool Project**

\*Margaret J. Fehrenbach, RDH, MS  
(Self-employed, Dental Hygiene Education Consulting)

**Problem Statement:** The number of xerostomia cases has increased greatly over time because people are taking an increased number of medications; there are more than 400 prescription and non-prescription medications associated with xerostomia. Other factors are also involved. In the absence of the protective factors of saliva, a patient becomes

more susceptible to oral disease such as caries, candidiasis and periodontal disease, all of which can result in significant oral care concerns. Thus the major concern for dental health care providers is to assess hyposalivation with xerostomia. A hyposalivation with xerostomia screening tool was created for the dental hygienist in dental practice by funding from an Unrestricted Educational Grant provided by GlaxoSmithKline, and utilizes American Dental Hygienists' Association (ADHA) Standards for Clinical Dental Hygiene Practice regarding the assessment, etiology and management of conditions. The screening tool generates an overall susceptibility to hyposalivation with xerostomia, using a simple grading scale ranging from low to moderate to high risk. Using the assessment and diagnosis clinical parameters, the tool comes to a conclusion or dental hygiene evaluation of risk for hyposalivation with xerostomia that allows for planning and implementation of interventions per risk level of the patient by the dental hygienist and rest of the dental team. The tool was presented to the ADHA members via an article in Access magazine.

**Purpose:** The validation of the screening tool in a clinical setting.

**Proposed Method:** One effective way to obtain objective measurements of quantitative changes in saliva is by collecting saliva. A total of 100 participants in a selected clinical setting with the primary symptom of xerostomia would be used in the study. Each participant would first be evaluated using the developed tool by a dental hygienist to determine the participant's risk level for hyposalivation. After the evaluation, first unstimulated saliva would be collected and then stimulated saliva, with both being weighed. Later the participant's salivary flow rate for both the unstimulated and stimulated flow is calculated by dividing the amount (weight) of collected saliva by the duration of the collection period (5 minutes). Both the responses to the tool and salivary flow rates for each participant would undergo data analysis in comparison to known values to determine the validity of the tool to adequately evaluate the risk level for hyposalivation.

**Funding Source:** GSK (future funding not appropriated at this time).

### **Palliative Oral Care: Perceptions of Long-Term Care Certified Nursing Assistants**

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**Background:** Oral care deficiencies continue to occur in long-term care (LTC) institutions despite governmental standards. Reported low priorities of oral care among LTC nurses and limited interdisciplinary utilization of dental professionals contribute to diminished optimal oral health. Certified Nursing Assistants (CNAs), primarily responsible for providing palliative oral care (POC) to LTC residents with life-limiting illnesses, critically need sound oral care knowledge and training to ensure patients' quality of life. Further investigation to understand CNAs' role in POC of institutionalized populations is necessary, as studies have indicated differences between CNAs' reported oral care and actual practices.

**Objectives:** This qualitative study explored the perceptions and barriers of LTC CNAs who provide POC and situated those experiences within a health-promotion planning model.

**Methods:** Digitally recorded, semi-structured interviews conducted with 10 LTC CNAs obtained POC knowledge and attitudes that were supplemented with field observations.

**Results:** CNAs perceived themselves as primarily responsible POC yet were deficient in that knowledge. Subsequently, personal dental experiences became their preeminent source of information. Absent were evidence-based guidelines, efficacious oversight and interdisciplinary communication to between dentistry and nursing leaving CNAs to self-monitor quality of oral care.

**Conclusion:** The lack of POC accountability and effectual interdisciplinary collaboration underscores the need for new models to address this multi-dimensional problem. Although increased oversight and training for CNAs can initiate POC improvements, augmented geriatric oral health education for dental and medical professionals is essential to improve achieving optimal oral health for all LTC residents.

## **Video Assisted Psychomotor Skill Development in Dental Hygiene Education (VAPS)**

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**Problem Statement:** Dental Hygiene education is challenged with the problem of psychomotor skill development, knowledge retention and transference of the new skill into practice. Successful dental hygiene instrumentation skills require practice time on typodont models beyond the clinical setting without the oversight and feedback of instructors. This may lead to incorrect technique development.

**Purpose:** The purpose of this study was to investigate the effectiveness of instructional instrumentation videos for first year dental hygiene student performance during clinical learning. Effectiveness was measured by instructors evaluating each student using a scored assessment for 11 dental hygiene instruments. The null hypothesis: there is no statistically significant difference in initial instructor assessment scores between students who have been provided instrumentation videos and students who have not.

**Methodology:** This randomized control trial involved 52 (n=52) first year dental hygiene students; 26 students were assigned to each group, experimental and control. Instructional instrumentation videos were created and made available to the experimental group only via the University's Learning Management System. The control group received identical lecture content and demonstrations but did not view the videos prior to the assessments. The experimental group had access to the videos for 72 hours following lecture. A total of 5 calibrated instructors, blinded to group selection, utilized 17 criteria to assess student effectiveness related to the use of 11 instruments. Criteria included grasp, fulcrum, positioning, activation and mirror use. Students also completed pre- and post-assessment surveys indicating prior dental hygiene instrumentation use, student learning style, utilization of videos during practice, frequency of video viewing and the perceived benefits of video use. IRB approval was granted from the University of Bridgeport. Data was analyzed at a significance level of  $p \leq 0.05$  utilizing SPSS Statistics version 20. Mann-Whitney U and Chi-square tests were applied to demonstrate differences between variables.

**Results:** The experimental group demonstrated

a statistically significant improvement with four of the 17 criteria, for 4 of the 11 instruments assessed when compared to the control group. Three of the 4 instruments demonstrating statistically significant improvement were assessment instruments. Post-assessment surveys indicated over 85% of students agreed the videos helped with dental hygiene fundamentals, typodont practice and instrumentation technique.

**Conclusion:** Instructional instrumentation videos can be a valuable tool to aid student psychomotor skill development in dental hygiene clinical education. Further research is warranted.

## **Innovative Internship Opportunities in a Baccalaureate Degree DH Curriculum**

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The baccalaureate degree dental hygiene curriculum is designed to pursue an area of focus, which is enhanced by Internship in Dental Hygiene Program Course. The purpose of these assignments is for the student to further develop interprofessional educational experiences, innovation, reflection, while assessing their future professional goals. The internship opportunities include areas of focus in Corporate, Research, Nursing, Education, Public Health, Geriatrics and Law/Ethics.

The students choose their assignment site, which is arranged through collaboration of the dental hygiene program with institutions, government agencies and private corporations.

Students enroll in the internship courses in their fourth year of curriculum. The following are the educational experiences where students can participate.

One internship is at a major pharmaceutical company, the students have the opportunity to learn about research, dental product development, manufacturing and marketing strategies.

Interprofessional educational experiences are achieved at the Colleges' Nursing Faculty Practice. In corroboration with Nurse Practitioners, the student participates in a pilot program on interdisciplinary learning model for nursing, dental and hygiene students. This experience engages students and faculty to develop strategies to promote greater interdisciplinary alliances in offering comprehensive holistic patient's care all in 1 location.

Another internship is with the Colleges' Patient Advocate. The student has the opportunity to learn about laws governing student and licensed dental practitioners, and ethical issues of conflict resolution.

The research Internship is at the College's Research Center. Students participate in various funded projects; where they learn about research protocol, grant writing and processes of conducting research.

A student whose interest is public health is achieved at the Veteran's Administration Hospital dental clinic, where they provide dental hygiene services to medically and mentally compromised patients. Students interested in the public health and the older adult can complete the internship at a Naturally Occurring Retirement Community (NORC). They work as a team member with a nutritionist, nurse and social worker to provide onsite care and lectures to meet the concerns of the older adult patient.

Students interested in pursuing education are assigned to dental clinics at the College to teach the undergraduate dental hygiene students under faculty supervision.

At the completion of each semester, the students share their internship experiences on the Blackboard Course site. The students expressed satisfaction with their chosen site, with the teaching internship most valued. All students stated that their internship empowered them to assess and reflect on their future professional goals, through innovative educational experiences.

### **Education Strategies for Integrating Evidence Based Principles in a Two Year Dental Hygiene Program**

\*Mary Therese Keating-Biltucci, RDH, MA; Beth Kettell, MLS; Alice Wilson, MLS and Pam Czaja, MLS (University of Rochester)

**Problem Statement:** The dental education environment fosters passive learning instead of critical thinking and lifelong learning skills.

**Purpose:** The purpose of this research was to investigate education strategies that support critical thinking and lifelong learning by utilizing the principles of evidence based learning in a dental hygiene 2 year curriculum.

