

Abstracts for Oral Free Papers

Self-Perception of Transformational Leadership Practices of American Dental Hygiene Program Administrators

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Problem Statement: Changes in oral health care delivery have resulted in the need of new workforce models leading to changes in the roles and responsibilities of the dental hygienist thus necessitating changes in the educational curriculum. Educational programs are shaped by program administrators. **Purpose:** The purpose of this study was to investigate self-perceived transformational leadership practices of American dental hygiene program administrators. **Methods:** Quantitative, descriptive, survey research design was employed. Quantitative data were collected using the 30 statement Leadership Practice Inventory-Self developed by Kouzes and Posner and an 8 question researcher designed survey collecting demographic data. Linear regressions were employed testing the hypothesis. Permission for use of the LPI-Self was obtained from Kouzes and Posner International and IRB approval from the UB IRB. The invited sample consisted of 304 dental hygiene program administrators. The responding sample was 177 (58.2%) and the data generating sample was 176 (57.8%). **Results:** A consistent factor for all 5 Practices of Exemplary Leadership was the standard deviations for the dental hygiene program administrator means, were less, although still high, when compared to those of middle management, education, and medical/healthcare. Dental hygiene program administrators had the highest means in all 5 Practices of Exemplary Leadership except "Inspire a Shared Vision" and middle management had the lowest means for all the leadership descriptors. The number of years in dental hygiene academia showed a significance level of 0.048 for Enable Others to Act making it statistically significant. **Conclusions:** Dental hygiene program administrators poses the transformational leadership characteristics necessary for development of new workforce models that will meet the demand for and changes in oral health-care delivery.

Legislative Advocacy Education in Dental Hygiene

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Purpose: The intent of this investigation was to determine the effect of a legislative advocacy project on knowledge, values, and actions of undergraduate and graduate dental hygiene students. **Methods:** Approval was granted by the IRB at Idaho State University. A quasi-experimental design was employed with a convenience sample of 21 undergraduate and 17 graduate students. A data collection instrument was designed by the researchers based on several instruments in the nursing literature and content of the advocacy project. The legislative advocacy instrument was developed with three subscales (knowledge, values and actions) and a section on barriers to future legislative advocacy actions scored using 7 point Likert scales. Content validity of the instrument was established based on a literature review and use of a content validity index with a small number of current and previously enrolled students. The survey was administered using an online survey tool. Students scored their pre-project and post-project status on the three subscales. **Results:** Cronbach's alpha revealed internal consistency of the knowledge, values and actions subscales at 0.95 or higher. Pre-project scores and post-project scores were analyzed by Mann Whitney U test. Knowledge, values, and actions statements were statistically significant with Bonferonni corrected p levels at 0.001 to 0.003; however, actions were rated lower than the other 2 subscales. The 4 barriers for future advocacy actions rated the highest were lack of time, lack of comfort testifying before legislators, lack of comfort speaking personally with legislators and lack of priority for involvement with advocacy endeavors. **Conclusions:** Implementation of a legislative advocacy project in an undergraduate and graduate dental hygiene program can positively influence the development of advocacy knowledge, values and actions. Educators and mentors in the professional association need to provide experiences to assist students and practitioners in overcoming barriers to becoming involved with legislative advocacy activities.

Professional Role Changes of Graduates from an Online Bachelor Degree Completion Program Based in Dental Hygiene

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Health Profession Students' Perceptions of Travel Service Learning on Their Development as Culturally Competent Interprofessional Health Care Providers

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Problem Statement: The overwhelming majority of dental hygienists practice as clinicians in private dental offices and have associate degrees. In order to pursue alternative career roles, a baccalaureate degree may be required. Online degree completion programs offer a mechanism to obtain this degree in preparation for these roles. **Purpose:** The purpose of this research is twofold: 1) to determine if graduates from online degree completion programs based in dental hygiene pursue different professional roles and 2) to assess if there is a relationship between completing an internship and experiencing a role change. **Methods:** Two confidential electronic surveys with open and close-ended questions were used to obtain data from the sample populations: 93 online bachelor degree completion graduates and 17 online program directors. Descriptive statistics were employed, chi-square and Kolmogorov-Smirnov tests compared differences, and Spearman's rho demonstrated relationships between variables. **Results:** There was a statistically significant difference ($p=0.000$) between the professional role of a graduate before and after an online degree completion program. Of the 93 graduates, 28% ($n=26$) changed roles and 71% ($n=66$) completed an internship. Regarding role changes, 26% ($n=7$) of graduates not completing an internship changed roles, 74% ($n=20$) did not, 29% ($n=19$) of graduates completing an internship changed roles and 71% ($n=47$) did not. No statistically significant relationship ($p=0.451$) existed between completing an internship and a role change. When graduates who completed an internship ($n=66$) were asked if the objective of the internship was working or learning, responses revealed: 90% ($n=18$) of graduates who changed roles ($n=20$) stated learning and 65% ($n=30$) of graduates who did not change roles ($n=46$) stated learning. **Conclusion:** A majority of graduates from online degree completion programs based in dental hygiene did not change roles. Internships structured to focus on student learning resulted in a higher frequency of professional role change by these graduates.

