

Location: Exhibit Hall D (Miami Beach Convention Center)

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Objectives: Polymer nanocomposites (PNCs) are a new class of materials consisting of nanoparticles at very small quantities dispersed within a polymer matrix. The extent of nanoparticle dispersion in the matrix is an important property. Depending on several factors such as the type of nanomaterial, the interaction between the nanoparticle and the matrix and the physical methods used for dispersion, the nanoparticle may be exfoliated (ie. fully dispersed at a nano-scale), intercalated (partially dispersed), or remain aggregated. Exfoliated nanocomposite usually results in substantially enhanced physical properties; dimensional stability, stiffness, mechanical and thermal properties and improved drug elution characteristics. This study investigates the use of PNCs as potentially useful materials in Endodontic surgery and to determine qualitatively the degree of dispersion of various nanoparticles namely, organoclays (OC), carbon nanotubes (CNT), and Graphene in a dental monomer matrix using Transmission Electron Microscopy.

Methods: Nanoparticles were mixed with Bis-GMA/TEGDMA/HEMA monomer resins to study the degree of dispersion (intercalation or exfoliation). Samples were photo-polymerized and sectioned by ultra-microtome. Nanoparticle dispersion in samples was examined by TEM.

Results: TEM micrographs reveal that smaller mass fractions of OC (0.5% and 1.0%) in the Bis-GMA/TEGDMA/HEMA system (40/40/20 mass ratio) demonstrated a high degree of exfoliation. When larger mass fractions of OC were used, these resulted in partially intercalated/exfoliated nanocomposites. Studies with CNT and Graphene also showed a homogenous dispersion of nanoparticles.

Conclusions: From the TEM studies, it can be observed that OC particles at lower loading appear to be highly exfoliated in the polymer matrix. Good dispersion has also been achieved using carbon nanotubes and graphene. However, other quantitative analytical techniques will have to be used to completely quantify the degree of dispersion of the nanomaterials. Future studies will also examine the role of the nanoparticles in improving bulk physical properties and drug-elution characteristics of the retrograde filling materials.

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Objective: To compare pre-treatment case complexity and treatment outcomes using the Discrepancy Index (DI) and American Board of Orthodontics Grading System (ABOGS) respectively. **Materials and Methods:** Corresponding pre- and post- treatment dental casts were assessed using DI and ABOGS to evaluate case complexity and quality of outcomes, from a sample drawn from 1960-2005. Information gathered included, but was not limited to, duration of treatment, mandibular canine and first molar width, and extractions. A total of 655 randomly selected cases (148 from 1960's, 194 from 1970's, 215 from 1980's, and 98 from 2000's) were evaluated by a single, self-calibrated operator. **Results:** Reliability tests (intraclass correlations) revealed good reliability with values of 0.987(DI) and 0.781(ABOGS). Individually, the evaluating scores showed statistical significance as a total ($p=0.00$) and between 1960's, 1970's, and 1980's compared to the 2000's ($p=0.00$). DI had mean scores of 14.36 ± 5.98 , 14.56 ± 7.98 , 12.39 ± 7.06 , 9.714 ± 5.82 , respectively to the progressing decades. Variables of significance included overjet ($p=0.00$), overbite ($p=0.003$), and occlusion ($p=0.002$). ABOGS had means of 14.59 ± 7.53 , 17.65 ± 8.56 , 14.64 ± 6.69 , 8.586 ± 5.92 , respectively, to consecutive decades. Almost all variables within the ABOGS showed statistical significance ($p<0.005$) except Bucco-lingual (BL) inclination. **Discussion:** Orthodontic post-treatment results illustrated an improvement between the decades with the 2000's having the lowest scores indicating the best results. A similar decrease in pre-treatment scores suggested that cases were less complex over the decades studied. For ABOGS, BL inclination was not significant possibly suggesting that occlusal relationship and occlusal contacts are more representative of occlusal correction. **Conclusions:** A directly proportional improvement in DI and ABOGS throughout the decades indicated that a more functional outcome was achieved with less complex cases.

