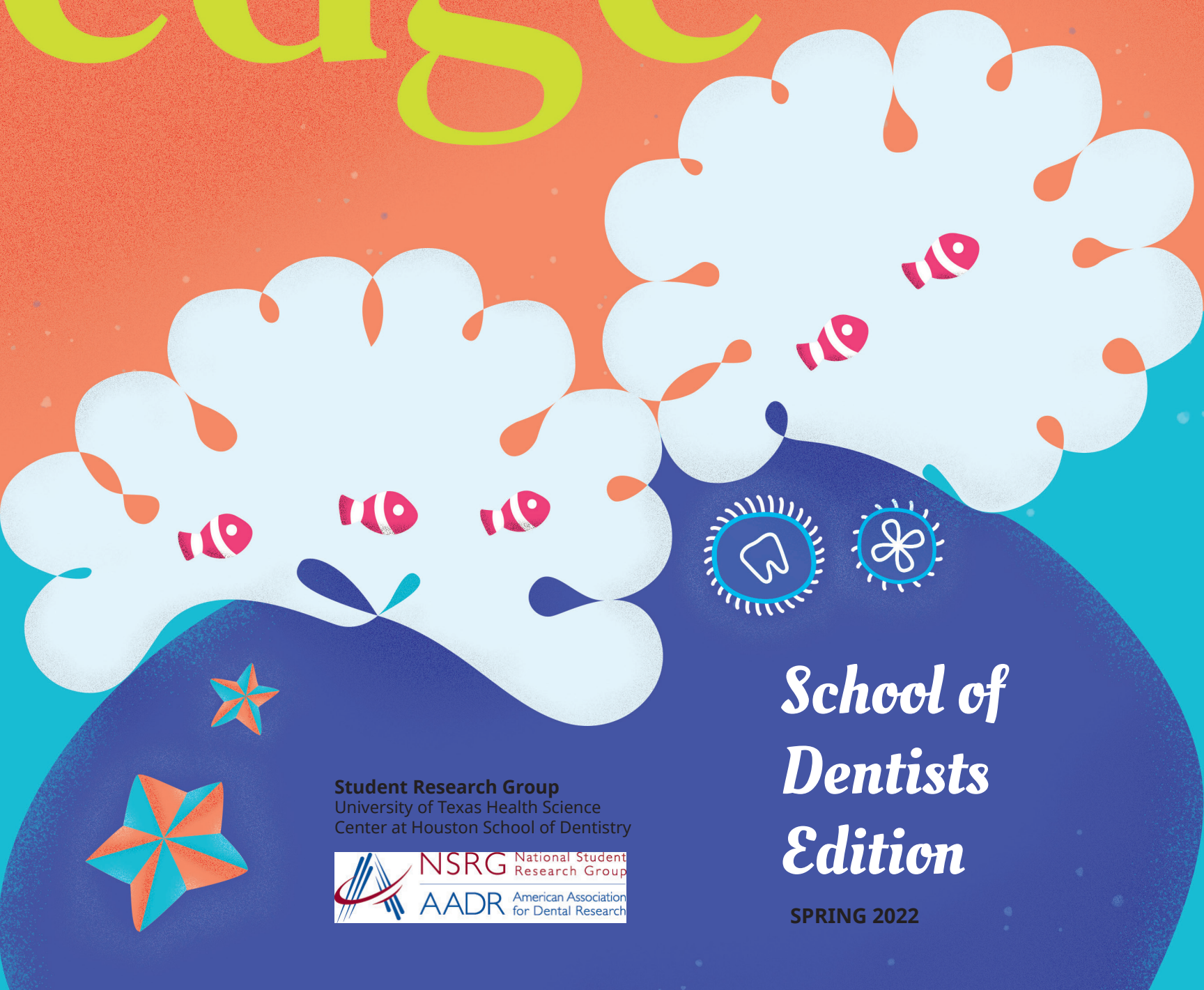


Incisal edge



Student Research Group
University of Texas Health Science
Center at Houston School of Dentistry



*School of
Dentists
Edition*

SPRING 2022

In This Issue

ABOUT INCISAL EDGE

Incisal Edge is a student-run, research-focused newsletter from UTHealth School of Dentistry's Student Research Group. A play on "the cutting edge," the title stands for the intersection of dentistry, research, and storytelling.

