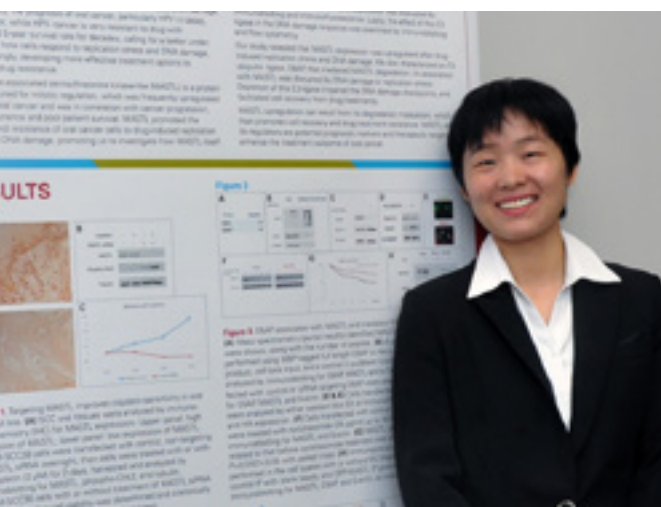


UNMC College of Dentistry Research Day 2022



Special Thanks

Student Scientific Program Sponsors

Thank you to the following organizations who sponsored the awards for the winning student research presentations.

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Dr. Gerard Byrne	Dr. Gregory Oakley
Dr. Marianne Day	Dr. Aimin Peng
Ms. Amanda Dolen	Dr. James Wahl
Ms. Lisa Moravec	Mr. Jason Jurca (student member)

Event Schedule & Zoom Links

Frank M. Wentz Student Scientific Program

12:00 - 1:30 p.m. D3 first round judging

[See presentation schedule](#)

Group 1 - [Zoom link](#)

Group 2 - [Zoom link](#)

Group 3 - [Zoom link](#)

Group 4 - [Zoom link](#)

Group 5 - [Zoom link](#)

DH4 first round judging

[See presentation schedule](#)

Group 1 - [Zoom link](#)

Group 2 - [Zoom link](#)

12:00 - 2:30 p.m. Postgraduate judging

[See presentation schedule](#)

[Zoom link](#)

**1:30 - 3:30 p.m. D3 final round judging
DH4 final round judging**

[Zoom link](#)

[Zoom link](#)

Keynote Speaker

3:30 - 4:30 p.m. Dr. Jeffrey Ebersole

[Zoom link](#)



'The Exposome & Periodontal Homeostasis in Aging'

Dr. Ebersole has been a professor and the associate dean for research at the University of Nevada Las Vegas School of Dental Medicine since 2017. He received the IADR award for basic oral science research in 1983, the IADR award for basic research in periodontal disease in 2000, and he served as the president of the American Association for Dental Research from 2011-2012. His CV contains over 300 publications, reviews and book chapters in the microbiology and immunology of oral diseases. [View full bio.](#)

Awards Ceremony

4:30 - 5:00 p.m.

[Zoom link](#)

(same as keynote speaker)

Student Presentations

Dental Group 1

[Zoom link](#)

#13 Impact of COVID-19 on Dental Students' Preparedness for General Dentistry

Student presenter: Ellen Anderson
Faculty mentor: Dr. Yun Saksena

#21 The role of DHHC13 in desmosome function and its effects on cellular adhesion

Student presenters: Erin Farnham and Kirstan Hyser
Faculty mentor: Dr. James K Wahl III

#23 A Survey of Nebraska Dental Students' Knowledge and Interest in Climate Change and Sustainable Dentistry

Student presenters: Ben Hanson and Corbin Smith
Faculty mentor: Dr. Sarah Lowman

#25 Experience and Comfort Levels of Orthodontists in Treating Patients with Special Needs

Student presenters: Hannah Hofmaier and Kaitlynn Harvey,
Faculty mentors: Dr. Meenakshi (Minnie) Vishwanath and Dr. Jennifer Kallio

#26 Determining preferred bone grafting materials among Nebraskan dental providers

Student presenters: Nicklaus Hofmaier and Rachel Persson
Faculty mentor: Dr. Joseph Bavitz

#39 Are Dentists Responsible for the Opioid Crisis?

Student presenters: Benjamin Kincaid and Logan Johnson
Faculty mentor: Dr. Nagamani Narayana

Dental Group 2

[Zoom link](#)

#17 Retention of Overdenture Attachments in Relationship to the Angulation of 0-Degrees and 20-Degrees Implants

Student presenters: Dang Dang and Truc Doan
Faculty mentor: Dr. Gerard Byrne

#19 Color Stability of Flowable Composites Used for Injectable Composite Resin Technique

Student presenters: Sarah Elkhodary and Prabhdiljit Singh
Faculty mentor: Dr. Amanda Ribeiro Wobido

#27 How life stressors affect dental service utilization in the pregnant women of Nebraska

Student presenters: Isaac Hohman and Laura Jacobs Mckniff
Faculty mentor: Dr. Sarah Lowman

#30 Printer variability and the impact on resin physical properties, an in vitro study

Student presenters: Heath Ketteler and Isaac Langan
Faculty mentor: Dr. Gregory Bennett

#31 The effect of orthodontic treatment with extraction of teeth on the upper airway dimensions and 3-Dimensional morphology: A retrospective radiologic evaluation using Cone beam tomography technique

Student presenters: Yan Mei and Nagadeepthi Kollipara
Faculty mentor: Ehsan Mostaghni

#40 Comparison of tensile bond strength of denture relining materials to 3D printed denture bases

Student presenter: Victoria Woodburn
Faculty mentor: Dr. Gregory Bennett

Dental Group 3

[Zoom link](#)

#18 The Protective Effects Of Silica On Elastomer-Base Prostheses

Student presenters: Andrew Dowd and Casey Jurczewsky
Faculty mentor: Dr. Mark Beatty

#29 Effects of Electronic Nicotine Delivery Systems (ENDS) liquid on the color stability of Dental Resin Composite

Student presenters: Logan Johnson and Ian Fullinfaw
Faculty mentor: Dr. Mark Beatty

#32 Investigating burnout, grit, and associated factors in dental students

Student presenters: Tommy Waters and Bridget McKeegan
Faculty mentor: Dr. Sarah Lowman

#33 Assessing Impacts of e-Module instruction on SOAP note documentation

Student presenters: Shyamaly Premaraj and Cassandra Nguyen
Faculty mentors: Dr. John Reinhardt and Dr. Jennifer Kallio

#34 Dental Student Understanding of Medicaid at UNMC College of Dentistry

Student presenters: McCamey McKinley and Katelyn Smith
Faculty mentor: Dr. Sarah Lowman

#41 Impact of COVID-19 on Applicant Perceived Barriers to Advanced Standing Dental Program (ASDP) Admissions Process

Student presenters: Khushbu Pareshkumar Ijner and Mariam Ali Malik
Faculty mentor: Dr. Julie Marshall

Dental Group 4

[Zoom link](#)

#12 Comparison of the Polishability of 3D Printed Denture Base Materials Using Three Different Additive Manufacturing Technologies

Student presenters: Mandy Amberg and Shelby Brown
Faculty mentor: Dr. Gregory Bennett

#22 Synthesis of Nanofilled Siloxane Copolymers for Facial Prosthetics Applications

Student presenter: Ryan Grove
Faculty mentor: Dr. Mark Beatty

#24 Examining the association between smoking, diabetes, periodontitis stage, periodontitis extent, and demographic factors with tooth loss

Student presenters: Edward Hardy and Randin Rawlings
Faculty mentor: Dr. Jeffrey Payne

#28 Pricing differences between Traditional and Digital dentures at UNMC College of Dentistry

Student presenter: Ethan Hoopes
Faculty mentors: Dr. Gregory Bennett and Dr. Nick Murray

#35 Noncarious cervical lesions prevalence and related risk factors: a pilot study

Student presenters: Makena Sundine and Justin Peterson
Faculty mentors: Dr. Luana Oliveira-Haas, Dr. Gregory Bennett, Dr. John Reinhardt, Dr. Stephen Haas

#36 TGF Signaling Leads to EMT through the Depalmitoylation of Desmosomal Proteins

Student presenter: Ben Reckmeyer
Faculty mentor: Dr. James K Wahl III

Dental Group 5

[Zoom link](#)

#14 Exploring Sustainable Dentistry: A Survey of Nebraska Dentists' Beliefs and Awareness of Climate Change and Eco-friendly Practice

Student presenters: Sydney Armstrong and Jared Smalley

Faculty mentor: Dr. Sarah Lowman

#15 The evaluation of microleakage between two different materials used in pit and fissure sealants: an in vitro study

Student presenter: McKenzie Brown

Faculty mentors: Dr. Adam Woroniecki and Dr. Jennifer Carter (Marshall)

#20 Comparing the accuracy of scanned alginate impressions to that of scanned physical casts

Student presenters: Reese Gebers and Brock Reichardt

Faculty mentor: Dr. Gregory Bennett

#37 Teaching Sexual and Gender Minority Health in Dental Education: Curriculum Trends in U.S. Dental Schools

Student presenters: Christine Scanlan and Jordan Brozek

Faculty mentor: Dr. Sarah Lowman

#38 Is Student Debt Decreasing the Number of Dental School Applicants?