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Objective: The purpose of this study was to determine the oral health knowledge levels and its effects on oral hygiene among selected rural and urban populations in India. **Methods:** The study population consisted of 400 adults (200 from each site) with a mean age of 38.9+/-16.8 years. Data on oral health knowledge were collected by face-to-face interviews using a standard questionnaire which consisted of 15 pre-coded and two open-ended items. **Results:** No difference in gender distribution was observed between the two sites. Overall, 68.2% of the individuals believed themselves to be in very good or good general health while 30.5% of the patients believed themselves to have good or very good dental health. Although 30.5% of the patients rated their dental health to be good, 60.2% did not know how often it is necessary to visit a dentist. There was no difference in the perception of general or dental health between the two sites. Nearly 44% said they had visited a dentist in the past six months and a majority of the subjects (78.3%) believed that brushing teeth could help prevent caries. The urban population reported consuming significantly higher number of sugared snack per day than the rural population (0.5+/-0.7 vs. 0.3+/-0.6; $p=0.03$). Significantly higher proportions ($p<.05$) of the urban population correctly identified different caries preventive measures than their rural counterparts: tooth brushing (81.6% vs 75.0%), eating less sugar (42.5% vs. 7.0%), fluoridated water (9.0% vs. 4.0%), fluoridated toothpaste (19.5% vs. 3.0%), and sugar-less gum (14.0% vs. 3.5%). **Conclusion:** Results indicate that the urban population was more knowledgeable about caries prevention and therefore a need to target oral health education programs towards rural population.

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Endodontic surgery aims to treat periradicular pathology and to seal the apical portion of the resected root to prevent further infection. Although a number of materials have been used to seal the root, none has been demonstrated to reach an ideal standard. Polymer organoclay clay nanocomposites are a new class of dental materials consisting of exfoliated organoclay nanoparticles within a polymer matrix. The organoclays are usually obtained by modifying Sodium montmorillonite (Na-MMT) with organic surfactants. An important property of nanocomposites is the degree of exfoliation (dispersion at a nanoscale) of the organoclays, which usually corresponds to enhanced physical properties such as dimensional stability, stiffness, mechanical and thermal properties and drug elution characteristics. Objectives: To quantitatively characterize the exfoliation of two different types of organoclays within a specific polymer-monomer matrix using X-ray Diffraction. Methods: Two different species of organoclays were incorporated into a dental monomer matrix in concentrations of .5%, 1%, 1.5%, 2%, and 2.5% by weight. The matrix was composed of bisphenol A glycerolate (1 glycerol/phenol) dimethacrylate (Bis-GMA), triethylene-glycol-dimethacrylate (TEGDMA), and 2-hydroxyethyl methacrylate (HEMA). A film with thickness of .5 mm was prepared of the sample for x-ray diffraction, with data being analyzed for patterns associated with exfoliation and compared to known patterns found in Na-MMT. Results: As evidenced by the XRD results, exfoliation was obtained in all samples with an organoclay concentration of 2% or less. The findings also need to be verified by alternative analytical techniques such as TEM. Conclusions: It is possible to obtain exfoliated polymer clay nanocomposites using organoclay based nanomaterials by an appropriate selection of a suitable organoclay/monomer system. This study also demonstrates that organoclay based polymer nanocomposites are a viable option for future development and use as an endodontic retrofill material.