**Methods:** A qualitative approach that adheres to

well established criteria of critical incident technique (CIT) was utilized as the research method. A total of 4 lesson plans (assessments) were developed to produce data collected from 3 critical incidents. These assessments reflected the students' comprehension of the teaching objectives.

**Results:** Dental hygiene students exhibited an increased level of comprehension in assessments 1 and 3. The n and descriptive statistics was used for the pre and post assessments. Research results used a p-value of <0.05 as the cut-off for statistical significance. Assessments 1 and 3 were both significant with p-values of 0.018 and 0.000, respectively. Dental hygiene student's in a 2 year college program exhibited skills when accessing the web for general information. Students also applied some critical thinking skills in the case study lesson and assessment. Students fared poorly when attempting to access and use scientific information instead of information available to the public.

**Conclusions:** These results suggest that while dental hygiene students are capable of utilizing evidence based theories they may lack the knowledge integral to practice this concept as a student and in their professional lives. Dental hygiene students require evidence based learning principles integrated into their curriculum beginning in their first semester of a 2 year program so they become familiar with the principles. Comprehension and utilization of evidence based practice will be a familiar concept if the principles are applied to dental specific courses such as community dentistry, clinical dental hygiene, dental therapeutics and periodontics.

### **Blood Glucose Testing in Dental Practices: A Community-Based Feasibility Study**

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**Problem Statement:** Diabetes prevalence has increased significantly. Optimal glycemic control is found in only 35% of diabetes patients (NHANES 1999 to 2000). Diabetes prevalence continues to increase suggesting additional methods are needed for screening patients at risk for the disease as well as those who are undiagnosed or whose disease is poorly managed.

**Purpose:** The purpose of this study was to assess the feasibility of blood glucose screening in dental practices in the National Dental Practice-Based Research Network (NationalDentalPBRN) and was

comprised of community dental practices across 5 regions: Alabama/Mississippi, Florida/Georgia, Minnesota, Permanente Dental Associates in cooperation with Kaiser Permanente NW Research Foundation, and Scandinavia (Denmark, Norway, Sweden).

**Methods:** Dental practitioners and/or staff were trained in how to use a handheld glucometer (FreeStyle Freedom Lite, Abbott Diabetes Care). Consecutive patients  $\geq 19$  years of age with one or more risk factor for diabetes were enrolled until 15 qualified and consented in each practice. Barriers and benefits to glucose testing in dental practice were reported using patient and dentist/staff questionnaires.

**Results:** Dental practitioners and staff ( $n=67$ ) in community-based dental practice settings ( $n=28$ ) enrolled patients ( $n=498$ ) into the study according to National Dental PBRN developed protocol. Most dentists considered glucose testing necessary (93%), agreed that testing was beneficial (85%), and agreed that testing may help identify patients at risk for periodontal disease (75%). Among dentist identified barriers to use, 22% perceived testing as time-consuming (58% disagreed), 5% expressed cost would be a barrier (51% disagreed) and 5% thought that testing will open practices to liability (72% disagreed). Among patient-respondents, most (83%) thought glucose testing in dental practice was a good idea (2% disagreed). Also, most patients (85%) reported that testing was easy (2% disagreed) and 62% said the test made them more likely to recommend other patients to the practice because glucose testing was conducted.

**Conclusion:** Glucose testing was generally well-received by both patients and dental practitioners and their staff. Results should dispel beliefs that glucose testing is time consuming, cost-prohibitive, and poorly accepted by dental patients.

Funding for this project was provided by NIDCR: DE-16746, DE-16747, U19-DE022516.

### **Patient Awareness of Xylitol**

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**Purpose:** Tooth decay continues to be a significant problem in the population. Research has demonstrated how daily use of xylitol gum is an effective way to stop the production of acid causing tooth decay. Little research has examined the awareness

and knowledge of xylitol in the general public. This study examined dental patients' knowledge of xylitol as it relates to prevention of tooth decay and overall health.

**Methods:** Surveys were distributed to a convenience sample of dental patients at a Midwest University Dental Hygiene clinic ( $n=39$ ) and a general practice dental office ( $n=11$ ). Researchers designed a knowledge score from 10 true/false items about xylitol based on the literature. Participants indicated their level of agreement regarding 8 various oral health beliefs related to xylitol and tooth decay. Frequencies and Pearson correlations between the oral health beliefs were examined. Relationships between knowledge and age groups were examined through an ANOVA test. Participants were grouped according to education levels with no college degree ( $n=23$ ) or a 2 year degree or higher ( $n=24$ ). Income levels were grouped according to less than \$50,000 ( $n=23$ ) or greater than 50,000 ( $n=22$ ). Knowledge scores according to education level and income level were examined with t-tests.

**Results:** Of those surveyed, 82% of participants were Caucasian with 85.1% between the ages of 25 and 54. The average knowledge score regarding xylitol was 5 correct out of 10 true/false items. Most participants were aware that xylitol is not readily available (70.2%) and that xylitol can reverse the initial stages of decay (68.1%). Most participants (61.7%) were unaware that xylitol can help regulate blood glucose levels for diabetics. Results revealed that there were no significant differences between the knowledge scores and participants' age ( $p=0.90$ ), education ( $p=1.0$ ), or income level ( $p=0.46$ ). There was a significant correlation ( $p=0.01$ ) between participants' value of oral health and the knowledge score ( $r=0.36$ ). Despite the lack of knowledge, 79.6% of participants were willing to administer and monitor the use of xylitol for their children to reduce the chance of tooth decay.

**Conclusion:** The findings in this study suggest that dental patients are largely unaware of xylitol and its potential benefits, regardless of age, education level, or income level. Further research should be conducted with a larger random sample to validate these findings. Increased knowledge among dental patients is needed to increase the use of xylitol to prevent dental decay. Dental hygienists can play a key role in educating patients about the benefits of xylitol.



## **Comparison of Critical Thinking in a Traditional Master's Degree Program and an Innovative Bridge Program for Associate Degree Dental Hygienists**

Linda D. Boyd, RDH, RD, EdD; Dianne S. Chadbourne, RDH, MDH; \*Lori Rainchuso, RDH, MS (Forsyth School of Dental Hygiene, Massachusetts College of Pharmacy & Health Sciences)

**Problem:** Self-perceived barriers to success among dental hygiene graduate students, prior to their entry into graduate level course work, is a belief that an extended absence from academia and fear of graduate courses being too difficult will prevent them from successful completion of their degree program.

**Purpose:** The purpose of this study was to evaluate and compare the critical thinking skills of students entering a newly designed online Associates Degree (AD) to Masters (MS) Bridge program and an established online MS program.

**Methods:** The Health Sciences Reasoning Test (HRST), a validated assessment of critical thinking skills of health science students, was administered to all entering AD to MS (n= 15) and MS students (n=7). AD to MS students repeated the test after completing the bridge portion of the program and at their point of entry into the MS curriculum. IRB approval was obtained for use of the HRST with all graduate students for the purposes of this study. The HRST is composed of 5 subscales with each subscale score tallied to create an overall performance score for each student's critical thinking skills. The scale for the HRST overall scores are interpreted as follows: 25 strong skills, 15 to 24 competent skills, 14 and below fundamental weakness in skills, and 10 or lower extremely weak skills.

**Results:** The mean HSRT score for the AD to MS students at entry into the program was 20 with an individual high score of 26 and low of 15. The mean HSRT score for the MS students at entry into the program was 17, with an individual high score of 24 and low of 12. The mean HSRT score for the AD to MS students after completing the bridge program was 22 with an individual high score of 25 and low of 14.

**Conclusions:** Outcomes of the mean HRST scores for AD to MS students showed improvement from the point of entry to the midpoint of the program. MS students' scores fell below those of the AD to MS students and may indicate students entering the AD to MS programs have critical thinking skills equal to or better than entering MS students. Further study

needs to be conducted to include a larger pool of participants before conclusions can be drawn.

## **Increasing Access to Oral Healthcare Services to Underserved Children Through a Collaborative School-Based Program Using Expanded Scope of Practice Dental Hygienists and Dental Hygiene Students**

Cynthia C. Gadbury-Amyot, MSDH, EdD and \*Melanie Simmer-Beck, RDH, MSDH (University of Missouri-Kansas City)

**Purpose:** To describe how collaboration between a university, a school district, an expanded scope of practice dental hygienist (ECP-RDH) and local dentists in a community has resulted in the delivery of comprehensive preventive and restorative oral health care to unserved and underserved children on site at their elementary schools.

**Statement of the Problem:** Accessing oral health care is a growing problem for children in the U.S. Promising oral health care workforce innovations are improving access to preventive oral health care. However, in most instances, these innovations do not have outcomes data that illustrate impact on access to care.

