



*The* UNIVERSITY of OKLAHOMA

# College of Dentistry

*33<sup>rd</sup> Annual*

# Scientific Day

April 16, 2014

Embassy Suites  
Norman, Oklahoma

Sponsored by:



## **33<sup>rd</sup> Annual Scientific Day**

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 student research program grew and corporate support became stronger, Scientific Day evolved into what it is today – **the 33<sup>rd</sup> Annual Scientific Day!**

The evolution of Scientific Day is due to the dedication and support of everyone 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!** We are particularly grateful to Delta Dental and the Delta Dental of Oklahoma Oral Health Foundation for their sponsorship of this event for the first time.

Please enjoy the outstanding projects presented here today by our dental students, dental hygiene students, residents and graduate students. 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 University of Oklahoma College of Dentistry's 33<sup>rd</sup> Scientific Day!**

## **Corporate Exhibitors**

The following companies have provided additional funding to support this year's Scientific Day and will be exhibiting their company's products in the foyer. Please spend some time visiting the corporate sponsors to learn about their products and to thank them for their generosity.

Biomet 3i

Brasseler USA

Colgate

Delta Dental of Oklahoma

Dentsply International

GlaxoSmithKline

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Procter & Gamble – Crest/Oral-B

Straumann

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**Special Thanks to the Following for Generous Support of  
The University of Oklahoma College of Dentistry's  
33<sup>rd</sup> Annual Scientific Day**

ADA/Dentsply Student Clinician Award by Dentsply International

Albert F. Staples Society

American Student Dental Association

Biomet 3i

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Delta Dental of Oklahoma

Delta Dental of Oklahoma Oral Health Foundation

Don Mitchell Excellence in Prosthodontics Award

GlaxoSmithKline

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J. Dean Robertson Society

**Special Thanks to the Following for Generous Support of  
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Oklahoma County Dental Hygienists' Society

Oklahoma County Dental Society

Oklahoma Dental Association

Oklahoma Dental Hygienists' Association

Oklahoma Orthodontic Society

Oklahoma Section of the American College of Prosthodontists

Oklahoma Society of Oral & Maxillofacial Surgeons

Oklahoma Society of Periodontists

Robert T. Probst Omicron Kappa Upsilon Award

Procter & Gamble - Crest/Oral-B

Student American Dental Hygienists' Association Award by Johnson & Johnson

**Thank You  
to the Following Area Businesses  
for Door Prize Donations**



Domino's Pizza  
National Cowboy & Western Heritage Museum  
Oklahoma City Redhawks  
Quizno's Subs  
The Albert F. Staples Society  
The Uniform Shoppe  
Whip Mix

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

## **Special Thanks to the Following Individuals**

### POSTER PRESENTATION JUDGES

Kay S. Beavers, D.D.S.	Conrad Hornbuckle, D.D.S., M.S.
John Biggs, D.D.S.	Mike Keenan, D.D.S.
Luis Blanco, D.M.D., M.S.	William Kent, D.D.S.
Perry L. Brooks, D.D.S.	Sharon K. Lloyd, R.D.H.
Cheryl L. Church, D.D.S.	Edward Lorentz, D.D.S.
Jon Clark, D.D.S.	Bing Martin, D.D.S.
Raymond Cohlma, D.D.S.	Robert Miller, D.D.S., M.Ed.
Vicki Coury, R.D.H., M.Ed., M.P.H.	Donald Mitchell, D.D.S.
Heather Cox, D.D.S.	Lynn Montgomery, D.D.S.
Lena Craig, D.D.S.	Nora Radmard, R.D.H., C.M.M.
William Croom, D.D.S.	Bernard C. Rhone, D.D.S.
Christinna R. Fairchild, D.D.S.	Jim Roane, D.D.S.
Steven M. Fick, D.D.S.	Douglas Rockwood, D.D.S.
Michael Fling, D.D.S.	Karen Sehorn, R.D.H.
Kim Graziano, R.D.H., M.P.H.	Susan L. Settle, D.D.S.
Berry Greenley, D.D.S.	Nan Shadid, D.D.S.
Joy Hasebe, D.D.S.	Donna Sheppard, R.D.H., M.Ed.
Robin Henderson, D.D.S.	Janet West, R.D.H.
Van Hensen, D.D.S.	Desiree White, R.D.H.
	Paul Wilkes, D.D.S., M.S.

### ISHMAEL ESSAY CONTEST JUDGES

Kay S. Beavers, D.D.S.	Kathy Miller, R.D.H., M.Ed.
Jane Gray, R.D.H., C.D.A., M.Ed.	Frank Miranda, D.D.S., M.Ed., M.B.A.
Douglas Hall, D.D.S., M.S.	Paul Mullasseril, D.D.S., M.S.
	Tammie Vargo, R.D.H., M.Ed.

### SCIENTIFIC DAY COMMITTEE

Mr. Jeremy Bueckers	Mr. Jason Jones
Ms. Luellen Chenoweth	Dr. Sharukh Khajotia
Mr. Neil Clark	Mr. Scott Newhouse
Ms. Sharon Ingram	Ms. Carolyn Ray
Dr. Nancy Jacobsen	Ms. Stacey Reynolds
	Ms. Ellen Ware

### REGISTRATION

Ms. Robin Barnes	Ms. Carla Lawson
Ms. Sara Driver	Ms. Julie Mowdy
	Ms. Diana Stone

University of Oklahoma College of Dentistry  
33<sup>rd</sup> 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>University A &amp; B Ballroom</i>
10:30	Poster Votes Due In Ballot Box <i>University Foyer</i>
10:30 - 12:00	Ishmael Essay Presentations <i>Oklahoma F Ballroom</i>
12:00	CE Forms Available <i>Registration Desk</i>
12:00 - 1:30	Awards Luncheon <i>Oklahoma GHIJ Ballroom</i>

## **Ishmael Essay Contest Finalist Presentations**

Oklahoma F Ballroom, 10:30 - 12:00

- 10:30 a.m. Savannah Fikes, (DH2)  
The Tools of the Trade
- 10:45 a.m. Shelby Olson, (DS2)  
The Effects of Different Image File Formats on Interproximal  
Caries Detection
- 11:00 a.m. Edith Quinonez, (DH2)  
Advanced Standing Dental Programs in the United States
- 11:15 a.m. Leaha Nels, (DS2)  
Assessment of Oklahoma Workforce of Dentists
- 11:30 a.m. Sneha Patel, (DS3)  
Oral Submucous Fibrosis: A Dangerous Debilitating Disease

## **POSTER PRESENTATIONS**

Poster #	Presenter Name(s) & Title
# 1	DAVID LAWRENCE (DS2); BRYAN KARIYA (DS2) Human Buccal Cell Binding by Veillonella Atypica
# 2	LEAHA NELS (DS2) An Assessment of the Workforce of Oklahoma Dentists
# 3	KATHERINE DILLARD (DS2) Analysis of Changes in Bone Trabeculae in Bisphosphonate Patients
# 4	BEN WINTERS (DS2) Longitudinal Comparison of Female Skeletal and Chronologic Ages
# 5	RYAN O'SULLIVAN (DS3) Longitudinal Comparison of Male Skeletal and Chronologic Ages
# 6	CHANDANI RAGHA (DS2); SHELBY OLSON (DS2) Effects of Three Image File Formats on Interproximal Caries Detection
# 7	MANOJ JAIN (DS4) Evaluation of Sialadenosis Rate in Patients with Diabetes Mellitus
#8	KONGYAN NICELY (DS2) Wettability of Bulk-filled Resin Composite Surfaces at Oral Temperature
# 9	CARLIE BROWN (DS3) Comparative Assessment of Biofilm Structure by Image Analysis Programs
# 10	DOMENIQUE BERGAMINI (DH2) Smoking and Good Oral Health
# 11	BRITTANY BOXBERGER (DH2) The Dental Hygienist's Role in Eating Disorder Detection
# 12	EDITH QUINONEZ (DH2) Advanced Standing Dental Programs in the United States