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N. JAHDI, S. CHOGLE, S. NARENDRAN, and D. LOWMAN, Case Western Reserve University, Cleveland, OH

Objective: This retrospective cohort study assessed the 9 months to 3-years outcome of endodontic treatment following nonsurgical root canal therapy. **Methods:** Data were abstracted from a random sample of 200 charts in a post graduate endodontic program at a teaching institution including both clinical and radiographic evaluations. The outcome was dichotomized as 'success' (no apical periodontitis, no signs or symptoms) or 'failure' and recorded by two independent observers. The preoperative factors included medical history and pretreatment diagnosis. Data analysis was carried out by Statistical Package for Social Sciences (SPSS) and included both descriptive and analytical tests. **Results:** The overall success rate was 80%. The success rate was significantly higher for teeth with a pre-operative clinical diagnosis of vital pulp (86%) than with Necrotic pulp (70%). The success rate significantly dropped from 84% to 60% with the presence of a pre-operative lesion. In the current study the endodontic success was lower in patients with a medical history of Diabetes and/or hypertension (76% vs. 82%) even though no significance was found. **Conclusion:** This study confirmed the presence of a peroperative periradicular radiolucency as the main prognostic factor in initial endodontic treatment. Continuation of the project will allow assessment of other prognostic factors with better power.

Location: Exhibit Hall D (Miami Beach Convention Center)

M. HALL, C.A. DEMKO, M.G. HANS, and M. VALIATHAN, Case Western Reserve University, Cleveland, OH

Objectives: To evaluate orthodontic case complexity and outcomes over four decades at an established graduate clinic, using the Index of Complexity, Outcome and Need (ICON). **Methods:** Pre- and post-treatment study models for 657 patients, who received treatment from the 1960s to mid-2000s, were randomly selected from the orthodontic department archival area. Occlusal traits of the models were scored by a single, self-calibrated examiner using the ICON. **Results:** Mean *pre-treatment* ICON scores were as follows: 1960s: 70.33±18.81 (SD), 1970s: 68.72±18.91, 1980s: 63.45±18.49, and 2000s: 59.68±19.43. The ANOVA statistical test revealed a significant difference ($p<0.000$) between pre-treatment ICON scores for each decade. The least squares difference (LSD) statistical test determined significance when the 1960s and 1970s were independently compared to the 1980s and 2000s ($p\leq 0.005$). Mean *post-treatment* ICON scores were as follows: 1960s: 25.02±9.85, 1970s: 27.81±11.67, 1980s: 24.65±10.08, and 2000s: 18.42±6.87. The ANOVA test found a significant difference ($p<0.000$) between decades for post-treatment ICON scores. The LSD test revealed that all decades, except the 1960s compared to the 1980s, were significantly different ($p\leq 0.012$). The degrees of improvement were as follows: 1960s: -29.75±39.27, 1970s: -42.54±49.95, 1980s: -35.14±40.15, and 2000s: -14.00±32.09. The ANOVA test established significance ($p<0.000$) between decades. The LSD test determined that the 1960s compared to the 1970s, and the 1960s, 1970s, and 1980s independently compared to the 2000s, were all significant ($p\leq 0.005$). Intra-examiner agreement for both pre- and post-treatment casts was good [0.76 and 0.81 respectively, measured with the Intraclass Correlation Coefficient (ICC)]. **Conclusions:** Case complexity from the 1960s to the present decreased. Accordingly, treatment outcomes improved from the 1970s to the present. A concurrent increase in degree of improvement indicates improved quality of treatment and outcomes at the orthodontic clinic of CWRU.

Location: Exhibit Hall D (Miami Beach Convention Center)

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Objectives: To determine provider and office characteristics that patients identify as important in deciding to stay with their current dentist or practice.

Methods: Adult patients in 8 general dental offices within the CROWN research-network were invited to complete a 44-item anonymous questionnaire in the waiting room. Patients rated the importance of dentist and office characteristics to returning to the office on a 5-point Likert scale. Patient characteristics, patient satisfaction, and five questions about electronic communication were included. Principal components analysis was used to reduce the number of items and explore factors related to retention. .