Student presenters: Ellen Molini-Janak and Zachary Berg

Faculty mentor: Dr. Merlyn Vogt

Dental Hygiene Group 1

[Zoom link](#)

#1 In-vitro Study Comparing the Effects of Chlorhexidine and Stellanlife® VEGA® Oral Care Rinse on S. mutans and S. salivarius

Student presenters: Jesi Adams and Kayla Bush

Faculty mentor: Lisa Moravec

#3 Tooth Loss In Correlation with Neurodegenerative Disease: A Retrospective Study

Student presenters: Kateralnada Mahdi and Brooke Lawson

Faculty mentor: Dr. Shayla Yoachim

#5 The Effect of Charcoal Infused Toothbrush Bristles Compared to a Soft Bristled Toothbrush: An In-Vitro Study

Student presenters: Haley Malnack and Collette Hamersky

Faculty mentor: Lindsay Mundil

#7 The Effects of Coconut Oil Pulling on Teeth Whitening Compared to Water

Student presenters: Megan Biddlecome and Kassi Plock

Faculty mentor: Brenda Utecht

#9 Extrinsic Stain Removal Efficiency between Phillips Sonicare DiamondClean and Burst Sonic Electric Toothbrushes

Student presenters: Shelby Rickett and Haleigh Hoos

Faculty mentor: Todd Junge

#11 Green Tea versus Black Tea Dental Stains

Student presenters: Kori Fischer and Madison Baumert

Faculty mentor: Amanda Dolen

Dental Hygiene Group 2

[Zoom link](#)

#2 Erosion Potential of Alternative and Probiotic Beverages on Extracted Human Teeth

Student presenters: Mahnaz Khafaji Zad and Sana Daraei Ahwaz

Faculty mentor: Dr. Marianne Day

#4 The Effect of Whitening Dentifrices on Filled Composite Resin

Student presenters: Mollie Lemmons and Ellie Myers

Faculty mentor: Dr. William Johnson

#6 Teeth Whitening: An In-vitro Study Comparing Professional-Grade and Store-Bought Whitening Strips

Student presenters: Taylor Newell and Lexi Pettit

Faculty mentor: Dr. William Johnson

#8 Effect of Fluoride on Remineralization: An In-vitro Study

Student presenters: Haley Stellingwerf and Logan Reynolds

Faculty mentor: Brenda Utecht

#10 An In-vivo Study of Ultrasonic Scaler and Sound Production for the Overall Health of the Hygienist

Student presenters: Gabbi E. Rader and Shae A. Toof

Faculty mentor: Lisa Moravec

Postgraduate

[Zoom link](#)

#43 The Effect of Interproximal Home Oral Hygiene on Clinical Parameters on Periodontal Maintenance Patients

Kevin Smith, DDS

#44 The evaluation of microleakage between two different materials used in pit and fissure sealants: an in vitro study

Adam Woroniecki, DDS; McKenzie Brown; Jennifer Carter (Marshall), DDS; Holly Roberts, PhD; Bobby Simetich, BSE

#45 Formocresol Pulpotomy vs. Vitrebond Indirect Pulp Therapy: a 5-year retrospective study on dental rehabilitation cases completed under general anesthesia

Jordan Castillo, DDS, Eric Phan, DDS, Bryan Skar, DDS

#46 Interleukin-6 Levels are Elevated in Saliva of Patients with Endodontic Disease

Arif Karim, Timothy Jernberg, Thomas Petro

#47 The effect of interproximal home regimens on inflammatory biomarkers in periodontal maintenance patients

Dr. Grace S. Moore and Dr. Richard A. Reinhardt

#48 Incidence and Cumulative Prevalence of SARS-CoV-2 in Asymptomatic Pediatric Patients

Pollmiller M, Lowman S, Roberts H

#49 Efficacy of Pit-And-Fissure Sealants on Primary Molars

Smith R, Roberts H, Koukol C, Lowman S

#50 Emergency Department and Urgent Care Utilization for Non-traumatic Dental Conditions

Cawley M, Koukol C, Roberts H

Abstracts

#1: In-vitro Study Comparing the Effects of Chlorhexidine and StellaLife® VEGA® Oral Care Rinse on S. mutans and S. salivarius

Jesi Adams and Kayla Bush

The antimicrobial effectiveness of StellaLife® VEGA® Oral Care Rinse, was tested on two species of oral bacteria, S. mutans and S. salivarius, as compared to the gold standard chlorhexidine gluconate 0.12% (CHX). StellaLife® and CHX (alcohol free) were tested as commercially available utilizing the Kirby-Bauer disk diffusion method for antimicrobial testing. Streptococcus mutans and S. salivarius were selected for their prevalence in the oral cavity and competing roles in conditions of disease and health. S. mutans is a primary etiological agent for dental caries, and while S. salivarius participates in some opportunistic infections, it is generally associated with an increased state of oral health. Streptococcus salivarius competes with S. mutans for colonization sites, neutralizes cariogenic acid produced by S. mutans, stimulates gingival re-epithelialization, inhibits colonization of A. actinomycetem-comitans, and possesses anti-inflammatory capabilities. A bacterial suspension of each microbe was poured on 24 agar plates, and diffusion disks hydrated with each rinse were placed on the plates with sterile water and dry controls. After 24 hours of aerobic incubation, the radii of inhibited growth zones were measured and analyzed for statistical significance. StellaLife® showed statistically insignificant microbial growth inhibition (mean radii 0.3625mm S. mutans; 0 mm S. salivarius) as compared to CHX (mean radii 11.64 mm S. mutans; 8.54 mm S. salivarius) and was determined to be ineffective in preventing growth of either species. Additionally, complete or β hemolysis was observed on 5% sheep blood supplemented agar plates around CHX diffusion disks only, suggesting that CHX may possess cytotoxic activity toward red blood cells. It was concluded that StellaLife® does not prevent growth of either microbes. StellaLife® VEGA® Oral Care Rinse would be ineffective in the management of S. mutans, however has no apparent antimicrobial action on the typically beneficial S. salivarius.

#2: Erosion Potential of Alternative and Probiotic Beverages on Extracted Human Teeth

Mahnaz Khafaji Zad and Sana Daraei Ahwaz

Objective: The goal of this study is to investigate human tooth erosion as a result of alternative beverages and probiotic drinks. When the drinks were compared to distilled water,

Methods and Material: A total of 25 extracted teeth were randomly assigned and immersed in five different solutions including Bubbl'r, Bubbly, Hint, Arvand Yogurt Soda, and distilled water. The pH acidity of each drink, as well as the weight of the teeth, were measured prior to the experiment. Each tooth was immersed in 50 ml of solution for one hour and the percent weight loss of extracted teeth was measured for 15 days of consecutive exposures. The weight of each tooth was measured using a digital balance. After the measurements, each sampled tooth was placed into distilled water for the next day.

Results: Results of this study revealed that erosion was found to be statistically higher in Bubbl'r ($p < 0.0001$). ANOVA was used to determine the significant difference of the tested beverages. For the comparison of Arvand Yogurt Soda, Bubbl'r, Bubbly, and Hint water with distilled water, Dunnett adjustment was used and revealed that erosion was higher for all the drinks when compared to distilled water with a p-value < 0.05 .

Conclusion: Considering the significant percent weight loss, we can conclude that alternative drinks (especially Bubbl'r) contribute to the erosion of human teeth. Therefore, it's necessary to educate patients regarding the adverse effects of these drinks as it can be an important factor in eliminating enamel erosion.

#3: Tooth Loss In Correlation with Neurodegenerative Disease: A Retrospective Study

Kateralnada Mahdi and Brooke Lawson

Previous research supports the correlation between neurodegenerative diseases and the loss of teeth. Although there is no clear causation, the correlation can be found in patient populations but may not be a commonly known fact. The purpose of this research was to determine if this correlation was present in the University of Nebraska Medical Center (UNMC) College of Dentistry patients. Goals of this research were developed from a public health standpoint; assessment of the current occurrence of this correlation, education on the correlation to the patients, and implementation of preventative care based on the information gathered.

Using an IT query in the SALUD patient database, patients from the years 2014 to 2019 were screened using inclusion criteria for patients that had answered YES to the question "Have you experienced, been diagnosed or treated for any nerve, brain or mental health conditions as outlined below?" and indicated any number of the following: Dementia, Alzheimer's, or Parkinson's disease. Data about patients of similar sex and age who answered NO to the neurological systems questions in the medical history was collected, as well, to compare the effects of brain function on tooth loss in neurotypical and neurodegenerative diagnosis.

The results of the study reflected that the average number of teeth lost in the patients without neurodegeneration was significantly higher in females aged 62 and 72, and in males 72 and 82 compared to the patients that had answered "YES" in the same cohort. This shows that in the data set for the UNMC College of Dentistry Patients, the hypothesis that the patients with neurodegeneration as defined by "YES" to the question would have a greater average of missing teeth was rejected. Although the numbers did not support the correlation occurring widespread in the patient population, this correlation still affects many individuals and must be addressed with preventative care and education.

#4: The Effect of Whitening Dentifrices on Filled Composite Resin

Mollie Lemmons and Ellie Myers

The purpose of this experiment is to determine how Crest 3D White, Sensodyne Extra Whitening, and Arm and Hammer Advanced Whitening will abrade composite resin restorations. 20 Aemelgen composite discs were made. There were five discs assigned to each dentifrice, and to the control- water. The initial surface roughness and light reflection measurements were taken before treatment. The discs were then subjected to 6,000 cycles of brushing, a cycle being one stroke forward and one stroke back, to simulate 6 months of brushing. Each group of five was brushed with a different dentifrice, Crest 3D White, Sensodyne Extra Whitening, Arm and Hammer Advanced Whitening, or water alone. The surface roughness and light reflection measurements of each composite disc was taken again post treatment. In order for a change in surface roughness to denote significance, there needs to be a change of 0.17 in the surface roughness measurements from pre- to post- treatment of the same variable. No variable groups showed a difference of significance. To indicate a significant change in roughness between variables, there needs to be a difference of less than 0.5 Ra between them. Crest 3D white showed a difference of less than 0.05 to Arm and Hammer Advanced Whitening. It showed greater than 0.05 when compared to the other dentifrices and the control (water). A value of 0.5 mm, was used to determine significance between pre- and post- treatment variable groups measuring light reflection. All variables experienced a decrease of 0.5 mm or greater, indicating that they experienced significant change. When comparing the post-treatment light reflection of the variables against one another, we find that the only significant differences are between Crest 3D Whitening and water, and Sensodyne Extra Whitening and water. In conclusion, the abrasion results after 6,000 cycles of brushing with Crest 3D White, Sensodyne Extra Whitening, Arm and Hammer Advanced Whitening, or water alone were not significant pre- to post- treatment, nor when compared against one another. The light reflection of each variable changed significantly and Crest 3D whitening experienced the least amount of light reflection loss.

#5: The Effect of Charcoal Infused Toothbrush Bristles Compared to a Soft Bristled Toothbrush: An In-Vitro Study

Haley Malnack and Collette Hamersky

The purpose of this experiment was to compare an Oral-B toothbrush with charcoal infused bristles compared to a soft bristled "indicator" Oral-B toothbrush and the abrasive effects it would have on extracted teeth in a laboratory setting. This study contained two groups of twenty extracted teeth soaking in a 0.5% phenol solution with pre and post weights taken to determine loss of enamel. Researchers brushed each tooth for four minutes and twenty-nine seconds, which is equivalent to brushing each tooth two times daily for one month. The data showed the teeth brushed with the charcoal bristles had a larger difference in the mean weight compared to the bristles on the normal Oral-b toothbrush. This shows that there is enough data to display that the charcoal infused toothbrush produced more abrasiveness towards the enamel surface.

#6: Teeth Whitening: An In-vitro Study Comparing Professional-Grade and Store-Bought Whitening Strips

Taylor Newell and Lexi Pettit

This study aims to determine if there is a significant difference between Crest 3D (Professional White) and Crest Supreme Professional whitening strips. Eighteen extracted human teeth were each treated, according to manufacturer's instructions, with one of two different strips for 20 consecutive days. Tooth shade was measured using Vita Easyshade digital shade guide at 3 intervals: prior to day one treatment, day 10, and after day 20 treatment. Both products generated a significantly lighter shade change from day one to day 20 but there was no significant difference between the two different strips when compared to one another.

