



31st Annual
Scientific Day

April 19, 2012

Embassy Suites
Norman, Oklahoma



OUCOD Scientific Day – 31st Anniversary

The first Scientific Day was held in 1981 and consisted of table clinics in the hallways of OUCOD and a few dozen donuts in the Commons. The next year, the event became more sophisticated with the addition of orange juice and coffee. We then graduated to bagels, and quickly outgrew the confines of our building. As the summer research program grew and corporate support became stronger, Scientific Day evolved into what it is today, -----
The 31st annual OU College of Dentistry Scientific Day!

The evolution of Scientific Day is due to the dedication and support of all of you here today. To the students and their faculty mentors who complete meaningful research projects, to all of the faculty and staff who help plan and coordinate this event, and to the many sponsors who provide funding and help show us how advances in research translate into better products and services for our patients --- **We Thank You!**

Please enjoy the outstanding projects presented here today by our dental students, dental hygiene students, and residents. As you do, we hope that you will reflect on our humble beginnings, be proud of where we are today, and help us build an even better future.

Welcome to the OU College of Dentistry 31st Scientific Day!

Corporate Sponsor Exhibitors

The following companies have provided additional funding to support this year's Scientific Day and have been granted exhibit space adjacent to the posters. Please spend some time visiting with the corporate sponsors to learn about their products and to thank them for their generosity.

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**Special Thanks to the Following for Generous Support of
The University of Oklahoma College of Dentistry's
31st Annual Scientific Day**

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31st Annual Scientific Day**

Oklahoma County Dental Hygienists' Society

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Oklahoma Society of Oral & Maxillofacial Surgeons

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to the Following Area Businesses
for Door Prize Donations**



Domino's Pizza
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The Albert F. Staples Society
The Uniform Shoppe

(To win a door prize you have to be present at the luncheon)

Special Thanks to the Following Individuals

POSTER PRESENTATION JUDGES

| | |
|------------------------------------|-----------------------------------|
| Kevin Avery, D.M.D., M.P.H., M.Ed. | Francis E. Lipsinic, D.D.S. |
| Fred W. Benenati, D.D.S., M.Ed. | Jimmy W. Lloyd, D.D.S. |
| Kay S. Beavers, D.D.S. | Sharon K. Lloyd, R.D.H. |
| Perry L. Brooks, D.D.S. | Desiree White, R.D.H., B.S. |
| Cheryl L. Church, D.D.S. | Bing Martin, D.D.S. |
| Richard Corwin, D.D.S. | Christy McCullers, R.D.H., M.S. |
| Vicki Coury, R.D.H., M.Ed., M.P.H. | Donald Mitchell, D.D.S. |
| Heather Cox, D.D.S. | Nora Radmard, R.D.H., C.M.M. |
| Christinna R. Fairchild, D.D.S. | Bernard C. Rhone, D.D.S. |
| Steven M. Fick, D.D.S. | Douglas Rockwood, D.D.S. |
| Terry J. Fruits, D.D.S., M.Ed. | Nancy Romano, R.D.H., B.S. |
| Lizmary Garcia, D.M.D. | Susan L. Settle, D.D.S. |
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| Mike Keenan, D.D.S. | Thomas W. Tylka, D.M.D., M.A.G.D. |
| William Kent, D.D.S. | Ellen L. Ware, B.S. |
| Thomas Klag, D.D.S. | Janet West, R.D.H. |

ISHMAEL ESSAY CONTEST JUDGES

| | |
|------------------------------------|--------------------------------------|
| Kay S. Beavers, D.D.S. | Douglas Hall, D.D.S., M.S. |
| Joy Beckerley, D.D.S., M.Ed., M.S. | Farah Masood, B.D.S., M.S. |
| Jane Gray, R.D.H., C.D.A., M.Ed. | Frank Miranda, D.D.S., M.Ed., M.B.A. |
| | Tammie Vargo, R.D.H., M.Ed. |

SCIENTIFIC DAY COMMITTEE

| | |
|-----------------------|--------------------|
| Ms. Luellen Chenoweth | Ms. Ruth Nevarez |
| Mr. Neil Clark | Mr. Scott Newhouse |
| Dr. John Dmytryk | Ms. Carolyn Ray |
| Mr. Jason Jones | Dr. Dan Tylka |
| Dr. Sharukh Khajotia | Ms. Ellen Ware |

REGISTRATION

| | |
|------------------|----------------------|
| Ms. Robin Barnes | Ms. Carla Lawson |
| Ms. Sara Driver | Ms. Diana Stone |
| | Ms. Shirley Williams |

University of Oklahoma College of Dentistry
31st Annual Scientific Day

Schedule of Events

| | |
|---------------|--|
| 9:00 - 9:30 | Registration <i>East Entrance</i> |
| 9:00 - 10:00 | Continental Breakfast <i>East Entrance</i> |
| 9:00 - 10:30 | Poster Presentations <i>Pre-Function East</i> |
| 10:30 | Poster Votes Due In Ballot Box <i>Pre-Function East</i> |
| 10:30 - 12:00 | Ishmael Essay Presentations <i>Oklahoma E Ballroom</i> |
| 12:00 | CE Cards Available <i>Registration Desk</i> |
| 12:00 - 1:30 | Lunch & Awards <i>Oklahoma ABCD Ballroom</i> |

Ishmael Essay Contest Finalist Presentations

Oklahoma E Ballroom, 10:30 - 12:00

- 10:30 a.m. Priyanka Kainthla, DS2
 Suppression of *Candida albicans* Growth by Oral
 Staphylococcus aureus
- 10:45 a.m. Taylor Kent, DH2
 Green Tea and Oral Health
- 11:00 a.m. Manoj Jain, DS2
 DIY: The Bioengineered tooth
- 11:15 a.m. Cynthia Bivens, DH2
 Oral Health in the Pediatricians Office
- 11:30 a.m. Angela Phan, DS2
 Effect of Storage Duration on Wettability of Resin
 Composites

POSTER PRESENTATIONS

| Poster # | Presenter Name(s) & Title |
|-----------------|---|
| # 1 | PRIYANKA KAINTHLA (DS2) Suppression of <i>Candida albicans</i> Growth by Oral <i>Staphylococcus aureus</i> |
| # 2 | MANOJ JAIN (DS2) A New Crystal Morphology for Brushite ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$) |
| # 3 | ANGELA PHAN (DS2) Effect of Storage Duration on Wettability of Resin Composites |
| # 4 | LAUREN YEARY (DS2) SENB Fracture Toughness of Resin Composites after Storage in Water |
| # 5 | AARON BUCHANAN (DS2) Predictive Value of the Z-Angle in Type of Extraction Pattern |
| # 6 | TAYLOR NORTHERN (DS2) Identification of Chemicals Inhibiting <i>Streptococcus mutans</i> Biofilm Formation |
| # 7 | TYLER HOLT (DS2) Evaluation of the Mixed Dentition Analysis (M.D.A.) using the Denver Growth Data |
| #8 | MICHAEL HENNEBERRY (DS2) Bolton's Ratios and Their Implications on Occlusion |
| # 9 | GABRIEL LUTTRELL (DS2) Longitudinal Changes in Arch Perimeter and Arch Length |
| # 10 | CYNTHIA BIVENS (DH2) Oral Health in the Pediatrician's Office |
| # 11 | BEKAH COPE (DH2) Dental Hygiene Dialogue |
| # 12 | KAYLA DUNCAN (DH2); APRIL GRAY (DH2) The Dental Hygiene Appointment: A Pilot Study |