Results: Seventy-four respondents were predominantly female(54%) , college graduates(54%), 49.8(\pm 17.3) years old and a patient in that office for 10 years(range 0-42). Patients ranked 'accepts my insurance', 'minimal pain', 'answers questions', and 'involves me in treatment plan' as the 4 most important factors in returning to an office. The three latter items demonstrated strong correlation with patient satisfaction. Among 17 statements, 74% and 69% of patients rated 'appropriate infection control' and 'dentist care and attention' as very important, respectively. 'Dentist age' and 'dentist offers praise' were rated as not important by 76% and 51% of respondents, respectively. Factor analysis identified 6 factors that accounted for 72% of variance in retention. Half(52%) of respondents indicated that email reminders would be very useful, while 37% and 41% thought online appointment scheduling and electronic records, respectively, would be very useful; those interested in electronic communication were younger than other respondents(41 vs. 56 years, $p < .001$)

Conclusion: Many aspects of the office can influence a patient's decision to return.. The most important retention factors reflect the dentist's skills, both technical and interpersonal. Several factors identified by patients as important for retention also correlated with patient satisfaction, suggesting that meeting patients' expectations, or importance factors, may be influential in patient retention

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Objective: To measure patients' attitudes regarding general health discussions in the dental office.

Methods: A cross-sectional survey in 12 CROWN(Community Research for Oral Wellness) network offices. Adult patients (n=124) completed anonymous 42-item surveys including demographics, oral and general health status, and willingness to discuss oral-systemic health and provide clinical samples/measures for screening in the dental setting.

Results: Respondents were predominantly female(62%), white(83%), college graduates (43%) and reported excellent/very good oral health(42%). Patients were 50.8 (\pm 15years) with a median of 8 years in that office. Most patients(77%) had discussed gum disease and general health with their dentist, while 22% heard this information from a physician, 45% from the media and 21% from family/friends. Oral health status did not associate with physician recommendations to see a dentist. Most patients(75%) strongly agreed that a healthy mouth was important for general health and 56% strongly agreed gum disease could affect general health. Oral and general health were correlated (Spearman's rho=.486, $p < .001$). Patients were very willing to discuss nutrition (66%), weight control(56%), hypertension(59%) and general risk factors(65%); willingness was greater among those with poorer oral health($p = .03$). Many(49%) current smokers would discuss tobacco cessation. For screening purposes, patients were very willing to provide saliva samples(64%), finger stick blood samples(48%), blood pressure readings(73%), and height/weight measurements(51%); women were less willing than men to be weighed($p = .014$). Willingness to discuss a topic and willingness to provide a physical measure were correlated($\rho = .565$, $p < .001$); willingness to provide blood samples was correlated with age($\rho = .202$, $p < .05$), but not with years in the office.

Conclusions: In this modest sample, patients appear open to discussions of general health topics and may be amenable to providing clinical measures for screening or discussions about oral-systemic health links. Patients with greater risk (poor oral health and tobacco use) would be accepting of these services.

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Location: Exhibit Hall D (Miami Beach Convention Center)

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Objectives: Oral hyperpigmentation (OHP) is a widely-recognized mucocutaneous manifestation of HIV-1 infection. Previous studies have only noted the presence of OHP. The objective of this study was to determine the location and intensity of OHP observed in an HIV-1 infected cohort to better understand its association with immunologic data.

Methods: The mouth was separated into five distinct areas (buccal mucosa, labial mucosa, tongue, hard palate, and soft palate). Each area was rated from zero to four, with zero representing OHP not present and four representing a defined and distinct presentation of OHP. Two independent raters retrospectively analyzed intra-oral photographs of an HIV-positive cohort and compared results. Raters discussed discordant ratings until agreement was reached. These data were combined with a database containing immunologic information for each subject.