Problem: Literature lacks evidence about the effectiveness of travel service learning in preparing students to provide health care in culturally diverse interprofessional environment. **Purpose:** The purpose of this study is to understand health profession students' perception of travel service learning on their growth as culturally competent interprofessional health care providers. **Methods:** This qualitative study utilized semi-structured open-ended interviews to explore the perceptions of health profession students with regard to the provision of culturally competent care to underserved populations. Nine students from two health professions institutions who travelled to Morocco to provide dental hygiene and nursing services were interviewed for this study. The interviews recorded were transcribed verbatim to generate inductive and deductive codes that will constitute the major themes of the data analysis. Thereafter NVIVO 8 will be utilized to determine the frequency of applied codes rapidly. The authors will compare the codes and themes to establish interpretive validity. Codes and themes will be initially determined independently by co-authors and applied to the data thereafter. Furthermore, the authors will compare the applied codes to establish agreement about reliability. **Results:** Initial data analysis reveals that students gained confidence in providing interprofessional care to the underserved populations in Morocco. The initial education and training at the Forsyth School of Dental Hygiene clinic enabled nursing students to provide fluoride varnish and oral hygiene instructions to those who lacked access to care. Their interactions with ethnically diverse patients and varied health professionals in international settings increased their appreciation for diversity and promoted cultural competence. **Conclusion:** The findings of this study will reveal that travel service learning experience can prepare students to provide effective interprofessional care to culturally diverse and underserved populations.

For Better or Worse Facebook Weds Professional and Personal Identities: A Study of Facebook Use Among Early Career Health Professionals

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Problem Statement: Early career health professionals are frequent users of Facebook, which promotes the blending of personal and professional identities. It is important that dental health care professionals understand the impact this has on their own image and that of their profession. **Purpose:** To explore the nature and content of information publicly posted to Facebook by early career health professionals. **Methods:** This was a cross-sectional descriptive study involving 494 early career veterinarians registered with the College of Veterinarians of Ontario. We searched for their publicly available Facebook profiles and evaluated the frequency of various pieces of information veterinarians posted, including photos, personal information, and education information. Profiles were categorized as having low, medium or high exposure of publicly available information. Using content analysis, high exposure profiles were further analyzed to assess for content that may pose risks to an individual's and the profession's public image. **Results:** Facebook profiles for 352 (71.2%) early career veterinarians were found. One quarter (24.7%) were categorized as low exposure, 54% as medium exposure and 21.3% as high exposure profiles. Content analysis revealed publicly posted breaches of client confidentiality, evidence of substance abuse, and demeaning comments toward others. **Conclusions:** A significant number of profiles were found with content that could create risks to professional boundaries, including client confidentiality. This is especially important where trust is vital to client care. Dental health professionals should be educated in the appropriate use of social media such that risks associated with blurring of private and professional identities are mitigated.

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Integrating Service-Learning into the Curriculum

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Purpose/Goals: Dentistry in the Community is a service-learning module with the purpose of developing culturally competent public health leaders and community responsive dentists. The goal is to

teach public health concepts that prepare students to be public health clinicians who are informed about community needs and serve in underserved areas. **Significance:** Today's dental and dental hygiene schools face the challenge of modifying curricula to graduate culturally competent clinicians who will address oral health needs in America's communities. In light of the current status of oral health in America, modern dental professionals need to be clinically competent, but also informed about community health and act with a sense of social responsibility. **Approach/Key Features:** Dentistry in the Community is a module that spans the second, third and fourth years of dental education at the Arizona School of Dentistry and Oral Health. The module is structured to educate students about planning, implementing and evaluating community projects, building community partnerships, assessing community needs, and understanding diverse cultures. The module includes 48 hours of lecture and group activities, participation in community oral health activities, and leadership in a community oral health project. The project and participation activities include non-clinical and clinical activities with over 60 not-for-profit and social service community partners. **Evaluation:** Assessment of project and participation experiences involves self-evaluation, reflection and project application assignments. Further evaluation is completed with a survey to determine whether the module develops community responsive dentists. In 2010, of the 54 senior dental student respondents, 91% strongly agree or agree the module increased their ability to apply principles of public health, 81% strongly agree or agree the module increased their desire to improve community health and 83% strongly agree or agree the module influenced their ability to serve as a resource in their community for dental public health issues.

Development of an Introductory Evidence-Based Decision Making Educational Module for Dental Hygiene Students

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Purpose/Goals: The goal of this project was to develop and implement an introductory Evidence-Based Decision Making (EBDM) educational module for first year dental hygiene students at Oakland Community College (OCC). The content of the program focused on developing the fundamental skills of EBDM. **Significance:** For evidence-based practice to become the standard of care within the dental hygiene profession, it must be present in educa-

tional programs. Placing evidence-based principles into dental hygiene curricula will prepare graduates to become self-directed problem solvers, facilitate patient-centered high quality oral health care decisions and develop skills necessary for graduates to become lifelong learners. **Approach/Key Features:** The program consisted of 3 phases: an assessment, an intervention and evaluation. A prospective study was developed to gather data on the knowledge of Evidence-Based Practice, attitudes and skills in critical appraisal and literature searching of first year dental hygiene students. Specifically, a pre-test/post-test non-equivalent study design was utilized. The second phase involved the development and presentation of 3 educational sessions. The introductory EBDM lesson content was designed to introduce EBDM principles, highlight the 5 steps and skills necessary to perform EBDM and increase knowledge and understanding of EBDM. There were 5 learning objectives developed and evaluated. The learning activities associated with each lesson plan facilitated the development of critical thinking and problem solving skills. **Evaluation:** The third and final step was the evaluation phase. The evaluation phase has an essential role within both the scientific method and EBDM principles. The post-test results provided comprehensive assessment to the growth in student's knowledge and understanding of the EBDM process along with evaluation of learning objectives. Survey results illustrate that placing an introductory EBDM educational module improved the knowledge and understanding of EBDM principles. Further studies are needed, however, to determine if this knowledge is retained long-term.