POSTER PRESENTATIONS

| Poster # | Presenter Name(s) & Title |
|----------|---|
| # 13 | AMY LEMONS (DH2) Oral Hygiene Implementation in Long-Term Care Facilities |
| # 14 | SETH BROOKS (DS2) Periapical Lesions: A Retrospective Study of the Microscopic Diagnosis of 1022 Cases |
| # 15 | MONA FARZANEH (DS2) Importance of Bone Grafts in Dentistry |
| # 16 | TEGAN LONGEST (DH2); SHERI MORRIS (DH2) The Root of the Problem: Causes of Poor Oral Health |
| # 17 | KERRI PERRIN (DH2) The New Adventures of an Old Flame |
| # 18 | ROXANN WHEELER (DH2) Sweet tooth: A Review of Theobromine |
| # 19 | SARAH DIGBY (DH2); KACIE NIEMYER (DH2) Dangerous Deficiency: Implementing CQ10 in Dentistry |
| # 20 | JILL VAUGHN (DH2); LINDSAY WOODARD (DH2) Healthy People 2020: Improving Oral Health of the Mentally Ill |
| # 21 | TAYLOR HARDEMAN (DH2) Preventing Orofacial Injuries in Sports |
| # 22 | CARRIE HARRIS (DH2) Designing Teeth: The Stem Cell Promise |
| # 23 | LESLIE KELLY (DH2) Osteoporosis and the Oral Cavity |
| # 24 | A. MICHELLE REYNOLDS (DH2) Hormonal Influences in Various Ages and Stages of Women's Lives |

POSTER PRESENTATIONS

| Poster # | Presenter Name(s) & Title |
|-----------------|--|
| # 25 | KAITLYNN EDWARDS (DH2); LAUREN MEEK (DH2); BREANNE RING (DH2) Oral Manifestations of HPV |
| # 26 | ASHLEY RODWELL (DH2); BETSY RUSSELL (DH2) Antioxidants Effects on Oral Health |
| #27 | ASHLEY TIMS (DH2); NEELEY VAN HORN (DH2) Illicit Drug Use and the Effects on the Oral Cavity |
| # 28 | SARAH BAKER (DH2) Addressing Barriers to Oral Health in Mexico |
| # 29 | PHOEBE BROWN (Postgraduate) Use of an Implant Supported Fixed-Detachable Hybrid Prosthesis for Complete Edentulism |
| #30 | ADAM COHLMIA (Postgraduate) CEREC Technology used for the Restoration of Root Canal Treated Teeth, Dental Implants, and Esthetic Veneers: A Case Report |
| #31 | TREY EDWARDS (Postgraduate) Rehabilitation of the Mandibular Dentition Involving a Patient with Severe Attrition |
| #32 | CHRIS FAULCONER (Postgraduate) Implant Supported Porcelain Restorations to Replace Diastemas Resulting from Congenitally Missing Laterals: A Case Report |
| #33 | MITCH HOOPES (Postgraduate) Treatment of an Edentulous Mandible from a Multi-Disciplinary Approach with a Hybrid Prosthesis |
| #34 | ROBERT SIMPSON (Postgraduate) Implants and Lithium Disilicate Restorations Used in Conjunction with Orthodontics to Properly Restore a Patients Smile |
| #35 | BLAIRE BOWERS (Postgraduate) Tetracycline as a Treatment Adjunct to Lichen Planus Therapy |

POSTER PRESENTATIONS

| Poster # | Presenter Name(s) & Title |
|-----------------|---|
| #36 | JASON NICHOLSON (Postgraduate) Allograft Treatment Choices – Just Say No to the Palate |
| #37 | TODD WALKER (Postgraduate) Comparison of Two Osseous Grafting Techniques for Maxillary Anterior Ridge Augmentation |
| #38 | MICHAEL SAUMUR (Postgraduate); KYLE SORENSEN (Postgraduate) The Role of Orthognathic Surgery in the Treatment of Obstructive Sleep Apnea |

Title: Suppression of *Candida albicans* Growth by Oral *Staphylococcus aureus*

Presenter(s): Priyanka Kainthla, DS2

Advisor(s): Felicia Qi

Abstract:

Background: A majority of the population has been shown to carry *Candida albicans* within their normal oral flora; however, very few people suffer from oral *Candida* infections. Past studies reveal that long-term antibiotic therapy markedly increases the host's susceptibility to oral thrush, suggesting that bacteria play a vital role in maintaining a healthy oral environment. **Objective:** The aim of this study was to isolate and identify specific bacteria obtained from healthy individuals that may be involved in suppressing *C. albicans* growth under normal oral conditions. **Method:** Various bacterial strains, isolated and purified from the saliva of healthy individuals, were co-cultured with *C. albicans* wild type strain 5314. The bacterial strains that most effectively suppressed yeast growth were identified using polymerase chain reaction and DNA sequencing. **Results:** Our results indicate that all of the bacterial strains isolated were able to suppress yeast growth to some extent; however, *Staphylococcus aureus* was determined to be the most effective inhibitor. **Conclusion:** Further studies are needed to determine the exact mechanism by which *S. aureus* suppresses *C. albicans* growth.

This study was supported by a grant from the J. Dean Robertson Society and was presented at the American Association for Dental Research 2012 General Session.

Title: A New Crystal Morphology for Brushite ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$)

Presenter(s): Manoj Jain, DS2

Advisor(s): A. Cuneyt Tas

Abstract:

Brushite ($\text{CaHPO}_4 \cdot 2\text{H}_2\text{O}$, dicalcium phosphate dihydrate) is a high solubility, mildly acidic calcium phosphate bioceramic and transforms into octacalcium phosphate ($\text{Ca}_8(\text{HPO}_4)_2(\text{PO}_4)_4 \cdot 5\text{H}_2\text{O}$) and calcium-deficient hydroxyapatite ($\text{Ca}_9(\text{HPO}_4)(\text{PO}_4)_5\text{OH}$), respectively, if it is hydrolyzed in physiological solutions at the human body temperature, 36.5°C . Brushite has the potential of replacing the apatite-based bone defect filling materials which are of minimal solubility and scant *in vivo* resorbability. To date only two morphologic shapes of brushite crystals were known: (a) the common flat plate morphology and (b) the water lily (or dumbbell) morphology. The purpose of this study was to investigate the effect of zinc in brushite synthesis solutions on the morphology of the brushite crystals to form. Experimental results showed that when small amount of zinc ions were added to the synthesis solutions, globular crystals or micro-granules of brushite were obtained for the first time. Globular or micro-granular brushite crystals were never reported before. A significant advantage of this method of production in the presence of very small concentrations of zinc ions was that the micro-granules were formed at room temperature and without using any organic or possibly toxic substances during synthesis to facilitate granulation. These bioceramic micro-granules may find novel uses in loading various porous or non-porous biopolymer scaffolds (such as, collagen, cross-linked gelatin, polyethylene glycol or polyvinyl alcohol) with bioactive and resorbable brushite.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Effect of Storage Duration on Wettability of Resin Composites**Presenter(s):** Angela Phan, DS2**Advisor(s):** Sharukh Khajotia

Abstract:

Objectives: To determine time-dependent wettability of selected resin composites after storage in water at oral temperature (37°C) for 2-, 4- and 7-days. **Methods:** Six specimens (d=6.0mm, h=3.6mm) each of Estelite-Σ (ES; Tokuyama), Esthet-X HD (EX; Dentsply/Caulk), Gradia Direct (GR; GC), Point 4 (PF; Kerr), and TPH3 (TP; Dentsply/Caulk) were fabricated in a steel mold against a glass slab. A 3μL drop of ultrapure water was dispensed onto the unpolished specimen surfaces within 90min (Day 0) in a contact angle goniometer (OCA15-Plus, FDSC). High-resolution digital images of the axisymmetric sessile drop were recorded @ 1frame/second for 10min at 37±1°C. Drop profiles were analyzed using the goniometer's software to determine contact angle (θ) values using the Laplace-Young equation. After testing, the specimens were stored in ultrapure water in a bath (37±1°C) and retested after 2-, 4- and 7-days. θ values at drop placement (θ_{Initial}) and at time=450s (θ_{Final}) for each storage duration were compared using General Linear Models and Student-Newman-Keuls tests ($\alpha=0.05$). **Results:** Mean \pm StdDev values for θ_{Initial} (degrees) were as follows:

| Day | ES | EX | GR | PF | TP |
|-----|-------------|-------------|-------------|-------------|---------------|
| 0 | 73.47±7.10A | 69.77±3.87A | 70.18±8.30A | 67.17±6.05A | 70.48±7.19A |
| 2 | 68.98±3.68A | 60.62±1.65B | 64.25±4.57A | 65.77±5.28A | 68.92±5.78A,B |
| 4 | 68.50±6.02A | 60.33±6.96B | 61.76±2.49A | 62.08±2.71A | 67.32±4.53A,B |
| 7 | 66.72±5.04A | 59.47±2.05B | 61.72±3.83A | 61.46±4.27A | 60.62±4.99A,B |

Superscript letters in each column denote mean values that are statistically different ($p<0.05$).