## **POSTER PRESENTATIONS**

<b>Poster #</b>	<b>Presenter Name(s) &amp; Title</b>
# 13	SNEHA PATEL (DS3) Generating Oral Health Statistics in Oklahoma
# 14	CHAD CARTER (DS3); JAMES TATE (DS3) Speech and Sleep Apnea in Children with Velopharyngeal Insufficiency
# 15	AMBER GROVER (DH2) Mercy Mothers' Oral Health Initiative
# 16	CARISSA COLE (DH2); KELSEY PATTERSON (DH2) Anti-adhesive and Anti-inflammatory Properties of Cranberry Polyphenols
# 17	ALLI HAMMER (DH2) Hormonal Influences on the Oral Cavity
# 18	DOMINIC AN (DH2); KATERI CRANE (DH2); CALLIE MOWREY (DH2) Holistic and Alternative Dentistry
# 19	DANA REDDEN (DH2) Malocclusion and its Effect on Periodontal Health
# 20	SAVANNAH FIKES (DH2) Tools of the Trade
# 21	GINA GOSSETT (DH2); AMANDA MARRA (DH2) Inflammation and Periodontal Disease
# 22	MONICA GREEN (DH2); LACEY STEEN (DH2) Oral Disease Detection Devices
# 23	JESSICA BARTUSCH (DH2) Oral Health Literacy and its Impact on Patient Care
# 24	JESSICA MORROW (DH2) Electronic Cigarettes Usage in Tobacco Cessation

## **POSTER PRESENTATIONS**

Poster #	Presenter Name(s) & Title
# 25	KAITLYN JONDAHL (DH2); ERYN PENNELLO (DH2) Acquired Gingival Recession: Causes, Effects, and Treatment Options
# 26	RYLEE MACK (DH2) Whitening: The Newest American Obsession
#27	SARAH MEHNER (DH2) Public Perception of Dentistry
# 28	KRISTEN OLSON (DH2) Laser Therapy as an Adjunct to Nonsurgical Periodontal Therapy
# 29	ROSS MARTIN (Postgraduate); JAROM MAURER (Postgraduate) Surgical & Reconstructive Treatment of a Mandibular Ossifying Fibroma
#30	BLAIRE BOWERS (Postgraduate) Crown Lengthening as an Adjunct to Esthetic Restorative Therapy
#31	CLARK MACKELPRANG (Postgraduate) Treatment of Mucogingival Deformities: Two Case Reports
#32	JOSEPH FENG (Postgraduate) Management of Dental Implant Complications
#33	LIN ZHU (Postgraduate) Diagnosis and Management of Maxillary Sinus Augmentation
#34	DAVID HERBERT (Postgraduate) Single Tooth Movement Using Orthodontic Alignment Trays: A Case Report
#35	HARIKA LALA (Postgraduate) Importance of Socket Preservation after Tooth Extraction
#36	NATHAN POWELL (Postgraduate); ASHLEA TURPIN (Postgraduate) Evaluation of Full Coverage All-Ceramic Restorations on Second Molars
#37	PATRICK CROWLEY (Postgraduate); TAYLOR MARCUM (Postgraduate) Restoring a Denture Patient using Digital Dentures and Mini Implants

**Title: Human Buccal Cell Binding by Veillonella Atypica**

**Presenter(s):** David Lawrence, DS2; Bryan Kariya, DS2

**Advisor(s):** Felicia Qi

Abstract:

The oral microenvironment is a complex setting where hundreds of different bacterial species interact amongst themselves, and with human tissues. Of particular interest in this paper are the interactions of *Veillonella atypica*. Its role as an early colonizer of the oral plaque biofilm is well documented and understood. This paper seeks to gain a better understanding of the mechanisms through which *Veillonella* attaches itself to the oral mucosa and other species of bacteria. Mutant *V. atypica* strains, each with a single adhesin gene knocked out, were mixed with human buccal cells and observed by means of light microscopy. HEG 44 has been found to be a single multifunctional molecular adhesin responsible for binding to other bacterial cells and human buccal cells. The implications of study suggest that *V. atypica* may play a role in establishing soft tissue oral plaque biofilms by serving as an anchor to other species.

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

**Title: An Assessment of the Workforce of Oklahoma Dentists**

**Presenter(s):** Leaha Nels, DS2

**Advisor(s):** Kenneth Coy

**Abstract:**

The purpose of this data collection was to obtain demographic information on the dental workforce in the state of Oklahoma. A list of dentists currently licensed by the Oklahoma Board of Dentistry was obtained from the Board and data was collected through a variety of internet search engines. Dentists were not contacted during the course of this research. The data collected on individual dentists included zip codes and practice location by county, type of practice, practice specialty, age of the dentist, gender of the dentist, average number of hours worked per week, average number of hygienists, school from which the dental degree was received and year of graduation, as well as if the dentist accepts Medicaid. County population data obtained from the U.S. Census Bureau was used to determine population and mean incomes of individual counties and zip codes.

The gender distribution of practicing dentists in Oklahoma is 20.3% female and 79.6% male. Age group distribution is as follows: 3.2% are 25-29 years of age, 14.7% are 30-34 years of age, 10.7% are 35-39 years of age, 11.4% are 40-44 years of age, 9.2% are 45-49 years of age, 10.0% are 50-54 years of age, 14.2% are 55-59 years of age, 12.5% are 60-64 years of age, and 14.1% are 65+ years of age. The average Oklahoma dentist works 35 hours per week. The ratio of dentist to population is 1:2190, however there is an unequal distribution of practitioners among the counties. In four counties, there are no practicing dentists, and in two counties with more than 10,000 residents, there is a single dentist. Of the six counties in which the ratio of dentists to population is greater than 10,000, only three of the counties have a median income significantly less than the median income of all Oklahoma households. The other three counties, with a high dentist to population ratio, have median incomes above or within \$1,500 of the state median income.

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

**Title: Analysis of Changes in Bone Trabeculae in Bisphosphonate Patients**

**Presenter(s):** Katherine Dillard, DS2

**Advisor(s):** Farah Masood

Abstract:

Bisphosphonate therapy is currently being used for treating patients with various types of cancer. Bisphosphonates act at sites of active bone remodeling, changing the activity of the cells needed for osteoclast activity. These drugs are found to result in changes in vascularity and cell activity of the bone.

This project was a continuation of a pilot study looking at bone density changes following tooth extractions in patients treated with bisphosphonate therapy. In this study, ten patients were selected, an experimental group of five patients who had received bisphosphonate therapy and a control group of five patients who had not. Digital periapical images were taken at initial visits, and at periods of 3 and 6 months following tooth extractions. In the pilot study, bone density was analyzed using Dexis Software using various regions of interest.

In this continuation, ImageJ software was used to complete a fractal analysis of each image taken. Fractal dimension (FD) was calculated using the box counting function and analyzed and compared using Student t tests.

FD values ranged from 1.494 to 1.883. The FD average for bisphosphonate extraction sites was  $1.690 \pm 0.130$ , and for the control group extraction sites was  $1.730 \pm 0.115$  ( $p > 0.05$ ). The bisphosphonate control site FD average was  $1.798 \pm 0.067$ . The control group control site was  $1.727 \pm 0.080$  ( $p > 0.05$ ).