Pilot Study of Oncogenic HPVS in Oral Lavage Samples From HIV Positive Senegal Women

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Problem Statement: Although HPV infection plays an etiological role in a subset of oral cancer, little is known about transmission and the natural history of oral HPV infection in individuals without cancer, nor the optimal methods to detect oncogenic HPVs. **Purpose:** In this pilot study, we determined whether HPV 16 and 18 can be detected in 19 oral lavage samples collected from 15 HIV positive women in Senegal using a real time PCR based assay. **Methods:** All patients attended an outpatient infectious disease clinic in Dakar and were part of a longitudinal study assessing HPV, HIV and the development of high-grade cervical lesions. Of these 15 women, 11 (73%) were positive for HIV-1, 4 (27%)

were positive for HIV-2. Of matched cervical swab samples, 8 were positive for HPV 16, 1 was positive for HPV 18 and 10 were negative for both HPV 16 and 18. Of the 15 women there were 4 patients that contributed 2 samples each. The presence of HPV 16 and 18 in oral lavage samples was determined using quantitative Taqman real time PCR assays. All samples were sufficient for HPV detection. **Results:** We found that none of 19 oral lavage samples was positive for HPV 16 and only one oral lavage sample was positive for HPV 18. The corresponding cervical swab sample from the same patient was positive for HPV, though it was not positive for HPV 16 or 18. The oral HPV-18 positive patient was HIV-1 positive with a low viral load (541). **Conclusions:** We concluded that oncogenic HPVs can be detected among cancer-free individuals using quantitative Taqman assays, HPVs though the frequency is low even among HIV positive individuals.

Describe Facilitators and Barriers To and Parent Satisfaction with Co-Location of Registered Dental Hygienists into Colorado Medical Practices

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Problem Statement: Five Dental Hygienists (RDHs) were Co-located into 5 Colorado medical practices to provide preventive dental care (PDC) to low-income, young children. Little is known about how hygienists, staff and parents view this approach. **Purpose:** The purpose was to investigate the factors that both facilitate and create barriers to co-location and parent satisfaction with co-location of RDHs in medical practices. **Methods:** Qualitative, semi-structured key informant interviews (KII) were conducted with co-location participants identified as those who had knowledge of system changes at participating practices. The 20 to 40 minute telephone interviews were recorded, transcribed, reviewed for recurring themes and thematically categorized using Atlas.ti. Parent/caregiver attitudes were measured with a 26 questionnaire, English/Spanish, hand written survey constructed using the Health Belief Model, piloted and administered 12 months after parent's first RDH encounter. **Results:** Co-located PDC was provided to 2071 children. KII was conducted with 3 medical directors, 4 medical providers, 5 RDHs and 3 office managers. KII responses revealed factors that facilitate co-location, including recognition of unmet dental needs of population served, desire to build comprehensive medical home and funding support. Revealed barriers included finding office space for RDHs, finding time

for RDHs to occupy the space, obtaining buy-in from medical staff and establishing effective referral systems. Forty-nine parents/caregivers completed survey. They reported they really like (71%) and like (24%) having their child see the RDH in the office, would recommend the co-located office to others because of the co-located services (86%) and plan on taking their child to the co-located RDH in the future (86%). **Conclusions:** Co-locating RDHs into medical practices is a novel way to improve access to PDC for underserved children and expands the concept of medical home. Identified barriers must be overcome to facilitate future co-location projects. Surveyed parents favor co-location.

Funding for this project was provided in part by Delta Dental of Colorado Foundation.

An Intervention to Improve Oral Health of Residents of Long Term Care Facilities

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Problem Statement: Residents of LTC/NH institutions are among society's most dentally-neglected members and need effective oral health care. Today's dental workforce model cannot meet this demand. Alternative models of providing oral care for underserved populations are necessary. **Purpose:** The purpose of this study was to examine the impact of onsite support by a dental hygiene champion on oral health status and quality of life of Long Term Care (LTC)/Nursing Home (NH) residents. **Methods:** A quasi-experimental, pre-test/post-test non-equivalent group controlled pilot study was designed to measure changes in oral health status and quality of life in residents following oral health interventions with Certified Nursing Assistants (CNAs) providing residents with activities of daily living. Three facilities served as study sites. A dental hygiene champion provided educational and onsite support to caregivers in Facility A for 2 months. Facility B received education alone. Facility C served as the control. The Oral Health Assessment Tool and the Geriatric Oral Health Assessment Index were used to measure oral health status and self-perceived quality of life pre- and post-intervention. **Results:** Provision of CNA training and onsite support resulted in statistically significant improvements for tongue ($p = 0.2$) and pain evaluations ($p = 0.04$). While not statistically significant, Facility A demonstrated greater improvement trends in gums and tissue status ($p = 0.10$) and in self-perceived quality of life ($p = 0.10$) than Facility C. **Conclusions:** Findings sug-

gest a dental hygiene champion providing support onsite in LTC/NH facilities has potential to positively impact oral health status and quality of life in LTC/NH residents.

ElderSMILES – Integrating Dental Hygiene Students into Long-Term Care Settings

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Purpose/Goals: The need exists for improved oral health (OH) care for residents of long-term care (LTC) facilities. The purpose of this new program is to improve mouthcare programs with LTC facilities, thus improving residents' oral health. A further purpose is socialization of dental hygiene students into a LTC environment, which may influence their employment choices after graduation.