#7: The Effects of Coconut Oil Pulling on Teeth Whitening Compared to Water

Megan Biddlecome and Kassi Plock

Coconut oil pulling has been thought to have beneficial whitening effects on the teeth. The purpose of the study was to examine the whitening effects of coconut oil pulling on the teeth compared to water. The researchers performed the experiment using one ounce of room temperature water, which was labeled Group B and using coconut oil for the other group labeled, Group A. Each main group was divided into subgroups that received either water or coconut oil for a different number of days. Results of the experiment showed a significant difference between coconut oil whitening effects and water whitening effects. However, there was not a conclusive difference between the different number of days within each main group. Coconut oil pulling overall does not seem to have significant whitening effects. However, there are several other benefits of coconut oil pulling.

#8: Effect of Fluoride on Remineralization: An In-vitro Study

Haley Stellingwerf and Logan Reynolds

The purpose of this study is to determine whether fluoride has a re-mineralizing effect on demineralized tooth surfaces. This is particularly important as demineralization can be detrimental to oral health and fluoride is considered beneficial to prevent the tooth structure from becoming demineralized. Research included demineralizing the enamel structure of 51 teeth split into three groups of 17. The first group was used as a control. The other two groups were fluoridated with NaF or SDF after demineralization. Initial and final measurements were taken using the Canary System, which measures decay and demineralization of tooth structures. Findings from this study show that NaF has higher re-mineralizing potential than SDF. The results suggest that fluoride application on demineralized surfaces is beneficial for the tooth structure and health.

#9: Extrinsic Stain Removal Efficiency between Phillips Sonicare DiamondClean and Burst Sonic Electric Toothbrushes

Shelby Rickett and Haleigh Hoos

Aesthetics are a major part of dentistry and self-esteem. Most people care about the appearance of their teeth and making their smile bright and healthy. Several foods and beverages that people love and enjoy can make an impact on their smile. Coffee, tea, and soda can leave visible stains on the outer surface of teeth. Removal of these stains can be done at-

home by means of tooth brushing with electric toothbrushes. The efficiency of stain removal between the Phillips Sonicare DiamondClean and Burst Sonic electric toothbrushes were evaluated in this study. Each toothbrush was subjected to 30 maxillary or mandibular molars. The molars were soaked in an artificial saliva solution for two days, then they were subjected to a coffee solution made from Folgers Classic Roast Dark Coffee for four days. Before and after the staining, the Vita Easyshade was used to measure the L*, a*, b* measurements of each tooth. The teeth were then brushed for two minutes, twice a day for seven days. The Vita Easyshade was then used to assess the effects of stain removal for each toothbrush. The delta E values were calculated for the two toothbrushes and an ANOVA was used to test if there were differences between them. The results support that there is no difference in shade changes from staining to post posting between the two toothbrushes. Both electric toothbrushes have similar effectiveness with respect to stain removal.

#10: An In-vivo Study of Ultrasonic Scaler and Sound Production for the Overall Health of the Hygienist

Gabbi E. Rader and Shae A. Toof

The purpose of this study is to evaluate ultrasonic usage and the ultrasonic combined with the external suction unit to determine if the decibel levels exceed the threshold of 85 dB. Due to COVID-19 restrictions, dental hygienists have needed extra adjuncts that produce more noise during aerosol producing procedures. Adjuncts such as the HEPA unit are needed combined with the normal armamentarium which increases the dB range. In turn this could cause more occupational noise induced hearing loss in dental hygienists. The decibels produced by the ultrasonic scaler with the portable high-efficiency particulate air filtration unit will create more occupational noise than the use of the ultrasonic alone. The methods used were a decibel reader which recorded 32 different recordings in a total of 4 rooms on 4 different typodonts. Results found that the recordings with the HEPA filtration unit were louder than without the HEPA. In conclusion, the estimated decibel results were that the HEPA recordings contained higher readings than without the HEPA unit.

#11: Green Tea versus Black Tea Dental Stains

Kori Fischer and Madison Baumert

Previous studies have compared the differences in staining on teeth exposed with coffee, tea, and wine. This study's aim was to specify the different staining effect found on teeth when they were exposed to green tea and black tea. A total of 26 extracted teeth were used in this experiment. They were divided into two groups: green tea and black tea. A baseline tooth shade was determined and recorded with a VitaEasy Shade, measuring each individual tooth's shade. The teeth were soaked in their destined tea for 24 hours and an end-product tooth shade was recorded and compared to baseline with the calculation of Delta E. The p-value was used in data-collection to determine if black tea-stained teeth more than green tea. The significant p-value in this study was 0.05, and our concluded p-value after conducting this experiment was 0.0132. This shows there was a significant difference between the two tea's tooth staining. This study concluded that the extracted teeth soaked in black tea had a greater staining effect than the

extracted teeth soaked in green tea. This indicates that among patients concerned about dental stains, green tea is a better alternative beverage than black tea.

#12: Comparison of the Polishability of 3D Printed Denture Base Materials Using Three Different Additive Manufacturing Technologies

Mandy Amberg, Shelby Brown, Dr. Gregory Bennett

The surface characteristics of removable dental prostheses are critical in biofilm accumulation and cleansability. Surface roughness can increase the retention of pathogenic microorganisms and decrease surface cleansability, thus emphasizing the importance of surface smoothness. This research aims to determine if 3D printed denture materials, using different additive manufacturing techniques, can achieve the same level of polishability as conventionally created resin denture materials.

To obtain a clinically predictable method of polishing for 3D printed denture materials, three different 3D printing technologies, along with conventional lab fabricated PMMA auto cured resin, were utilized to create ten cylindrical samples in which five of each type were polished using the Pala Polishing one-step system or the Miltex course and fine pumice with Acryluster polishing system. The printing technologies used for manufacturing the samples include Stereolithography (SLS), Digital Light Processing (DLP), and Continuous Liquid Interface Printing (CLIP) using the Formlabs USA Form3B, SprintRay Pro Desktop Dental 3D printer, and Carbon M2d printer. Each 3D printer used denture base resin from the same manufacture (DENTCA) and the samples printed were identically sized cylinders. After polishing, the surface roughness and surface gloss of each sample were measured and analyzed.

Data analysis is ongoing, although, preliminary data suggests that 3D printed denture materials can achieve a higher level of polishability when compared to conventionally fabricated resin denture materials when polished with the Pala Polish Cream system versus the conventional pumice system.

Due to the scarcity of research on the polishability of 3D printed materials despite the growing trend and convenience of digitally manufactured products, this research's intent is to provide and equip the dental community with polishing protocols. It is paramount that as dentistry and materials advance, so do the polishing techniques, ultimately refining and enhancing patient care.

#13: Impact of COVID-19 on Dental Students' Preparedness for General Dentistry

Ellen Anderson, BS; Yun Saksena, BDS, MMSc, DMD; Maricelle Abayon, DMD, MS; Joyce A. Barbour, DDS, MBA; Susi Hamilton, MEd; Eswar Kandawamy, BDS; Neeraj Panchal, MD, DDS, MA; Rachel Rogers, BA; Joseph Vitolo, DMD, MS, PhD

Objective: The purpose of this study was to determine if and how the COVID-19 pandemic affected dental students' preparedness for general dentistry (AEGD/GPR programs/private practice/rural settings/public health settings).

Methods: To investigate the effect of COVID-19 on students' preparedness, we conducted an electronic survey directed at

students from the graduating classes of 2021 and 2022. This project was granted IRB exemption status.

Results: A total of 37 students completed the survey. Descriptive statistics were used to analyze the results. For the students who applied to AEGD/GPR programs (minority of respondents) one third of the Class of 2022 and one half of the Class of 2021 said they would not have applied if COVID-19 did not occur. The majority of respondents indicated they would have applied to the same number of programs or fewer if COVID-19 hadn't occurred. When asked about clinical requirements, 13 students indicated requirements decreased, while 18 students indicated requirements did not change. Regardless of race, a majority of students felt not at all confident or somewhat confident in their ability to practice general dentistry in private practice, rural, or public health settings. Students of color compared to whites felt that their dental school experience had not prepared them for AEGD/GPR programs.

Conclusion: The pandemic appeared to have a negative effect on the confidence of the class of 2021 and 2022 though, for most students surveyed, clinical requirements didn't change. Students appeared to have less confidence in their ability to practice general dentistry in a private practice, rural, or public health settings. This survey highlights the negative effect of the COVID-19 pandemic amongst dental students' perception of their training, which has influenced students' decision in applying to AEGD/GPR programs or beginning practicing as a general dentist.

#14: Exploring Sustainable Dentistry: A Survey of Nebraska Dentists' Beliefs and Awareness of Climate Change and Eco-friendly Practice

Sydney Armstrong; Jared Smalley; Jesse Bell, PhD; Azar Abadi, PhD; Sarah Lowman, DDS, MPH

Introduction: Dentistry is a resource-intensive practice that includes consumption of plastics, water, electricity, and chemical pollutants. However, few studies have investigated the attitudes and beliefs of practicing dentists regarding climate change, health, and environmentally friendly practice approaches. It is unclear where the gaps lie and how to best address them in dental education. Our study aims to describe common dental practice patterns that may contribute to climate change, provider beliefs related to climate change and health, and opportunities for pre-doctoral and continuing dental education.

Methods: A survey was distributed via email to licensed dentists in Nebraska (n=1562). Survey items are grouped into four domains: (1) dental practice patterns, (2) beliefs about climate change and health, (3) interest in learning about sustainable practice and climate change, and (4) demographics. Survey data were collected in REDCap, a secure web application for building and managing online surveys, and analyzed using R.*

Results: Data analysis is ongoing.

Conclusion: This study will elucidate knowledge and beliefs among dentists related to climate change and health, and eco-friendly practice. In addition, current dental practice patterns in a Midwestern state will be described and discussed. Implications exist for the development of timely and innovative curricula in both pre-doctoral and continuing education.

