

The Adequacy of Oral Care Performed for Critically-Ill Patients in Intensive and Critical Care Unites.

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Oral care becomes a lower priority when a patient is critically ill and other important nursing duties need to be performed (Berry & Davidson, 2006). Oral care is a necessary procedure to maintain the patients' oral health and to prevent infections. In addition to maintaining the patient's oral health and decreasing the chance of nosocomial infections, oral care may improve the patient's mood and overall feeling of wellness (Holmes & Mountain, 1993). When patients cannot eat properly, do not feel clean or are concerned about the social aspect of a neglected and unclean mouth, they can become discouraged during their recovery, resulting in a longer hospitalization (Holmes & Mountain, 1993).

By healthcare professionals controlling oral bacteria, the patient may exhibit fewer nosocomial infections, which can develop from aggressive types of bacteria that can be found in the mouth. For instance, patients with upper respiratory infections have an increased chance of developing candidiasis from ventilators and inhalers due to a lack of routine and proper oral care (Adachi, Ishihara, Abe, & Okuda, 2007).

It is the intention of this study to determine if adequate oral care is performed by healthcare professionals and to what extent is oral health education being taught in nursing education programs, based on the standard of care stated by the American Association of Critical-Care Nurses. This study also may identify the need for positions for dental hygienists who are interested in branching out of private clinical practice and entering hospitals, nursing homes and assisted living facilities.

Short-Term Effects of Non-Surgical Periodontal Therapy on Clinical Measures of Impaired Glucose Tolerance in People with Prediabetes and Chronic Periodontitis.

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Problem: Diabetes and Periodontal Disease are conditions considered to be biologically linked. Prediabetes is a condition in which individuals have blood glucose levels, impaired fasting glucose and/or impaired glucose or A1C levels higher than normal but not high enough to be classified as diabetes. Few

studies address the relationship between periodontitis and prediabetes and none clarified an association between periodontitis and prediabetes. This pilot study examined impact of non-surgical periodontal therapy (NSPT) on clinical measures of glycemic control in prediabetes.

Hypotheses: 1) Non-surgical periodontal therapy (NSPT) will improve clinical measures of IFG, IGT, and A1C in participants with prediabetes and slight to moderate chronic periodontitis; 2) Improvement in measures of periodontal status, (PD, CAL, PI, and GI), result in statistically significant improvement in IFG, IGT or A1C in participants with prediabetes.

Methods: Prediabetes measures of IFG, IGT, A1C, and periodontal measures of PD, CAL, PI, GI, were taken at baseline and 3 months in 5 subjects with prediabetes and treated chronic slight to moderate periodontitis. Blood samples were taken from each subject following an 8 hour fast. Controlled for changes in BMI, physical activity and diet.

Results: Comparison of mean prediabetes and periodontal measures from baseline and post treatment at 3 months demonstrates an improvement in both clinical measures of prediabetes and periodontal disease.

Conclusion: This pilot study demonstrated slight improvement in prediabetes and periodontal measures after 3 months. Limitations are the small sample size and lack of a control group which may impact the robustness of measures.

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

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Recent reports examining the increased incidence of academic dishonesty in higher education have fueled a renewed interest in the subject of academic integrity and methods to reduce cheating. As high-tech resources such as electronics and electronic devices become more readily available to students, the popularity of e-cheating continues to increase. Upon reviewing academic dishonesty in dental hygiene programs, little research has been published addressing the prevalence of academic dishonesty and no research has been published concentrating on the prevalence of academic dishonesty with electronic de-

vices. The purpose of this study was to investigate the prevalence of e-cheating among second year dental hygiene students and to evaluate the effect of honor codes on academic dishonesty. An explanatory email and survey link was sent to the thirty-nine dental hygiene directors in Mississippi, North Carolina, and Texas. Each director was asked to forward the survey link to all second year dental hygiene students enrolled in the program. A total of 103 usable surveys were completed.

The results from the study revealed that 21 percent of second year dental hygiene students in Mississippi, North Carolina, and Texas have participated in at least one form of e-cheating. Students identified sharing homework answers via IM, text messaging, or email as the most frequent form of e-cheating. Students acknowledged not knowing the material and striving to obtain a better grade as the most common reasons for cheating.

The results from this study may enable dental hygiene faculty to recognize the occurrence of e-cheating and the need for academic integrity or honor codes policies.

Ultrasonic Instrumentation Instruction in Dental Hygiene Programs in the United States.

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The purpose of this study is to determine the existence and extent of ultrasonic scaling instrumentation instruction in dental hygiene programs nationally. Currently, there is no research available defining a consensus of instruction for ultrasonic instrumentation in dental hygiene programs. An email survey was sent to all directors of dental hygiene programs in the United States (n=323). The response rate was 45%.