The results from the study indicated statistically significant differences only between bisphosphonate control sites and bisphosphonate extraction sites (P value 0.003), and between bisphosphonate control sites and control group control sites (P Value 0.016).

Further research is needed to determine whether bisphosphonate therapy affects new bone, or only bone that is in place at the time of treatment. If that can be determined, research may be done to stimulate bone remodeling through activation of osteoblasts, and help to prevent the unwanted necrosis effect of bisphosphonate therapy.

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

**Title: Longitudinal Comparison of Female Skeletal and Chronologic Ages**

**Presenter(s):** Ben Winters, DS2

**Advisor(s):** Fräns Currier; Onur Kadioglu

Abstract:

A sample of 101 female subjects from the Denver Growth Study was selected to compare their hand and wrist radiographs to formulate skeletal ages using the Greulich and Pyle and Fishman Index methods. Our goal was to verify the validity of these methods and their ability to accurately estimate skeletal ages in patients by comparing the ages generated back to the chronologic ages of the longitudinal study. The Fishman index uses 11 discrete adolescent skeletal maturation indicators or SMI's. These SMI's cover the entire period of adolescent development and are found on six distinct sites of the hand located on the thumb, the third finger, fifth finger, and radius. The Greulich and Pyle method uses an Atlas based approach where clinicians can take a single hand and wrist film and compare it to the averages recorded during their study. Of the 101 subjects, 31 females met the standards required for the study. After digitally transferring the entirety of the female hand and wrist radiographic library, the skeletal ages and SMI's were recorded. The ages calculated using these methods were then compared back to the chronologic ages of the patients to see how accurate these dating methods were. Findings showed that except for a few random outliers, both aging systems held relatively parallel and within normal limits of deviation. This confirmed that both methods are statistically relevant ways to estimate the skeletal ages of ones patients.

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

**Title: Longitudinal Comparison of Male Skeletal and Chronologic Ages**

**Presenter(s):** Ryan O'Sullivan, DS3

**Advisor(s):** Fräns Currier; Onur Kadioglu

**Abstract:**

A sample of 21 male subjects from the Denver Longitudinal Growth Study was analyzed relative to the subjects' skeletal and chronologic ages to verify the validity of the Fishman Skeletal Maturity Indicators and the Greulich and Pyle Standards as methods of determining skeletal age. The original Denver Longitudinal Growth Study included 300 subjects with nearly 3000 hand-wrist radiographs, which were transferred from film to digital format. The Fishman Skeletal Maturity Indicators along with the Greulich and Pyle Standards were used as criteria for classification of the skeletal growth and development. The Greulich and Pyle method can be used for ages 0-18 years, while the Fishman Index can only be used from ages 11-17 years. Greulich's and Pyle's method of calculating skeletal age revolves around the ossification of the carpals and the sesamoid bones. Fishman's skeletal maturity indicators, on the other hand, focus on the epiphysis and diaphysis of the metacarpals of the third finger along with the ossification of the sesamoid. The skeletal age of each subject was calculated using both the Fishman and the Greulich and Pyle method. From the data acquired, the specific sequence of carpal ossification was confirmed. The subjects studied were slower to mature than either the Fishman or Greulich and Pyle method indicated. However, the Greulich and Pyle method more closely resembled the data acquired in our study.

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

**Title: Effects of Three Image File Formats on Interproximal Caries Detection**

**Presenter(s):** Chandani Ragma, DS2; Shelby Olson, DS2

**Advisor(s):** Farah Masood, Ji Li

Abstract:

**Objective:** To determine the best digital intraoral image format for interproximal caries detection on extracted teeth.

**Methods:** 48 non-carious teeth were used in this study. The teeth were mounted in plaster sets of three, with each set representing an area of the maxillary or mandibular arch. Simulated caries was created on either the mesial or distal aspect of each tooth, using three different sizes round burs. Standardized periapical (PA) radiographic images were taken. A total of 16 PA images were exported into Tagged Image File Format (TIFF), Joint Photographic Experts Group (JPEG), and Bitmap (BMP). All 48 images were then compiled into a PowerPoint presentation and presented to evaluators in randomized order. The evaluators reviewed the images for the presence of caries based on a 5-point confidence scale. All images were read twice by the two evaluators. Logistic regression model were used to compare the probability of diagnosing caries among 3 types of images. Chi-square test was used to compare proportions. Kappa coefficient with 95% confidence limits was calculated to evaluate the intra and inter rater agreement on diagnosing the caries. A 2-sided 0.05 alpha level was used to define the statistical significance.

**Results:** There was no significant difference regarding the sensitivity among the three image formats. The three types of images did not statistically differ in detection of caries (p-value=0.5329).

**Conclusions:** Image format preference for viewing ultimately remains with the dentist.

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

**Title: Evaluation of Sialadenosis Rate in Patients with Diabetes Mellitus**

**Presenter(s):** Manoj Jain, DS4

**Advisor(s):** Lida Radfar

Abstract:

The purpose of this study was to evaluate the relationship between diabetes and sialadenosis. Sialadenosis (also known as Sialosis) is an asymptomatic bilateral parotid gland enlargement that is non-inflammatory and non-neoplastic. In the diabetic sialadenosis the enlargement of the parotid gland is more profound than other conditions causing sialadenosis. Sialadenosis generally involves glandular hypertrophy, produced either by adipose infiltration or by acinar hypertrophy. In addition to glandular enlargement there is glandular dysfunction. An autonomic neuropathy, seen as a demyelinating polyneuropathy, seems to be the common underlying basis for this. Retrospective data of 163 patients who presented with dry mouth and eyes during 2007-2012 to the Oklahoma Medical Research Foundation (OMRF) was analyzed. The results reveal that there is a positive correlation between Stimulated parotid saliva and parotid enlargement (Spearman rank Correlation coefficient = 0.66). Pearson's correlation for unstimulated whole saliva and enlarged parotid showed a poor negative correlation (-0.08) and a poor positive correlation with enlarged submandibular gland(0.01) . Additional analyses reveal that there is a poor correlation between sialadenosis and immunoglobulins IgA, IgG, and IgM as analyzed by Pearson's correlation. This further verifies that sialadenosis is non-inflammatory and non-neoplastic in etiology. Future study should focus on the level of long term glycemic control in diabetes mellitus and the presence of sialadenosis.

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

**Title: Wettability of Bulk-filled Resin Composite Surfaces at Oral Temperature****Presenter(s):** Kongyan Nicely, DS2**Advisor(s):** Sharukh Khajotia, Terry Fruits

Abstract:

Extensive research has shown that accurate measurement and interpretation of contact angles is a complex issue. **Objectives:** To determine the initial wettability of water on various polymerized surfaces of bulk-filled resin composites at oral temperature. **Methods:** Specimens of resin composites QuiXX Posterior Restorative (QX; Dentsply), Surefil High Density Posterior Restorative (SR; Dentsply) and Tetric EvoCeram (TE; Ivoclar Vivadent) were fabricated in a stainless steel mold and polymerized against either a glass slab (control), Mylar strips or Toffelmire stainless-steel matrices (n=7/group/resin). A 3 $\mu$ L drop of ultrapure water was dispensed onto the specimen's surface in a contact angle goniometer (OCA15-Plus, Future Digital Scientific Corp.). High-resolution digital images of the axisymmetric sessile drop were recorded (1 frame/s, 10 min, 37°C). The goniometer's software was used to analyze drop profiles and calculate contact angle values at drop placement ( $\theta_{\text{INITIAL}}$ ) and rate of change of  $\theta$  over time ( $\theta_{\text{SLOPE}}$ ). The data was analyzed using two-factor ANOVA and *post hoc* Student-Newman-Keuls (SNK) tests ( $\alpha=0.05$ ). **Results:** Statistically significant differences were found among the products tested ( $p<0.0001$ ) but not among surface finishes ( $p>0.05$ ).