Conclusions: Mean initial contact angles of products EX and TP decreased significantly after storage in water for up to seven days, but remained the same for the remaining products. Mean final contact angle values decreased significantly with increased storage time for all products.

This study was supported by a grant from the J. Dean Robertson Society and was presented at the American Association for Dental Research 2012 General Session.

Title: SENB Fracture Toughness of Resin Composites after Storage in Water**Presenter(s):** Lauren Yeary, DS2**Advisor(s):** Sharukh Khajotia

Abstract:

Objectives: To determine the effect of storage in water at oral temperature for seven days on Single-Edge Notched Bending (SENB) fracture toughness of selected resin composites using ASTM Standard D5045-99 (2007). **Methods:** Seven SENB specimens each of Esthet-X HD (EX; Dentsply/Caulk), 4-Seasons (FS; Ivoclar-Vivadent), Gradia Direct (GR; GC), Point 4 (PF; Kerr), and TPH3 (TP; Dentsply/Caulk) were fabricated in a metal mold (17.6x2.0x4.0mm; blade length \approx 2mm). Specimens were stored in ultrapure water at $37\pm 1^\circ\text{C}$ for 1-day (control group) or 7-days (experimental group), and fractured in three-point bending in air (33R4468 Instron universal testing machine). K_{IC} fracture toughness values were calculated and validated as per the ASTM Standard. Mean K_{IC} values within each group were compared using one-factor ANOVA and *post hoc* Student-Newman-Keuls tests ($\alpha=0.05$). A t-test was used to compare mean values of each product after storage for 1- and 7-days ($\alpha=0.05$). **Results:** Mean \pm StdDev K_{IC} values ($\text{MPa}\cdot\text{m}^{1/2}$):

| Storage duration | EX | FS | GR | PF | TP |
|------------------|------------------|-------------------|------------------|------------------|------------------|
| 1-day | 1.22 \pm 0.09A | 0.88 \pm 0.13C* | 0.89 \pm 0.03C | 1.01 \pm 0.03B | 1.31 \pm 0.10A |
| 7-days | 1.21 \pm 0.12B | 0.71 \pm 0.09E* | 0.83 \pm 0.07D | 0.96 \pm 0.08C | 1.31 \pm 0.06A |

Letters denote mean values in each row that are statistically different ($p<0.05$)

* denotes mean values in each column that are statistically different ($p<0.05$)

Conclusions: Mean K_{IC} values of the resin composites tested were not statistically different ($p>0.05$) after storage in water at oral temperature for 1-day versus 7-days, except for product FS. Mean K_{IC} values of the resin composites differed statistically within each group ($p<0.01$).

This study was supported by a grant from the J. Dean Robertson Society and was presented at the American Association for Dental Research 2012 General Session.

Title: Predictive Value of the Z-Angle in Type of Extraction Pattern

Presenter(s): Aaron Buchanan, DS2

Advisor(s): Tarisai Dandajena

Abstract:

Background: The most common orthodontic problem presents as clinical crowding due to inadequate space to accommodate the teeth. Space can be gained or created either through extraction or arch expansion. Primary determinant of the treatment approach of either approach is the mandibular arch. Other factors to include aesthetics need to be considered in the extraction treatment plan. The most commonly used primary determinant of esthetics is the E-line. Another important diagnostic criterion is the Z-angle. Unlike the E-lines, the Z-angle is not commonly used. **Objectives:** The purpose of this project was to assess the diagnostic importance of the Z-angle in discriminating among various types of premolar extraction patterns. We hypothesized that one could predict which premolar teeth would be extracted by evaluation of the Z-angle.

Methods: Pretreatment lateral cephalograms of 205 subjects treatment planned for extractions only without surgery were traced and digitized using DFP (Dentofacial, Toronto, Canada). Dependent variables included: upper lip Z-angle (ULZ), lower lip Z-Angle (LLZ), and difference between ULZ and LLZ (diffZ). The subjects were stratified according to the following extraction patterns: U0L4, U4L0, U4L4, U4L5, U5L0, U5L4, and U5L5 as well as Angle's type of occlusion. Hence there were three dependent variables ULZ, LLZ and diffZ and two independent factors extraction and occlusion. The data were analyzed using SAS, Version 9.2. **Results:** Final study sample was 195 after exclusion of 10 subjects. ANOVA showed no significant interaction between occlusion and extraction. Neither ULZ nor LLZ were associated with the extraction patterns. Occlusion was only associated with ULZ. However, extraction patterns were significantly associated with diffZ ($p < 0.0001$). **Conclusion:** The original Z-angle cannot be used to predict the extraction pattern. However, it is the difference between the two Z-angles, diffZ that can possibly predict the extraction pattern independent of the occlusion.

This study was supported by a grant from the J. Dean Robertson Society and the Department of Orthodontics.

Title: Identification of Chemicals Inhibiting *Streptococcus mutans* Biofilm Formation

Presenter(s): Taylor Northern, DS2

Advisor(s): Felicia Qi

Abstract:

Streptococcus mutans, a Gram-positive facultative anaerobic pathogen commonly found in the human oral cavity is considered a primary pathogen for dental caries. A major virulence factor of *S. mutans* is the synthesis of extracellular polysaccharides called glucans from sucrose. Glucans are major components in the *S. mutans* biofilm. Glucosyltransferase enzymes (GTFs) are central to glucans production. The purpose of this study was to identify inhibitory chemicals on biofilm formation of *S. mutans* and to estimate the minimum inhibitory concentration (MIC) of the chemicals. Using a phenotypic microarray (Biolog plates) we identified 8 chemicals that inhibited *S. mutans* biofilm formation in the presence of sucrose. MICs of these chemicals were then determined by 2-fold serial dilutions using two strains of *S. mutans*. Biofilms were visualized by crystal violet staining. Of the eight chemicals, norspermidine, norspermine and decanoic acid+tween80 inhibited biofilm formation in very low concentrations in both UA140 and UA159 strains. The estimated MIC against the biofilm of UA140 were 0.039% decanoic acid + tween 80 diluted in H₂O, 0.06% norspermine in H₂O, and 0.12~0.15% norspermidine. These chemicals were also tested with a large number of *S. mutans* clinical isolates, and the inhibition of biofilm formation was demonstrated in all strains. More research is needed to further understand the mechanism of inhibition of biofilm formation by these chemicals.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Evaluation of the Mixed Dentition Analysis (M.D.A.) using the Denver Growth Data

Presenter(s): Tyler Holt, DS2

Advisor(s): Onur Kadioglu, Fräns Currier

Abstract:

Introduction: The Mixed Dentition Analysis (MDA) is commonly used for predicting the space required within the maxillary and mandibular arches in growing children.

Aim: The primary purpose of this study was to evaluate the crowding/spacing in the arches from the transitional dentition to permanent dentition for a large longitudinal sample of boys and girls. The results of these arch changes were correlated to the buccal segments (canine and molar relationships) as well as anterior overbite/overjet over time.

Material and Methods: A total of 48 males and 51 females were selected from the entire sample of 260 individuals following the scanning of their 3,000 models from the Denver Growth Study. Those selected had the availability of the models for the various stages of occlusal development. Two time points were identified. T1 measurements included the widths of the mandibular permanent incisors, all four primary canines and all eight primary molars. At T2, the widths of all permanent canines, and premolars were measured along with space available. At T2 the canine and molar relationships as well as overbite and overjet were also recorded.