Meet



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'24

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For better or worse, I've committed each edition of the newsletter to a design element based around an animal. I couldn't think of any for the "School of Dentists" Edition, except to make a bad pun on "school of fish." But more to the point, this issue is dedicated to the students. We accomplish so much. Students learn information in the classroom, conduct experiments in the lab, and drill teeth in the clinic. But we have done so much before we even got to school, too. Students from all over the world have gathered in this building. Everyone of us has a story of how we got here. For this edition of Incisal Edge, we at the Editorial Board want to tell the stories of students and how they found their love for dental research.

I cannot be more proud of the team that has made this issue possible. Reader, you'll find that we have no small contribution from the class of 2025, who wrote and edited these articles during their busy first year of dental school. It's no coincidence that the future generation of dentists is already making the biggest impact. I am writing this with the knowledge that my own time at the dental school is nearing its end. Big changes are coming to the newsletter after I'm gone, and I can't wait to see what's in store for the future.

"You'll blow us all away" - From a parent to their child, the Hamilton musical (2015)

EDITOR-IN-CHIEF
Ryan Lee '23

A Letter From the Editor

The Editorial Board

Want to get involved? **Incisal Edge** is always looking for interested writers! We also want to hear from you!

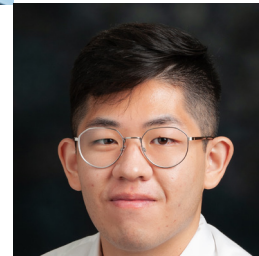
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Identifying caries by **AI**: my research experience as an **ADVANCED STANDING STUDENT**

SONAM PATEL
Writer '23



I HAVE ALWAYS been fascinated by artificial intelligence (AI) and how our lives benefit from this technology, such as in self-driving cars and smart voice assistants. I wanted to join a research project that demonstrates AI's use in dental healthcare. My research project with Dr. Chun-Teh Lee and Dr. Ana Neumann is about developing an effective AI-assisted caries lesion identification tool. I annotated radiographs in order to train the AI program to recognize caries as a clinician would.

The project leverages intraoral radiographic images stored in the UTSD axiUm MiPACs database. We hypothesize that an advanced computer vision algorithm backed by deep learning can provide an accurate diagnosis of caries comparable to trained humans. Experienced dentists, dental students, and clinical findings provide the baseline expectations the algorithm needs to meet. We can then calculate sensitivity, specificity, and other metrics to grade the AI's performance.

Finding a research home

I first participated in research during my dental school internship in my home country of India as a writer for the abstract section of a research project about periodontics. Having developed a taste for research, I then sought an opportunity to work on a clinical project applicable to day-to-day dentistry.

I had this goal in mind by the time I enrolled in UTSD as an advanced standing student. However, I also had several questions. How do I choose a research project? How much work does research require on top of the dental school curriculum? I also faced unique barriers as an advanced standing student. Big changes in my life were taking place at the same time as school. I had just moved to an unfamiliar country. None of my family has a background in dentistry or even healthcare in the United States. I felt like a stranger without connections, and I didn't know who to approach about research. But my experience has also prepared me to face situations outside of my comfort zone. I used to feel intimidated when introducing myself to faculty, but no longer. The more I challenge myself with new situations, the more I boost my own confidence.

"I felt like a stranger without connections.... But my experience has also prepared me to face situations outside of my comfort zone."

How it's been

Dr. Neumann's mentorship has been an excellent learning opportunity for me. During my training, she and Dr. Chun-Teh Lee walked me through the process of annotating intraoral radiographic images and drilled me with several practice cases. They both reviewed equally my annotations with attention and timeliness, and continued to motivate me. I feel so inspired by my mentor's enthusiasm and determination. Thanks to this project, I learned about clinical research and improved in analyzing radiographs.

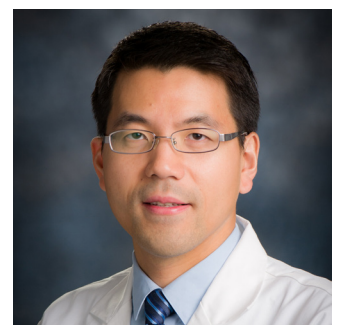
Research helps students clinically and academically. It encourages me to think critically and interact with people outside of regular classes. I have made new friends and developed deeper connections with old ones. I am currently working with Riddhi Solanki '23 and Maryam Baldawi '25, two people whose talent and dedication I admire. I developed a friendship with my co-worker Maryam in the year since we've been working together. Riddhi was already a close friend by the time she joined the lab, and our friendship grew as we partnered together.