Significance: Studies have demonstrated the need for improved OH for LTC residents, yet oral health professionals rarely form part of the staff in LTC, and facility staff are under-prepared in provision of daily mouthcare. **Approach/Key Features:** Eight dental hygiene students and two instructors visited two LTC facilities one full day per week for 13 weeks. Students worked in pairs to provide OH assessments and client-focused mouthcare instruction to the resident and health care aide (where possible). Essential components included collecting OH indicators, the ability to incorporate mouthcare into daily schedules, and identification of barriers that may impede OH care. A modified version of Chalmers' Oral Health Assessment Tool (OHAT) was used to collect data on health of the lips, tongue, gingival tissues, saliva, dentition or dentures, oral cleanliness, and presence of pain. Neither facility had an existing specific mouthcare program. **Evaluation:** Four qualitative evaluation components are underway: focus groups with students examining their experiences, individual interviews with Health Care Aides, registered nurses and nurse educators regarding their perceptions of the program and interviews with LTC administrators regarding the value and fit of the program. Themes emerging from the data include: communication challenges between students and staff, and students and residents, uncertainty about follow-up to student recommendations, barriers to provision of daily mouthcare, uneasiness of students in the LTC environment and impacts of dental hygiene repeat visits to residents.

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Patient Education Techniques Utilized By Practicing Dental Hygienists

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Problem: There is a lack of publications that report current techniques used by dental hygienists concerning patient education on oral health promotion or identifies hygienists' perception of the importance of patient education. This information can provide insight to all dental hygienists on how and what to include during patient education. **Purpose:** The purpose of this study was to investigate techniques utilized by active, licensed dental hygienists when providing instruction on oral self-care to their patients and to identify the importance of patient education in the dental hygiene process of care. **Methods:** Select-survey.net was used to deliver a self-administered questionnaire to active members of the American Dental Hygienists Association (ADHA) in District IX (New Mexico, Oklahoma and Texas). This sample of convenience was sent to those members who had email addresses on the ADHA listserv (n=1,039). The 15 item survey included questions regarding the dental hygienist's educational background, current practice setting and Likert-scaled responses concerning techniques used to teach oral self-care to patients. Quantitative analysis utilized descriptive statistics. All open-ended questions were reviewed. **Results:** The response rate was 14% (n=147), with 93% (n=137) of respondents indicating that they saw an average of 31 patients per week with 76% (n=102) in general dental practice settings. Sixty-nine percent (n=101) reported having a bachelor's or higher degree. Respondents reported spending a mean of 8.84 minutes providing patient education during their appointments. Commonly used techniques included: assessment of current self-care practices, use of hand mirror, explanation of plaque and consequences of inadequate plaque removal, brushing and flossing demonstration and recommendations for appropriate dental products. Sixty-seven percent (n=99) utilized the "tell-show-do" model and 46% (n=68) used brochures. **Conclusion:** Results indicate that dental hygienists identify scaling, root planing and plaque removal as the most important therapy they provide. However, they acknowledge the importance of patient education. Direct one on one questions with the patient, demonstrating proper brushing techniques, stressing the oral systemic link, and positive reinforcement appear to be the choice of most practicing hygienists.

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Comparison of Tooth Loss after Conventional and Intensity-Modulated Radiation Therapy for Head and Neck Cancer

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Problem Statement: With the advent of advanced radiation therapy (intensity-modulated radiotherapy, IMRT) and the use of chemoradiation to treat head and neck cancer (HNC), there is potential for oral and dental complications. It is important for dental hygienists to understand the life-long changes after radiation therapy (RT) and to establish collaborative treatment programs to minimize oral and dental sequelae. **Purpose:** This exploratory study aimed to understand the status of dental health by comparing tooth loss up to 10 years after IMRT and non-IMRT (\pm surgery, \pm chemotherapy) treatment. **Methods:** Eighty-six subjects (44 IMRT, 42 non-IMRT) were selected for this study. Data on tooth loss were obtained from archival records and clinical photographs. Data were compared between RT groups by one examiner before and up to 10 years after RT. Health Research Ethics Board (HREB) approval was obtained from the University of Alberta. **Results:** After adjusting for gender and baseline number of teeth, the difference in tooth loss over time between RT groups was not significantly different ($p > 05$) from the baseline data using repeated measures analysis of covariance. One-year after RT yielded the most data (n = 82). Due to the paucity of data available past the second year after initiation of RT, data points from the third year onward were not included in the final analysis using RM-ANCOVA. **Conclusions:** The findings from this project will provide a greater understanding of the effects RT has on dentition. This knowledge will assist oral health professionals to collaborate with oncologists to establish preventive dental care protocols to minimize oral and dental complications in the HNC survivor. Radiation-related changes to the dentition such as tooth loss may occur years after RT; therefore, longer follow-up data are required to assess to what extent dentition is retained. This project was presented at the International College of Prosthodontists Conference 2011.

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Associations of Periodontal Micro-Organisms with Salivary Proteins and MMP-8 in Gingival Crevicular Fluid

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Problem statement: Periodontal pathogens can trigger inflammatory response and influence the local host immunity. **Purpose:** We investigated the levels of certain salivary proteins and matrix metalloproteinase-8 (MMP-8) in gingival crevicular fluid (GCF), in relation to the presence of specific periodontal pathogens. **Methods:** Clinical parameters were recorded at baseline in 1985, and in 2009, from 99 subjects; 55 with 44 without periodontitis (mean age $60.2 \pm SD 2.9$). Saliva samples collected in 2009 were analyzed for salivary albumin, total protein, and immunoglobulins A, G and M. GCF was collected for analysis of MMP-8 levels and for the PCR-analysis of the micro-organisms *A. actinomycetemcomitans*, *P. gingivalis*, *P. intermedia*, *T. denticola* and *T. forsythia*. The study was approved by Ethics Committee, Karolinska University Hospital, Huddinge. **Results:** Periodontitis patients were more often infected by *P. gingivalis* ($p < 0.01$), *P. intermedia* and *T. denticola* ($p = 0.01$) than controls. Salivary albumin and protein concentrations were significantly higher in subjects with *T. denticola* ($p < 0.05$). MMP-8 levels were significantly higher in subjects with *T. denticola* ($p < 0.001$) and *T. forsythia* ($p < 0.01$). **Conclusion:** The presence of *T. denticola* seemed to increase salivary albumin and total protein concentrations, and GCF levels of MMP-8. Both *T. denticola* and *T. forsythia* seemed to induce a cascade of host response with increased MMP-8 in GCF.