**Study Significance:** A change in the dental practice act allowing dental hygienists direct patient access provided the opportunity for this unique collaboration, where a dental hygiene faculty member with an ECP-RDH supervises dental hygiene students in the children's elementary schools using portable dental equipment to provide comprehensive preventive oral health care services. Restorative services are provided by dentists in the local community. This study will provide 4 years of robust outcomes data that demonstrate the impact this model had on improving access to oral health care.

**Methodology:** This study is a descriptive, retrospective, review of the electronic patient record from 2008 to 2012.

**Results:** Since its inception in 2008, 960 children have been provided comprehensive preventive oral health care services including prophylaxis, radiographs, fluoride varnish and sealants. A total of 292 (n=292) children were provided preventive oral health care services 2 or more times indicating the presence of a dental home. The decay rate remained decay free in 21%, decreased in 40%, increased in 27% and did not change in 11% of the children who used this model as a dental home. While urgent needs have been addressed by community dentists on a volunteer basis this has not

solved the need for comprehensive restorative care. As of Fall 2012 a partnership with a federally qualified health center has resulted in the provision of place-based restorative care.

**Conclusion:** A change in the dental practice act allowing children direct access to dental hygienists combined with a school-based, place-based approach to care has resulted in the provision of preventive and restorative oral health care to children who have not been able to access the predominantly private practice, fee-for-service dental model in the U.S. Future research should examine how the provision of place based restorative care impacts the children's state of oral health

Funding for the project was provided by the REACH Healthcare Foundation"

NDHRA: Health Services Research.

### **Dental Hygiene Service-Learning in Belize**

\*Brigitte R. Cooper, MS, RDH; \*Angela L. Monson, PhD, RDH  
(Minnesota State University, Mankato)

**Purpose:** The purpose of this program was to provide preventive oral health services to underserved children in Belize. Program goals were to treat children who do not have regular access to oral health care, to provide students the opportunity to participate in a culturally diverse outreach program, and to increase student's competency in providing oral health services for children.

**Significance:** Integrating service-learning into dental hygiene curricula fosters graduates who are better prepared to work effectively among diverse populations and have the opportunity to learn beyond what could be achieved in the classroom.

**Approach:** Dental hygiene faculty at Minnesota State University, Mankato collaborated with dentists in Belize to establish a service-learning rotation in San Pedro, Belize, located on the island of Ambergris Caye. During their final semester in the program, senior dental hygiene students participated in this optional, 7 day study abroad experience. Prior to departure, the students acquired knowledge concerning the culture of Belize, health care standards and protocols, and what the anticipated experience providing oral health care in Belize would involve. A total of 6 students, 2 dental hygiene faculty and 3 dentists volunteered at 2 clinics in San Pedro to provide oral health care for children ages 5 to 13. Treatment included prophylaxes, radiographs, seal-

ants, fluoride varnishes and oral hygiene instructions. They also organized a massive school fluoride varnish campaign, led by one of the volunteer dentists. While in Belize, students were immersed in the Belizean culture as they explored the island, participated in community events, and traveled to the mainland of Belize to see the Mayan ruins and small villages in the rain forest.

**Evaluation:** Students wrote daily reflection papers to evaluate their accomplishments, reflect on their day providing oral health care and document their cultural experiences during travel. Reflections were positive, indicating greater confidence in their dental hygiene skills, awareness of cultural diversity and a desire to be involved in outreach projects as they begin their professional careers. We believe service learning enhances dental hygiene education and is an important part of the curriculum.

Partial funding for this project provided for by Minnesota State University, Mankato.

### **Inter-Rater Reliability of the Mallampati Classification for Patients in a Dental Hygiene Clinic**

\*Diane P. Kandray, RDH, MEd; Mary L. Yacovone, RRT, MEd; Debbie Juruaz, DDS; G. Andy Chang, PhD  
(Youngstown State University, Ohio)

**Purpose:** Obstructive sleep apnea (OSA) is a condition characterized by a partial or complete closure of the airway resulting in repeated episodes of breathing cessation during sleep. There are a number of methods to screen and evaluate patients for sleep disorders like OSA. Dental professionals can contribute to the identification of risk factors for OSA by screening patients for physical characteristics associated with OSA. The Mallampati classification is one assessment used by anesthesiologist to identify the size and shape of the oropharynx which can be an indicator of OSA. There is little data to demonstrate the use of the Mallampati classification by dental hygienists in the clinical setting. The purpose of this study was to assess the inter-rater reliability between dental hygiene students and a supervising dentist using the Mallampati classification to evaluate and classify the pharyngeal soft tissues.

**Methods:** A sample of 234 patients volunteered for the study. The dentist and dental hygiene students were trained by a licensed respiratory therapist on the proper method to determine Mallampati classification. The dentist and the dental hygiene students were instructed to sit the patient upright in the dental chair, and to use the dental light to

look into the patients open mouth without phonation. The students were given a diagram of the Mallampati classification and were instructed to place a check mark next to the appropriate image that corresponded to the patients' oropharynx opening. The clinic dentist performed the same exam with the same recording criteria on a separate but identical form.

**Results:** Quantitative research methods were used to evaluate the inter-rater reliability between dental hygiene students and the clinical dentist in performing the Mallampati classification. The data was analyzed using adjusted McNemar test for non-independent data, Kappa score and percentage of agreement with 95% bootstrap confidence interval. There was an agreement between the dental hygiene student and the dentist in the majority of the independent assessments with a p-value=0.498 from the adjusted McNemar test. Inter-rater agreement measured by Cohen's Kappa coefficient is 0.54 with a 95% bootstrap confidence interval of (0.42, 0.64). The percentage agreement is around 77% with a 95% confidence interval of (72%, 82).

**Conclusion:** It was concluded that dental hygiene students can evaluate and classify the pharyngeal soft tissues comparable to a supervising dentist in the clinical dental hygiene setting. Future research should be explored to study dental professionals' important role in the recognition of risk factors for OSA.

### **Accessing Dental Hygiene Services in Price County, WI: An Ongoing Investigation of Quality of Life and Quality of Care**

\*Jodi Olmsted, RDH, PhD  
(University of Wisconsin-Stevens Point)

**Problem Statement:** Little research exists documenting Quality of Care (QoC) and Quality of Life (QoL) for individuals accessing dental services through public health departments when dental hygienists are using a consultative/referral model. Using a consultative/referral model is one way of addressing the issues of declining funding, access to care and workforce development for improving oral health of families with economic disparities and cultural differences.

**Purpose:** The purpose of this research was documenting quality of life and quality of care measures for families receiving care from dental hygienists within public health departments, and considering if oral health for families with economic disparities and cultural differences improved.

**Methods:** A longitudinal, descriptive analysis was conducted. Data existed for analyzing how the Quality of Care (QoC) provided by the dental hygienist offering educational and preventive services through the local public health department impacted/improved the Quality of Life (QoL) for individuals served. A consultative and referral model is used, working with community dental providers. Evidence based practices and descriptive, statistical evidence gathered allowed for conducting a descriptive, longitudinal analysis of these programs.

**Results:** From 2005 to 2011, 3,633 oral health education sessions were provided, 2,216 fluoride assessments were conducted and 1,786 (61%) children received systemic fluoride supplements. A total of 1,667 children were eligible for a weekly topical mouth rinse program, with 1,258 (75%) participating, and 3,028 (83%) children received fluoride varnish. A total of 59 minorities received care, and 30 to 35% of clients served were either Medicaid or Badger Care recipients. Data documenting QoC and QoL was analyzed for described communities. Initial QoL data was ranked in the bottom half of state, while 70% of original determinant data was also ranked in the bottom half of reported metrics. Improvement in QoL measures were noted through improved health outcomes and determinant metrics. QoL measures are annually re-normed statewide, requiring further study.

**Conclusions:** Data describes how QoC and QoL measures for individuals with economic disparities and cultural differences are affected in the service communities studied. This analysis describes positive impacts made, and efficacy of using a consultative/referral model when care required is outside the scope of dental hygiene practice.

**Funding Source:** Northern Wisconsin Association of Health Education Centers (NAHEC).

### **The Need for Improved Health Professionals' Education in the Treatment of Persons with Developmental Disabilities**

\*Gino R. Garza, RDH, BSDH; M. Cunningham; K. Perez; V. Agado; C. Yeung; C. Nguyen  
(University of Texas Health Science Center at San Antonio)

**Problem Statement:** Health professionals' education lacks specific training in providing care for patients with developmental disabilities (DD). It is important for health professionals to have communication and hands-on skills necessary to treat patients with DD.