Results: Analyses are being performed to identify any correlations between the MDA predictions and anterior overbite/overjet, canine and molar relationships.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Bolton's Ratios and Their Implications on Occlusion

Presenter(s): Michael Henneberry, DS2

Advisor(s): Onur Kadioglu, Fräns Currier

Abstract:

The Bolton Analysis investigates the effects of interarch tooth width discrepancies on the analysis and treatment of malocclusion. The major intention of this study was to contrast Bolton's ratios with overbite, overjet, crowding, and Angle's classifications of malocclusion in search of any significant correlations over time. Utilizing the Denver Growth Study, a sample size of 23 males and 22 females were selected from a pool of 250 patients and 3,000 models. All models were converted into a stereo-lithographic (STL) format using a 3Shape three-dimensional scanner. Of those selected, Bolton's analysis was performed digitally at two points in time. There was intent to retrieve data regarding overbite, overjet, crowding, and Angle's classifications of malocclusion and contrast those values over time to Bolton's ratios in search of any significant correlations.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Longitudinal Changes in Arch Perimeter and Arch Length

Presenter(s): Gabriel Luttrell, DS2

Advisor(s): Fräns Currier, Onur Kadioglu

Abstract:

Arch perimeter/circumference and arch length/depth represent the classical approaches in the evaluation of the dentitions from the primary through the transitional up to the permanent dentition. These changes are affected by the exfoliation and eruption of succedaneous and the eruption of accessional teeth. Longitudinal assessment is needed for a more accurate analysis of the differences from normal growth and development versus changes from orthodontic treatment. In the summer 2011, all 3,000 models from the Denver Growth Collection were manually transformed into an electronic format via the aid of a digital three-dimensional scanner. A selected sample of 20 males and 20 females from the ages of 6 to 16 years of age were studied. Five time periods were evaluated: before 6 years, 7 to 9, 10 to 12, 13 to 15, and 16 or older. Male/female variations will be presented concerning the different stages of dental and occlusal development from primary tooth loss through permanent tooth eruption.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Oral Health in the Pediatrician's Office

Presenter(s): Cynthia Bivens, DH2

Advisor(s): Carolyn Ray

Abstract:

Background: Dental caries is the most prevalent disease process among children. While it is recommended that children find a dental home by age one, most do not. Most children do, however, have a medical home. Pediatricians can play a major role in assessing oral disease and educating parents on the importance of oral health. The purpose of this study was to gather information concerning the knowledge and current practices of Oklahoma pediatricians in regards to their adoption and/or implementation of a preventive dental health program in their practices with patients aged 0-3 years.

Methods: A systematic sampling technique was used to select 256 of the 606 licensed Oklahoma pediatricians currently in practice. A 17-item questionnaire was mailed in a self-addressed, stamped envelope.

Results: Seventy-eight pediatricians (30.5%) returned the survey with 68 being usable for this study. Most pediatricians (n=67, 98%) routinely perform an oral exam and provide assistance in finding a dentist (n=49, 72%). Very few pediatricians take on the task of applying fluoride varnish (n=7, 10%). Most (n=46, 68%) feel confident in their ability to complete an oral health screening, yet report uncertainty or lack of confidence in applying fluoride varnish (n=55, 81%). Fifty-nine pediatricians (88%) indicated a slight to high interest in taking continuing education in pediatric oral health.

Conclusions: The pediatricians participating in this study indicated agreement with their roles in screening for oral disease, ability to do oral screening, and referral to a dentist. They were less agreeable about their roles in providing fluoride varnish and ability to apply it on their patients.

Clinical Implications: The results from this study indicate a potential for interprofessional collaboration between dentistry and pediatricians. An interdisciplinary approach to providing oral health can benefit children who otherwise do not have access to dental care.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Dental Hygiene Dialogue

Presenter(s): Bekah Cope, DH2

Advisor(s): Carolyn Ray

Abstract:

Background: Effective communication skills are important in the dental hygienist's role in the promotion of oral health. The purpose of this research study was to investigate current dialogue strategies used by Oklahoma dental hygienists with their patients.

Methods: Dental hygienists with known email addresses (N=118) with the Oklahoma Dental Hygienists' Association were sent an online survey. A 19-item questionnaire with dropdown responses and open-ended questions was sent to those on the listserv via an online survey tool.

Results: Seven of the 218 were undeliverable. Response rate was 21% (n=45). A majority of the respondents (n=38, 84%) had a bachelor or master's degree and worked in a general practice setting. Hygienists reported speaking with patients about brushing (93%) and flossing (84%) every visit (93%). The most common communication methods used were: demonstrate proper techniques at 96% (n=43), instruction on how to improve current technique 78% (n=35), discuss the oral-system link at 67% (n=30), and motivational interviewing at 49% (n=22).

Conclusion: Overall, the hygienists who participated in the survey felt they were effective at communicating with their patients and helping their patients improve and maintain oral health. Eighty-seven percent stated they would be interested in taking an educational course on motivational interviewing, which was the least common communication method used at 49% (n=22).

Clinical Implications: Motivational interviewing should be implemented into educational regimens to allow the patient more control and responsibility over their own oral health. This communication strategy can be implemented via continuing education courses.

This study was supported by a grant from the J. Dean Robertson Society.

Title: The Dental Hygiene Appointment: A Pilot Study

Presenter(s): Kayla Duncan, DS2; April Gray, DH2

Advisor(s): Carolyn Ray

Abstract:

Background: Dental hygienists are oral health care providers who aid in dental patients' overall health. The hygiene profession was established over 100 years ago with the intent of establishing a healthcare provider who focused on the prevention and promotion of oral health. The scope of practice for hygienists varies from state to state. The process of care and the ADHA Standards for Clinical Hygiene Practice provide a fundamental "list" of procedures performed on dental hygiene patients. There are very few published articles that detail the time required to provide dental hygiene therapy to patients during their hygiene appointments.

Purpose: The purpose of this study was to gather data on the therapy provided by dental hygienists during appointments with their patients.

Methods: The IRB application and required information were submitted in June 2011. Final approval was not completed until late August. The delay in getting approval prevented the researchers from completing the data-collecting observations. The observation that was completed was intended to aid in the creation of the assessment tool for the study.

Conclusions: The Dental Hygiene Process of Care includes therapy in the areas of: assessment, dental hygiene diagnosis, planning, implementation, evaluation, and documentation. There are many interventions that are included in each of these areas. The amount of time that is required to accomplish the procedures is uncertain. The standard 60-minute dental hygiene appointment may not provide enough time to complete comprehensive care to hygiene patients. Research should be done to gather a data that supports a standardized model for the dental hygiene "prophy hour". This pilot study will serve as a foundation for future dental hygiene researchers.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Oral Hygiene Implementation in Long-Term Care Facilities

Presenter(s): Amy Lemons, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this study was to investigate the oral health policies and practices currently implemented in long-term care facilities in Oklahoma.

Methods: Surveys were mailed to 195 long-term care facilities in the state of Oklahoma with self-addressed, stamped envelopes. The list of facilities was accessed using the Oklahoma Department of Health website. The 15-item survey included questions regarding policies and practices with oral health and preventive dentistry in their respective facilities.

Results: The response rate was 34% ($n=66$). Nurse aids are typically held responsible for oral hygiene care with 77% of responses ($n=66$). Most residents of the long-term care facilities surveyed receive oral hygiene care at a minimum of once a day, with 45% ($n=30$) receiving daily oral hygiene care and 53% ($n=35$) receiving oral hygiene care two or more times a day. Financial constraints were considered to be the most significant obstacle in providing residents with dental care, with 39% ($n=36$) of responses.

Conclusion: Results from this study indicate that most long-term care facilities do consider oral hygiene and health care to be a priority. Most facilities that participated in the study have policies in place regarding oral health care and strive to implement oral hygiene into their daily routines. The results could contribute suggestions for improvement of oral care provided to residents in both long-term care facilities by employees and dental professionals.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Periapical Lesions: A Retrospective Study of the Microscopic Diagnosis of 1022 Cases

Presenter(s): Seth Brooks, DS2

Advisor(s): Glen Houston

Abstract:

Periapical lesions are frequently diagnosed in the oral and maxillofacial pathology laboratory. This study reviewed periapical lesions involving the calendar years 2007 through 2010 that were submitted to the Oral and Maxillofacial Pathology Laboratory, College of Dentistry, University of Oklahoma Health Sciences Center, Oklahoma City, OK for diagnosis. This involved over 16,064 total accessions, of which 1022 were recorded as periapical lesions. There was a slightly higher incidence in females (50.9%) than males (49.1%). The most common decade of life that periapical lesions occurred was the 6th decade (50-59 years of age, 19.57% of the cases). The periapical granuloma and cyst were the two most common lesions (63.99% and 31.8% respectively). The most common location for these periapical lesions was the maxilla (66.7%). The results of this current study are consistent with previous reported studies.