Product/ Surface	$\theta_{\text{INITIAL}}$			$\theta_{\text{SLOPE}}$		
	QX	SR	TE	QX	SR	TE
Glass (control)	66.06 $\pm$ 2.87	78.6 $\pm$ 15.13	70.70 $\pm$ 2.41	- 0.025 $\pm$ 0.010	- 0.044 $\pm$ 0.028	-0.028 $\pm$ 0.010
Mylar	64.95 $\pm$ 2.06	67.59 $\pm$ 4.73	75.75 $\pm$ 11.09	- 0.025 $\pm$ 0.014	- 0.028 $\pm$ 0.015	-0.031 $\pm$ 0.017
Steel	64.58 $\pm$ 2.42	68.93 $\pm$ 6.50	77.26 $\pm$ 3.73	- 0.035 $\pm$ 0.009	- 0.026 $\pm$ 0.016	-0.020 $\pm$ 0.012

\* Mean values within each column were not statistically different (SNK;  $p>0.05$ ).

**Conclusions:** Time-dependent decrease of contact angles was clearly observed for all bulk-filled resin composites tested. Wettability differed depending on the product tested, but did not differ among the various surfaces against which the products were polymerized.

*This study was supported by a grant from the J. Dean Robertson Society and was presented at the American Association for Dental Research 2014 General Session.*

**Title: Comparative Assessment of Biofilm Structure by Image Analysis Programs****Presenter(s):** Carlie Brown, DS3**Advisor(s):** Sharukh Khajotia

Abstract:

**Introduction:** Oral biofilms have been investigated using confocal laser scanning microscopy (CLSM) and fluorescent stains, and quantified with image analysis software. **Objective:** To compare the results of analyses by different image analysis programs. **Methods:** Biofilms stained with BacLight™ LIVE/DEAD fluorescent stains to produce images comprised of two CLSM channels (green channel for live cells and red channel for dead/damaged cells) were selected for this study. The images were analyzed using Image Structure Analyzer-3D (ISA), *bioImage\_L*™ (BIL), and *dai*™ (DAI) software programs. Biovolume was one of the common parameters selected for a comparative analysis. **Results:**

Software	Channel	Biovolume ( $\mu\text{m}^3$ )	Biovolume (%)
ISA	Green channel	112,230	Not calculated
	Red channel	116,298	Not calculated
BIL	Combined channels	101,968	100.0
	Green channel	90,373	88.6
	Red channel	8,123	8.0
	Non-specific	3,472	3.4
DAI	Green channel	Not calculated	79.3
	Red channel	Not calculated	81.6

Since the various programs did not generate the parameters in a consistent manner (see table above), it was not possible to statistically compare the data. Qualitative analysis of the data demonstrates that the results of both biovolume parameters were different even though the same CLSM images were analyzed. Furthermore, addition and averaging of data from the channels did not produce results that could be compared. **Conclusions:** Image analysis programs do not use a standardized formula or handle channel data in a consistent manner, which is a significant limitation of the programs that is not widely known. Biofilms research in other fields such as medical, marine, and geological sciences could also be adversely impacted similarly.

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

**Title: Smoking and Good Oral Health**

**Presenter(s):** Dominique Bergamini, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this study was to investigate the influence of good oral self care on the periodontal health of smokers.

**Methods:** A systematic sampling technique was used to select 319 of the 1,416 charts at the OUHSC College of Dentistry. A chart review was conducted and data was collected from a list of people who had reported smoking and had been diagnosed with chronic periodontitis. The patient's age, periodontal classification, bleeding index, plaque percentage, and the number of pocket depths greater than four were recorded on an excel spreadsheet.

**Results:** Positive correlation resulted with the following: disease status and age ( $r=0.56$ ) and disease status and plaque index ( $r=0.16$ ). Statistical significance was indicated with disease status and age ( $p<0.0001$ ) and disease status and the plaque index ( $p<0.0036$ ).

**Conclusions:** The findings of this study were similar to other studies. Age, plaque index, and bleeding index were positively correlated to the severity of periodontal disease. The results from this study suggest that good oral hygiene in a patient that smokes will not prevent their disease from worsening.

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

**Title: The Dental Hygienist's Role in Eating Disorder Detection**

**Presenter(s):** Brittany Boxberger, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this research was to gather information concerning the knowledge Oklahoma dental hygienists have regarding eating disorders, as well as, how they counsel patients they suspect may have an eating disorder.

**Methods:** An online 14-item survey was sent out to 144 members of the Oklahoma Dental Hygienists' Association using Qualtrics online survey program. Nine of the emails were inaccurate and were not utilized in this study.

**Results:** Thirty-six Dental Hygienists (25.5%) returned the survey with 33 being usable for this study. All the hygienists ( $N=33$ ) in this study routinely perform an intraoral examination as a part of their dental hygiene appointment. When the participants were asked to identify oral cues of disordered eating all of hygienists incorrectly identified location of erosion on maxillary teeth, and only 21% ( $n=7$ ) correctly identified that mandibular teeth are usually not affected by erosion due to disordered eating. About 70% ( $n=23$ ) of the participants indicated providing some kind of intervention for patients displaying oral cues of an eating disorder. Those who did not provide interventions (30%,  $n=10$ ) indicated it was due to lack of knowledge, fear of misdiagnosis, not enough rapport built with patient, or unsure of etiology of oral cues.

**Conclusions:** The dental hygienists in this study indicated part of their role was to perform screenings as secondary prevention for medical and dental disorders but were not in agreement that this included providing interventions for patients suspected of disordered eating.

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

**Title:** Advanced Standing Dental Programs in the United States

**Presenter(s):** Edith Quinonez, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Background:** There is a large demand for dental training of foreign trained dentists whose intention is to obtain licensure in the United States.

**Purpose:** This study was undertaken to investigate the current demand for such programs, admission criteria, statistics, and graduation rate of the applicants from advanced standing dental programs (ASP) in the United States.

**Methods:** A 19-item questionnaire was electronically sent to 32 dental U.S. dental programs using Qualtrics Survey Software. Information was also gathered through the American Dental Education Association website.

**Results:** Thirty-two e-mails were sent to advanced standing programs participating in the 2013-2014 application cycle. Eight out of the thirty-two programs (25%) returned the survey either fully or partially completed. Seven (100%) require National Dental Board Exam part 1, test of English as a foreign language exam, and an interview to be considered for acceptance. On mean (n=5), programs accept 4.5 applicants into their advanced standing dental programs. The cost for attending a program was estimated to be \$200,000 for the entire length of the program. The mean (n=4) ASP was 29 months long.

**Conclusions:** The response rate for this survey did not provide significant data to generalize information for all programs. Additional data was obtained from ADEA CAAPID<sup>SM</sup>. The data from this study suggests that there is a great demand for programs that prepare foreign trained dentists to obtain dental licensure in the United States. Additional data was found using ADEA CAAPID<sup>SM</sup>.

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

**Title: Generating Oral Health Statistics in Oklahoma**

**Presenter(s):** Sneha Patel, DS3

**Advisor(s):** Marsha Beatty

Abstract:

**Objective:** High quality, consistent oral health data is generally not available in Oklahoma at the local level. This type of information is vital for program planning, resource allocation, and monitoring oral health trends over time. Oklahoma currently ranks last in the U.S. for adult dental visits, and the lack of oral health data restricts the development of meaningful solutions to impact oral health disparities. This project explores methods for generating this kind of data with the intent to develop a data collection strategy that can be replicated in communities across the state.