#15: The evaluation of microleakage between two different materials used in pit and fissure sealants: an in vitro study

McKenzie Brown; Adam Woroniecki, DDS; Jennifer Carter (Marshall), DDS; Bobby Simetich, BSE; Holly Roberts, PhD

Application of sealants is a safe and effective treatment for the prevention of caries on the occlusal surfaces of permanent molars. The marginal sealing ability of sealing materials is tremendously important for successful treatment. Microleakage, which can be defined as the passage of bacteria, fluids, molecules, and ions through the tooth-material interface, can occur following lack of sealing. This in vitro study was aimed to evaluate the marginal microleakage of two different materials used as pit and fissure sealants. 50 extracted third molar teeth were obtained from the College of Dentistry's Oral Surgery department. The teeth selected for the study were intact and free of caries, restorations, or cracks. The teeth were randomly assigned to two groups according to the material used as pit and fissure sealant: Clinpro (3M/ESPE), a light-cured, fluoride releasing pit and fissure sealant with a unique color-change feature and Beautifil Flow Plus (SHOFU Dental ASIA-Pacific Pte. Ltd.), a fluoride-releasing and recharging, light-cured flowable restorative material. Both groups received a pit and fissure sealant (no enameloplasty performed prior to sealant placement). After sealant placement, teeth from both groups were thermocycled (500 cycles; 5°C and 55°C), isolated, immersed in 1% Crystal Violet dye for 4 hours at room temperature, washed, and sectioned longitudinally in a buccolingual direction yielding two sections per tooth. One randomly selected sectioned half were examined under 50x stereomicroscopy for the presence and extent of dye penetration from the margin of the tooth-sealant interface (microleakage). The teeth were then scored as having "no" microleakage or "some" microleakage when evaluating dye penetration. While both groups had some teeth that scored as having microleakage to some extent, a chi-square test revealed there was not a significant relationship between sealant type and penetrability, $X^2(1) = 1.30$, ($p > 0.05$). Clinpro and Beautifil were equally as likely to have dye penetrate some (i.e., dye penetration limited to the outer half of the sealant) to all of the tooth (i.e., dye penetration extending to the underlying fissure).

#17: Retention of Overdenture Attachments in Relationship to the Angulation of 0-Degrees and 20-Degrees Implants

Dang D, Truc D, Simetich B, Byrne G

Purpose: The purpose of this in vitro study was to investigate the effect of cyclic dislodgement on the retention of an overdenture attachment system when 2 implants were placed at different angulations. In this study, we evaluate the retention strength of locators with comparative insertion and removal forces from 0 to 5000 test cycles, for locator attachments at 3 different vertical forces and at a non-angled (Zero-degrees) versus angled (20-degrees), to mimic the durability over long term use.

Materials and Methods: The attachments placed on angulation of 0° and 20° implants were subjected to 3 different longitudinal forces, 1lb, 2lbs, and 3lbs, represented by the colors red, orange and green respectively to test for its tensile load (N)

using the Instron 8511.20. Each tensile load value was recorded at the following cycles: 1, 10, 25, 50, 100, 150, 200, 300, 400, 500, 1000, 1500, 2000, 3000, 4000, and 5000. 5 tests were done at each specified cycle number to get an average tensile load value.

Results: Data analysis showed that implant angulation had significant effects on retention of both attachments at all 0 angled, and 20 angled abutment ($p \leq 0.05$). In addition, the number of cycles had a significant effect on retention of both attachments ($p \leq 0.05$).

Conclusions: There is a significant difference between tensile load values between each of the angulations at each specified cycle. Locator tensile/removal/retention forces are significantly higher for 20-degree angled abutments compared with Zero-degree abutments. Locator compressive/insertion forces were generally lower than tensile/retention forces for Zero than 20-degree angled implants. Additionally, there are significant negative effects when implant supported overdenture experienced drastic changes in angulation and cyclic loading. Finally, as the angle of the implant and cyclic loading were changing, the decrease in retention became more evident.

#18: The Protective Effects Of Silica On Elastomer-Base Prostheses

Andrew Dowd and Casey Jurczewsky

Due to ultraviolet light exposure, color degradation of medical prostheses begins in a matter of a few months, which leads to the need for replacement in under three years on average. In an attempt to prevent or mitigate this degradation, a 0.2 mm layer of silica impregnated vinyl terminated polydimethylsiloxane gel was applied to four different colored elastomer discs and exposed to UV light for 1,000 hours. Half of the discs were coated and half were non-coated. These two groups were then further split into two smaller groups, a UV light exposed group and a light-protected group stored in complete darkness. A photospectrometer was used to measure the change in color after solar UV light exposure. It appears the silica coating had a small protective effect on the pigment of the prostheses, however, the coating itself darkened the color of the prostheses. In conclusion, more research involving varying silica particle size, concentration, and layer thickness is needed to optimize protective properties, while having limited effects on the initial color change of the prostheses.

#19: Color Stability of Flowable Composites Used for Injectable Composite Resin Technique

Sarah Elkhodary, Prabhiljit Singh, Dr. Amanda Ribeiro Wobido

Background: There are many resin-based composite materials with different compositions and properties. The flowable composites have been indicated for low stress-bearing areas, like liners or in small cavities, because of their reduced filler content. However, a new technique, called the injectable composite resin technique, proposed flowable composites for veneers restorations in anterior teeth.

Aim: This study aimed to analyze the color stability of different formulations of flowable composites after thermocycling.

Methods: Ten samples ($n=10$) of five composite resins (Filtek Supreme and Filtek Supreme Flowable Restorative – 3M ESPE; Tetric Evoceram – Ivoclar Vivadent; Beautifil Flow Plus – Shofu; G-aenial Universal Flo – GC) were obtained using a Teflon matrix (12mm x 2mm). After 48 hours, the initial color of each sample was measured using a spectrophotometer with CIEL*a*b* system. In sequence, the samples were aged in a thermocycling machine for 5,000 cycles. After aging, the color was measured, and the color difference (ΔE) was calculated. The data were analyzed by the One-Way ANOVA test, complemented by the Tukey test.

Results: There was a statistical difference between the composites tested ($p < 0.05$). Both Tetric Evoflow and Filtek Flowable Supreme presented the highest color stability, $\Delta E=0.95$ and 1.59, respectively. Filtek Supreme and Beautifil Flow showed lower color stability, being clinically unacceptable ($\Delta E > 3.3$).

Conclusion: The composites tested in this study presented different color stability after thermocycling. According to the results, Filtek Flowable Supreme and Tetric Evoflow presented high color stability and can potentially be used for the injectable composite resin technique in esthetic restorations.

#20: Comparing the accuracy of scanned alginate impressions to that of scanned physical casts

Reese Gebers, Brock Reichardt, Dr. Gregory Bennett

Background: In order to fabricate a complete removable denture, a faithful reproduction of the intra oral structures must be created. Traditionally this has been accomplished through physical impressions using various kinds of impression material. These impressions must then be poured in dental stone in order to fabricate a working model. Digital impressions allow for data manipulation that allows the dentist to invert data of an impression to create a model. This saves time, money, and simplifies the process, yet little is known about the accuracy of these inverted models.

Purpose: The purpose of this study is to determine whether or not a dental professional can reliably digitally scan a patients' alginate impression and produce a digital cast that is as accurate as an analog cast. The implications of this being: reducing time spent on pouring casts, reducing overhead, and creating a more manageable workflow.

Methods: Ten alginate impressions were taken of a single edentulous maxillary cast. These impressions were then digitally scanned using a Cerec Prime Scan. Each digital impression was then inverted into a digital cast using Meshmixer software. Additionally, the edentulous maxillary cast that was used for the 10 alginate impressions was scanned 10 times in the same manner as the impressions. A master scan of the edentulous maxillary cast was created using a lab scanner with a 12 micron global accuracy "E3. Scanner (3shape, Netherlands). Metrology software was used to compare each of the 20 scans to the master scan to evaluate the accuracy of the model across the full surface. The accepted standard of fit for a denture is surface deviations of less than 300 microns.

Results: Data analysis is ongoing

Conclusion: Data analysis is ongoing

#21: The role of DHHC13 in desmosome function and its effects on cellular adhesion

Erin Farnham, Kirstan Hyser, Benjamin Crnkovich, Dr. James K Wahl III

Desmosomes are prominent cell-cell adhesion junctions found in epithelial tissues including skin and the oral mucosa. The transmembrane component of the desmosome consist of the desmosomal cadherins, desmogleins and desmocollins which recruit cytoplasmic adapter proteins and recruit the intermediate filament cytoskeleton to the adhesive contact. Desmosomal junctions help maintain tissue integrity and help protect against environmental stresses. Palmitoylation is a post-translational modification that increases lipophilicity to increase protein association with membranes, move proteins throughout cellular compartments, and facilitate protein interaction. Palmitoyl acyltransferases add a 16 carbon palmitate to specific cysteine side chains on substrate proteins. DHHC13 is a palmitoyl acyltransferase known to have a role in epidermal homeostasis. We hypothesized that DHHC13 acts to palmitoylate desmosomal components an affects cell-cell adhesion and migration. DHHC13 expression was reduced in UM-SCC-1 cells using shRNA targeting and reduced protein expression was confirmed by immunoblot and immunofluorescence microscopy. Cell migration in cells with reduced DHHC13 expression was compared to control cells. Scratch assays revealed increased cell migration in DHHC13 knockdown cells compared to control cells. Understanding the relationship between DHHC13 and desmosomes is important to understand mechanisms controlling cell migration.

#22: Synthesis of Nanofilled Siloxane Copolymers For Facial Prosthetics Applications

Ryan Grove, B. Simetich, M. W. Beatty

Objectives: To develop new maxillofacial prosthetic materials that are more life-like to the touch. This study evaluated nanofilled polydimethyl siloxanes (PDMS) with varying copolymer ratios to assess physical and skin-like properties.

Methods: Two PDMS comonomers (MWs 49,500(V35) & 28,000(V31), Gelest) combined in ratios 0/100, 25/75, 50/50, 75/25 and 100/0 by weight with 10 wt% 15 nm silica. Mixtures polymerized into ASTM D412 tensile dumbbells, D624 tear samples, and 6 mm-thick discs to test D2240 Durometer hardness. ASTM tests conducted. Four viscoelastic skin properties measured on 2 mm-thick discs (BTC-2000, IADR 2014 #238) and compared to previous facial skin measurements: elastic deformation (ED), creep (C), stiffness (S), energy (EA). Results assessed with ANOVA/Tukey.

Results: See Tables 1 & 2. 75% & 100% V31 mixtures n.s. different from 4 facial locations for (ED), (C)–1 location, (S)–4 locations, (EA)–4 locations (all $P > 0.05$).

Conclusions: 75% & 100% V31 formulations produced closer face-like properties, demonstrated higher modulus and Durometer, lower tensile breaking strain.

#23: A Survey of Nebraska Dental Students' Knowledge and Interest in Climate Change and Sustainable Dentistry

Ben Hanson, BS; Corbin Smith, BS; Jesse Bell, PhD; Azar Abadi, PhD; Sarah Lowman, DDS, MPH

Background: Oral health care may impact climate change and the environment. Water and energy usage, as well as the waste generated in dental practice, are potentially harmful to the planet. Several barriers to eco-friendly dental practice have been cited in the literature, including reliance on fossil fuels, challenges with biomedical waste recycling, and the lack of knowledge and awareness about sustainable healthcare. As knowledge grows about climate change and the related impact on human health, an increasing number of graduate programs have implemented climate change content into their curricula. This study aims to characterize the beliefs, experiences, and interests of dental students in Nebraska related to climate change and dentistry.