Results: In a cohort of 117 HIV-1 infected adults, 51 subjects(44%) had observable oral hyperpigmentation. Of those with OHP, mean CD4+ T-cell count was 470 (± 293) cells/mm³ and most(n=47) were African-American(92%). Mean time on HAART was 33.4 (± 36.6) months. The most frequent location for hyperpigmentation was the buccal mucosa (n=35), followed by labial mucosa (n=34), hard palate (n=32), soft palate (n=22), and tongue (n=12). The most common site with a rating of four was labial mucosa. A lower number of OHP-affected sites was significantly associated with Higher CD4+ T-cell counts (Spearman's rho= -.300, p=.03).

Conclusion: OHP among HIV-1 infected adults can be quantified by both location and intensity. Within this cohort, OHP occurred most commonly among African-Americans. The negative correlation between the number of sites with OHP and CD4+ T-cell count may suggest that either immunosuppression due to HIV - 1 infection and/or immune reconstitution on HAART influences the number of oral sites with OHP presentation. Longitudinal assessment will be necessary to confirm these cross-sectional findings. (Supported by NIDCR/K23-DE15746-05)

Location: Exhibit Hall D (Miami Beach Convention Center)

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Objectives: We reviewed community dental clinic charts to determine if blood pressure readings, hypertension or diabetes were charted in this at-risk population.

Methods: Chart abstraction was conducted on a random sample of adult patient's charts at two urban community clinics. Both clinics provide dental care regardless of ability to pay and medical care is also onsite. Abstracted data included patient and visit characteristics, blood pressure readings, documentation of diabetes, prescription antimicrobials, home care protocol and referrals to other health professionals.

Results: Sample patients (n=122) were predominantly African American(71%), male(62%), current smokers(59%) and 43.7(\pm 10.4) years old. Returning patients(61%) had a median of 4 visits during the past 24 months, which did not differ by clinic. The most common visit reasons were emergency exam(32%), pain(14%), restorations (12%), dentures(9%), extractions(5%) and endodontics(5%). Only 5 visits were classified as preventive. Antibiotics were prescribed to 32% of patients and 18% had a home care or oral hygiene protocol documented in the chart. Blood pressure readings were recorded more often in Clinic A than B, (86% vs. 48%, $p < .001$), although documented hypertension did not differ between clinics(15%). Blood pressures readings were recorded similarly for new and returning patients. There were more documented diabetics in Clinic B than A(16% vs. 3%, $p = .01$). Smoking status was not documented in 20% of charts and no chart notes reflected discussions or referrals for tobacco cessation. Fifty patients(41%) were referred to an oral surgeon and 2 were referred to a physician.

Conclusions: A relatively young patient population presented most often for acute care, with few scheduled preventive visits. This may reflect clinic capacity, patient interest or a combination of both. Given the high proportion of smokers, tobacco cessation services were negligible. Even with competing demands, opportunities to screen for prevalent systemic disease in this population may exist during the dental visit.

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Objectives: The aim of this study is to identify if there is a relationship between periodontal status and systemic bone density in postmenopausal women with mild to moderate periodontitis. **Methods:** 30 white, postmenopausal women between the ages of 40-55, diagnosed with mild to moderate periodontitis participated in this IRB approved study. Confounders for periodontitis such as smokers and diabetics were excluded. Age was eliminated as a confounder because the ages are not significantly different ($p < 0.05$). DEXA measurements at hip and spine were conducted to identify T-scores at hip and spine and cone beam CT was used to measure the distance from CEJ to alveolar crest of bone (AC) in mm at 6 sites per tooth for each participant. All the subjects received a clinical periodontal exam from a calibrated examiner. Plaque score percentage (PS) for each participant, periodontal probe depth (PD), and clinical attachment level (CAL) in mm on 6 sites per tooth for each participant. Based on clinical attachment levels participants were classified as mild (1-2mm CAL > 30% sites), moderate (3-4mm CAL in > 30% of sites), severe (>5mm CAL in greater than 30% of sites) periodontitis. Based on T-score, participants were classified normal, pre-osteopenic, osteopenic, osteoporotic. Linear regression analysis was conducted. **Results:** Participant's average T-scores at the hip and spine were -1.9 and -1.7 respectively, average AC was 2.1 +/- .9, plaque score was 53.7%, PD was 2.3 +/- 1.1, and CAL was 2.4 +/- 1.3. There was neither a relationship between hip T-score and AC ($p > 0.05$) nor CAL ($p > 0.05$). There was neither a relationship between spine T score and AC ($p > 0.05$) nor CAL ($p > 0.05$). **Conclusion:** In postmenopausal women with mild to moderate periodontitis, there is no relationship between periodontal status and bone density.