**Method:** Current oral health data collection procedures in Oklahoma were identified and evaluated. A review of successful data collection methods was also conducted.

**Results:** Available oral health data in Oklahoma includes adult dental visits, childhood caries experience, water fluoridation, SoonerCare enrollment statistics, and other basic demographics. Much of this data is either not available at the local county level or is not updated frequently. The Interoperable Patient Health Information System (IPHIS), which allows data matching between a patient's medical and dental records, has been used in some states to identify trends in both dental and medical diseases.

**Conclusion:** While many resources exist that can provide a glimpse into the oral health status of Oklahomans, the data is limited in scope and in how it can be used. County level data is often not available, which prevents the accurate profiling of a community's oral health needs. Much of the data is self-reported and not completely representative of the total population. When applying for funding to support oral health programs, current, accurate data is crucial for demonstrating need. Cost and manpower are the most significant barriers to collecting this type of data. Steps are being taken to introduce an IPHIS system into Oklahoma, which could potentially address the lack of oral health data in the state.

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

**Title: Speech and Sleep Apnea in Children with Velopharyngeal Insufficiency**

**Presenter(s):** Chad Carter, (DS3); James Tate (DS3)

**Advisor(s):** Kevin Smith, Randolph Deal, Jeffrey James, Stephen Martin

**Abstract:**

A literature review was conducted and protocol developed for a prospective study in collaboration with the Keys Cleft Palate - Craniofacial Team at the University of Oklahoma Health Sciences Center. The team utilizes a multidisciplinary team approach for the evaluation of patients born with congenital facial defects and clefts. Members of the team include specialists from oral and maxillofacial surgery, orthodontics, otolaryngology, pediatric dentistry, speech and language pathology, audiology, and genetics.

Velopharyngeal insufficiency (VPI) is a delayed complication in the surgical correction of congenitally developed palatal clefts. VPI occurs in between 8-10% of all surgically corrected palatal clefts. VPI is the failure of the velopharyngeal mechanism to effectively seal the nasal cavity from the oral cavity. The failure of complete seal results in excessive air passage through the nasal cavity resulting in hypernasal speech. Pharyngeal flap surgery is the most commonly employed surgical procedure used to correct anatomic limitation. The surgery is accomplished by elevating a myomucosal flap from the posterior pharyngeal wall. The flap is then inserted into the soft palate creating an anatomic barrier, and preventing nasal air escape. One of the postoperative complications in pharyngeal flap surgery is the development of obstructive sleep apnea. Long-term effects of obstructive sleep apnea in children are correlated with many systemic co-morbidities.

The purpose of this project is to prepare the a multiyear interdepartmental prospective study to evaluate the post-surgical effects of pharyngeal flap surgery in cleft palate patients in relation to nasal air emission, speech improvement, and the development of obstructive sleep apnea. The literature review identified significant trends, data points, and knowledge gaps to refine the protocol.

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

**Title:** Mercy Mothers' Oral Health Initiative

**Presenter(s):** Amber Grover, DH2

**Advisor(s):** Lindsey Hays

Abstract:

**Purpose:** To increase oral health literacy among new mothers and health care staff by using an interdisciplinary approach.

**Background:** The CDC estimates that 86.7% of United States residents have untreated dental caries. Early intervention and education may help reduce the caries risk. Early childhood caries is often undetected until the child complains of pain or has entered into public education around age five. Multiple studies show positive results in reducing caries risk intervening as early as pre/post-natal care.

**Significance:** Healthy People 2020 is seeking improvement in many facets of public health. Multi-disciplinary approaches have shown a greater impact on outcomes of patient healthcare. In recent years, oral health has become the forefront of many medical conditions making dental hygienists perfect avenues to deliver much needed patient education. Preventive measures implemented prior to the onset of dental caries could impact the quality of life of many patients nationwide.

**Conclusion:** The University of Oklahoma/Southern Oklahoma Technology Center Distance Education Site has partnered with Mercy Memorial Hospital to make early childhood oral health a priority. Mercy Mothers' Oral Health Initiative was designed to educate new mothers on both maternal and infant oral health following delivery and prior to leaving the hospital setting. Oral health education kits have been delivered to over 500 patients making this initiative an ongoing success.

**Title:** Anti-adhesive and Anti-inflammatory Properties of Cranberry Polyphenols

**Presenter(s):** Carissa Cole, DH2; Kelsey Patterson, DH2

**Advisor(s):** Tina Tuck

Abstract:

**Purpose:** To determine natural oral health alternatives for prevention of periodontal disease and inflammatory responses while decreasing caries risk.

**Background:** Components of cranberries alter the adhesion of bacteria in the oral cavity while also controlling the host immune response without the negative side effects of antibiotics.

A combination of polyphenols found in cranberries inhibit glucan synthesis and acidogenicity of *S. mutans* which will inhibit the secretion of bacteria proteases. Components of cranberries help to prevent caries and reduce periodontal disease.

**Clinical Implications:** Dental professionals should be aware of the natural benefit of cranberries reducing the risk of caries in their patients.

**Conclusion:** The results showed that the cranberry polyphenols considerably reduced the pro-inflammatory cytokine production, as well as protecting macrophages and epithelial cells from bacteria to reduce periodontitis. The prevention of caries occurs by cranberry polyphenols inhibiting the attachment and formation of biofilm by decreasing destructive enzymes secreted by disease causing bacteria.

**Title:** Hormonal Influences on the Oral Cavity

**Presenter(s):** Alli Hammer, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to educate dental professionals on the effects of hormonal changes to the oral cavity.

**Background:** Hormones are regulatory molecules produced in the body that aid in reproduction, growth, and development. They also assist in energy utilization, production, and storage. The four types of hormones made in the body are steroids, glycoproteins, polypeptides, and amines. The sex steroid hormones affect the oral cavity throughout life. During puberty, menstruation, pregnancy, menopause, and post menopause, hormonal variations take place and produce major effects in the oral environment.

**Clinical Implications:** Hormonal alterations are a part of every individual's life. Recognizing the changes the oral cavity experiences through these stages will help dental professions realize what is normal versus what is an anomaly. Dental professionals should be knowledgeable about the oral manifestations associated with hormonal changes.

**Conclusion:** The oral cavity is affected by the changing hormones in the various stages of a woman's life.

**Title:** Holistic and Alternative Dentistry

**Presenter(s):** Dominic An, DH2; Kateri Crane, DH2; Callie Mowrey, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to explore the various methods of holistic and alternative dentistry.

**Background:** Holistic medicine takes into account the body as a whole, not just the parts. Alternative medicine involves the healing effects attributed to various products and therapies. Holistic and alternative practices are evolving in the dental profession. Various supplements have been found to have beneficial effects. Cranberry phenols, green tea, CoQ 10, omega-3 fatty acids, and St. John's wort are among those supplements that are used as adjuncts to traditional periodontal therapy. Acupuncture is an alternative therapy that has been utilized for the suppression of extreme gag reflex, as non-evasive pain control, and a treatment for dental anxiety.

**Clinical Significance:** With the rise in the costs of medical and dental treatment, more patients are seeking less expensive remedies for their overall and oral health using holistic and alternative options.

**Title: Malocclusion and its Effect on Periodontal Health**

**Presenter(s):** Dana Redden, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to evaluate the effects of malocclusion on periodontal health and to determine if tooth alignment with proper occlusion helps decrease the incidence of periodontal pathogens and disease.