Methods: All dental students enrolled in an accredited DDS program in Nebraska ($n=680$) were invited in January 2022 to participate in a survey on climate change. Survey items were grouped into four domains: (1) dental school experiences, (2) beliefs about climate change and health, (3) desire to learn about sustainable practice and climate change, and (4) student demographic characteristics. Survey data were collected in REDCap, a secure web application for building and managing online surveys, and analyzed using R.*

Results: Pending.

Conclusions: We anticipate that study findings may help inform curriculum development on climate change and sustainable practice in dental education.

#24: Examining the association between smoking, diabetes, periodontitis stage, periodontitis extent, and demographic factors with tooth loss

Edward Hardy, Randin Rawlings, Kaeli Samson, and Dr. Jeffrey Payne

Introduction: Progression of periodontitis may lead to tooth loss if untreated. The objective of this study was to determine the reasons for tooth loss in periodontal maintenance patients over a seven-year period and to examine the association between smoking, diabetes, periodontitis stage, periodontitis extent, and demographic factors (i.e., age and gender) with tooth loss.

Methods: Data from periodontal maintenance visits of patients who were seen in both 2013 and 2019 were collected from the Electronic Dental Record at the UNMC COD. Associations between variables of interest and any tooth loss were assessed in bivariate analyses using Chi-Square tests or independent samples t-tests. A logistic regression, with any tooth loss during the study period as the outcome (yes vs. no), was run and included all variables of interest that had a p-value less than 0.20 in their bivariate analysis with the dichotomous outcome (i.e., any teeth lost). Adjusted odds ratios are presented with 95% confidence intervals (CIs).

Results: Approximately half of the 323 periodontal patients in this study lost at least one tooth during that period ($n=167$). The two most common reasons for tooth loss for this population were caries (21.4%) and periodontitis (17.0%). After

adjusting for other variables in the regression model, patients with diabetes had 2.35 (95% CI: 1.09, 5.10) the odds of losing at least one tooth during the study period than those without diabetes, patients with Stage 3 or 4 periodontitis had 2.48 (95% CI: 1.29, 4.79) times the odds of losing at least one tooth than those with a Stage 1 or 2 periodontal diagnosis, and older patients had 1.24 (95% CI: 1.01, 1.53) times the odds of losing at least one tooth than patients who were a decade younger.

Conclusion: Diabetes, higher periodontitis stage, and older age were associated with tooth loss in this retrospective study of periodontal patients. Risk factors associated with tooth loss in a periodontitis population are critical for clinicians to understand to aid in tooth retention.

#25: Experience and Comfort Levels of Orthodontists in Treating Patients with Special Needs

Hannah Hofmaier, Kaitlynn Harvey, Dr. Meenakshi (Minnie) Vishwanath, Dr. Jennifer Kallio

The American Association of Pediatric Dentistry defines special health care needs (SHCN) as “any physical, developmental, mental, sensory, behavioral, cognitive, or emotional impairment or limiting condition that requires medical management, health care intervention, and/or use of specialized services and programs.” The prevalence of malocclusions in individuals with intellectual and developmental disabilities is higher than in individuals without. Despite these malocclusions often being complex skeletal issues, patients with SHCN are less likely to receive needed orthodontic treatment. One of the possible reasons individuals with SHCN may not be getting the necessary orthodontic treatment is lack of provider experience in treating these patients.

Currently, a significant gap in knowledge exists in the dental education orthodontists have received in treating patients with SHCN. The goal of this research is to assess the dental education, training, and comfort level in treating patients with special needs of practicing orthodontists in the United States. By better understanding the educational backgrounds of orthodontists and determining their comfort levels, we hope to improve the access and quality of orthodontic treatment for patients with SHCN.

A Microsoft Forms survey was created to assess the educational backgrounds and comfort levels of orthodontists in treating patients with SHCN. The survey is divided into three sections, assessing the training received at the predoctoral dental level and during orthodontic residency, as well as experiences in orthodontic practice. A pilot survey was distributed to orthodontic residents to determine the reliability of the instrument, and 14 responses were collected. Revisions were made based on the feedback collected. The revised survey is planned to be distributed to practicing orthodontists in the United States using the American Academy of Orthodontics Partners in Research Program. Data analysis is still ongoing.

#26: Determining preferred bone grafting materials among Nebraskan dental providers

Nicklaus Hofmaier, Rachel Persson, Dr. Joseph Bavitz

Bone grafting procedures have become common practice for dental providers. However, there are several different types

that can be used. Most frequent types are allograft, xenografts, autogenous grafts, or a combination with either endogenous or exogenous growth factors. Many providers have used or at least tried a multitude of materials before deciding on the one they prefer to use most often. This study aimed to determine which material or materials were used most often, how they determine which material, and for which procedures they use grafting. The study also took into account the practice setting, specialty, board-certification, years in practice, and the various factors that determine materials used. These factors included: cost, data to support the material, material properties, company/sales pitch, risk of complications, continued education/mentor preference, and procedure type. A survey was created and distributed via email to dental providers that were included on the Nebraska Dental Association (NDA) network website and those that are UNMC alumni. The survey was distributed using GoogleForms, which allows for recorded responses to be automatically shown in the appropriate graphical representation. Overall, of the providers that responded, most are general dentists and practice in an urban setting. Bone grafting is most commonly done for socket preservation among the surveyed providers. Allograft was the most frequently used material. Procedure type was the most important factor when deciding what material to use overall, but board-certified specialists considered material properties the most important. These results demonstrate a preference for allograft material for most procedures among Nebraskan dental providers. However, there is a difference on how providers choose their material based on specialty. IRB #0664-21-EX

#27: How life stressors affect dental service utilization in the pregnant women of Nebraska

Isaac Hohman, Laura Jacobs Mckniff, Sarah Lowman, DDS, MPH, Jessica Seberger, MA

Background: Oral health is critical for the overall health and well-being of pregnant women and their unborn children. Periodontitis, in particular, has been linked to adverse pregnancy outcomes including preterm labor and low birth weight, which increase the risk of poor health among children. Additionally, meta-analysis suggests that periodontitis is associated with increased risk of gestational diabetes among pregnant women compared to those without periodontitis. In this study, we seek to identify specific factors relating to “life stressors” that decrease dental service utilization during pregnancy.

Methods: Stressors were broken down into categories so as to group together certain life stressors that occurred in some women's lives during pregnancy. These categories were: traumatic stress, partner related stress, financial stress, emotional stress and no stress if none of the previous applied to the individual. By analyzing the 2018-2020 Nebraska PRAMS (Pregnancy Risk Assessment Monitoring System) data set, we hope to identify life events that decrease dental service utilization in order to address oral health care utilization directly and work towards alleviating this issue.

Results: According to the PRAMS data set analysis, dental service utilization showed an overall decrease in pregnant women even with no stressors as compared to pre-pregnancy dental service utilization. Dental service utilization decreased even further in pregnant women with: traumatic stress events, partner related stress events, and financial stress.

Conclusion: Our hope in identifying these stressors which negatively affect oral healthcare service utilization is to provide knowledge to public health advocates and dental healthcare providers. By doing this, the information can provide awareness for healthcare providers to support these at risk populations. Healthcare providers could offer increased education, outreach or service programs to ultimately help those stressed individuals receive necessary dental services during their pregnancy and beyond.

#28: Pricing differences between Traditional and Digital dentures at UNMC College of Dentistry

Ethan Hoopes, Dr. Gregory Bennett, Dr. Nick Murray

As a student at UNMC we are introduced to the world of digital dentistry in our academic courses and shown its advantages and disadvantages. With shifts toward a newer age in dentistry it was interesting to see the comparison of traditional fabrication of dentures vs the digital fabrication and the processes that accompanied each. The aim of this study was to compare the financial cost and time spent for each of the two denture making methods at the UNMC college of dentistry. To obtain the pricing for each method I had to break down each of the methods into its individual steps and evaluate what materials would be needed and how much time would be associated with the following steps. I found that the digital fabrication of dentures was 4 appointments including delivery was \$17.85 while the traditional denture method was 7 appointments and \$341.74. The convenience of traditional dentures seems to outweigh the financial advantages of digital dentures as most cases treated at UNMC are done traditionally even though time and money could be saved were we to do them digitally. Future studies involving investment of more digital dentures being fabricated would benefit the cost evaluation for the school.

#29: Effects of Electronic Nicotine Delivery Systems (ENDS) liquid on the color stability of Dental Resin Composite

Logan Johnson, Ian Fullinfaw, Bobby Simetich, Dr. Mark Beatty

The use of Electronic Nicotine Delivery Systems (ENDS), commonly known as Electronic cigarettes (E-cigs), has increased rapidly over the past few years. Due to this explosion of electronic cigarette usage, limited research has been done looking at the correlation of ENDSs and discoloration of composite restorations. This study's aim was to evaluate the effect of the ENDS solution on the color stability of dental resin composite. A total of 20 resin composite disks were split into 4 groups: control, 0mg, 3mg and 6mg nicotine concentrations. The disks were left in either distilled water (control) or Jus™ vaping solutions of different nicotine concentrations for 2 weeks. The disks were taken out following 1 week and 2 week. The disks were placed in a spectrophotometry and the L*a*b* values were recorded. Data analysis of final outcomes is ongoing.

#30: Printer variability and the impact on resin physical properties, an in vitro study.

Heath Ketteler, Isaac Langan, Dr. Gregory Bennett

Background: Digital dentistry is a new and rapidly evolving field.

3D printers are incredibly versatile and cost effective when compared to milling counterparts. Printable dental materials and restorations have become a growing corner of the market leading to advancements which have begun to challenge traditional restorative processes.

Purpose: 3D printing is only limited by the properties we can achieve with today's resins. The company BEGO has developed VarseoSmile Crown plus, a hybrid resin designed and marketed to produce final indirect restorations. This product is new to the market, and little has been done in the way of independent research. Due to widespread innovation leading to a large number of new 3D printers companies are not able to test their resins on all possible 3D printer and curing systems on the market. The way a resin is cured can have huge implications on the properties of the final product. The goal of this experiment was to compare the compression and flexural strengths as well as the water sorption and solubility of VarseoSmile plus samples that have been printed and cured through two different systems. Group 1 was printed and cured using SprintRay Pro 95 and SprintRay Procure, Group 2 was printed using The Vareo XS printer and the Otoflash by BEGO.

Methods: The experimenters will use SprintRay Pro95 to print samples of appropriate size for each test in two different prints out of the VarseoSmile Crown plus material. Post processing will be completed according to company recommendations with final cure occurring in a Procure. Technicians at BEGO on the same day will print identical samples using Vareo XS printer and perform the company recommended post processing and final cure using the Otoflash. ISO 10477- 2020 will be followed to acquire flexural and compressive strength along with water sorption and solubility. The average values of group 1 and group 2 will be determined and compared for statistically significant differences. Instron servohydraulic 8511+ will be used to determine compression and flexural strength. Sorption and solubility will be tested by first desiccating the samples to acquire a dried weight. The samples will then be soaked for 1 week to measure water sorption. Lastly, the samples will be desiccated a second time to produce a final weight demonstrating solubility. Results will be compared between the samples produced by the two different systems.