**Purpose:** The purpose of this study was to identify patient satisfaction with the quality of health care received from medical and dental professionals.

**Methods:** This pilot study focused on the health care transition experience of young adults with developmental disabilities and their family members to gain new insights into their medical and dental needs. A mixed research design was used to identify a convenience sample of 15 in which descriptive and qualitative data were gathered in a structured 45 minute interview. This pilot study was approved by the University of Texas Health Science Center San Antonio Institutional Review Board, May 6, 2009, approval number HSC2009033H.

**Results:** Patients most commonly reported (33%) that their general physician was not prepared to treat those with DD. Other results include the patients' perception that their general dentist was not prepared to treat patients with DD (27%), patients reporting being very dissatisfied with the quality of dental care they have received (13%) and patients reporting being very dissatisfied with the quality of medical care they have received (13%). Furthermore, families often felt segregated during appointments and treatment planning. Lastly, patients would like doctors to "explain, listen and answer questions, take more time, make sentences shorter" when communicating.

**Conclusions:** Health professionals lack training specific to interacting with young adults with developmental disabilities. Training of new health professionals should focus on "patient and family centered care". Licensed healthcare professionals should attend continuing education courses designed to educate professionals on treatment and communication of patients with DD.

Funding for this project was provided by the South Texas Area Health Education Center.

### **Dental Anatomy: Analysis of Teaching Methods in Dental Hygiene**

\*Alcinda K. Trickett Shockey, RDH, DHSc; Cathryn L. Frere, RDH, MSEd (West Virginia University)

**Problem Statement:** The subject matter of Dental Anatomy within the dental hygiene curriculum historically has been a very difficult subject for successful student completion. Dental anatomy instruction methods have traditionally been lecture and laboratory. Changes in student safety and the addition of innovative teaching tools have been encouraged for

improved student success.

**Hypothesis:** With a seemingly increased use of technology, what types of teaching methods are dental anatomy instructors employing for dental hygiene student success? Have traditional lecture and laboratory methods been replaced?

**Purpose:** The purpose of this study was to assess an understanding of instructor teaching methods used for student learning enhancement within dental hygiene curriculum systems.

**Methods:** Using an on-line tool to survey teaching methods used in dental anatomy for dental hygiene students, all post-secondary dental hygiene schools in the U.S., with encouragement for the assigned dental anatomy instructors' participation preferred, were surveyed after securing WVU IRB approval on file. The results of those surveys were gathered and analyzed (n=108). A simple crosstab data analysis was conducted.

**Results:** With the majority of DH schools surveyed provide an associate degree (AS/AA,AAS=76.6%, BSDH=19.6%, BA=0.9%, MSDH=2.8%); the use traditional lecture for dental anatomy didactic is preferred by instructors for all types of schools (94.2%) with the use of text and atlas usage being the second most preferred method (89.4%). Audio-visual (79.8%) and models (79.8%) were reported as the next highest followed by interactive multi-media (64.4%) and extracted human teeth (34.6%). Self-instructional text (27.9%) was the least preferred method. Laboratory teaching methods were varied. Permanent dentition models (92.0%) and labeling of drawings and diagrams (88.6%) were the most preferred with deciduous dentition models (73.9%) and study guides (70.5%) being the next preferred. The use group discussions (65.9%) and extracted human teeth (60.2%) are used with skull observation (51.1%), self-study (44.3%) and self-instructional packages (33.0%). 19.3% carve the entire tooth and 11.4% use add-on technique carving with 10.2% reported using entire crown carving and extracted tooth scaling methods. Interestingly, the participants reported using a combination of many methods during laboratory experiences.

**Conclusions:** Dental anatomy is taught in dental hygiene programs throughout the U.S. and is an essential part of the curriculum. Various teaching methods are used by instructors to meet students' learning styles to encourage student success. Although new teaching methods with new technology are available, a combination of various teaching methods is used by instructors to assure continued student success.

## **Evaluation of the Plaque Removal Efficacy of a Water Flosser Compared to String Floss in Adults After a Single Use**

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**Statement of Problem:** The ability of a water flosser to remove plaque is still questioned by some dental professionals especially when compared to string floss.

**Purpose:** The objective of this study was to compare the plaque removal efficacy of a water flosser to string floss combined with a manual toothbrush after a single use. This study adds to the body of evidence of using a water flosser and either a power or manual toothbrush as the optimal regimen compared to the current standard of brushing and flossing. This study supports the NDHRA category of Health Promotion/Disease Prevention.

**Methods:** Seventy adult subjects participated in this randomized, single use, single blind, parallel clinical study. Subjects were assigned to 1 of 2 groups: water flosser plus a manual toothbrush (WF), or unflavored waxed string floss plus a manual toothbrush (SF). Each participant brushed for 2 minutes using the Bass technique. The WF group added 500 ml of warm water to the reservoir and followed manufacturer instructions using the classic jet tip. The SF group used waxed string floss between each tooth following standard flossing technique. Scores were recorded for whole mouth, marginal, approximal, facial, and lingual regions for each subject using the Rustogi Modification Navy Plaque Index. The primary comparison evaluated the mean change between the groups, utilizing a between independent groups one-way analysis of variance. Data was summarized using descriptive statistics (mean, median, minimum, maximum and standard deviation) by treatment group and overall. All statistical tests were conducted using a significance level of  $\alpha=0.05$ . Study and forms were approved by the Institutional BRCL (IRB), Mississauga, Ontario, Canada.

**Results:** The WF group had a 74.4% reduction in whole mouth plaque and 81.6% for approximal plaque compared to 57.7% and 63.4% for the SF

group respectively ( $p<0.001$ ). The differences between the groups showed the Water Flosser was 29% more effective than string floss for overall plaque removal and 29% for approximal surfaces ( $p<0.001$ ). The WF group was more effective in removing plaque from the marginal, lingual, and facial regions; 33%, 39% and 24% respectively ( $p<0.001$ ) than SWR group.

**Conclusion:** In this study the water flosser and manual toothbrush group demonstrated significantly better plaque removal scores for all tooth surfaces than the manual brush and string floss group as measured by the RMNPI after a single use.

**Funding Source:** Water Pik, Inc.

## **Dental Hygienists' and Dentists' Clinical and Teledentistry Screening for Dental Caries in Urban Children**

\*Susan J. Daniel, RDH, MS, PhD  
(University of Tennessee Health Science Center)

**Problem Statement:** Early screening for dental caries in ages 2 to 5 is a critical first step in prevention and treatment. Teledentistry has been identified as an effective and efficient means of increasing access to care for screening, referral and treatment.

**Purpose:** The purpose of this study was to determine whether or not there was a difference in dental hygienists' and dentists' screening for dental caries with either clinical or teledentistry methods.

**Methods:** A convenience sample of 82 children 4 to 7 years of age was selected for the study. Two clinical examiners (i.e., dental hygienist and dentist) and 2 teledentistry examiners (i.e. dental hygienist and dentist) screened for dental caries and existing restorations. The clinical dentist's screenings were standard of care for the UTHSC, Urban Smiles mobile program. Each professional's findings were recorded on separate charts. Photographs of each child's teeth were obtained using the iPhone 4S, images were stored in an album by participant number, uploaded to the cloud for retrieval, checked for quality and uploaded to a course in Black Board accessible by the 2 teledentistry examiners. The teledentistry examiners screened images, and charted caries and restorations. Each child's 4 charts were converted to a decayed filled surfaces (DFS) score.

**Results:** A total of 78 children met inclusion criteria. Among the examiners, the teledentistry dentist had the highest DFS scores. Spearman's correlation

between the 2 clinical examiners was 0.99. Spearman's correlations in other group relationships with the clinical dentist were between 0.75 and 0.81. No difference was found between the teledentistry dental hygienist and the clinical dentist ( $p>0.10$ ).

Conclusions: Use of teledentistry for dental caries screening could increase early access to care for young children.

### **Constructing a Collaborative Model to Improve Access to Oral Health in Yamhill County**

\*Lori Killen Aus, RDHEP, MA

Purpose/Goals: To increase access to preventive oral health care in Yamhill County, Oregon by serving the needs of the uninsured and under-insured while reducing the number of Emergency Department (ED) visits related to oral infections and pain.