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D. LOWMAN, S. CHOGLE, S. NARENDHAN, and N. JAHDI, Case Western Reserve University, Cleveland, OH

Objective: This retrospective cohort study assessed the 9 months to 3-years outcome of endodontic treatment following non-surgical root canal therapy. **Methods:** Data were abstracted from a random sample of 200 charts in a post graduate endodontic program at a teaching institution including both clinical and radiographic evaluations. The outcome was dichotomized as 'success' (no apical periodontitis, no signs or symptoms) or 'failure' and recorded by two independent observers. The operative and Post-operative factors included Pre-operative Prognosis, Number of visits, Coronal restoration, and Presence of Periodontal disease. Data analysis was carried out by Statistical Package for Social Sciences (SPSS) and included both descriptive and analytical tests. **Results:** The overall success rate was 80%. The Preoperative prognostication was a strong indicator of success (81%). The success rate was significantly lower in teeth with periodontal involvement (63%) as compared to those without periodontal disease (83%). The success rate significantly dropped from 85% to 42% with the absence of an acceptable coronal restoration. In the current study the endodontic success was lower when endodontics was performed in one visit(76%) compared to multiple visits(82%) even though no significance was found. **Conclusion:** This study confirmed the presence of periodontal involvement and the absence a proper coronal restoration as the main prognostic factor in initial endodontic treatment. Continuation of the project will allow assessment of other prognostic factors with better power.

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Objective: To determine the quality of orthodontic outcomes and evaluate the trends over the past 40 years using the Peer Assessment Rating Index (PAR). Method: Using the protocol described by Richmond et al. (1992), 655 pairs of pre-treatment and post-treatment dental stone models were scored to determine pre-treatment complexity and post treatment outcomes. The dental casts from the 1960's to the mid-2000's are archived in the Department of Orthodontics. Percent reduction was determined by the difference in PAR over Pre-treatment PAR, multiplied by 100. Intraclass Correlation using SPSS software was utilized to determine reliability. Results: Reliability was determined to be 0.96 and 0.88, for pre-treatment and post-treatment, respectively (95% Confidence Interval, n = 16). The means and standard deviations of pre-treatment PAR scores (1960 – 27.1, 8.4; 1970 – 27.2, 8.9; 1980 - 25.2, 8.9; 2000 - 24.2, 9.6) are significantly different between decades recorded (p = 0.011). However, only Total Overjet subscore demonstrated a difference within the decades (10.8, 5.4; 10.2, 5.5; 8.8, 5.7; 7.8, 5.6) (p < 0.000). Post-treatment PAR scores (6.5, 4.7; 6.5, 5.1; 5.5, 4.8; 3.6, 2.8) displayed trends throughout the decades not only in overall score (p < 0.000) but in many of the subscores using a 95% Confidence Interval (Total Maxillary Anterior Alignment, Total Right Buccal Occlusion, & Total Overbite). Percent Reduction was shown to be significantly different in each of the decades (75.5, 17.9; 75.4, 22.1; 77.7, 19.0; 83.6, 12.6) (p = 0.003). Conclusion: The largest discrepancies in PAR scores were evident during the earlier decades. Higher case-complexities were shown in the 1960s and 1970s. Ultimately, statistical as well as clinical trends were demonstrated throughout each decade with a considerable focus on overjet and overbite evaluations.