This study was supported by a grant from the J. Dean Robertson Society.

Title: Importance of Bone Grafts in Dentistry

Presenter(s): Mona Farzaneh, DS2

Advisor(s): Robert Carson, Todd Walker

Abstract:

Introduction: Periodontitis and tooth loss are associated alveolar bone loss, and alveolar bone loss increases with age. Males, Asians, Pacific Islanders and Native Americans are more likely to have severe bone loss compared to females and Caucasians. Smoking is associated with periodontal attachment loss. Following tooth loss, alveolar bone resorbs due to lack of functional stimulation. Maintaining one's natural teeth is important for esthetic and functional reasons. Tooth replacement is often best accomplished with dental implants. Ridge augmentation/preservation procedures are commonly used to provide adequate alveolar bone for dental implant placement. These procedures include autografts (from the same individual), allografts (from the same species) and xenografts (from a different species).

Summary: Following tooth extraction, alveolar bone resorbs and remodels. Research has shown that 40-60% of bone loss associated with tooth loss occurs in the first six months following extraction. However, after six months alveolar bone changes are minimal. The resorptive process may affect the success of implant placement. During the this process, the greatest amount of alveolar bone loss occurs in the horizontal dimension. Implant position is affected by the horizontal and vertical dimensions of the alveolar ridge. Thus, it is important to maintain the dimensions of the alveolar ridge following tooth extraction in order to achieve clinically acceptable implant placement. **Conclusion:** Alveolar bone loss is multifactorial. It can be caused by periodontitis or tooth loss. In order to successfully place an implant, adequate width and height of alveolar bone is necessary. Different kinds of bone grafts exist to help the clinician achieve this goal.

This study was supported by a grant from the J. Dean Robertson Society.

Title: The Root of the Problem: Causes of Poor Oral Health

Presenter(s): Tegan Longest, DH2; Sheri Morris, DH2

Advisor(s): Lindsey Hays

Abstract:

Background: Oral disease is multi-faceted and includes family values, socioeconomic status, access to care, culture, and fluoridation, as well as, nutrition. It is hypothesized that the School Lunch Program could address multiple areas of oral disease if properly mandated. School-aged individuals are at high risk for nutritional deficiencies, which can lead to a multitude of health problems including dental caries. Public and private schools are a perfect setting to introduce proper nutrition and education over dental health. Children participating in these programs have a greater advantage to obtain healthy foods than those who are not.

Clinical Implications: Dental professionals should focus on prevention of oral disease by addressing the root of the problem: education in early childhood. Dental professionals should also work toward expanding their scope of practice to include employment in the educational system. Furthermore, dental professionals should take an active role in the legislative process by educating law makers on the contributing factors of oral disease.

Conclusions: School mandated breakfast and lunch programs are currently in place, however, guidelines are not strictly enforced. Many programs include items that meet the nutritional requirements, but still contribute to oral disease. Legislation needs to be restructured to include the opinion of dental professionals. Addressing the root of the problem will in turn have a compounding effect that will improve other aspects of oral disease.

Title: The New Adventures of an Old Flame

Presenter(s): Kerri Perrin, DH2

Advisor(s): Lindsey Hays

Abstract:

Purpose: To increase the awareness of subclinical inflammation in the human body by exploring past and present theories of disease.

Background: Inflammatory periodontal diseases are the most common chronic infection found in the human population worldwide. Knowledge of inflammation has changed over the past few decades. Previously thought to be an acute condition; inflammation was treated only when it peaked as an acute disease.

Present knowledge considers subclinical inflammation to be an immense contributing factor to the onset of other inflammatory conditions by raising the inflammation threshold. Current research shows that periodontal disease, and its associated bacteria, has been directly linked to systemic diseases by raising the level of subclinical inflammation in the body.

Clinical implications: Dental professionals can improve the quality of patient care by understanding the direct link of periodontal disease to subclinical inflammation.

Conclusion: Periodontal diseases and other oral infections may pose a risk to healthy patients, as well as, have a significantly increased risk to those with systemic diseases. Therefore, control of such manifestations is paramount to the prevention, morbidity and mortality rates of patients with systemic diseases. Patients should be advised to have annual C-Reactive Protein test to identify inflammation levels and to help correctly identify the cause.

Title: Sweet Tooth: A Review of Theobromine

Presenter(s): Roxann Wheeler, DH2

Advisor(s): Lindsey Hays

Abstract:

Background: Dental caries is a disease that affects millions of people across the world. Theobromine is a naturally occurring substance. It is found in high concentrations in cocoa and has demonstrated the capability to remineralize enamel. Theobromine increases the size of the hydroxyapatite crystals in enamel, which is correlated to a decrease in caries incidence.

Significance: Theobromine can be added to various dental products to remineralize enamel and prevent caries. It would be a cost effective alternative to fluoride, without the negative side effects of fluorosis. Current research suggests that enamel surfaces subjected to theobromine have greater integrity and are more resistant to bacterial attack.

Conclusion: Theobromine has been shown to remineralize enamel, which would aid in caries control and reduction. Due to minimal side effects, theobromine would be acceptable to use on pediatric patients. Current developments are including theobromine into dental products, such as toothpaste and mouth rinses. Due to the availability of theobromine in chocolate and other food sources, it is becoming a superior alternative to fluoride.

Title: Dangerous Deficiency: Implementing CQ10 in Dentistry

Presenter(s): Sarah Digby, DH2; Kacie Niemyer, DH2

Advisor(s): Lindsey Hays

Abstract:

Background: Coenzyme Q10 is a naturally found enzyme in the human body. Its main function is energy production, by aiding in the formation of the ATP molecule, which provides cells with the energy to subsist. Increased cellular energy production leads to improved tissue response. Coenzyme Q10 is a powerful antioxidant that inhibits free radical damage on cells and also boosts immune system support. Deficiency rate is rising in the United States due to multiple factors, thus contributing to overall poor health status.

Clinical Significance: Coenzyme Q10 aids with systemic inflammation reduction by boosting the cellular energy. Current research shows that topical application of CQ10 targets specific cells and aides in wound site healing. Adjunct dental therapies should be explored to include topical CQ10 in cases of periodontal disease to improve pocket healing.

Conclusion: Coenzyme Q10 is a much needed enzyme in the human body. More research is needed to develop products that target periodontal pockets during NSPT, such as chemotherapeutic agents. It is imperative that dentists, physicians, and pharmaceutical companies work together in the development of topical applications of coenzyme Q10 for disease treatment. Dental hygienists' can implement coenzyme Q10 into patient care plans to help treat, prevent, and promote healing of periodontal diseases and to cease the dangerous deficiency.

Title: Healthy People 2020: Improving Oral Health of the Mentally Ill

Presenter(s): Jill Vaughn, DH2; Lindsay Woodard, DH2

Advisor(s): Tammie Golden

Abstract:

Background: Studies have shown that patients with mental illness are at higher risk for both caries and periodontal disease. Several factors that contribute to this are high smoking rates, poor nutrition, amotivation among patients, and xerostomia as an adverse effect of medications.

Purpose: The objective of this literature review was to investigate what changes could be made in the healthcare setting to provide better oral health care to this underserved population.

Findings: Many healthcare providers attach a negative stigma to mental illness and perceive patients with mental illness as difficult or disorderly. Rather than viewing their abnormal behavior as a symptom of disease, many providers view their conduct as a personal attribute. Increasing education about mental illness can enable healthcare providers to feel more comfortable around these patients and develop successful interventions that bypass the emotional, cognitive, and intellectual deficits that accompany mental illness.