Results: Results showed a significant differences in the flexural strength (p=0.0021) and compressive strength (p=0.0097) between SprintRay and Bego samples. Although sorption between the two was not statistically significant (p=0.0692), the calculated solubility difference was statistically significant (0.001).

Conclusion: It can be concluded that the different printing and post processing systems did have some impact on the solubility, flexural and compressive strength of the final products.

#31: The effect of orthodontic treatment with extraction of teeth on the upper airway dimensions and 3-Dimensional morphology: A retrospective radiologic evaluation using Cone beam tomography technique

Yan Mei, Nagadeepthi Kollipara, Ehsan Mostaghni

Background: Orthodontic treatment with extraction of teeth has been speculated to reduce the upper airway dimension and minimum cross-sectional area. Upper airway assessment

to analyze the changes after orthodontic treatment has been done with various two and three-dimensional imaging methods. However, no study has implemented a superimposition technique using reliable landmarks to assess changes in the upper airway morphology following orthodontic treatment.

Purpose: To assess and compare the upper airway dimensions and 3D morphology before and after orthodontic treatment with and without extraction using cone beam tomography technique.

Method: The records of 40 patients who received orthodontic treatment with or without dental extractions were retrospectively studied. Pre-and post-treatment volumes, minimum cross-sectional areas, and linear dimensions of oropharyngeal airways were quantified using InVivo Dental 6.0. Additionally, pre and post CBCT images of the upper airways were superimposed on each other using voxel-based registration and fixed coordinate system using 3D Slicer 4.1.1 and ITK-SNAP.

Results: Welch Two Sample t-test was used to ensure that there was no statistically significant age difference between the patient groups ($p > 0.05$). Pearson's Chi-square test with Yates' continuity was used to confirm no statistically significant difference in sex distribution among the two study groups ($p = 0.65$). Correlation Coefficient (ICC) among the three examiners proved the study to be reliable (ICC value ranging > 0.8).

Conclusion: Results show that there is no evidence to conclude that orthodontic treatment with teeth extractions would result in reduction of the upper airway dimensions. The results suggest that InVivo Dental 6.0 is a reliable tool to measure the oropharyngeal airway volumetric and linear dimensions.

#32: Investigating burnout, grit, and associated factors in dental students

Tommy Waters, BS; Bridget McKeegan, BS; Sarah Lowman, DDS, MPH; Merlyn Vogt, DDS; Holly Roberts, PhD; Jillian Wallen, BDS, MS

Background: The non-cognitive concept of grit has gained traction within the health professions literature as a possible correlate of success among trainees. However, grit is a relatively new concept within the oral health literature. Burnout, on the other hand, has been studied across the health professions and implicated in negative outcomes for patients and clinicians alike. Furthermore, as many as one-third of dental students may experience burnout during their training. However, from our review of the literature, the relationship between grit and burnout has not been explored.

Aims: To our knowledge, this will be the first study in the nation to report results related to burnout for first- and second-year dental students, as students in all four grade levels (D1-D4) are included in the sample. To fill this gap in the literature, our study aims to assess the prevalence of burnout among dental students in a Midwestern state while also exploring the relationship between grit and burnout among these students.

Methods: This study utilizes the Maslach Burnout Inventory and Short Grit Scale to assess and quantify burnout and grit, respectively. Both instruments are validated assessments in their respective fields and have been used with health professional students. Demographic characteristics in the survey

include age, race, marital status, student loan burden, history of stressful life events, and intention to specialize. Data will be collected securely and anonymously through a cross-sectional REDCap survey, and distributed electronically to all students attending public and private dental schools within a single Midwestern state ($n = 680$).

Results: Data analysis is currently ongoing.

Conclusion: We hypothesize that students with lower grit scores are more likely to experience burnout, paralleling findings in the medical literature. We anticipate that results may inform future dental school admissions processes and comprehensive student wellness efforts.

#33: Assessing Impacts of e-Module instruction on SOAP note documentation

Shyamaly Premaraj; Cassandra Nguyen; Elizabeth Beam, PhD, RN; John Reinhardt, DDS; Liz Lyden, MS; Jennifer Kallio, DDS

Objectives: The purpose of this study is to assess use of an E-module to teach SOAP note writing to dental students, especially in the time of COVID where e-learning is a critical platform for teaching. The SOAP (subjective, objective, assessment and plan) note documentation is used by healthcare providers to format clinical notes, document third-party billing, and provide an interdisciplinary, standardized form of communication between clinicians. The specific aims of the study are: 1) to describe the impact of the E-module as a learning tool at baseline for SOAP note documentation, and 2) to determine if the skill performance is sustained after 3 months of time and clinical experience.

Methods: Third-year dental students at the University of Nebraska Medical Center College of Dentistry will view an E-module and a clinical case study video, then write a SOAP note immediately following and complete a self-evaluation survey. This will be repeated 3 months later using a different video. The documentation will be scored using a four-point analytic rubric. The hypothesis is that students will be competent in writing a SOAP note following watching the e-module, and their scores will improve on the rubric during the second evaluation due to increased exposure to dental emergencies and the continued practice of note writing in the clinic. IRB #353-21-EX

Results: A total of 32 students participated in the first part of the study, 14 in the second and 12 in both. Analysis of the data from those who participated in both studies is ongoing.

#34: Dental Student Understanding of Medicaid at UNMC College of Dentistry

McCamey McKinley, Katelyn Smith, Dr. Sarah Lowman

As of January 2021, over 80 million Americans were enrolled in Medicaid for health coverage, up almost 14% in the past year after the declaration of the global pandemic (hhs.gov). Currently, 43% of dentists in the US accept Medicaid (ADA). Dentists have the choice to participate or not participate in the Medicaid program. To see where the decision to participate in Medicaid originates, a look into dental school curriculum may allow us to see what dental students are learning regarding public health

and serving the patients that participate in Medicaid.

The goal of this research is to identify the level of understanding that current first year and fourth year dental students at UNMC College of Dentistry have of the Medicaid program. It is hypothesized that fourth year dental students at UNMC College of Dentistry will have an increased knowledge and negative attitude towards the Medicaid program after working first-hand with patients in the clinic. Fourth year students will have taken courses on public health during school and encountered patients that participate in Medicaid by the time they take the survey, opposed to first year students with potentially less experience and exposure to patients that participate in Medicaid.

#35: Noncarious cervical lesions prevalence and related risk factors: a pilot study

Makena Sundine, Justin Peterson, Dr. Luana Oliveira-Haas, Dr. Gregory Bennett, Dr. John Reinhardt, Dr. Stephen Haas

The loss of cervical tooth structure through processes unrelated to caries is an increasingly common clinical finding, with prevalence rates as high as 85% in some populations. Despite this, there is still no consensus of the mechanism and factors involved in the etiology and progression of noncarious cervical lesions (NCCLs).

The two-fold purpose of our study was to: 1) measure the prevalence of NCCLs in an adult population of patients at the UNMC College of Dentistry student clinics, and 2) explore potential risk factors that may lead to NCCLs. Following approval of the project by the UNMC Institutional Review Board, the subjects were selected by third- and fourth-year dental students based on the inclusion criteria of age 19+ with a minimum of 20 natural teeth and exclusion criteria of no restorations in the gingival 1/3 (including crowns and Class 5 restorations). Each subject received a Trios 3 or Trios 4 scan (recorded by either of two calibrated scanners).

Subjects also completed an electronic survey gathering demographic information with questions related to diet; exercise; health; lifestyle; and dental procedures, practices, and habits. Once data collection was completed, all scans were analyzed by three calibrated evaluators to assess presence (or absence) of NCCLs on the buccal and lingual cervical surfaces as well as occlusal/incisal wear. Statistical analysis focused on associations between risk factors and NCCLs or occlusal/incisal wear. Our null hypothesis was that there are no significant relationships between the demographic variables and presence of NCCLs at the $p < 0.05$ level of statistical significance. In a pool of 46 subjects, 48% had one or more NCCLs and 96% had occlusal or incisal wear. The remaining analysis detected some interesting and surprising results comparing the relationships between clinical and survey findings.

#36: TGFβ Signaling Leads to EMT Through the Depalmitoylation of Desmosomal Proteins

Ben Reckmeyer, Benjamin Crnkovich, Dr. James K Wahl III

TGFβ signaling has a multitude of effects upon a cell, including but not limited to growth, differentiation, migration and apoptosis. Among these effects is the epithelial to mesenchy-

mal transition (EMT), in which a cell loses characteristic of an epithelial cell, such as polarity and cell-cell adhesion, and gains properties of a mesenchymal cell, such as migratory capabilities. One of the chief changes during EMT is the loss of desmosomes, which are cell to cell adhesion complexes. However, the mechanism by which TGFβ induces a cell to undergo EMT and lose desmosomes is still unknown. One proposed mechanism is that of palmitoylation and depalmitoylation of desmosomal components. Palmitoylation involves the addition of palmitic acid fatty chains to cysteine residues, which can help localize a protein to the cell surface, where the palmitic acid inserts itself into the cell membrane. Depalmitoylation is this process in reverse, which can remove proteins from the cell membrane. The aim of this research was to determine whether TGFβ signaling downregulated desmosomal expression during EMT, and to determine if depalmitoylation of desmosomal protein components was the mechanism by which that downregulation occurred. Palmitoylation assays were performed using cell lysates from oral squamous cell carcinoma cells grown in the presence or absence of TGFβ. Data analysis is still ongoing, but results show that TGFβ treatment does in fact decrease desmosome expression in SCC cells, and that depalmitoylation of desmosomal protein components is the mechanism by which this decreased expression occurs.

#37: Teaching Sexual and Gender Minority Health in Dental Education: Curriculum Trends in U.S. Dental Schools

Christine Scanlan, BS, Jordan Brozek, BS, Sarah Lowman, DDS, MPH

Background: Sexual minorities may have different identities, orientations, and/or practices from the majority of surrounding society. SGMs (Sexual and Gender Minorities) have less favorable oral and overall health outcomes compared to the non-SGM population. However, SGM health disparities may be reduced by educating health professions students about the unique needs of this population.

Aims: The aim of this study is to characterize trends in dental education related to SGM oral health in U.S. dental schools, identify gaps and opportunities for improvement, and offer recommendations for curriculum development. A secondary aim is to compare current findings to previous survey results to assess possible change over time.