No significant differences in methods or extent of instruction were found between associate and baccalaureate degree granting programs. Eighty-nine percent of programs introduce hand scaling prior to ultrasonic scaling instrumentation instruction. Students in 96% of the programs are required to administer a pre-procedural mouth rinse reducing the amount of bacteria that would potentially be released in the aerosol produced.

A variety of resources and strategies are employed for teaching ultrasonic instrumentation and competency is measured in several ways. The availability of magnetostrictive ultrasonic scalers is much great-

er than that of piezoelectric ultrasonic scalers in the student clinics. Programs use a variety of inserts and tips and some programs require students to purchase magnetostrictive ultrasonic units.

The results of this study show that ultrasonic instrumentation is an integral component of the clinical curriculum and the majority of the dental hygiene programs prescribe to similar teaching methods, use the same textbooks, teach the same adaption techniques and strokes and use typodonts, student partners and onsite patients.

A Pilot Study: Examining Objective Structured Clinical Examination (m-OSCE) as an Effective Way to Measure Dental Hygiene Students' Critical Thinking.

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The purpose of this study was to examine objective structured clinical examination (OSCE) as a feasible method of evaluating critical thinking in dental hygiene education.

The goal of this study was to answer the central questions developed, and evaluate the methods and procedures of the exam for later comparison hopefully on a larger scale. Central questions of the study were: 1) Does a case-based OSCE that utilizes higher order multiple-choice questions effectively evaluate dental hygiene students' critical thinking? 2) Is this type of student evaluation a feasible form of assessment in dental hygiene education? 3) Is a written treatment plan an effective method of evaluating students' application of basic clinical and biomedical sciences? 4) When formulating a written treatment plan, do students utilize the dental hygiene process of care model?

A convenience sample of 50 volunteer senior dental hygiene students participated. The exam was designed as an OSCE consisting of 24 multiple-choice questions, one fill in the blank, and a written treatment plan section.

Statistical analysis determined the OSCE did not reliably measure dental hygiene students' critical thinking. From the item analysis it was evident gaps in students' knowledge existed. Understanding these 'gaps' in knowledge provides valuable information to educators who often assess their teaching in conjunction with student learning. With modifications to the questions, grading rubric, and patient case it is suggested that further investigation of this topic is warranted.

Determining Caregiver and Infant Caries Risk.

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Bacterial testing can identify and quantify mutans streptococci and lactobacilli, two bacteria considered to be highly responsible for the dental caries infection. CAMBRA protocol recommends that patients assessed at high caries risk in terms of Disease Indicators be given a bacteria culture test to determine MS and LB counts. However, conventional methods used for culturing these bacteria are inconvenient and time consuming. Traditionally, bacterial cultures must be incubated for forty-eight to seventy-two hours before specific bacteria are identified.

The objective of this study is to determine if a real-time caries assessment tool using Adenosine-Triphosphate Driven Bioluminescence (CariScreen ATP testing by Oral Biotech) can reliably predict the amount of bacteria associated with dental caries. Can ATP-B testing be useful in developing a caries management plan for high risk caregivers and infants? Can ATP-B infant readings predict ATP-B readings of the caregiver? The Caries Risk Test (CRT by Ivoclar-Vivadent) will be used as the gold standard in identification of mutans streptococci and lactobacilli.

Caries Management by Risk Assessment (CAMBRA) will be used as an oral assessment tool in identification of caries risk in both primary caregivers and infants.

Correlation of Perceived and Objective Stress in Temporomandibular Disorder: A Case Control Study.

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Perceived stress is associated with temporomandibular disorder (TMD). Whether levels of cortisol are also elevated in individuals with TMD is unknown.

We hypothesized that cortisol concentration, a biomarker of hypothalamic-pituitary-adrenal (HPA) axis reactivity, was elevated in TMD cases relative to controls, and that perceived stress was positively correlated with cortisol concentration.

This study used a case control design in which TMD case status was determined by examiner using the TMD Research Diagnostic Criteria. Participants (n=116) aged 18-59 years were recruited from within a 50 mile radius of the University of North Carolina at Chapel Hill. Following examination, cases (n=45) and controls (n=71) completed the 14-item Perceived Stress Scale using a reference interval of the past three months.

Approximately 100 strands of hair were cut from the posterior vertex segment of their scalp. The three centimeters of hair most proximal to the scalp was analyzed with a commercially available salivary cortisol enzyme immunoassay adapted for hair cortisol. This length of hair corresponds to the last three months of growth and thereby captures systemic HPA axis activity over time.

TMD cases perceived higher levels of stress than controls over three months preceding this study (P=0.001). However, systemic cortisol production was lower in TMD cases than in controls (P<0.001) over the corresponding three month period. The correlation coefficient revealed a negative relationship (r= -0.12) between perceived stress and cortisol concentration (P=0.044). In analysis stratified by case status, the relationship of perceived stress and cortisol concentration was non significant for cases (P=0.169) and controls (P=0.498).