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Dental Plaque Associates with MMP-9 and TIMP-1 in Blood from Subjects with and Without Chronic Periodontitis

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Problem Statement: The bacterial biofilm on the teeth trigger an immune-inflammatory response in the adjacent host tissues and can initiate periodontitis. This long lasting low -grade inflammation is a key feature in many chronic infectious diseases, such

as periodontal disease and cardiovascular diseases. A recently published review concluded that periodontitis may indeed contribute to the systemic inflammatory burden and pathogenic processes, leading to systemic diseases in otherwise healthy individuals.

Purpose: The aim was to study the influence of oral hygiene on MMP-9 and TIMP-1 in blood from subjects who in a longitudinal study had developed chronic periodontitis. **Methods:** A group of 50 subjects were randomly selected in 2003 from 1,390 periodontally healthy individuals initially examined in 1985. Clinical parameters were determined at the start and end of the study. At the time of the final oral examination, blood was collected after 12 hours of overnight fasting for the analysis of MMP-9 and TIMP-1. The relation between dental plaque, MMP-9 and TIMP-1 as dependent variables and several independent variables were evaluated in a multiple regression model. **Results:** Clinical examination 16 years after baseline revealed that 16 subjects had developed chronic periodontitis 31 were still periodontally healthy. Multiple logistic regression analyses identified PLI as a principal independent predictor in blood for MMP-9 as well as for TIMP-1 with OR, 6.54; $p = 0.013$, CI 1.48 – 29.0 and OR 6.30, $p = 0.029$, CI 1.20 – 33.0, respectively. **Conclusions:** Our results implicate that dental plaque associate with increased levels of MMP-9 and TIMP-1 in blood hence supporting the oral infection – systemic inflammation paradigm.

The study was sponsored by Philips Oral Healthcare (Snoqualmie, WA, USA), and Karolinska Institutet, Stockholm, Sweden.

Adjunctive Clinical Effect of a Water-Cooled Nd:YAG Laser in Supportive Periodontal Maintenance Patients

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Problem Statement: Debridement of the diseased root surface is usually performed by mechanical scaling and root planing using manual or power-driven instruments. The Nd:YAG laser has shown a bactericidal effect, although at 3 months following supra and subgingival debridement, no additional advantage was achieved with the adjunctive use of a Nd:YAG laser on clinical and microbiological parameters of periodontitis in subjects with moderate to severe generalized periodontitis. The adjunctive effect of a water-cooled Nd:YAG laser during periodontal maintenance care is unknown. **Purpose:** To test whether use of a water-cooled Nd:YAG laser as an adjunct to periodontal maintenance care with a thorough professional prophylaxis by hand and ul-

trasonic instruments improves clinical outcomes as compared to periodontal maintenance care alone during a recall program. **Methods:** This study was an examiner-blind, randomized, controlled clinical trial using a split-mouth design. Thirty subjects diagnosed with moderate to severe generalized periodontitis at baseline and following active periodontal treatment enrolled in a maintenance program were selected based on ≥ 2 sites with a residual probing pocket depth (PPD) of ≥ 5 mm in each quadrant. Immediately following a full-mouth supra- and subgingival prophylaxis the pockets ≥ 5 mm in 2 randomly assigned contra-lateral quadrants were additionally treated with the Nd:YAG laser (1,064 nm, 4W, pulse 250 μ sec) by a dental hygienist. Clinical assessments PPD and bleeding upon pocket probing (BOPP) were performed pre-treatment and at 6 months post-treatment. In addition, the periodontal inflamed surface area (PISA) value was estimated. **Results:** At 6 months, clinical parameters had significantly improved for both regimens. No statistically significant differences ($p < 0.05$) between treatment modalities were observed for PPD and BOPP scores at any time. Changes in PISA values support these findings ($p = 0.178$). **Conclusions:** The additional use of the Nd:YAG laser to a professional maintenance program does not provide a clinically significant advantage. The study protocol was approved by the Medical Ethics Committee of the Academic Medical Center in Amsterdam (MEC # 02/270).

This study was self-funded by the Clinic for Periodontology Utrecht, The Netherlands.