**Background:** Tooth malocclusion affects approximately 75% of the population and is a risk factor in the initiation and progression of periodontal disease. The role of malocclusion as an *initiator* in the periodontal disease process had been a controversial topic among dental professionals since the 1920's.

**Clinical significance/implications:** All severities of malocclusion have the potential to implement stresses on the periodontium. These stresses can compromise the integrity of the periodontium, the structural components of the tooth itself, and can interfere with the patient's ability to achieve and maintain adequate oral hygiene. Malocclusion has also been linked to head and neck disorders such as headaches and temporomandibular joint dysfunctions (TMD.)

**Conclusion:** Early detection and diagnosis of malocclusion is important to assist in the control of destructive disease processes. Dental professionals should inform and educate patients concerning malocclusion's effect on oral and overall health.

**Title: Tools of the Trade**

**Presenter(s):** Savannah Fikes, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this study was to investigate the type, age, and quality of instruments utilized by a small sample of dental hygienists in the delivery of patient care.

**Methods:** A convenient sample of 24 dental hygienists was recruited to participate in this study. The researcher completed an inventory of the instruments utilized by the dental hygienists. Eleven dental offices (2 corporate, 8 general, and 1 pediatric private practice) were represented. The researcher recorded the various instruments by type, number, date and company where it was manufactured. The manufacturing date was noted for scaling instruments, as well as, assessment instruments where possible. Participants completed a 3-question survey to determine their sharpening and instrument replacement routine. One hygienist did not participate in the survey.

**Results:** The age of manufacturing of the scaling instruments ranged from less than <1 to 25 years old. The average number of instruments per hygienist was 54. One hundred percent of dental hygienists ( $n=22$ ) reported that they did not sharpen their instruments daily as recommended by the manufacturers. They reported sharpening their instruments on an average of every 85 days. The hygienists reported that they purchased new instruments “as needed” based on their perception. Seventy-four percent of the participating dental hygienists ( $n=17$ ) indicated that there was no reason why they did not purchase new instruments more routinely.

**Conclusion:** This study was a small convenient sample that suggests that dental hygienists do not follow manufacturers’ recommendations for instrument sharpening or replacement. Dental hygienists may suffer from the detrimental effects resulting from practicing their profession with less than optimal instruments. More research should be undertaken to determine the effects of instrument sharpness on effective and safe dental hygiene practice.

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

**Title: Inflammation and Periodontal Disease**

**Presenter(s):** Gina Gossett, DH2; Amanda Marra, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to demonstrate the effective measuring tool of testing C-reactive protein levels in patients with periodontal disease to help prevent the risk for cardiovascular disease and other systemic effects.

**Background:** Periodontal disease is one of the most common infections in the world. It is defined as a chronic infection that is a destructive and irreversible. This disease can lead to a systemic inflammatory reaction that results in increased levels of C-reactive protein. C-reactive protein acts as a systemic marker of inflammation in periodontal disease and has been shown to play a pertinent role in dentistry. Research has shown that it can be used as a measuring tool for numerous disease processes, including cardiovascular disease. C-reactive protein has been identified to show association with periodontal infection and heart conditions. Measuring levels of C-reactive protein can help identify risk factors and is cost effective. Taking preventive measures in conjunction with testing C-reactive protein levels can potentially stop a life-threatening disease. When C-reactive protein levels were tested in several clinical studies, elevated rates were shown to be higher in patients with periodontal disease and systemic health problems. Elevated rates also demonstrated greater risk factors for developing cardiovascular disease.

**Clinical Implications:** Dental professionals can utilize diagnostic tests identifying C-reactive protein and make appropriate interventions that are more customized to their patients.

**Title:** Oral Disease Detection Devices

**Presenter(s):** Monica Green, DH2; Lacey Steen, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to inform patients about different methods that facilitate the detection of oral cancer, periodontal disease and carious lesions.

**Background:** There are several screening and diagnostic tools used in the detection of oral diseases. The oral brush test, chemiluminescence, and toluidine blue dye are the current available tools used in screening for oral cancer. Salivary testing for oral cancer is an emerging science that shows promise for future chair side diagnostics. Diagnostic aids are available for use in detecting periodontal disease and the associated pathogens. Caries detection aids are also available for use by dental professionals.

**Clinical significance:** Dental professionals will benefit from staying abreast of current diagnostic aids used in the detection of any oral disease. Patients will appreciate and favor non-invasive diagnostic testing.

**Conclusion:** Screening and diagnosis of oral diseases is an emerging science that is providing more options for dental professionals to utilize daily with their patients. More research should be done to determine the efficacy of these devices.

**Title: Oral Health Literacy and its Impact on Patient Care**

**Presenter(s):** Jessica Bartusch, DH2

**Advisor(s):** Laurie Cunningham

Abstract:

**Purpose:** To provide examples of effective communication tools and strategies delivered during care of patients with low oral health literacy levels.

**Background:** Oral health literacy is the ability to obtain, process and understand health information and services needed to make appropriate oral health decisions. It includes various abilities such as listening, writing, calculating, speaking and reading comprehension.

**Significance:** Health literacy can have more of an impact on individuals' health status than age, income, education level, employment race and ethnicity. Low health literacy contributes to disease and costs billions of dollars annually.

**Clinical Implications:** Dental health professionals should take time to assess their patients' level of health literacy, evaluate communication methods and incorporate numerous strategies to help improve patient's understanding of health related materials.

**Conclusion:** Research has shown that oral health is a critical component to a person's overall health. Therefore, it is the dental health professional's responsibility to incorporate oral health literacy into all patient care.

**Title:** Electronic Cigarettes Usage in Tobacco Cessation

**Presenter(s):** Jessica Morrow, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Background:** Over 42 million Americans smoke cigarettes. Tobacco smoking contributes to diseases in 16 million people and is the leading cause of preventable death in the US. Nicotine is the most common chemical dependency in the US. Successful tobacco cessation is contingent on addressing withdrawal from the nicotine dependency.

**Introduction:** Nicotine replacement therapy is an important component of tobacco cessation. The electronic cigarette was introduced by not marketed for use in 1962. E-cigarettes were reintroduced in 2003 as an alternative to smoking cigarettes.

**Clinical Significance:** Dental professionals should recommend and facilitate tobacco cessation with their patients that smoke. Dentists and dental hygienists need to be knowledgeable on alternative and effective nicotine replacement therapies.

**Conclusion:** More studies need to be undertaken to investigate the safety and efficacy of the use of electronic cigarettes as a viable nicotine replacement therapy. Decisions to recommend e-cigarettes should be evidence-based.

**Title: Acquired Gingival Recession: Causes, Effects, and Treatment Options**

**Presenter(s):** Kaitlyn Jondahl, DH2; Eryn Pennello, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to outline the causes, effects, and treatment options of acquired gingival recession not associated with periodontal disease.

**Background:** Gingival recession is a common occurrence among the adult population. Etiological considerations include incorrect toothbrushing technique, orthodontic treatment, and trauma from oral piercings.

**Clinical Significance:** Dental professionals are charged with recognizing, treating, and making preventive recommendations to patients with gingival recession on a daily basis. These patients present with concerns related to esthetics and resulting sensitivity. Dental professionals need to stay abreast of research that will facilitate their knowledge of gingival recession and related treatment options.

**Conclusion:** Gingival recession is of multifactorial condition. Communication between dental professionals and patients is vital in the treatment and prevention of further gingival recession.

**Title: Whitening: The Newest American Obsession**

**Presenter(s):** Rylee Mack, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Background:** Whitening has been used in dental offices for many years. However, recently over the counter products and at-home whitening methods have become an obsession. Society's need for esthetically pleasing teeth has increased the use of whitening by 300%, resulting in as much as 1.4 billion dollars spent on all types of whitening products.