Significance: An Oral Health Survey conducted from November 2011 to January 2012 in Yamhill County revealed that only 34% of the convenience sample ( $n=59$ ) had a dental visit in the past year, citing cost as the number 1 barrier. Approximately 27% were without any form of dental insurance. Some had dental insurance that cover extractions only, offering no preventive services. Local hospital ED report significantly high numbers of individuals seeking urgent care for dental related problems. Approach/Key Features: Love INC (In the Name of Christ) is a national non-profit, faith based organization. A volunteer base of providers was established of Expanded Practice Dental Hygienists (EPDH), Dental Hygienists, Dental Assistants, Receptionists, Dentists and various specialists. A-dec, a local manufacturer of dental equipment, donated mobile dental units and Newberg church of Christ offered space to establish a dental clinic. Materials and supplies are acquired through donations from local dental offices and vendors. Equipment maintenance and repair is provided by Dental Service and Repair, Inc. and Newberg Providence Medical Center donated grant monies enabling the purchase of an autoclave. Two EPDH clinics are currently held each month with dental hygiene students from Mt. Hood Community College participating through volunteer clinic rotations. EPDHs provide oral cancer screenings, periodontal screenings, patient education, radiographs, preventive periodontal therapies, fluoride varnish and a restorative triage report that is sent to collaborating dental offices for free treatment to the Love INC client.

Evaluation: Although it is too soon to see reduc-

tions in ED cases, the clinic has treated 2 patients who were referred by physicians for quadrant periodontal therapy: 1 to prepare for cardiac surgery, and one as an un-controlled type 1 diabetic case ( $HbA1c=11$ ). Both received the treatment they could not afford with successful outcomes. The Love INC dental clinic represents a group of volunteer professionals demonstrating community concern and social responsibility. In 2012, 142 volunteer dental health professionals were able to provide 203 under-served individuals with dental care, an increase from 139 who received care in 2011. Since opening the clinic in 2010, Love INC has provided over \$153,000 in dental care to individuals in need. The Love INC dental clinic has demonstrated an innovative and effective model for access to public health care.

### **Effectiveness of Computer-Assisted Guidance for Tobacco Dependence in Dental Offices: A Randomized Clinical Trial**

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Introduction: Tobacco use is an etiologic factor for multiple diseases, including periodontal disease and oral cancers. Current evidence suggests dental providers ask about tobacco use but don't assist the patient in tobacco cessation. Approaches that involve screening for drug use, brief intervention and referral to treatment (SBIRT) provide a promising, practical solution. This project examines whether dentists and hygienists will assess interest in quitting, deliver a brief tobacco intervention and refer to a tobacco quitline more frequently when provided with computer assisted guidance compared to a control group.

**Methods:** This study is a blocked, group-randomized trial in which the HPDG dental clinics are the unit of randomization and patients nested within each randomized clinic represent the lowest level unit of observation. All clinics assess tobacco use including type and amount, dependency questions and interest in quitting. The intervention clinics included the intervention that provided suggested scripts for the provider to use based on dependency, prior attempts and interest in quitting. Primary outcomes were patient reports of the provider assessing interest in quitting, delivering a brief intervention and referring to a quitline. The outcome measure came from a random sample of smokers surveyed by phone 1 to 3 days after the dental appointment. Electronic data recorded by providers in the electronic dental record was also examined.

**Results:** Dental providers assessed interest in quitting (control 71% vs. intervention 89%,  $p=0.0001$ ), discussed specific strategies for quitting (control 25% vs. intervention 48%,  $p=0.003$ ) and referred the patient to a tobacco quitline (control 17% vs. intervention 39%,  $p=0.007$ ).

**Conclusion:** Computer tools embedded within electronic health records can effectively assist providers in the delivery of tobacco interventions. This tool was developed with user-centered design principles increasing the likelihood of adoption by providers. This approach holds promise for translating current evidence into daily clinical practice.

Funding provided by the National Institutes of Health: National Institute of Dental and Craniofacial Research.

### **Interprofessional Health Care for Disabled Populations**

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**Problem and Significance:** Disability impacts 22% of Americans this accounts for more than 54 million people. It has been estimated that more than 90% of children born with chronic or disabling conditions will live longer than 20 years, meaning that more and more children with developmental disabilities (DD) will need to transition from pediatric care to the adult health care system. To effectively meet the needs of this population health professionals must collaborate to improve patient outcomes. The purpose of the study was to detect disparities that

young adults with DD experience during health care transition (HCT) and identify potential methods to improve health outcomes through interprofessional collaboration.

**Methods:** A mixed study design was used to describe a convenience sample of 15 participants. Frequency and descriptive statistics were used to evaluate quantitative results. Qualitative epistemologies used Adult Learning Theory and Social Capital Theories to guide interprofessional network. Participants were young consenting adults with DD who completed a high school transition program. Interprofessional fellows from the UT Health Science Center San Antonio Medical School, College of Pharmacy and School of Health Professions gathered data in a single 45 minute face-to-face structured interview. Two person teams gathered, transcribed and categorized data in nodes using NiVo 9. Major themes identified were disparities and barriers to care. This study was approved by the Institutional Review Board, May 6, 2011, approval HSC2009033H.

**Results:** To improve utilization of services 9 participants expressed a need for increased collaborations to coordinate health services. Seven reported a need for a health advocate to navigate the health care system. Ten participants in this study lacked autonomy to make health decisions and lacked health literacy to use and apply health information.

**Conclusion:** As our dynamic healthcare system evolves educators need to incorporate interprofessional education during clinical training to improve health outcomes and maximize health service utilization. This project was funded through Southwest Border AHEC.

This project was funded through Southwest Border AHEC.

### **Outcomes Assessment of Expanded Practice Dental Hygienists in Oregon**

\*Amy E. Coplen, RDH, MS; Kathryn P. Bell, RDH, MS (Pacific University, Hillsboro, OR)

**Problem Statement:** Currently the dental hygiene practice model in Oregon includes the Expanded Practice Dental Hygienist (EPDH). This allows hygienists to provide care to populations that have limited access to care without the direct supervision of a dentist. The impact of EPDH practitioners is yet undocumented.

**Purpose:** The purpose of this study is to conduct

an outcomes assessment of EPDH practitioners in order to quantify the impact on the access to care crisis in Oregon.

**Methods:** A 16 question anonymous survey was developed and approved by the IRB at the Pacific University. The survey was delivered via mail to all EPDHs in Oregon (n=181) in November 2011. A second mailing was sent to non-respondents. Descriptive statistics and were used to analyze the data in SPSS. Variables analyzed include: demographic characteristics of the sample, geographic areas/settings where care is provided, and numbers of services provided.

**Results:** The response rate for the survey of EPDH holders was 39% (n=71). Approximately 40% (n=39) of the respondents were currently using their EPP to provide care to limited access patients with an additional 21% (n=15) planning to start their own expanded practice. The majority of practicing EPDHs provide care in residential care facilities and in school settings. Of the current practicing EPDHs, they practice independently 9.3 hours per week on average with independent practice comprising on average 22% of their total annual income. Of practicing EPDHs 72% report using portable equipment, 40% advertising for the services they provide and 41% express difficulty obtaining supplies. Of the EPDHs 47% reported never getting reimbursement from insurance companies for their services. Total services provided in an average month from all EPDHs were: 254 adult prophylaxis, 1,003 child prophylaxis, 106 adult fluorides, 901 child fluorides, 1,994 fluoride varnishes, 56 SRPs >4 teeth, 24 SRPs 1 to 3 teeth, 83 periodontal maintenance, 45 full mouth debridement, 3 FMX, 885 sealants, 19 soft relines, 1,744 oral hygiene instruction and 162 comprehensive periodontal evaluations.

**Conclusion:** EPDHs are making a difference by providing preventive care to underserved populations in Oregon. This is the first study to attempt to quantify the impact of EPDHs. Although several limited access areas have been approved by the Oregon Dental Board, to date only a few settings have been utilized. Additional ways to continue expanding the care provided by EPDH practitioners should be explored. Increasing the ability for EPDH practitioners to get reimbursed by insurance companies should also become a priority.

**Funding Source:** Faculty Development Grant, Pacific University.

## Preparing Baccalaureate Dental Hygiene Students for Expanded Practice Upon Graduation

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(Pacific University, Hillsboro, OR)

**Problem Statement:** Oregon is among several states allowing dental hygienists to provide services to limited access patients without the supervision of a dentist if they hold an expanded practice permit (EPP). Currently two pathways exist to obtain an EPP. The second pathway allows applicants with at least 500 hours of supervised practice in "limited access" settings to apply for an EPP. Pacific University dental hygiene students meet this requirement through clinical practice and external rotations during their course of study. Thus, students are able to apply for an EPP upon graduation. To date, perceived barriers to practicing using the EPP in Oregon have been unreported.

**Purpose:** This study surveys current EPP holders (EPDHs) on perceived barriers to providing service to limited access patients with the purpose of better educating students to begin EPP practice upon graduation.