The Effect of Tongue Cleaning in Reducing Oral Bacterial Load in Hematopoietic Cell Transplant Recipients

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Problem Statement: Hematopoietic cell transplant (HCT) recipients frequently develop severe stomatitis following chemotherapy and radiotherapy. Preventive oral care has been instituted, resulting in a decreased incidence of the complication. However, there are few studies on changes in oral microflora with oral care in HCT recipients. **Purpose:** This study was designed to examine the effectiveness of tongue cleaning in reducing oral bacterial load. **Methods:** The study included 15 subjects randomly selected from HCT recipients at Komagome Hospital. Mucosal swab samples were obtained from the tongue dorsum before and after tongue cleaning. The tongue was cleaned 3 times a day after meals from 4 weeks pre-transplant to 3 weeks post-

transplant. The subjects were instructed to scrape residue off the tongue by using a sponge brush and stroking in 1 direction. Swab samples were subjected to microscopy and bacterial culture. Gram-positive cocci (G+C), Gram-positive rods (G+R), Gram-negative cocci (G-C) and Gram-negative rods (G-R) were observed under microscope. Bacterial counts of ≥ 50 , $< 50 \geq 20$ and < 20 were given the scores of +3, +2 and +1, respectively. Alpha-streptococci (α -S) and Neisseria (N) were cultured on agar. Over 2/3, $< 2/3 \geq 1/3$ and $< 1/3$ of the agar surface area occupied by the bacterial colonies were scored by visual inspection as +3, +2 and +1, respectively. Pre- and post-cleaning scores were compared using the Wilcoxon signed-rank test. **Results:** Microscopic examination revealed pre-cleaning scores of 1.9 ± 1.2 , 1.9 ± 0.7 , 0.7 ± 0.7 and 1.3 ± 1.1 , and post-cleaning scores of 1.3 ± 1.0 , 1.1 ± 1.0 , 0.1 ± 0.3 and 0.4 ± 0.6 , for G+C, G+R, G-C and G-R, respectively. Significant reductions were observed for G+R, G-C and G-R ($p < 0.05$). Culture tests also demonstrated significant reductions in the score from 2.7 ± 0.5 and 1.6 ± 0.9 before cleaning to 1.1 ± 1.4 and 0.5 ± 0.8 after cleaning for α -S and N, respectively ($p < 0.05$). **Conclusions:** These results suggest that tongue cleaning is effective in reducing bacterial load on the tongue dorsum.

Effects of a Paste-Free Prophylaxis Polishing Cup and Various Polishing Prophylaxis Pastes on Enamel and Esthetic Restorative Materials: An In Vitro Investigation

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Problem Statement: Polishing of teeth and existing dental restorations is an integral part of an oral prophylaxis as defined by ADHA and other dental professional organizations. It is vital that dental hygienists and other dental health care providers are knowledgeable of effects that various prophylaxis polishing agents and devices have on surface characterization of hard dental tissues and esthetic restorative materials. **Purpose:** The purpose of this study was to measure surface roughness and surface gloss of tooth enamel, composite resin and dental porcelain when polished with a paste-free prophylaxis polishing cup and conventional prophylaxis polishing pastes. **Methods:** Samples of human enamel, a composite resin restorative material and dental porcelain were prepared by a series of polishing papers to produce a flat smooth surface. Baseline average surface roughness (Ra) was measured using a contact stylus profilometer and

surface gloss was measured with a glossmeter. Test samples were subjected to a standardized polishing routine using a paste-free prophylaxis polishing cup, a fine particle and a coarse particle prophylaxis polishing paste. Post-treatment surface roughness and gloss measurements were compared using a paired t statistical test. The paired t-test with statistical significance set at a p value of 0.05 was used to compare roughness and gloss of the baseline and treated composite resin, dental porcelain and tooth enamel surfaces. **Results:** The conventional prophylaxis pastes increased the surface roughness and decreased the gloss of the composite resin and tooth enamel test groups. The paste-free cups did not significantly affect the surface roughness of the enamel or esthetic restorative materials. Dental porcelain surface roughness was not affected by the application of paste-free cups or the fine or coarse prophylaxis pastes. **Conclusions:** Unlike conventional prophylaxis pastes, paste-free prophylaxis polishing cups can be used on enamel and esthetic restorative materials without significant disruption of the surface characterization.

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Collaboration Between Two Health Disciplines to Train Dental Hygiene Students to Identify Risk Factors for Obstructive Sleep Apnea

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Purpose/Goals: The purpose of this program was two-fold. First, to institute collaborative measures between dental hygiene and respiratory faculty to develop a program to instruct dental hygiene students about Obstructive Sleep Apnea (OSA). Secondly, to implement a program to train dental hygiene students how to effectively incorporate screening methods for OSA into the dental hygiene examination. **Significance:** Many dental patients have undiagnosed chronic diseases. The impact of these undetected diseases on an individual's general and oral health may have implications on their social life and workplace environment. The dental professional has a unique opportunity to recognize signs and symptoms of OSA and refer patients for further evaluation. **Approach/Key Features:** The respiratory therapy and dental hygiene faculty trained students on 2 separate measurement tools used to assess patients for OSA. First was the Epworth Sleepiness Scale, a daytime sleepiness questionnaire composed of 8 questions completed during the health history assessment. Secondly, the students were trained to evaluate the patients' oropharynx

using the Modified Mallampati classification. To measure the accuracy of the students' ability to perform the Modified Mallampati, the clinic dentist also performed the Modified Mallampati classification. The results of the student and dentist assessments were compared to determine the students' performance of the Modified Mallampati classification in the clinic setting. **Evaluation:** After 3 semesters of students utilizing these 2 screening tools they have successfully performed these simple assessments during the dental hygiene visit to screen patients for risk factors associated with OSA.