**Clinical Implications:** Dental professionals should educate their patients on the side effects and the potential risks with the use of different whitening products. Problems such as sensitivity, bond strengths in resins, the loss of enamel integrity, and gingival irritation can occur.

**Conclusion:** Most whitening products will produce whitening results as well as clinical side effects. It is imperative that the people using these products are educated and instructed on how to utilize them properly in order to minimize these effects. Dental professionals need to add whitening education into oral hygiene instructions to help reduce the risks and increase protection.

**Title: Public Perception of Dentistry**

**Presenter(s):** Sarah Mehner, DH2

**Advisor(s):** Carolyn Ray

Abstract:

**Purpose:** The purpose of this literature review is to inform dental professionals on the public's perception of dentistry.

**Background:** The success of the dental profession hinges on patient satisfaction. The public perception of dentistry is therefore very important. There are numerous factors that contribute to how a patient perceives their dental care. The factors that influence patients the most are dental anxiety, the relationship between patients and dental professionals, and the unclear roles and motives of members of the dental team.

**Clinical significance:** Dental anxiety affects 5-20% of populations around the world. It is a complex issue that all members of the dental team should be educated on in order for treatment to go smoothly for both the patient and the provider. Patients value a dental team that is friendly, technically skilled, trustworthy, and confident. Building an excellent rapport with patients is a skill that every dental professional should develop in order to have a successful practice. When the roles of each dental team member are clear to the patient, the patient has a greater understanding of what to expect from each member. A dental professional that puts patient care as a high priority along with monetary success can help to build better relationships with patients.

**Conclusion:** Dental team members have a responsibility to educate each patient on the respective roles of each member. When the patient understands what education, skills, and ability each oral health care provider has, mutual respect and trust is created. Dental professionals should aim to establish trusting relationships with their patients. They can do this by letting their patients know what procedures will be done, asking for their patients' opinions, listening to their patients concerns, and treating their patients with respect and understanding. All of these things can also help to reduce patient anxiety. When members of the dental team strive to work on these things, the public perception of dentistry can start to change to a more positive one.

**Title: Laser Therapy as an Adjunct to Nonsurgical Periodontal Therapy**

**Presenter(s):** Kristen Olson, DH2

**Advisor(s):** Jennifer Dyer

Abstract:

**Purpose:** The purpose of this literature review is to investigate the use of lasers as an adjunctive therapy with nonsurgical periodontal therapy.

**Background:** One out of every two American adults aged 30 and over has periodontal disease. Chronic periodontitis is an inflammatory response by the body that results in injury or destruction to the affected tissues. Laser use in dentistry has been around since 1992. Laser therapy provides bactericidal effects within the periodontal pockets that contribute to healing.

**Significance:** Lasers provide an adjunctive therapy that is beneficial in reducing the periodontal pathogens associated with the inflammatory response of chronic periodontitis. Eliminating these pathogens is an important intervention that facilitates healing when done in conjunction with nonsurgical periodontal therapy.

**Clinical Implications:** Dentists and dental hygienists need to be knowledgeable about adjunctive therapy utilized in the treatment of chronic periodontitis.

**Conclusion:** Laser therapy is a treatment that needs to be studied further to determine its efficacy as an adjunctive therapy to nonsurgical periodontal therapy. While some of the studies suggest minimal measurable benefits, others show therapeutic benefits with the use of laser therapy.

**Title: Surgical & Reconstructive Treatment of a Mandibular Ossifying Fibroma**

**Presenter(s):** Ross Martin, Postgraduate; Jarom Maurer, Postgraduate

**Advisor(s):** Steven Sullivan

Abstract:

Ossifying fibromas are slow-growing benign neoplasms most commonly found in the jaws. Although small lesions are often asymptomatic, ossifying fibromas may cause enlargement of the affected jaw and eventually require reconstructive treatments for aesthetic and/or functional problems after resection.

In this study, we present a case of a 16-year old female who presented for evaluation of an expanding lesion of her left mandible. A biopsy revealed an ossifying fibroma and an initial attempt of enucleation and curettage was unsuccessful. The patient underwent resection of the lesion with reconstruction using a custom-fitted reconstruction plate fabricated by TMJ Concepts and only a combination of Vitoss and Infuse BMP bone grafting material for the 8 cm defect. One year later, imaging showed complete regeneration of the mandible with appropriate contours, stability and bone dimensions. The reconstruction plate was removed and three dental implants were placed in the newly formed bone. A biopsy showed viable dense lamellar bone without any fibro-osseous process noted.

Our case report will demonstrate a unique, but viable, combination of reconstructive materials and restorative treatment that results in appropriate aesthetic and functional outcomes.

**Title: Crown Lengthening as an Adjunct to Esthetic Restorative Therapy**

**Presenter(s):** Blaire Bowers, Postgraduate

**Advisor(s):** Eros Chaves, James Kessler, Juan Rodriguez

Abstract:

**Introduction:** Tooth eruption consists of an active and a passive phase. Active eruption is the movement of the teeth in the direction of the occlusal plane, whereas passive eruption is related to the exposure of the teeth by apical migration of the gingiva. In some patients, passive eruption never occurs. In these patients, the bone is at the level of the CEJ and the coronal position of the soft tissue results in a short clinical crown, and as a consequence a “gummy smile” with compromised esthetics. Anatomical or esthetic crown lengthening can aid the restorative dentist in achieving the smile and esthetic results expected by their patients.

**Case Summary:** Three different patients with Altered Passive Eruption were treated in the Graduate Periodontics clinic with esthetic crown lengthening as an adjunct to restorative therapy. A comprehensive examination including full periodontal charting, height:width measurements of clinical crowns, and palpation of the CEJ were completed. The three patients all presented with different clinical scenarios, but the same diagnostic and surgical protocol were utilized in all three patients. The surgical protocol consisted of a sulcular incision, re-contouring the osseous architecture to 2.5-3mm apical to margin of the CEJ, root planning, and apically positioning the flap. All three patients were placed on Peridex post operatively and returned for follow up at 1,3, and 6 weeks. One patient was followed for 6 months after the final restoration was placed.

**Conclusion:** Correct diagnosis of altered passive eruption and proper therapy will result in improved dental care and esthetic results for our patients. Additionally, this case series highlights the necessity of an interdisciplinary team approach to esthetic cases.

**Title: Treatment of Mucogingival Deformities: Two Case Reports**

**Presenter(s):** Clark Mackelprang, Postgraduate

**Advisor(s):** Eros Chaves

Abstract:

Mucogingival deformities are a common finding in dental patients. Mucogingival deformities can be defined as a number of conditions including gingival recession, inadequate keratinized tissue, decreased vestibular depth, aberrant frenum, excessive gingival, and abnormal gingival color. There are various treatment modalities to address these deformities and it is important to know the indications for each modality. Two cases are presented that demonstrate two modalities for treatment of mucogingival deformities. The first case is an autogenous free gingival graft and the second is a subepithelial connective tissue graft. Free gingival grafts are best suited for areas that have inadequate keratinized tissue, decreased vestibular depth, and are outside of the esthetic zone. Connective tissue grafts are ideal for areas of gingival recession and for areas where there is a high esthetic expectation. The patient with the free gingival graft reported more postoperative discomfort compared to the patient who received connective tissue graft. The connective tissue graft had a better result treating the gingival recession by achieving a greater amount of root coverage and a better esthetic blend of the graft with the surrounding tissue.