**Methods:** A 16-item survey was developed, approved by Pacific University's IRB, and pilot tested with current EPDHs. A list of current EPDHs was obtained from the board of dentistry (n=186), and paper surveys were mailed in November 2011 to a sample of 181 recipients (all EPP holders except for pilot testers and 1 of the authors). Responses were collected from 71 (39%). Statistical analysis included descriptive statistics. The survey instrument addressed demographics, utilization of EPP, and perceived barriers to practicing in EPDH capacity.

**Results:** The most frequently identified barriers encountered by practicing EPDHs included insurance reimbursement (33%) and lack of knowledge or acceptance within the dental community (21%). The most frequently identified barriers that kept EPP holders from pursuing EPDH practice were: currently working in a different setting (44%), lack of business knowledge (31%), time (22%) and inability to make a living wage (22%).

**Conclusions:** Additional education may be indicated in dental hygiene programs to help students prepare for independent practice, specifically business management education. Practice management continuing education may also prove helpful for practitioners who are not recent graduates. Next steps: Investigators plan to continue monitoring EP-



DHs through surveys on a biannual basis as well as monitor Pacific University graduates' involvement with limited access populations. In addition, investigators plan to survey dental hygiene programs in other states that have independent practice laws to explore ways they prepare students to provide care in limited access settings.

Funding Source: Faculty Development Grant, Pacific University.

### **The Analysis of Recession Location, Frequency, and Contributing Factors Seen in a Clinical Setting**

\*Joseph W. Evans, DDS; Wendi J. Hulseley, RDH, MPH; Samuel Yerragudla (Western Kentucky University)

**Problem Statement:** Specific areas of the dentition are more prone to recession and could be associated with factors such as age, sex and treatment modalities. It is important for the dental team to understand which sites are more opportunistic to recession and what factors can contribute to this process.

**Purpose:** The purpose of this study was to determine which specific teeth and surfaces are more likely to exhibit recession in a generalized patient pool as well as the correlation of recession to age, gender and orthodontic history. Recent studies have not been conducted to see if changes in recession patterns are occurring.

**Methods:** The investigation utilized a sample size of 1,070 patient records through a retroactive collection process deriving information from the medical/dental history and periodontal charting section of each chart. Charts of all active patients seen over a 3 year period were used for the study with the mean age of the sample being 40.86 years of age. The following items were recorded during data collection: age, gender, individual sites affected by recession for each tooth and previous orthodontic history. Descriptive statistics were used to analyze the data. IRB approval was obtained from Western Kentucky University.

**Results:** Using the linear regression test, the result  $(-4.598 + 0.238 * \text{Age} + 0.991 * \text{gender})$  indicated that with the increase in age the chances of recession occurring is 0.238 times more. The mean sample test of 432 males against 638 females resulted in the means of recession of males 6.36 and females 5.31. Using this data with regression analysis, it was determined that males tend to have more

teeth with recession than females 0.991 of the time. The paired t-test sample indicated that recession on anterior teeth is significantly less than posterior teeth ( $t(1,069) = -15.896$ ,  $p\text{-value} < 0.0001$ ). Using the mean sample test, the recession on buccal surfaces (4.96 teeth) is significantly higher than the lingual surfaces (2.05 teeth). Recession was found on teeth 22.26 percent of the time when compared to all teeth present. The tooth and surface most frequently seen with recession is the buccal surface tooth #3 (1,070-781(non recessed teeth)=289 teeth) then the buccal surface tooth #29 (1,070-798=272) followed by the buccal surface tooth #21 (1,070-799=271). The linear regression method  $(6.705 - 3.262 * \text{orthodontic treatment})$  was used to deduce that patients undergoing orthodontic treatment have a less number of recessed teeth on average in comparison to those who have not undergone orthodontic treatment.

**Conclusions:** It is essential for the dental team to understand correlating factors associated with recession and to appreciate trends seen with these statistics for clinical communication and enhanced patient education.

### **A Survey of Dental Hygienists in the United Kingdom in 2011**

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In June 2009 Professor Jimmy Steele suggested how a high-quality and flexible dental workforce could help deliver NHS dental care for the future. However, irrespective of these plans for the future, there are questions with regard to the knowledge and skills that dental hygienists and dental hygienist/therapists who have been trained and qualified possess, whether they are using them and if not, why not. Against this background, the aims of this part of the survey were to establish which operative skills dental hygienists and dental hygienist/therapists had been trained in and which they were using.

**Method:** The survey was conducted using a piloted self-reported questionnaire which consisted of 100 questions with sections on: practice profile, as-

assessment, prevention and operative skills, demography, continuing professional education as well as space to write free comments on respondent's opinions as to why certain skills were not utilized. Statistical advice was that a 10% sample of all those GDC registered would be sufficient to achieve an error rate of 5% at 90% confidence level, if there was at least a 66% response rate. The sample was drawn by selecting every tenth name from the resulting list of 561 names. First mailing was sent out May 2011 with follow ups in June and July 2011. The resulting data were entered into an Excel spreadsheet and differences between the responses from dental hygienists and dental hygienist/therapists were statistically tested with the Chi-squared test.

**Results:** A total of 371 of the 561 in the sample (66.1%) had responded. The skill most frequently taught was supragingival scaling (95.1%) with the least being tooth whitening in surgery (25.9%). The most frequently used skill was supragingival scaling (96.2%) and the least were casting impressions (6.2%). Taught skills associated with restorative procedures such as ID blocks (65%), rubber dam(41%) and temporary fillings(81.4%) were more frequently used by dental hygienist/therapists than dental hygienists compared to taught skills of supragingival scaling (95.1%), subgingival debridement (94.9%) and subgingival placement of antibiotics (84.5%) where there was no difference in use by either group. Free comments referred to lack of time for appointments, lack of nurse support and lack of understanding by the dentist as a common theme as to why skills were not used.

**Conclusion:** The results of this study provide an insight into the level of training of, and frequency of use of operative skills of dental hygienists and dental hygienist/therapists in the UK in the summer of 2011.

Funding for this project was provided by P&G.

### **Survey of N.C. Cardiologists' Knowledge, Opinions and Practice Behaviors Regarding Periodontal Disease and Cardiovascular Disease**

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**Objective:** There has been an increase in awareness of the link between oral health and systemic health over the last several years. While questions exist about the relationship of oral disease to car-

diovascular conditions, no published study to date has addressed cardiologists' knowledge and opinions about this area of science.

**Purpose:** To examine North Carolina cardiologists' knowledge, opinions and practice behaviors regarding periodontal disease and cardiovascular disease.

**Methods:** A survey was developed, revised, pilot tested and mailed to 625 licensed, practicing cardiologists' in North Carolina. Three mailings have been conducted with the most recent mailing in January, 2013. Data were analyzed using descriptive statistics.

**Results:** The response rate was 19% (n=119). Respondents were mostly males (86%) and working in private group practice (48%) or academia (32%). A total of 63% were correct on the first sign of periodontal disease, however, only 18% choose the correct answers for the etiology of periodontal disease. Half of cardiologists' surveyed are unsure that treatment of PD can decrease a patient's risk for CVD. A total of 60% of respondents stated that medical students and dental students should be trained to work corroboratively. The majority are interested in learning more about the relationship between CVD and Periodontitis.

**Conclusion:** The majority of cardiologists surveyed are unclear about the etiology of periodontal disease and would like to have more information about the potential oral-systemic link regarding CVD. It is important for educators and administrators in higher education to examine the need for interprofessional education and collaboration between medicine and dentistry.

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### **Game Based Learning and a Oral Health Education Project**

\*Mário Rui Araújo, RDH, BSDH, M. Psych (P&G International Board Member)

Since good oral health is essential to good overall health as well as to the prevention of oral disease and unnecessary suffering, oral health education and promotion is a major concern of the Portuguese Oral Health. Mobilizing support for good oral health within the community is essential to have success in improving oral health outcomes. It is often useful to develop community oral health strategies, adding to the normal approaches and new ways on interacting with different target populations to obtain this support.