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A Survey of United States Dental Hygienists' Knowledge, Attitudes and Practices (KAP) Regarding Current Dental Infection Control Guidelines

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Problem Statement: The Centers for Disease Control (CDC) indicated a need to understand KAP of dental workers because evidence indicates low compliance with infection control practices among health care providers. Identifying KAP of U.S. dental hygienists (USDH) regarding infection control guidelines (ICG) will provide data for future interventions. **Purpose:** To assess 4 questions: 1) What do USDH know about ICG? 2) What are USDH attitudes regarding ICG? 3) What infection control behaviors are used by USDH? 4) Are there relationships among demographics and KAP data? **Methods:** After IRB approval, a proportional stratified random sample of USDH (n=2500) was recruited for participation in a descriptive survey. The instrument, "KAP of USDH Regarding Current ICG," was adapted from a validated instrument that included a scoring rubric categorizing compliance barriers into domains (lack of familiarity, awareness, agreement, self-efficacy, outcome expectancy; previous practice; external factors). Descriptive data analyses reported demographics. Cronbach's alpha determined internal reliability of the domains. Spearman's rho determined relationships among demographics and KAP responses. The level of significance was set at <0.05. **Results:** A 31% response rate (n=765 of 2,500) was attained. Internal reliability of the domains was not validated by Cronbach's alpha at the 0.70 level; however, 2 domains approached significance: familiarity=0.671 and environmental factors=0.666. Respondents somewhat agreed to familiarity with guidelines (mean=4.23/6.0) and relevance to pa-

tients (mean=4.26/6.0). Responses indicated ICG recommendations were rarely followed for alcohol-based hand rubs (mean=2.66/5.0), pre-procedural rinses (mean=2.86/5.0), and utility glove use (mean=2.34/5.0). Significant positive relationships ($p<0.05$) were found between years of practice and 2 items: utility glove use and inconvenience of guidelines. Comments indicated time is a barrier, and respondents' perceived a need for involvement of the entire dental team. **Conclusions:** Interventions for improving compliance with dental infection control guidelines are needed.

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Student and Faculty Perceptions of Distance Education in Dental Hygiene Bachelor Degree Completion Programs

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Problem Statement: Dental Hygiene Bachelor of Science degree completion programs across the country are utilizing distance education to deliver their curriculums, yet little research has been conducted to explore the perceptions, of faculty and students who have had experience with this method of learning. **Purpose:** The purpose of study was to investigate student and faculty perceptions of online learning in Dental Hygiene BS degree completion programs. **Methods:** Part I of the study was conducted as a qualitative multiple case design. Subjects were selected by purposeful sampling. Semi-structured interviews were conducted with 6 students. NVIVO qualitative software was used for data analysis. Part II of the study was conducted as a quantitative analysis. An email invitation with a link to the 36 question, faculty survey was sent to faculty teaching online in degree completion programs in the U.S. The faculty survey was created using Vovici online web survey service. Data analysis was conducted utilizing SPSS 17. **Results:** Students reported the amount of effort they put into the classes directly impacted the quality of the learning experience. Findings indicated students would like more opportunity to interact with their classmates online. Students reported the convenience and flexibility of online is what most influenced their satisfaction. Faculty was well-informed regarding the factors that influence the quality of the learning experience. Moreover, they were aware of the significant role they play in developing discourse, and in providing well-organized courses that incorporated various instructional techniques. There were no differences found in the faculty's perceptions on the dimen-

sions explored based on the format they taught in or faculty position. **Conclusions:** By examining faculty and student perceptions of online learning environments, program administrators and faculty members in BS degree completion programs will be better able to meet the needs of advanced degree seeking dental hygienists.

Cultural Competence and Dental Hygiene Program Evaluation

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Problem statement: There was a void in the literature to demonstrate the effectiveness of the curricular interventions for cultural competence. This study involved the fourth phase of an action research project which was designed to answer the question: How effective is the dental hygiene program curriculum in educating students to become more sensitive to different cultures? **Significance:** Oral health disparities within the United States are documented by the Oral Health in America: A report of the Surgeon General (USDHHS, 2000). The Institute of Medicine report on health disparities, Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care (IOM, 2002) called upon all health professionals to be trained in cultural competence as an action towards removing this disparity. **Methods:** The dental hygiene cultural competence curriculum had been implemented since 2006 and encompassed lectures, clinical experiences and discussions. A mixed methods approach was designed to evaluate the curriculum by collecting data from 3 sources: students in a focus group, patient satisfaction surveys and student exit surveys upon graduation. The IRB application and approval assured student and patient confidentiality of information. The data from the focus group yielded subjective information on strengths, challenges and suggestions for improvement. The patient and student exit surveys yielded data analyzed for themes and opinions. **Evaluation:** Statistical results indicated that the dental hygiene program was 98% effective in educating students to be sensitive to different cultures. Students found difficulty conversing with the patient if English was not the native language. Improved communication could improve the provider-patient relationship. Investigating those students delivering care and those patients receiving dental hygiene care is suggested as methodology to evaluate program effectiveness.

Funding for this project was through the Dental Hygiene Program at New York University.

Increasing Antiplaque/Antigingivitis Efficacy of an Essential Oil Mouthrinse Over Time (6-Months)

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Factors Influencing Oral Hygiene Behaviour 12 Months After Dental Hygiene Treatment

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Problem Statement: The Third National Health and Nutrition Examination Survey in the U.S. revealed that 62% of individuals had gingivitis at the time of examination. This number may be an underestimate as other surveys suggest over 90% of the population have some gingival inflammation. This study was conducted to evaluate the effect of a fixed combination of essential oils in a mouthrinse in reducing existing plaque and gingivitis over time.