Despite perceiving more stress, TMD cases had lower cortisol levels than controls. Cortisol concentration was negatively associated with perceived stress.

Point-of-Care HbA1c Screening Predicts Diabetic Status of Dental Patients.

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Problem: A diabetes incidence predictive model calculates the prevalence of diabetes in 2050 as high as 33% of the population (Boyle, Thompson, Gregg, Barker, & Williamson, 2010). Currently, there is a lack of opportunistic diabetes screenings (Ealovega, Tabaei, Brandle, Burke, & Herman, 2004) which may prevent or delay the onset of diabetes and likewise decrease or eliminate diabetic complications (Zhou, et al., 2010) including periodontal disease.

Null Hypothesis: A Point-of-Care (POC) HbA1c screening will not reliably identify dental clients who have self-proclaimed diabetes risk factors, as diabetic or pre-diabetic when compared to laboratory tests methods.

Methods: This was a prospective cohort descriptive study in which subjects were chosen by convenience sampling and a diabetes risk questionnaire. A POC fingerstick HbA1c screening identified subjects for laboratory HbA1c testing.

Results: The diabetes risk questionnaire identified 75 subjects for inclusion in the POC screening. Thirty four of these subjects (71% female and 29% male) had glycolated hemoglobin levels at or above the American Diabetes Association's recommended 5.7% cut-point. Three subjects were less than age 44, ten were 44 to 57, and 21 were over 57. Laboratory results categorized

six of these subjects as normoglycemic and 28 with HbA1c greater than or equal to 5.7%. Four nonparametric tests revealed statistical significance: Kendall's tau analysis ($p=.004$), Pearson's chi-square ($p=.000$), Likelihood ratio ($p=.004$), and Cramer's V ($p=.000$). The nonparametric Lambda test ($p=.145$) did not show statistical significance.

Conclusion: This study showed that a safe and minimally invasive dental chairside point-of-care HbA1c screening unveiled statistically significant previously unidentified diabetic and pre-diabetic patients.

The Effectiveness of Locally Delivered Minocycline Hydrochloride in the Treatment of Periodontal Disease in an HIV-Positive Population.

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Periodontal diseases are infections of the teeth's supporting and surrounding structures. If left untreated, they can result in tooth loss. Periodontal diseases are not evenly distributed among United States adults. They are more prevalent in immune-compromised individuals such as those with Human Immunodeficiency Virus (HIV) infection. Various strategies are utilized routinely for treating periodontal diseases. Scaling and root planing (SRP) followed by the application of locally administered antimicrobials (e.g., minocycline hydrochloride) has shown a greater reduction in periodontal pocket depths than SRP alone. While SRP followed by the administration of minocycline hydrochloride has been effective in arresting periodontal diseases in non-HIV adults, little is known about suggested treatment regimens and their effectiveness in the HIV positive population.

The purpose of this study is to assess whether the effectiveness of a locally delivered antimicrobial (i.e., minocycline hydrochloride) used in conjunction with SRP in the reduction of periodontal pocket depths in periodontally involved HIV positive adults is comparable to the results achieved in a healthy population. One tooth in each subject with a periodontal pocket depth equal to or greater than five millimeters will be used to assess the effectiveness of minocycline hydrochloride used in conjunction with SRP.

The study sample will consist of twenty HIV-positive adults from whom a treatment tooth will be selected. Only individuals with minimally compromised immune system (e.g., CD4 cell count of 200 or greater and WBC count ranging from 4 to 11) will be permitted to participate in the study. Subjects with allergy to tetracyclines and a history of or predisposition to oral candidiasis will be subsequently excluded from the study. Each study tooth will undergo SRP followed by the administration of minocycline hydrochloride and re-probed for possible

periodontal probing depth reduction in one month. A one-tail t-test will be used to analyze the study results.

To interpret the results, the t-obtained will be compared to t-critical. The value of t-obtained will be calculated using the study results and the formula. The value of t-critical will be obtained from the one-tailed test table with a critical error equal to 0.05.

The Role of the Dental Hygienist on the Cleft Palate Team.

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Individuals with cleft lip and/or palate (CLP) need anticipatory guidance and preventive care for oral health. Complexity of CLP requires a multidisciplinary team for comprehensive care.

This study examined roles of dental hygienists on CLP teams based on opinions of U.S. CLP team representatives. Data were collected via a Web-based questionnaire and analyzed using descriptive statistics, frequencies, and percentages. Responses were coded for roles defined by the American Dental Hygienists' Association (ADHA). Respondents scored roles of the dental hygienist based on importance to the CLP team as identified by the American Cleft Palate-Craniofacial Association during the Neonatal Period and Infancy (Birth to 1 year), Childhood to Young Adulthood (1 year to 20 years), and Throughout Lifespan of the Case.