Statler et al (2002) say that play is a mode of activity that involves imaging new forms of individual and collective identity. Within the special frame of Game Based Learning (GBL) people develop emotionally, socially and cognitively, building skills and establishing ethical principles to guide actions. Games, with no relation to health care can also be employed in order to positively influence patient's treatment compliance (Sharar, 2007). This project aims at identifying the effects of different games on motivation and oral health behavioral changes in view of developing a (currently not available) strategic model to use the potential impact of GBL (e.g. the integration of games in oral health prevention programs and intervention). The project will be directed towards the identification of optimal game-based characteristics for different populations, as a way to acquire oral health habits, motivations and increase perceptions. These effects will be studied through their relationship with the socio-cognitive health behavior for the model appearing Health Action Process Approach (Schwarzer,1992) and also by the change in the oral health behavior using the Hiroshima University Dental Behavioral Inventory (HUDBI) (Portuguese version) evaluated before and after the interventions. Drawing upon the HAPA, the purpose of the present project will be to gain insights on the social cognitive determinants of oral health behaviors. Different kind of materials and strategies will be used: Lego pieces, mobile phones, painting skills, music and VJ's interaction. We will be working with a multiprofessional team, to create a network of skills: dental hygienists, artists, musicians, psychologists, dentists, nurses and so on. In sum, with this project, we want to contribute to the current discussion on the affordances of games-based learning by looking for evidence on the claimed effects of GBL in the pre-intentional motivational phase, given that action self-efficacy is recognized as the major determinant of intention. We expected that a successful relation with the game positively influence players' experienced self-efficacy regarding oral health self-management.

### **General Dentists' Recommendations for Third Molar Removal: A Practice-Based Study**

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Objectives: Recommendations for third molar management are not universal. In the U.S., little is known about general dentists' decision making process for third molar recommendations. This study

investigated reasons given by general dentists for third molar removal or retention and assessed patient adherence to dentists' recommendations. Patient and dentist characteristics associated with dentists' recommendations and patient compliance were investigated.

Methods: Northwest PRECEDENT, a dental practice-based research network, trained 50 general dental practices for participation in this longitudinal study. Baseline data on the reasons for general dentists to recommend third molar removal or retention was collected on 798 patients 16 to 22 years old during a routine examination. Patients' reasons to remove or retain third molars were assessed over 2 years by a periodic survey. Generalized estimating equations logistic regression was used to assess the association of dentist and patient characteristics with both dentist recommendations and patient compliance with third molar removal or retention.

Results: Overall, 59% of all third molars were recommended for removal (1,683 third molars from 469 participants). The reasons most commonly given were to prevent future problems (79%), poor orientation/tooth unlikely to erupt (57%), and need to remove other third molars in the same patient (25%). Harmful conditions like pericoronitis, periodontal concerns, caries, or existing pathology were only reasons in 4%, 4%, 4% and 1%, respectively. The most common reasons for recommending retention of third molars were that dentists considered it too early to decide (73%), tooth had a favorable eruption path (39%), and sufficient space for eruption (26%). Among the participants recommended for third molar retention, 84% complied with this recommendation during follow-up, while 55% complied with dentists' recommendation for removal. Patients who had had orthodontic treatment, those with TMJD pain, and from solo practice dentists were more likely to comply with the dentist recommendation to remove third molars than patients without those characteristics. Having a female dentist was the only factor associated with patients' compliance to retain third molars.

Conclusions: General dentists frequently recommended removal of third molars. The main reasons were to prevent future problems, not due to symptoms or pathology. Compliance with dentists' recommendations for third molars was fair for removal and high for retention.

Funding for this project was through NIDCR grants DE016750 and DE016752.

## **Systematic Review of the Association Between Chronic Obstructive Pulmonary Disease or Pneumonia and Periodontal Disease (1997-2012)**

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**Objective:** The purpose of this systematic review was to answer the focused research question: Is there an association between periodontal disease and pneumonia or chronic obstructive pulmonary disease (COPD)?

**Methods:** Databases and keywords searched included: Medline, PubMed, CINAHL and the Cochrane Database of Systematic Reviews on combinations of pneumonia, lung disease, obstructive, OR COPD, and periodontal disease. The literature searches were limited to 1997 (January) to 2012 (December), humans and in English. Inclusion criteria were RCTs/clinical trials, systematic reviews/meta-analysis, and longitudinal, cohort, case control, multicenter and epidemiological studies for links between COPD OR pneumonia and periodontal disease.

**Results and Discussion:** Overall, 126 articles from databases and 12 from reference lists of articles obtained were scrutinized for predetermined inclusion and exclusion criteria. Of these, 24 and 3 (n=27) respectively met the criteria, were analyzed and scored independently by each reviewer to extract evidence. A total of 4 systematic reviews provided fair evidence (Level I – Grade B) of an association between periodontal disease and respiratory diseases (i.e., pneumonia or COPD), 1 additional systematic review (Level I – Grade B) concluded that periodontal disease is a significant and independent risk factor of COPD, 7 studies (counting one that also studied COPD) provided fair evidence (Level II-2 – Grade B) of an association between pneumonia and periodontal disease, including 4 well-designed and controlled studies, 3 studies with research design limitations that affected the strength of the evidence, and 2 studies (counting one that also studied COPD) at lower levels in quality of research design (Level II-3 – Grade C) indicated conflicting results regarding the association of pneumonia and periodontal disease. Ten additional well-designed longitudinal or case control studies (Level II-2 – Grade B) provided fair evidence of an association between periodontal disease and COPD. Three additional studies at lower levels in quality of research design (Level II-3) supported the association between periodontal disease and COPD.

**Conclusion:** A causal association between respira-

tory diseases (pneumonia or COPD) and periodontal diseases remains conjectural. The conclusions reached based on this systematic review indicate there is significant evidence supporting an association of pneumonia and periodontal disease concurring with previous reviews and an association between COPD and periodontal disease.

ADHA National Dental Hygiene Research Agenda: D.3 (D. Clinical Dental Hygiene Care: 3. Investigate the links between oral and systemic health.).

## **Short Term Gingival Health Improvement with Essential Oil Mouthrinse**

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**Problem Statement:** The antiplaque and anti-gingivitis benefit of adding an antimicrobial rinse to tooth brushing has been clinically proven in numerous long term studies. There is very little data for the short term efficacy used in conjunction with mechanical oral hygiene.

**Purpose:** The objective of this SITE-WISE ANALYSIS™ was to evaluate short term efficacy in reducing gingivitis by determining the mean percentage of healthy gingival sites after 4 weeks use of an antimicrobial rinse when added to mechanical oral hygiene.

**Methods:** Subjects with mild to moderate gingivitis were selected to participate in the studies. No initial prophylaxis was provided. Subjects were randomly assigned to treatment groups and were instructed to practice their assigned regimen twice daily. After 4 weeks the Modified Gingival Index (MGI) was determined as at baseline. The MGI was split into 2 categories: scores 0 or 1 (healthy sites) and  $\geq 2$  (unhealthy sites). The mean percentage of healthy sites was plotted by treatment group over time. Data reflecting subjects that completed 4 weeks of treatment from 4 studies were evaluated. The treatment groups evaluated were Brushing (B) or Brushing and flossing (BF) and Brushing and Rinsing (R) or Brushing, flossing and rinsing (BFR) with an essential oil containing mouthrinse. The percentages of healthy sites and unhealthy sites were used in the analysis. No imputations were made for missing data. Descriptive summaries including number of subjects, mean, standard deviation, standard error, median and range are presented. The p-values were calculated using Wilcoxon rank sum tests with a 2-sided 0.05 significance level. The 95% confi-

dence interval and location shift parameter were calculated by using Hodges-Lehmann approach.

Results: Across 4 studies, <3.5% mean percentage healthy sites were found at baseline. In studies designed up to 4 weeks, the 4 week mean percentage healthy sites ranged from 0.8 to 16.1 in the B group and 7.4 to 29.3 in the R group. In the study designed up to 6 months, the 4 week mean percentage healthy sites was 2.1 in the BF group and 4.2 in the BFR group.

Conclusion: The results of this analysis demonstrate that adding LISTERINE® Antiseptic to mechanical oral hygiene improves gingival health in the short term (4 weeks).

Funding for these studies was provided by Johnson & Johnson Consumer and Personal Products Worldwide Division of Johnson & Johnson Consumer Companies, Inc.

### **The National Dental Practice-Based Research Network**

Kimberly S. Johnson, RDH, MDH  
(National Dental Practice-Based Research Network)

Program purpose: ADHA's goal is to broaden dental hygienists' involvement in research. The National Dental Practice-Based Research Network (DPBRN) is an investigative union of practicing dental professionals whose purpose is to provide practitioners with an opportunity to propose or participate in research studies that address day-to-day issues in oral health care. The National PBRN's overall goal is to perform science that is immediately applicable to everyday clinical practice, to foster its movement into everyday clinical practice, and thereby help improve the health of the nation. The National Dental PBRN is an ideal conduit to meet the ADHA's research goals.