Purpose: This randomized, observer-blind, parallel, controlled clinical study evaluated essential oil-containing (EO) antiseptic mouthrinse (LISTERINE® Antiseptic) efficacy in reducing and/or controlling existing plaque and gingivitis over 6 months compared to a control (C) (toothbrushing and placebo rinse). **Methods:** One hundred thirty-eight healthy adults with mild to moderate plaque and gingivitis, following ethics board approval, were randomized into EO or C groups. All subjects received oral examinations, oral/written instructions on mouthrinse usage, monthly supplies replenishment and compliance assessment and assigned rinses to use unsupervised twice daily. Efficacy variables were whole mouth mean Modified Gingival Index (MGI), Turesky Modification of Quigley Hein Plaque Index (PI) and Bleeding Index (BI). Data were analyzed at 6 weeks, 3 and 6 months via ANCOVA. **Results:** EO group provided significant ($p < 0.01$) MGI, BI, and PI reductions vs. C group, with increasing efficacy over each examination period. Control group MGI, BI and PI means remained relatively stable throughout the 6 month period with minimal increases across time. Compared to control, at 6 weeks, 3 and 6 months, MGI reductions were 4.7%, 9.1%, 20.4% and PI reductions were 7.6%, 12.6%, 26.3%, respectively. BI scores decreased over time and were significant vs. control. Additionally, MGI % sites improved for EO, 14.1%, 26.4%, and 43.3%, respectively. **Conclusion:** This study demonstrated that an EO containing mouthrinse provides an increasing benefit over a period of 6 months when used twice daily. The results confirm that daily use of an antiseptic EO rinse provides a clinically significant benefit in reducing existing plaque and gingivitis.

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Problem statement: A patient's engagement in his own oral hygiene self-care is fundamental for a successful outcome in periodontal treatment. Little is known of which factors contribute to a predication of future interproximal cleaning behavior. **Purpose:** The purpose of the study was to provide an empirical test of the extended Theory of Reasoned Action (TRA) and the prospective direct and indirect role of attitudes, normative beliefs, subjective norms, self-efficacy and decisional balance in adult oral hygiene behavior and gingival outcomes. A second aim was to explore if a cognitive behavioral intervention in oral hygiene behavioral change had an impact on oral hygiene behavior and gingival outcomes 3 and 12 months after treatment. **Method:** The experimental intervention was based on cognitive behavioral strategies and Motivational Interviewing and the control was routine oral health education (information and instruction only). Structural equation model and maximum likelihood estimation with bootstrapping was used to test direct and indirect effects of the extended TRA model on oral hygiene behavior and gingivitis after treatment. The model was tested in a population ($n=113$) who had undergone initial periodontal treatment performed by dental hygienists. A blinded periodontist performed the clinical examinations. Before baseline examination, participants completed a questionnaire assessing oral hygiene behavior, TRA, attitude towards dental hygienists, self-efficacy and pros and cons towards interproximal cleaning. **Results:** The extended TRA, a cognitive behavioral intervention and gingival health at 3 months explained 73% of gingival outcomes at 12 months. A higher level of self-efficacy to perform interproximal cleaning at baseline was associated with higher frequencies of interproximal cleaning at 3 months ($\beta=0.248$, $p < 0.05$). Greater beliefs in the hygienist and being female was linked to more normative beliefs which, in turn, related to greater self-efficacy in interproximal cleaning. Cognitive behavioral intervention was the strongest predictor for gingival health outcome at 3 months ($\beta=0.664$; $p < 0.01$). **Conclusions:** The model demonstrated that psychosocial characteristics, impact from dental health professionals, gender and cognitive behavioral intervention are predicting factors for oral hygiene behavioral change.

Interdisciplinary Approach to Care: The Role of the Dental Hygienist on the Pediatric Feeding Team

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Practice Research Coordinator In- volvement Improves Study Participa- tion

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Problem Statement: Achieving and maintaining optimal oral health is challenging in children with special health care needs (CSHCN) due to the many challenges this group faces in both medical and dental care. **Purpose:** The purpose of the study was to gain a consensus from Washington State pediatric community feeding team members on the role of the dental hygienist as a team member in relation to elements of care coordination (assessment, dental hygiene diagnosis, planning, implementation, evaluation, advocacy and health education/promotion). **Methods:** The Delphi technique was used in 2 online rounds to survey community feeding team members (n=112). In round one, participants were asked to identify items within the elements of care coordination deemed necessary for inclusion in the roles of the dental hygienist as a member of the team. Items identified were categorized within the elements of care coordination. In round two, participants rated the importance of each item for inclusion. **Results:** Participants identified 33 items for possible inclusion in the role of the dental hygienist in round one and reached consensus in identifying 31 specific roles for the dental hygienist in all seven elements of care coordination in round two. **Conclusions:** Members of the WSCFTs believe the dental hygienist's role in an interdisciplinary approach to care would encompass all elements of care coordination. These findings may provide a framework for future implementation of a model for integrating dental hygienists into this interdisciplinary team.

Purpose/Goals: The goal of practice based dental research networks is to answer the questions that dental practitioners encounter in everyday dental practice. **Significance:** Practice based research networks help build the knowledge base in dentistry. **Approach/Key Features:** The network is made up of over 200 dental sites. Each site has a designated practitioner-investigator (P-I) and practice research coordinator (PRC). P-Is are defined as dentists, and PRCs are members of the dental team such as dental hygienists, dental assistants and office personnel. Site P-Is and PRCs are CITI certified and conduct all studies in accordance with Good Clinical Practice (GCP). All studies are IRB approved, and there are 16 studies either ongoing or completed. **Evaluation:** During a recent program evaluation among 84 network respondents, a statistically significant correlation ($p=0.004$) was found between the level of use of practice research coordinators and the number of studies participated in by each site. Practice research coordinators are key members of the research team, and they are important to conducting clinical studies in everyday practice. In addition, there was a correlation between satisfaction with the training and support and involvement of PRCs in organizing study activities ($p=0.008$), and there was also a correlation between satisfaction with training & support and the number of PRCs utilized by the office ($p=.039$).

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