Conclusion: Programs that create awareness in dental school curriculums can help in removing negative stigmas associated with mental illness. Dental professionals and medical care providers that collaborate are more successful in treating this underserved population. Collaborative efforts also enable dental professionals to gain insight on mental illness and become more familiar with characteristics of the disease. More research could be done to help improve quality of care.

Title: Preventing Orofacial Injuries in Sports

Presenter(s): Taylor Hardeman, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this poster is to inform dental professionals on how to prevent orofacial injuries in sports.

Significance: Orofacial injuries are more numerous in team sports but more severe in individual sports. Athletes have been getting bigger, faster, and stronger leading to more forceful collisions.

Implications: Dental professionals are likely to see patients who have suffered sports injuries during their career. Summarize dental therapy used to help prevent these injuries.

Conclusions: While the athletes are at risk for experiencing orofacial trauma from sports injuries, coaches are in the position to help prevent these from happening. Dental professionals are in a position to help educate and train both athletes and coaches.

Title: Designing Teeth: The Stem Cell Promise

Presenter(s): Carrie Harris, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: This literature will provide dental professionals information about stem cells and the potential oral benefits that they may provide to many dental patients.

Background: Stem cells can best be described as a cell with the ability to continuously divide and are undifferentiated cells of a very flexible nature. The oral cavity – teeth and surrounding tissues – offers a convenient, safe, and ethical source for harvesting stem cells. These cells can be “programmed” by their DNA to become many different bodily features. Stem cell research is being done in areas such as Parkinson’s disease, diabetes, nerve regeneration, organ transplants, and dentistry.

Clinical Implications: Stem cells have the potential to develop into teeth, parts of the periodontium, and structures of the head and neck. Current research supports and offers great promise for the use of dental stem cells in re-creating oral structures lost to disease or congenital abnormalities. Dental professionals are in a position to educate patients regarding how to harvest, store, and potentially use dental stem cells to restore oral function.

Conclusions: All members of the dental team must be prepared and educated regarding the use of stem cells in treating and preventing the morbidity associated with oral disease. Dental stem cells offer great hope and potential for oral reconstruction in patients who want and need a return to a normal oral function and esthetics.

Title: Osteoporosis and the Oral Cavity

Presenter(s): Leslie Kelly, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this poster is to inform the dental professionals on the effects of osteoporosis on the oral cavity.

Significance: According to the National Osteoporosis Foundation, it is estimated that over 10 million Americans suffer from osteoporosis and nearly 44 million Americans are at risk. Osteoporosis is defined as a skeletal disorder that affects the bones of the body and causes them to become porous, thin, brittle and susceptible to fractures. Some of the modifiable and non-modifiable risk factors for osteoporosis include family history, gender (female), post-menopausal age, physical inactivity, deficiency in vitamin D and calcium, and having a low body mass

Implications: Some of the effects that osteoporosis can have on the oral cavity include periodontal disease, oral bone loss and tooth loss, which could have a significant impact on the dental community.

Conclusion: There is a correlation between osteoporosis and the oral cavity. Periodontal disease and osteoporosis both result in bone loss. Calcium and vitamin D are crucial for maintaining and preventing bone loss due to osteoporosis. Osteoporosis may be detected on dental radiographs and bisphosphonates lead to necrosis of the jaw. Therefore, it can be concluded that osteoporosis has a significant impact on the oral cavity.

Title: Hormonal Influences in Various Ages and Stages of Women's Lives

Presenter(s): A. Michelle Reynolds, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this literature review is to educate and inform dental professionals regarding the influence of hormones on women's oral health. This knowledge can help them motivate and educate their female patients regarding oral manifestations of hormones.

Background: Hormones are microscopic chemicals released by glands in the body that send messages to target cells. These hormones may cause physiologic and pathologic changes in most tissues of the body including the periodontium. Certain oral manifestations caused by hormones have been found in various ages and stages of a woman's life.

Practice Implications: Awareness of hormonal influences on women's oral health can assist dental professionals in educating their female patients on possible negative effects encountered during their lives.

Conclusions: Experimental studies show there are many oral manifestations of hormones. Hormones during puberty have an effect on the periodontium of pre-teen girls. Pre-pregnancy aged women that use hormonal contraceptives may show hormonal effects on the periodontium, as well. It is well known that pregnancy influences several effects on a woman's oral cavity. Menopause may also show similar signs of hormonal influences.

Title: Oral Manifestations of HPV

Presenter(s): Kaitlynn Edwards, DH2; Lauren Meek, DH2; BreAnne Ring, DH2

Advisor(s): Carolyn Ray

Abstract:

Background: The purpose of this literature review is to inform dental professionals of the etiologies and multiple risk factors associated with HPV-affiliated oral conditions. The most commonly affected intraoral sites, available treatment alternatives, and vaccinations for HPV-related oral malignancies will be discussed.

Conclusions: HPV has been identified as a risk factor for oropharyngeal cancer even in the absence of tobacco or alcohol use. HPV infection was consistently detected in the tonsillar region. Human papillomavirus infection has been reported in patients who present with typical lesions of the oral mucosa. The bulk of white oral lesions—thickened white patches, papillary growths, and warty growths could potentially be manifestations of high-risk HPV infection. Benign lesions located within the oral cavity include: squamous cell papilloma, condyloma accuminatum, verucca vulgaris, oral leukoplakia, oral lichen planus, and focal epithelial hyperplasia. Benign oral HPV lesions are generally asymptomatic and may disappear spontaneously or remain intact for many years. Compelling research revealed that high-risk HPV-16 was implicated in the vast majority of oral cancer cases.

Practice Implications: Dental professionals can enhance their patient care and potentially save an individual's life by performing thorough intraoral and extraoral exams. Practitioners should be knowledgeable about the risk factors, treatment modalities, and oral presentations associated with head and neck cancers. The education of the dental team concerning the detection of oral HPV manifestations can result in more efficient preventive care.

Title: Antioxidants Effects on Oral Health

Presenter(s): Ashley Rodwell, DH2; Betsy Russell, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this literature review and poster is to inform dental professionals about the effects of antioxidants on oral health.

Background: When disease is present, periodontal tissues are exposed to many reactive oxygen species (ROS). Antioxidants can help reduce the number of ROS present. An antioxidant is anything that can inhibit oxidation of a molecule, such as a free radical, by contributing an extra electron. This process is necessary for the body to maintain normal cellular function. In patients with periodontal disease, there is an imbalance between oxidants and antioxidants in the oral cavity. One type of antioxidant, known as a polyphenol, is found very readily in all fruits and vegetables and is capable of scavenging free radicals. Catechins found in green tea are another form of antioxidants and also work by scavenging free radicals.

Clinical Implications: Dental professionals should be aware of the health-enhancing benefits of antioxidants. This knowledge can contribute to their patients' oral health. Dental professionals need to educate and make recommendations regarding the use of antioxidants to patients with inflammatory diseases.

Title: Illicit Drug Use and the Effects on the Oral Cavity

Presenter(s): Ashley Tims, DH2; Neeley Van Horn, DH2

Advisor(s): Carolyn Ray

Abstract:

Purpose: The purpose of this literature review is to present the oral manifestations that can result from illicit drug use and provide a review for dental professionals.

Background: According to the National Institute of Drug Abuse, millions of people today suffer with illegal drug addiction. Cocaine, cannabis, heroin, ecstasy, and methamphetamine are the major drugs used today in the United States. Severe oral effects can result from abuse of these substances. Dental intervention is essential for drug abusers.

Methods: A range of recently published (2006 to present) articles were reviewed in order to get the most up to date information regarding the effects of illicit drug use on one's oral health. The drugs reviewed included: cocaine, cannabis, heroin, ecstasy, and methamphetamine.

Practical Implications: The findings in this literature review suggest many practical implications to the dental professional. Dentists and dental hygienists' should be aware of the patient's history of drug use and the implications on planned therapy. Modifications of the dental interventions might be appropriate based on the reported abuse. Information about the substance can aid dental professionals on how to treat and educate the patient on the oral consequences of drug abuse.

Conclusion: Drug abuse has severe effects on the oral cavity. Dental professionals need to be knowledgeable and able to recognize the specific manifestations associated with the various substances that are abused.