Methods: Academic deans at all accredited U.S. dental schools ($n = 68$) were invited to participate in a cross-sectional REDCap survey. The survey covered dental curriculum content, number of relevant contact hours, common methods of instruction and evaluation, as well as general knowledge of SGM healthcare.

Results: Data analysis is ongoing.

Conclusions: An anticipated long-term outcome of this study is to help identify gaps in dental education and inform future SGM curriculum development. A continuation of this study has been planned, which will survey fourth-year dental students in order to characterize student attitudes and experience regarding SGM oral health in U.S. dental schools.

#38: Is Student Debt Decreasing the Number of Dental School Applicants?

Ellen Molini-Janak, Zachary Berg, Dr. Merlyn Vogt

Student debt is one of the most controversial topics in economics today. Many have an opinion on this issue without the actual experience of taking on such a debt. There are debates between politicians every day regarding this growing problem; however to most it can be an abstract problem that does not affect their everyday life. Many graduates and postgraduates are naïve to what it will take to pay back this debt in real time. In this study, we are aiming to represent the reality of student debt for dental students and what that means for the future of dentistry. If there are fewer dental graduates in the future, how will the entire industry change? In this country there is a singular path you can take to practice dentistry. You must receive a bachelor's degree, attend 4 years of dental school, and take licensing exams. With no alternate paths available, most incur upwards of \$300,000 in student debt. When will this sum become too cumbersome? When will students who love dentistry start to choose other paths simply because it becomes too difficult to crawl out from underneath the mountain of student debt owed? In this study we will analyze data from several sources including the American Dental Association (ADA), the American Dental Education Association (ADEA) and the Student Debt Relief resources. We will lay out the growth in total number of dental students and dental schools, number of applicants per cycle of enrollment, tuition costs, average return on investment, and average debt to income ratio following graduation. Most data we analyze will be from 2010-2020 as those are the most accurate numbers to help us predict possible future trends. Some earlier data may be presented to compare changes over a longer time period. Based on the data we have accumulated we will speculate where these trends could lead dentistry in the very near future.

#39: Are Dentists Responsible for the Opioid Crisis?

Benjamin Kincaid, Logan Johnson, Dr. Nagamani Narayana

Objectives: 1) Identify demographics of UNMC's opioid receiving patient population 2) Analyze the specific procedures that resulted in prescription of opioids at UNMC COD (UNMC College of Dentistry).

Methods: A retrospective analysis of patients with a history of opioid use and patients prescribed opioids by UNMC COD from (June 2012-July 2021) was conducted following an expedited UNMC IRB 293-21-EX. The reports were reviewed with demographic and narcotic history, which was recorded in Excel. Descriptive statistics (counts, percentages, means and standard deviations) were utilized. To analyze the change in opioid prescribing patterns over the time period considered, we will use generalized estimating equations (GEEs) with a binomial distribution to model the probability of receiving an opioid prescription using the log link function.

Results: Of the total subjects reviewed, 61% of patients with a history of current or previous opioid prescriptions were women with a median age of 59 years. The most commonly prescribed opioids by outside physicians given to patients seen at UNMC COD were tramadol and oxycodone, whereas dentists of

UNMCCOD usually prescribed hydrocodone/acetamoniophen, most commonly for extractions. Data indicates adolescents and young adults receive short-term opioids from dentists at UNMC COD for extractions of third molar teeth.

Conclusions: Opioid prescribing patterns differ depending on the pain being treated, as well as, the healthcare provider prescribing the drug. The findings suggest that adolescents and young adults might first be exposed to opioids through UNMC COD for extractions

#40: Comparison of tensile bond strength of denture reline materials to 3D printed denture bases

Victoria Woodburn and Dr. Gregory Bennett

Background: The ability to 3D print dentures is revolutionizing many aspects of removable prosthodontics. Although a 3D printed denture base may be made of the same constituent acrylic materials as a traditional denture, the different method of fabrication leads to changes in the physical properties. Little is known at this point how this affects the interaction of existing denture materials. One such question is how denture soft liners adhere to a 3D printed denture base compared to one that is traditionally fabricated. Dentistry is evolving to incorporate more 3D resin printed dentures for patients. An important feature to the denture fabrication process is patient comfort which may be accomplished using a soft reline material, two of the most common of which are Coesoft and Lynol. Properties such as tensile bond strength have an important impact on the longevity of a reline and patient satisfaction.

Aim: The aim of this analysis is to determine which combination of printer and soft liner has the highest tensile strength and therefore would result in the longest lasting bond and highest patient satisfaction outcome.

Methods: Two 3D printers were used, the SprintRay Pro and the Form 3B. Each was used to create 40 10mmx10mmx20mm blocks from Denture base 2 resin according to current ISO (insert the ISO number) standards. After printing, samples were air dried, supports removed, washed twice for 5 minutes in an ultrasonic bath and air dried again. Samples cured at 80 degrees C for 2 30 minute cycles. Groups of 10 samples for each group were created from blocks with 10mm of liner material between. Samples were placed in distilled water for 24 hours prior to testing by an Instron 5500 machine. Data collected on Excel and analyzed via a standardized T-test.

Results: The highest mean tensile bond strength value was obtained for the Form 3B Printer and Coesoft combination with the highest mean tensile stress at peak local maximum load .201 MPa.

Conclusion: The best combination of printer and liner with the highest mean tensile strength appears to be from the Form 3B Printer and Coesoft liner. Ongoing data analysis in progress.

#41: Impact of COVID-19 on Applicant Perceived Barriers to Advanced Standing Dental Program (ASDP) Admissions Process

IRB 0786-21-EX

Khushbu Pareshkumar Ijner, BDS, Mariam Ali Malik, BDS, Elizabeth R Lyden, Julie Ann Marshall, DDS, MS

Objectives: To compare perceptions of Advanced Standing Dental Program (ASDP) applicants on potential barriers during COVID-19 pandemic and identify perceptions of interview process modifications.

Methods/Material: An 18 question survey targeted internationally trained dentists who applied to ASDPs during 3 different application cycles between March 2019 - February 2022 (N=101). Using respondent's most recent application status differences between 3 application groups (March 2019-Feb 2020, March 2020-Feb 2021, March 2021-Feb 2022) and eight perceived potential barriers were compared. Interviewed applicant experiences and perceived opportunities to express applicant abilities was determined.

Statistical Methods: Mann-Whitney test compared median response to barrier questions between respondents not accepted (N=68) and accepted (N=35). Fisher's exact test evaluated associations of categorical perceived variables with groups (p<0.05). Higher values on the barrier scale questions indicated more difficulty. Statistical tests were non-parametric and median values reported.

Results: Responses to eight perceived barriers (testing delays, obtaining educational documents, clinical work experience, college communication, travel delays/quarantine/restrictions, travel delays/immigration/visas, financial resources, and hesitancy) did not differ significantly between the three time periods. Non-accepted applicants found barriers of testing delays (p=0.004), obtaining work experience (p=0.001), travel delays/quarantine/restriction (p=0.027) and travel delay due to immigration/visas (p=0.008) more difficult than accepted dentists.

Barriers to obtaining clinical experience was the most frequent selected negative impact on applications. There was no difference in hesitancy to apply between different application cycles however a tendency toward greater hesitancy by non-accepted applicants compared to accepted dentists (73% vs. 54%, p=0.078). 63 respondents invited to interview indicated on-site skills test with on-site personal interviews occurred most frequently (20%). Most interviewed applicants experienced virtual interviews exclusively or combined with on-site components (52%). Respondents experienced 18 different combinations of virtual and on-site interview experiences. Half the interviewees (47%) perceived the interview/skills test option offered did not provide an equal opportunity to express their abilities.

Conclusion: Internationally trained dentists perceived several barriers to the ASDP application process during the COVID-19 global pandemic and experienced broad variations in interview processes.

#42: Dental Service Utilization Patterns of Adult Medicaid Beneficiaries at a Public Dental School: A Retrospective Study

Paige Griffin, Nicole Steinhauser, Maddison McConaughay, DDS, Sarah Lowman, DDS, MPH

Background: Oral health is an important aspect of one's overall

wellbeing. Patient finances and geographic location are known barriers to accessing dental care, especially among low-income individuals. Medicaid, a federal-state insurance program for low-income patients, offers a dental benefit to adults in many states. There is evidence to suggest that patients with private insurance are more likely to receive preventive dental services than their counterparts who utilize dental Medicaid. This study aims to investigate whether this is the case in Nebraska as well. In addition, we will identify demographic characteristics and utilization trends among UNMC College of Dentistry patients (age 21+) who receive dental Medicaid benefits. Finally, we will explore whether there is a relationship between distance traveled to the dental clinic and preventive care utilization.

Methods: We conducted a retrospective chart review of UNMC College of Dentistry electronic health records (Salud). Included patients were adults aged 21 and older who had dental Medicaid benefits and received care at the College between July 1, 2015 and June 30, 2019. In addition to total annual spending, we collected procedure codes, patient sex, race, age, hometown, and zip code. Data were gathered to determine whether there was a relationship between preventive care utilization and distance traveled to the College of Dentistry. The patient population was divided into a subgroup of those that utilized or exceeded the annual monetary cap.

Results: Pending.

Conclusions: Pending.

#43: The Effect of Interproximal Home Oral Hygiene on Clinical Parameters on Periodontal Maintenance Patients

Kevin Smith, DDS

Background: Periodontal disease is a chronic inflammatory disease that results in the destruction of the supporting structures around teeth. The long-term success in controlling inflammation is by regular effective plaque removal through periodontal maintenance therapy (PMT). Even so, periodontal maintenance therapy cannot be sustained without establishing a regular program of clinical evaluation, adequate biofilm control, and continued reinforcement of at home oral hygiene. However, despite constant compliance with PMT many patients continue to struggle to control localized areas of inflammation manifesting as deep pockets, and bone loss. It is commonly supported that the use of interproximal brushes and oral irrigators can aid in controlling inflammation in these localized areas. However, oral hygiene compliance among periodontal maintenance patients can be inadequate to achieving periodontal stability. The use of an oral hygiene specific smart phone application to monitor patient compliance could be an effective adjunct in achieving and maintaining periodontal stability. The aim of this study was to compare the localized use of the interproximal brush, interproximal brush + Brushlink® application, and the Waterpik flosser on the effects on inflammation in periodontal maintenance patients.

Materials and Methods: 76 periodontal maintenance patients with a 4-7 mm interproximal probing depth and a history of regular PMT and bleeding on probing were randomly allocated to interproximal brush + Brushlink®, interproximal brush only, or Waterpik group. Each group received instruction on proper

usage of the device and were directed to use the device 5 seconds on the buccal and 5 seconds on the lingual once daily for 6 weeks. Probing depths, plaque index, gingival index and clinical attachment level were registered on four sites of the tooth at baseline and 6 weeks.

Results: Final data was submitted to the statistician on 2/8/2022.