Conclusion:

Both free gingival grafts and subepithelial connective tissue grafts are viable techniques to treat mucogingival deformities. The clinician must be familiar with the indications for each procedure and treatment plan according to patient needs.

**Title: Management of Dental Implant Complications**

**Presenter(s):** Joseph Feng, Postgraduate

**Advisor(s):** Eros Chaves

Abstract:

Dental implant therapy has been well documented to be a highly successful form of dental treatment for the replacement of missing teeth. Studies have shown the long-term (5-10 years) success rate of dental implants to be 93%-98%. Following proper implant protocol and placement, implants can have a predictable outcome. However, dental implant complications do occur, resulting in ailed or failed implants. Implant complications can include peri-implantitis, screw loosening, screw fracture, implant fracture, implant mobility, among other factors. It is important for clinicians placing dental implants to have the clinical ability to recognize and properly manage or refer these dental implant complications. Our objective is to present five (5) clinical cases with common implant complications along with our diagnosis and management of these cases.

**Title: Diagnosis and Management of Maxillary Sinus Augmentation**

**Presenter(s):** Lin Zhu, Postgraduate

**Advisor(s):** Eros Chaves

Abstract:

**Background:** Maxillary sinus augmentation is a surgical procedure to increase the height of bone in the posterior maxilla. It is an important pre implant placement surgery in dental implant treatment planning. However, despite the high success rate, complications do occur. Most of these complications are related to the sinus anatomy and preexisting antral pathologies. Knowledge about common sinus diseases and how to properly manage the pathologies would greatly reduce the occurrence of these complications.

**Case Descriptions:** The present report is of 4 patients who had been identified with different sinus pathologies during diagnosis and treatment planning. Therefore, different approaches were utilized to treat and manage these cases. Case 1: patient had no apparent sinus pathology and underwent conventional lateral window sinus augmentation procedure. Case 2: patient had a failed sinus augmentation procedure with chronic sinusitis; a reentry of sinus was needed before implant placement. Case 3: patient was presented with radiographic impression of sinus pseudocyst. The cyst was subsequently removed and a histologic report confirmed the diagnosis. Case 4: patient had a sinus infection that was odontogenic origin. The sinus pathology was controlled with extraction and socket preservation. Implant was placed with up-fracture approach to augment the sinus.

**Conclusion:** In order to achieve more predictable sinus lift results, clinicians need to be aware of possible complications related to different sinus pathology; always use CBCT for sinus diagnosis and to guide the surgery. Also it is important to realize our limitations and work closely with other specialties. Sinus reentry is a challenging approach with lower implant successful rate.

**Title: Single Tooth Movement Using Orthodontic Alignment Trays: A Case Report**

**Presenter(s):** David Herbert, Postgraduate

**Advisor(s):** David Buxton

Abstract:

A common finding in post-orthodontic treatment is lower anterior crowding, where unwanted forces on teeth in the lower arch cause the incisors to fall out of alignment. The practitioner will choose to permanently bond a wire to the lingual surfaces of the lower incisors or to construct a customary Hawley retainer with acrylic and wire to hold the teeth in place. Even after the patient uses these appliances for several years after treatment, the lower anteriors may still undergo crowding once the appliances are no longer used. The traditional approach to correct crowding in this circumstance is to do limited full arch orthodontic treatment to bring the teeth back into alignment. This case report details an alternative treatment where single crowded teeth can be moved into alignment using plastic trays fabricated in the dental office, leaving in place the remaining teeth in the arch.

**Title: Importance of Socket Preservation after Tooth Extraction**

**Presenter(s):** Harika Lala, Postgraduate

**Advisor(s):** David Buxton

Abstract:

In this era of dental implants, the standard of care for a missing tooth is restoring it with dental implant prosthesis. Not all patients with edentulous space can be candidates for restoring with dental implants. Certain dimensions of vertical height and width of bone and inter dental and inter arch space play a vital role in the assessment of the region for dental implants.

Teeth are supported by alveolar bone through desmodontal fibers. The mechanical stimulation of alveolar bone during mastication is important to keep the bone healthy. Soon after tooth extraction, due to the loss of this mechanical stimulus, the bone undergoes resorption in terms of height and width. Trauma from tooth extraction plays a key role in determining the amount of resorption, dimensional and the structural changes that occur early post extraction. When tooth extraction is necessary, trauma should be minimized during the procedure and bone preservation should receive careful attention. The literature has shown that socket grafting can significantly reduce early bone loss. It is a relatively simple procedure and when done with meticulous care, predictable result can be obtained. When an extraction site is considered for future implant placement, in order to avoid harvesting an autograft, and thereby eliminating additional surgical procedures and risks, bone grafting materials and substitutes are to be used for ridge augmentation. Some studies have shown dimensional loss of height and width of the alveolar bone even after socket preservation, however, provided the procedures of extraction and bone grafting done appropriately, in most case scenarios, it is less significant.

This project documents the process of extraction and subsequent alveolar ridge socket preservation with bone grafting.

**Title:** Evaluation of Full Coverage All-Ceramic Restorations on Second Molars

**Presenter(s):** Nathan Powell, Postgraduate; Ashlea Turpin, Postgraduate

**Advisor(s):** David Buxton, James Kessler

Abstract:

The purpose of this study was to evaluate the success of all-ceramic restorations on second molars and to establish reasonable recommendations for their use. This topic is very relevant to modern dentistry due to the increased use of all-ceramic restorations. Also, extensive marketing by dental suppliers continues to advocate the use of these products. Multiple complications can arise when trying to select the appropriate material for a patient. Many restorative patients are driven largely by absolute esthetics, rather than selecting a material to maximize restoration longevity. Also, material selection within the family of all-ceramics is important because they each have very different properties. Appropriate material selection for all-ceramics largely depends on the location in the oral cavity in addition to the preparation design and the intended function of the restoration. This study evaluates both the success of all-ceramic restorations on second molars as well as preparation design and the use of zirconia as a dental material. The data from this study supports the concept that second molars are generally better served with gold full coverage restorations than they are with all-ceramic restorations. Evidence will be presented that demonstrates potential risks for restoration failure, TMJ concerns, and periodontal concerns when placing all-ceramics on second molars. Such evidence has practical implications for the current practice of dentistry because the concerns addressed are encountered frequently in the restorative dental practice. Finally, it is important that patients be made aware of such evidence in order to make a fully informed decision about their dental health.

**Title: Restoring a Denture Patient using Digital Dentures and Mini Implants**

**Presenter(s):** Patrick Crowley, Postgraduate; Taylor Marcum, Postgraduate

**Advisor(s):** Paul Mullasseril, David Buxton

**Abstract:**

Digital dentures are an emerging concept in today's dental industry. One such company introducing this technology is Avadent. The Avadent system combines traditional PVS impressions with digital scanning to produce a computer designed and milled complete denture. The final denture can be delivered in two to three appointments depending on if a wax try in appointment is desired. A 48-year-old Caucasian female presented to the AEGD clinic with a chief complaint of ill-fitting dentures, exhibiting poor esthetics. The clinical exam revealed an atrophied mandibular arch resulting in a lower denture with poor retention and stability. The treatment plan presented to the patient included a new set of upper and lower dentures, along with mini implants in the mandibular arch to increase retention of the new denture. A cone beam CT was ordered to evaluate available bone for placement of mini implants. The patient accepted the proposed treatment plan. It was determined at the wax try in appointment, that all of the teeth needed to be anteriorly advanced by several millimeters to provide a more full facial profile, resulting in the case not being completed at the time of this writing. The denture is still to be delivered and mini implants placed. At this point in time, the authors feel it is too early to draw any conclusions related to the effectiveness of the Avadent system.