Professional roles of dental hygienists identified by the ADHA were educator, researcher, administrator/manager, advocate, clinician, and public health. Findings provide information about dental hygienists potential as a member of CLP teams.

Evaluation of an Audit and Feedback Approach to Promote Sustainability of a Pediatric Fluoride Varnish Program in a Primary Care Setting.

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Problem: Early childhood caries (ECC) is the most common chronic disease of childhood. Rates are highest among children from low-income, minority families. Although fluoride varnish (FV) is a low cost caries prevention agent, these children have little access to early preventive dental care. Because they frequently visit medical providers for their well child exam, it is recommended that primary care providers apply FV to the teeth of at risk 1-5 year olds at their well-child visit.

Purpose: To evaluate the effect of an audit and feedback intervention on the rate of FV applications during

well child visits at 12 months compared to baseline values in a county safety-net system as measured by electronic billing data.

Methods: After assessing the rate of FV applications among 1–5 year olds at baseline time periods in 8 primary care clinics, we implemented an audit and feedback intervention in 3 clinics identified as low, moderate and high FV application performers. The intervention consisted of presenting individual clinic performance data for all 8 clinics during site manager interviews and in provider focus groups during which barriers and facilitators for program sustainability were identified. Findings were disseminated to all 8 county health center site managers who transmitted them in all staff/ provider meetings.

Results: Preliminary 4 month follow-up data indicate that FV applications increased from 17% of the 1–5 year olds in a baseline cohort studied to an overall 79% among 1–5 year olds in all 8 clinics. Barriers, facilitators, and 12 month outcomes will be presented.

Conclusion: Audit and feedback appeared to facilitate pediatric FV program sustainability.

Cost Analysis of the Miles of Smiles Program, A School-Based Preventive Oral Health Program.

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The purpose of this study was to provide a cost analysis of the Miles of Smiles Program, a collaboration between the University of Missouri–Kansas City (UMKC) School of Dentistry and the Olathe School District.

This preventive program was implemented to address the access to oral health care issues that affect low income children within the school district. The analysis of the program utilized an inventory list and an existing de-identified database to determine the costs associated with operating the program throughout the 2008–2009 school term. Costs related to equipment, supplies, and personnel were included.

The results of the analysis revealed that the cost of operating the program during 2008–2009 was \$107,515.74. The program received Medicaid reimbursement for approximately 1.5% of the total cost of operating the program and approximately 6.3% of the amount produced through billable services; however, challenges with submitting and billing Medicaid claims for the first time contributed to this low percentage of reimbursement.

It was determined that for the program to be sus-

tainable, continuous external sources of funding or a change in the program design would be necessary.

Effects of Low Temperature Atmospheric Pressure Plasma on Tooth Whitening.

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Low temperature atmospheric pressure plasma (LTAPP) is a novel science being studied as an alternative light source to enhance tooth whitening.

The safety and effectiveness of LTAPP has not been established therefore; the purpose of this study was to determine if LTAPP along with H₂O₂ gel would safely and effectively accelerate the tooth whitening process, in terms of lightness and temperature.

The hypotheses were the following: HO1: There is no difference in the lightness of teeth exposed to LTAPP plus 36% H₂O₂ gel compared to those with 36% H₂O₂ gel alone. HO2: There is no difference in temperature of teeth exposed to LTAPP plus 36% H₂O₂ gel compared to 36% H₂O₂ gel alone. Thirty extracted human teeth were randomized to three groups: (I) LTAPP plus 36% H₂O₂ gel; (II) 36% H₂O₂ gel only; and (III) control. Group I received LTAPP plus H₂O₂ gel at 10, 15, and 20 minutes; Group II received H₂O₂ gel only at the same time intervals; and Group III served as a control and received no treatment. Tooth surface temperature was measured periodically throughout the experiment with a non-contact thermometer. Pre and post photographs were taken to compare color using the CIE L* a* b* system. Only L* (lightness) values were measured.

Data were analyzed using descriptive statistics and t-test at the .05 level. There was a statistically significant difference in mean CIE L* values after exposing teeth to LTAPP plus H₂O₂ gel versus H₂O₂ gel only, in the 10 minute group (p-value of .0003) and 20 minute group (p-value of .0103). There was no statistically significant difference in mean CIE L* values among the 15 minute group (p-value of .3815). The temperature in both groups remained under 80 throughout the study, which is below the thermal threat for vital tooth bleaching.

Results indicate that LTAPP + H₂O₂ mean CIE L* values in the 10 and 20 minute groups were significantly greater than the H₂O₂ only groups. However, the mean CIE L* values for 15 minute group were not significant.

The research revealed the potential for plasma usage in the tooth whitening process is promising, and may prove to be a new technology to enhance tooth whitening.