Conclusion: TBD

#44: The evaluation of microleakage between two different materials used in pit and fissure sealants: an in vitro study

Adam Woroniecki, DDS; McKenzie Brown; Jennifer Carter (Marshall), DDS; Holly Roberts, PhD; Bobby Simetich, BSE

This is an in vitro study aimed at comparing the effectiveness between two different pit and fissure sealant materials (Beautiful Flow Plus [blue] and Clinpro) applied to extracted human third molars that were free from caries or defect. Third molars were obtained from the UNMC College of Dentistry oral surgery department that were obtained during routine exodontia. The selected teeth were free from identifying factors and considered routine medical waste according to the UNMC IRB. The teeth were randomly assigned to the two different groups. Both materials were applied to the occlusal grooves of the teeth according to the manufacturer's instructions. The prepared teeth were thermocycled with the OMC 300 TS (Odeme Dental Research company {Brazil}); (500 cycles; 5°C and 55°C). The teeth were then immersed in a 1% Crystal Violet dye for 4 hours at room temperature. After the dye, the teeth were washed then sectioned in a buccolingual direction using a diamond saw. One randomly chosen sectioned half was examined under 50x stereomicroscopy. The teeth were then scored as having "no" microleakage or "some" microleakage. With any leakage beyond the sealant/tooth margin being scored in the "some" category. Both groups had some teeth that scored as having some extension of microleakage. These findings show that there were slightly more Beautiful sealants with no dye penetration (n=13; 52%) compared to Clinpro sealants (n=9; 36%). however, a chi-square revealed that there was not a significant relationship between sealant type and penetrability, $X^2(1) = 1.30, (p > .05)$. In conclusion, the study shows that both materials have similar levels of microleakage. Further studies would be indicated to help clinicians choose an optimal material for pit and fissure sealants.

#45: Formocresol Pulpotomy vs. Vitrebond Indirect Pulp Therapy: a 5 year retrospective study on dental rehabilitation cases completed under general anesthesia

Jordan Castillo, DDS, Eric Phan, DDS, Bryan Skar, DDS

Purpose: Our 5 year retrospective study is to follow up on the UNMC Pediatric Dental Clinic's full mouth dental rehabilitation cases under general anesthesia requiring either a Formocresol pulpotomy or Vitrebond indirect pulp therapy on primary molars and their success rate. We aim to evaluate if indirect pulp therapy is a good treatment alternative to the Formocresol

pulpotomy.

Methods: 361 patients that received full mouth rehabilitation while under general anesthesia from July 2016-December 2017. Inclusion criteria: ages 2-9, either a Formocresol pulpotomy or Vitrebond indirect pulp therapy on a primary molar. Relevant data was gathered retrospectively from patients' record on Eaglesoft, a dental practice software. All data was recorded and calculated on Microsoft Excel.

Results: Of 361 eligible patients, the failure rate at 5 years for the Formocresol pulpotomy was 9.7% while the Vitrebond indirect pulp therapy was 0.2%. Out of 247 Formocresol pulpotomies, there were 24 failures. The reason for these failures included: internal resorption that perforated to bone, external resorption and acute abscess. Out of 522 Vitrebond indirect pulp therapies, there was one failure due to chronic abscess and parulis development of the tooth. The average age of our patient pool was 4.5 years old with a gender distribution of 54% female and 46% male.

#46: Interleukin-6 Levels are Elevated in Saliva of Patients with Endodontic Disease

Arif Karim, Timothy Jernberg, Thomas Petro

Interleukin-6 is an inflammatory cytokine that is expressed in abundance during any inflammatory response. Several studies have shown that these cytokines can be measured in saliva and are in direct proportion to the levels found in blood. The purpose of this study is to determine if cytokine levels of Interleukin-6 in saliva are elevated in patients undergoing endodontic treatment.

Twenty patients aged 20-65 years presenting to the UNMC Graduate Endodontic clinic for treatment were included in the study. Six healthy volunteers were recruited to be in the control group. Passive saliva was collected in sterile, polystyrene tubes and stored in a -75°C freezer until analysis. Samples were subjected to standard Human Salivary IL-6 ELISA protocol and values were obtained using a photo-spectrometer. The results were statistically analyzed using Student T-test. In the endodontic treatment group, the mean IL-6 measurement was 4.481 pg/mL (SD=1.028). In the control group, the mean IL-6 measurement was 1.965 pg/mL (SD=.8022). The difference was statistically significant ($p < .05$) with a p-value of .0216.

Patients in the treatment group presented significantly higher levels of salivary IL-6 cytokine than the control group. These results suggest that salivary IL-6 levels could be used as a potential biomarker of endodontic disease severity and aid in endodontic diagnosis. The materials for saliva collection and storage, and the Human IL-6 ELISA kit were provided by the Department of Oral Biology of the University of Nebraska Medical Center.

#47: The effect of interproximal home regimens on inflammatory biomarkers in periodontal maintenance patients

Dr. Grace S. Moore and Dr. Richard A. Reinhardt

A survey of dental hygienists in general practice (DHGP) and periodontal practice (DHPP) indicated a significant difference in preference for interproximal cleaning of posterior pockets with

oral irrigators (DHGP) and interproximal brushes (DHPP) during periodontal maintenance therapy (PMT). The purpose of this blinded, randomized controlled clinical trial was to determine the effect of interproximal irrigators, brushes or brushes with a tracking device on reducing inflammation in posterior periodontal pockets in patients on PMT. Seventy-six patients diagnosed with generalized periodontitis Stage III and IV Grade B, with history of a 5-8mm interproximal probing depth and bleeding on probing (BOP) were included in the trial. Patients were randomly allocated to one of three interproximal, home hygiene groups: 1) interproximal brush with Brushlink® device (BL; n=23), 2) Waterpik® water flosser (W; n =27) and 3) interproximal brush alone (IBA; n=26). Patients were instructed to use their assigned oral hygiene modality at the test site once daily, for 6 weeks. Inflammation was assessed by BOP, Gingival Index (GI) and gingival crevicular fluid (GCF) inflammatory profiles at baseline and 6-weeks. Proinflammatory analytes IL-1 β , IL-6, IL-17A, TNF- α and anti-inflammatory analytes IL-4, IL-10 and IFN- γ will be assessed with Human Milliplex Analysis; and albumin with ELISA to standardize for serum contribution. Results are pending at this time.

#48: Incidence and Cumulative Prevalence of SARS-CoV-2 in Asymptomatic Pediatric Patients

Pollmiller M, Lowman S, Roberts H

Purpose: To investigate trends in SARS-CoV-2 (COVID -19) infection in asymptomatic pediatric patients seeking aerosol generating procedures (AGPs) at an academic dental institution in the U.S. Midwest.

Methods: We retrospectively reviewed 1,097 COVID-19 test results (Polymerase chain reaction and rapid antigen tests) conducted between January 1, 2020 and October 31, 2021 at an academic dental institution. Tested patients were asymptomatic, aged 18 or younger, and awaiting aerosol generating dental procedures. Caregivers of positive patients were notified and referred to their primary care physicians for evaluation.

Results: Results pending.

Conclusions: Results may highlight the importance and feasibility of testing asymptomatic pediatric dental patients for COVID-19 prior to performing aerosol generating dental procedures. In addition, we anticipate that results will highlight epidemiologic trends in pediatric COVID-19 infections in a Midwestern state. In addition, we will discuss infection trends in the context of local masking policies and shifts to/from remote learning in K-12 school settings. Findings from this research may inform best practices for safe dental care in future waves of the COVID-19 pandemic, especially as new and emerging variants are identified.

#49: Efficacy of Pit-And-Fissure Sealants on Primary Molars

Smith R, Roberts H, Koukol C, Lowman S

Purpose: Aim #1: To determine the incidence and cumulative prevalence of caries detected on previously sealed primary molars at a hospital-based pediatric dental residency program.

Aim #2: To explore associations between caries and demo-

graphic characteristics of the population that received sealants on primary molars placed at a hospital-based pediatric dental residency program.

Methods: We conducted a retrospective chart review of 627 teeth that received pit-and-fissure sealants in 2017 at a hospital-based pediatric dental residency program. This study excluded any tooth that was not a primary molar (such as permanent teeth, primary canines and anterior teeth). Primary molars had untreated surfaces prior to sealant placement in 2017; included patients were aged 1-6 years old at the time of sealant placement and were seen for at least one recall appointment within 24 months after initial sealant placement. Sealed primary molars with occlusal decay at a subsequent dental appointment were identified through clinical chart review. Tooth number, time elapsed since sealant placement, sealant material used, and patient demographics were collected for sealed primary molars with charted occlusal decay. Data were analyzed using IBM SPSS Statistics for Windows, Version 21.0. This study received approval from the University of Nebraska Medical Center Institutional Review Board.

Results: Pending.

Conclusions: Results of this study will add to a growing but inconclusive body of evidence regarding the efficacy of pit-and-fissure sealants placed on primary molars. Increased understanding of sealant outcomes may inform future clinical practice guidelines.

#50: Emergency Department and Urgent Care Utilization for Non-traumatic Dental Conditions

Cawley M, Koukol C, Roberts H

Purpose: Barriers to accessing preventive dental care can lead to negligence of dental health, causing severe pain, infection, or swelling. This study attempts to describe patient characteristics of those who sought non-traumatic dental care in urgent care or emergency department settings. Trends in utilization and assessment of patient demographics, with an emphasis on how zip code and insurance status affect utilization, will be described in hopes of identifying barriers to dental care within the local community.

Methods: A query of electronic health records from the University of Nebraska Medical Center and the Children's Hospital and Medical Center was performed with search parameters to include all patients ages 18 and under who had an emergency department or urgent care visit in the years 2016 through 2020 with a visit ICD-10 diagnosis code listed as a non-traumatic dental code. Demographic information including patient age, gender, race, ethnicity, zip code, and insurance status were collected for each patient visit.

Results: Results pending.

Conclusions: The results of this study may inform new policies and processes among the local dental community in an attempt to remove barriers to routine dental care for children in this area and encourage establishment of a dental home.

About the

Frank M. Wentz

Student Scientific Program

Frank M. Wentz, DDS, MS, PhD, was a scholar, philosopher, dentist, humanitarian and a Diplomat of the American Board of Oral Medicine. His practice, in Chicago from 1955 to 1969, was limited to periodontics. He taught for many years at the University of Illinois and at the Loyola University College of Dentistry before coming to the University of Nebraska College of Dentistry in 1969.

Dr. Wentz served the college with distinction as assistant dean for graduate studies and continuing education and professor of periodontics. He made a difference in countless lives and will forever be remembered for his exuberant enthusiasm and gracious manner.

We are pleased to honor the memory of Dr. Frank M. Wentz (1917-1984) with great appreciation for his many years of dedicated service to the College of Dentistry and to the dental profession.