Title: Addressing Barriers to Oral Health in Mexico

Presenter(s): Sarah Baker, DH2

Advisor(s): Tina Tuck

Abstract:

Background: Tooth decay affects 61% of children in Mexico. Factors contributing to the prevalence of poor oral health in Mexico are lack of regulated fluoride levels, poor oral hygiene, limited access to dental care, and bottle feeding with high sugar sources.

Objectives: To increase the level of oral health knowledge in children and parents.
To increase oral health preventive measures

To increase knowledge about healthy foods contributory to oral health.

Project outline: The target population from Las Pozas, Guerrero, Mexico consisted of 17 people ages 5 to 42. Most could not read, all spoke Spanish, few families have transportation to the closest dental facility (15 miles away). The initial phase included three lesson plans. Etiology of plaque, oral hygiene instructions and the importance of fluoride were taught. Participants were surveyed via translator to determine outcomes.

Clinical Implications: 95% of the target population had never seen floss
5% had never brushed their teeth
24% have active decay
12% have gold restoration fillings.

Results: By the end of the initial phase, 100% of the participants were brushing twice daily, identified use of floss, and understood the causes and incidence of decay in children. 88% identified the causes for plaque and decay.

Conclusion: The community project held in Las Pozas was a successful initial phase to the long-term project designed to provide preventive services to this underserved population. In order to provide a significant increase in oral health, the second phase of this project will be the provision of oral prophylaxis provided by a registered dental hygienist in July 2012. The ultimate goal of this project is the implementation of a community oral health facility constructed and funded in order to provide comprehensive oral health care to this underserved population.

Title: Use of an Implant Supported Fixed-Detachable Hybrid Prosthesis for Complete Edentulism

Presenter(s): Phoebe Brown, Postgraduate

Advisor(s): David Buxton

Abstract:

The treatment of edentulous arches with implant supported fixed-detachable hybrid prostheses is an excellent alternative to conventional dentures for increased retention and function. This case presentation involves restoration of an edentulous mandibular ridge with a fixed-detachable implant denture. The patient presented with an atrophic, edentulous mandibular ridge extending from a long history of periodontal disease. Remaining anterior mandibular teeth were extracted and three implants were placed immediately. Two implants were later placed in the posterior mandible away from the ideal location due to availability of bone. While the five bone-level implants were being placed, a complete denture was worn as an interim prosthesis. Restoration of the implants incorporated a milled titanium framework made from digital scanning software with a traditional denture setup. The milled framework was modified and approved digitally. The methods and materials used to fabricate this prosthesis are detailed, and options for increased patient comfort during use of the interim prosthesis are explored.

Title: CEREC Technology used for the Restoration of Root Canal Treated Teeth, Dental Implants, and Esthetic Veneers: A Case Report

Presenter(s): Adam Cohlma, Postgraduate

Advisor(s): Mark Phan, David Dembinski, David Buxton, Michael Fling

Abstract:

A healthy 50-year-old female patient presents to the clinic with the chief complaint that she does not like the color or shape of her teeth and would like to have them restored for functional and esthetic reasons. She is eager to replace her missing tooth and feel comfortable smiling again. The patient had a severe illness as a young child, was hospitalized and treated with tetracycline. All teeth show signs of enamel hypoplasia and many are tetracycline stained. The patient has 20-year-old composite veneers on her upper anterior teeth. These have become heavily stained and require replacement. Preparations were scanned both directly and indirectly with the CEREC Bluecam using CEREC 3D and CEREC 4 software. Ivoclar IPS Empress and IPS e.max blocks were milled in the MC XL milling unit. An otherwise non-restorable root canal treated tooth #30 was restored with a milled Empress crown, rather than extraction and implant placement or 3-unit bridge preparation. Root canal treatment was completed on tooth #3 and an Empress crown was milled as a final restoration. A Zimmer tapered screw vent implant was placed in area of tooth #19 and was allowed to heal for 3 months. A titanium abutment was prepped, and a low translucency e.max (lithium disilicate) crown was milled, fired and custom stained to match the patient's adjacent natural teeth. Monolithic e.max was chosen to restore this implant crown due to its high flexural strength of 360 MPA. The stained composite veneers were removed, preps were modified, and temporary bis-acrylic Integrity restorations were fabricated using a stint made from the diagnostic wax-up. The final impression was poured in CAD stone and scanned with the CEREC Bluecam. An impression of the temporary crowns was poured in CAD stone and was also scanned with Bluecam. This digital model of the temporary crowns was used as a correlation for final veneer design. e.max veneers were milled and adjusted on the model. Low translucency lithium disilicate blocks were chosen to block out tetracycline staining, and because the wear rate of e.max is comparable to tooth enamel. The incisal edges of #7-10 were cut back and layered with IPS e.max Ceram Essence translucent incisal porcelain. This added depth to the porcelain restorations, providing a more natural, life-like appearance to the anterior teeth. Milled CEREC restorations can be used to restore natural teeth and implants, and can be used to fabricate functional and esthetic restorations.

Title: Rehabilitation of the Mandibular Dentition Involving a Patient with Severe Attrition

Presenter(s): Trey Edwards, Postgraduate

Advisor(s): David Buxton, Barry Greenley

Abstract:

A 45 year-old female presented to clinic with a chief complaint that her lower front teeth hurt, and she doesn't like the appearance of her smile. The patient had significant erosion and attrition of the mandibular teeth due to a history of bulimia and destructive forces from PFM crowns on the maxillary teeth. Alginate impressions were taken for study models. A wax up of the mandibular teeth was completed on study casts to increase her vertical dimension of occlusion (VDO) and to improve esthetics. An occlusal guard was then fabricated at the increased VDO to determine if the patient could tolerate an increased VDO. The patient wore the occlusal guard for four weeks without any muscle pain. The mandibular incisors were extracted, the extraction site was alveoplastied approximately 2-3 mm, teeth #22 and #27 were prepped, and a bis-acryl provisional was fabricated from #22-#27 at the increased VDO. Composite resin was added to posterior teeth to provide posterior rest stops at the increased VDO. Teeth #28-29 were prepped and restored with Emax all-ceramic crowns while the mandibular anterior healed. Seven weeks after the extraction of the mandibular incisors, the preps on #22-27 were refined, a final PVS impression was taken, and a six-unit PFM bridge was fabricated. After cementation of the anterior bridge, anterior guidance and occlusion was adjusted, then #20 and #21 were prepped and restored with PFM crowns. The patient was very satisfied with the final esthetic and functional result. Future treatment includes implants in #19 and #30 positions and PFM crowns #3, #12, #13, and #14.

Title: Implant Supported Porcelain Restorations to Replace Diastemas Resulting from Congenitally Missing Laterals: A Case Report

Presenter(s): Chris Faulconer, Postgraduate

Advisor(s): Stephen Reagan, David Buxton

Abstract:

A 21-year-old patient presented with congenitally missing lateral incisors after undergoing comprehensive orthodontics. Patient's chief complaint was that she was missing teeth #7 and #10. The patient agreed that the ideal treatment for her case was to go with implant-supported restorations. A CBCT was obtained as well as a diagnostic wax-up to verify that there was enough space for both the implant and the restorations. An acrylic surgical stint was used to assist in placement of two 3.3mm x 10mm HA coated Zimmer implants. Implants were allowed to integrate for 3 months. Provisionalization was performed at the time of stage two surgery. Pt was left in temporaries for 8 weeks for tissue contouring. The abutments chosen are custom zirconia restored with a cement retained full coverage pressed lithium disilicate crown layered with feldspathic porcelain. A shade of 1M1 was chosen and intraoral photographs were taken to communicate the hypocalcification spots and incisal translucency to the laboratory technician. Upon delivery of the crowns, it was determined that the patient's natural teeth had more chroma than the porcelain restorations. The patient selected bleaching which was performed for 6 weeks to lighten the teeth slightly to match the restorations instead of staining the porcelain. Final restorations were bonded Calibra resin cement.