Significance of the program: The National DPBRN is committed to maximizing the practicality of conducting research in daily practice across geographically dispersed regions. The studies, to be conducted in participating dental offices with consenting patients, help to expand the profession's evidence base and further refine care. Dental hygienists can now enroll and participate in the network with the prospect of increasing the dental hygiene body of knowledge.

Program's approach: Practitioners are engaged at every step of the research process, generating study

ideas, developing study design, designing data collection forms, feasibility testing, pilot testing, data collection, data analysis, presentations (local, regional and national), and manuscript preparation. Ideas for studies must be of broad interest to practitioners, sufficiently impactful on routine clinical practice and the oral health of the public, and are feasibly conducted in daily clinical practice.

The evaluation plan: As of February 28, 2013, a total of 2,458 persons have enrolled including 484 dental hygienists. Enrollment continues to expand and includes broad national representation of practitioners. Study ideas are being generated, reviewed and prioritized.

Funding for this project through NIDCR.

### **The Dental and Mental Health Connection: Integrating New Dental Workforce Strategies in Minnesota**

Jennifer S. Berge, RDH, REF, MSADT

Mental illnesses are common but often unrecognized and misunderstood. Evidence suggests an association between poor oral health and mental illness. It is estimated that 61% of individuals with severe mental illness have suboptimal oral health. Many factors contribute including lack of awareness of the importance of dental health amongst those living with mental illness, barriers to accessing dental care, the dental practitioner's knowledge of the mental health problem and dental implications and oral side effects of medications used to treat the condition.

According to the National Alliance of Mental Illness (NAMI) organization about 6% of the population or 1 in 17 Americans suffer from a mental illness. It is estimated that mental illness affects 1 in 5 families in the U.S. It usually strikes individuals around adolescence and young adulthood, however, the young and old are considered especially vulnerable.

Oral health, physical health and mental health are linked together. Dental practitioners need to be informed of how mental illness impacts the individual's oral health and be able to manage dental implications caused from the illness. It is important for dental practitioners to integrate with mental health specialists and primary physicians to improve patient outcomes in this special needs population group.

Opportunities to incorporate interdisciplinary

teams are emerging in the health care arena. Mobile dental equipment is being utilized in a community mental health center in Rochester, Minn. Through collaboration, dental professionals, a pharmacist and the mental health specialist team work together in one building, providing dental services and mental health care to those underserved. Dental care has long been an issue for the minority, low-income and homeless populations served by the mental health center. Pairing the 2 providers together has helped hundreds of individuals and families receive dental care.

With the intention to serve those with unmet dental needs, Minnesota recently created a new dental professional known as the advanced dental therapist that is dual licensed whose scope includes that of both a dental hygienist and dental therapist.

Expanding the dental workforce and implementing the services of advanced dental therapists in a non-traditional work setting such as a community mental health center is one way of improving dental access for those that are experiencing a higher prevalence of dental disease.

### **Faculty Practice Programs in Dental Hygiene Educational Settings**

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(Idaho State University)

**Problem Statement:** As dental hygiene programs continue to experience reductions in state funding and increasing educational costs, coupled with the ongoing need to provide professional development opportunities and increase clinical research, faculty practice programs may serve as one strategy to address these factors.

**Purpose:** The purpose of this study was to identify characteristics of faculty practice programs housed in U.S. dental hygiene educational institutions to assess operational parameters, fiscal characteristics, benefits and barriers. This study supports the American Dental Hygienists' Association National Dental Hygiene Research Agenda related to access to care and clinical dental hygiene care.

**Methods:** In 2012, a self-designed electronic questionnaire comprised of 31 closed-ended and open-ended items, was sent to 334 dental hygiene education program directors using an online survey engine, Survey Monkey®. The questionnaire contained 2 primary sections. Section I included demographic program items and questions assessing

clinic operations, patient care services and faculty involvement. Section II included fiscal management items. Open-ended questions were available for respondents to express any additional information they believed important. Results were reported using descriptive statistics only.

**Results:** A 53% (n=161) response rate was obtained after 3 mailings. Results revealed that 15.3% (n=25) of the programs either currently had an operating faculty practice (n=21) or previously had a faculty practice within the past 5 years (n=4). The majority of faculty practices were housed on campus in separate clinical facilities for 11 or more years, were funded by the state, operated 5 days per week and provided care primarily to the geriatric population. Maintaining clinical competency for faculty was the primary reason for the faculty practice - faculty participation was optional. The primary barrier of the faculty practice program was the unwillingness of faculty to participate in the program.

**Conclusions:** Faculty practice programs were perceived as a positive experience by program directors. Despite faculty unwillingness to participate, all directors responded they would create a faculty practice again, if given another opportunity to do so. Findings of this study are consistent with prior studies finding limited numbers of dental hygiene programs have a faculty practice, and the main advantage was having opportunities to maintain clinical skills and competency of clinical faculty. This study may provide health care programs with preliminary information when developing new faculty practice programs in their institutional settings.

### **Interprofessional Collaboration to Assess and Care for the Oral Health Needs of Homeless**

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(Metropolitan State University)

**Problem Statement:** Low income Minnesotans, including the homeless, face many barriers to accessing oral health care services.

**Purpose:** The purpose of this study was to assess the perceived oral health needs of clients attending a wellness center for the homeless and use the information to develop a plan to treat those needs.

**Methods:** Clients seeking blood pressure screenings and foot care from nursing students at a wellness center were asked to complete a short written survey regarding their oral health. The survey in-

cluded 5 questions regarding the oral health of the client and his or her family.

Results: Survey information will continue to be collected through the end of April, 2013. Data collected thus far indicates that 47% of those surveyed have not had a dental visit in over a year and 50% had a concern about their dental health.

Conclusions: Homeless Minnesotans have difficulty accessing oral health care services. The survey results collected by Metropolitan State University School of Nursing students prompted a pilot project in collaboration with and the Advanced Dental Therapy Program to deliver prevention, education and other services for homeless individuals.

### **HbA1c Test for Screening Undiagnosed Prediabetes and Type 2 Diabetes in Patients with Chronic Periodontitis During Periodontal Examinations**

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Problem Statement: Bi-directional associations between diabetes and periodontitis suggest using screening protocols in oral health care settings. Although chairside glycosylated hemoglobin (HbA1c) screenings show promise, it is unknown whether using these tests is feasible for identifying undiagnosed diabetes.

Purpose: To assess diabetes screening for patients with periodontitis using validated diabetes risk questionnaires, periodontal findings and chairside HbA1c analyzers during periodontal examinations.

Methods: A correlation research design was employed and approved by Idaho State University's HSC. A purposive sample (n=50) of volunteers was recruited from a periodontal practice. Participants

diagnosed with periodontitis and never diagnosed with diabetes yet reporting  $\geq 1$  diabetes risk factors on a diabetes risk test were examined for periodontal parameters and administered an HbA1c test. Spearman rank correlations assessed relationships between HbA1c values and diabetes risk scores. Pearson's correlations tested relationships between HbA1c values and numbers of missing teeth, percentage of PD $\geq 5$  mm, and percentage of teeth with bleeding on probing (BOP). Independent samples t-tests compared new and maintenance patients' HbA1c values and periodontal measures. Statistical significance was set at 0.05. A 2 week follow-up for participants with elevated HbA1c assessed whether they had contacted their primary health care provider. Cost and time for HbA1c testing were assessed.

Results: A total of 32% (n=16) of participants presented HbA1c values indicating pre-diabetes, 1 presented an HbA1c value indicating diabetes, totaling 34% (n=17). One significant relationship (r=0.269, p=0.030) was found between HbA1c values and percentages of teeth with BOP. No relationships existed between HbA1c values and diabetes risk scores (r=0.060, p=0.340), numbers of missing teeth (r=0.127, p=0.190) or percentage of PD (r=0.124, p=0.196); Further analysis using subgroups of new (n=25) and maintenance patients (n=25) found a significant relationship (r=0.365, p=0.037) between new patients' HbA1c values and percentage of teeth with BOP, yet no significant relationships (r=-0.040, p=-0.426) in maintenance patients. There was a significant difference (t=2.697, df=48, p=0.010) in percent BOP between new and maintenance patients. Of those who presented elevated HbA1c values, 53% (n=9) contacted their primary health care provider within 2 weeks. Cost of each HbA1c was \$9 USD. Mean HbA1c screening time, including related patient education was 19 minutes (SD=6.2).

Conclusions: HbA1c screenings for patients presenting  $\geq 6$  teeth with BOP and diabetes risk factors are available and effective for detecting undiagnosed diabetes. Oral health care providers have opportunities to provide effective diabetes screenings, however, time and costs may be a barrier.