Title: Treatment of an Edentulous Mandible from a Multi-Disciplinary Approach with a Hybrid Prosthesis

Presenter(s): Mitch Hoopes, Postgraduate

Advisor(s): David Buxton, Stephen Reagan

Abstract:

The hybrid prosthesis is a treatment option for an edentulous or partially edentulous arch. The treatment involves a multiple disciplinary approach to restoring a patient's oral function and esthetics. In this case the patient presented with a completely edentulous maxillary arch along with six precisely placed implants. I will discuss the restorative process from the integration of the implants to the delivery of the prosthesis. To begin two separate procedures were started, one being the fabrication of a maxillary complete denture and the other the fabrication of a custom milled titanium bar. The restoration begins in these two distinct areas that are eventually combined. Through careful planning and verification I will explain how this is accomplished. The end result is an edentulous patient with a prosthetic device that provides the function and esthetics that closely mimics the natural dentition. The treatment process that the patient and doctor endure is a long and tedious one taking patients from both. The end result achieved in this case was a success that will serve the patient well for many years to come.

Title: Implants and Lithium Disilicate Restorations used in Conjunction with Orthodontics to Properly Restore a Patients Smile

Presenter(s): Robert Simpson, Postgraduate

Advisor(s): David Buxton, Stephen Reagan, Barry Greenley

Abstract:

Patient is a 51 year old female who presented post-ortho in need of esthetic restorations. The orthodontist intruded and splayed her upper anterior teeth so that her teeth coupled and had proper spacing for restorations. The patient also had a root tip #6 area from retained primary canines. #11 had been replaced with an anterior cantilever bridge from #12. The treatment plan includes replacing #6 and #11 with implants and PFM crowns. #7-#10 will be replaced with Lithium disilicate veneers. Prior to treatment, a diagnostic wax-up was rendered so that an intraoral mock-up could be fabricated for the patient to visualize proposed end result. The patient was pleased with how the mock-up looked so treatment was started. At time of implant placement the root tip in the #6 spot was extracted and the cantilevered bridge #11 was sectioned off. Implants were placed and allowed to heal for four months. During the healing phase a composite mockup was done in the patient's mouth on #7-#10. At stage 2 surgery, temporaries were made on impression coping abutments to sculpt the tissue and work out the occlusion in her mouth. Once the veneers were prepped an open tray impression was taken of #6-#11. The patient chose shade B1 and Paragon Esthetics fabricated her restorations. Good esthetics were achieved and the patient loves her new smile. This multidisciplinary case shows the need for orthodontics in certain esthetic cases.

Title: Tetracycline as a Treatment Adjunct to Lichen Planus Therapy

Presenter(s): Blaire Bowers, Postgraduate

Advisor(s): Robert Carson

Abstract:

Introduction: Lichen Planus is a chronic inflammatory dermatologic disease of unknown etiology affecting numerous people worldwide. Many patients with lichen planus present with manifestations intra-orally of both the reticular and erosive forms. Current accepted treatments for the erosive form include topical steroids, systemic corticosteroids, and immunosuppressive therapy. Tetracycline has many non-antibiotic properties, one of which is anti-inflammatory. Recent evidence in the literature suggests topical treatment with tetracycline as an adjunctive therapy.

Case Summary: A patient with generalized erosive intraoral lichen planus, generalized soft tissue recession, and facial bone loss presented to our clinic with a chief complaint of “I don’t want to lose my teeth.” The patient had previously been treated with conventional therapies that failed including systemic and topical steroids, alcohol free peridex, and immunosuppressive oral medication. The patient was not a candidate for soft tissue grafting due to the aggressive nature of the disease and the inability to graft to a healthy recipient site. Tetracycline 250mg capsule was dissolved in 2cc saline. Cotton pellets were then soaked and applied to the upper right gingival tissues and exposed root surfaces. The patient was then instructed to swish with Vibramycin suspension 4x daily, 30 seconds, for one month. Follow-up photos and examination were performed at one week and four weeks. The patient reported cessation of discomfort at both recall visits. Clinically, soft tissue ulcerations improved in as little as one week.

Conclusion: Tetracycline/Vibramycin topical treatment and rinses are a viable treatment adjunct for patients with erosive lichen planus. Explanation for the mechanism may include inhibition of the T-lymphocyte response.

Title: Allograft Treatment Choices – Just Say No to the Palate

Presenter(s): Jason Nicholson, Postgraduate

Advisor(s): Robert Carson, John Dmytryk, Joy Beckerley,

Abstract:

Gingival defects are common disorders, and many treatment modalities have been employed through the years to correct these defects. Soft tissue harvested from the patient is known as a soft tissue autogenous graft and has the longest history of use in clinical practice. Harvesting tissue from a patient's own donor site has proven very predictable and successful for augmentation of soft tissue defects. However, harvesting tissue from the patient necessitates a second surgical procedure and possible associated morbidity, such as post-operative pain, bleeding, and infection. Many alternatives to autogenous grafts are now available for soft tissue augmentation, including allografts and xenografts. Typical allograft materials for soft tissue augmentation are AlloDerm, Puros Dermis and PerioDerm. All may have various advantages and disadvantages. (e.g., better handling characteristics, increased inflammatory response, etc.) Three allografts, which may be used for soft tissue augmentation, are presented here. These products can be used safely and predictably for soft tissue augmentation without the morbidity associated with autogenous grafts.

Title: Comparison of Two Osseous Grafting Techniques for Maxillary Anterior Ridge Augmentation

Presenter(s): Todd Walker, Postgraduate

Advisor(s): Robert Carson

Abstract:

Introduction: Alveolar bone loss following tooth loss is an ongoing process due to lack of functional stimulation. The rate and degree of bone loss varies among individuals. Alveolar reconstruction and replacement of teeth may become more difficult when alveolar deformities are present, and this is a common situation encountered in dental practice. Available evidence suggests that hard tissue defects can be corrected with reconstructive surgical hard tissue grafting techniques.

Case Summary: Two patients desiring to have implants placed presented with maxillary anterior alveolar ridge defects. The two areas were evaluated and grafted using two different techniques. First technique: titanium mesh with particulate allograft and bone morphogenic protein (TI/BMP). Second technique: long-lasting resorbable membrane with particulate allograft (COL). Pre-operative and post-operative radiographs and photographs were obtained. The maxillary alveolar ridges were evaluated at baseline, one week, 2 months, and 4-7 months after surgical therapy. The two sites grafted showed a gain in alveolar bone width using both techniques. The area of grafting with TI/BMP showed a greater increase in alveolar bone width (CT scan seven months after graft; average of 5.5mm increase) than the area treated with COL (CT scan four months after graft; average 3.5mm increase).

Conclusion: When choosing a grafting technique for treatment of an alveolar ridge deficiency, type of deficiency, patient's and clinician's desired outcomes and clinician's experience help determine the preferred graft materials and surgical technique to employ. Both techniques we found to be appropriate for hard tissue grafting, depending on the surgical objectives.

Title: The Role of Orthognathic Surgery in the Treatment of Obstructive Sleep Apnea

Presenter(s): Michael Saumur, Postgraduate; Kyle Sorensen, Postgraduate

Advisor(s): Steven Sullivan

Abstract:

Obstructive sleep apnea (OSA) is a common sleep disorder characterized by partial or complete collapse of the upper airway during sleep. It occurs in up to 9% of women and 24% of men age 30-60 years. OSA can have drastic effects on a patient's health, and is strongly linked with cardiovascular disease, hypertension, stroke, and even premature death. Chronic airway obstruction leads to multiple arousals during sleep resulting in sleep deprivation and an overall decrease in quality of life.

First-line treatment for OSA is usually continuous positive airway pressure (CPAP). When patients are non-compliant or CPAP is unsuccessful, however, surgical management is often required. Advancement of the maxilla and mandible is an orthognathic surgical procedure that enlarges the patient's airway and results in fewer episodes of obstruction during sleep. Short-term studies have shown 75% to 100% success rates, comparable to that of CPAP and higher than other surgical interventions (except tracheostomy). This indicates orthognathic surgery is an effective treatment option for patients with OSA. We will present a case of OSA and its management with orthognathic surgery, as well as a review of recent literature.