Dr. Ana Neumann is Director and Professor of General Practice and Dental Public Health.

Where it's going

Last year, a total of 362 radiographs from 62 patients was selected as the dataset. The annotations created by the machine learning algorithm compared to the standard gave us encouraging results. The data indicated that our deep learning models can help clinicians diagnose caries with accuracy and reliability. This year we are increasing our dataset by annotating more images with a focus on identifying caries. By expanding the scope of the project, we hope to make our findings ever more relevant to dentists. ■



Dr. Chun-Teh Lee is Associate Professor of Periodontics and Dental Hygiene, and Director of Periodontics Research.

Medical and oral manifestations of multiple myeloma



JOY HOANG
Guest Writer '24

YOU ARE SEEING a new patient, 68-year-old Mr. M. Mr. M is pleasant but sheepish as he tells you that he hasn't seen a dentist in several years. However, he's been having some bad jaw and tooth pain over the past couple of months, and it's developed into a painful tingling that convinced him to make an appointment with you.

You go to examine his mouth and notice slight swelling of his mandible. His gingiva is also slightly swollen and bleed easily. Most significant of all is his tongue: it's enlarged to the point that there are lateral tooth imprints on his tongue. When you ask, he reports he's been biting his tongue more often than usual. Mr. M isn't running a fever, and you don't see any signs of necrosis or infection. When you look at his radiographs, you see several radiolucent areas in the maxilla, along with areas of sclerosis of the lamina dura and diffuse osteoporosis. What's going on?

The dental picture

This picture is highly indicative of multiple myeloma (MM), a hematologic malignancy of plasma cells. One systematic review found that for 81 patients, the most common clinical features in the dental cavity were facial swelling (65.4%), bone pain (33.3%), paresthesia (27.1%), amyloidosis lesions (11.1%), and bleeding gingiva (10%). Additionally, osteolytic lesions on radiographs were seen in 90.1% of patients. Other oral signs and symptoms of Multiple Myeloma included bleeding, dysphagia, and generalized pain.

The pathology of multiple myeloma can help us better understand Mr. M's dental signs and symptoms. The uncontrolled proliferation of plasma cells leads to increased production of proteins including immunoglobulins and amyloid light chains. These excess light chain proteins are deposited in various tissues and organs in a process

called amyloidosis. When amyloidosis occurs in the tongue, this causes macroglossia. Patients may present with lateral tongue indurations or complain of difficulty breathing.

The interaction between tumor and normal cells also causes overexpression of RANK-L and IL-6, signaling molecules which result in increased osteoclastic activity. Simultaneously, the reverse signaling RUNX2 is downregulated, resulting in osteoblastic inhibition. These changes result in an overall net resorption of bone. This breakdown of bone results in the generalized maxillary osteoporosis, as well as the pathognomonic "punched-out lesions" seen on X-rays. The osteoclasts also cause inflammation at the lesion site, resulting in Mr. M's facial and gingival swelling.

The broader clinical picture

Multiple myeloma is one of the most common hematological malignancies worldwide, with an incidence of seven out of 100,000 people. It occurs primarily in patients between 50 and 80 years old and is up to three times more common in African Americans than whites. A mnemonic for the clinical symptoms of MM is "CRAB":

- hyperCalcemia
- Renal Impairment
- Anemia
- Bone lesions

Once again, the pathology of MM can be helpful to understand each part of this mnemonic. The breakdown of bone tissue frees up calcium and weakens bone, leading to bone pain and increased risk of fracture. The accumulation of light chains damages renal tubules, akin to a "plumbing blockage" that leads to renal impairment. This renal

OVERALL HEALTH

Welcome to our guest column, where we feature an article written by a student from medical school. Following UTSD's vision, the guest writer takes on a topic that connects oral and overall health. The goal of this column is to make the connection ever more salient here in the Texas Medical Center.

About the writer

Hello, I'm Joy Hoang, a third year medical student at Baylor College of Medicine. I am from Houston and went to college at Baylor University in Waco, Texas before returning home for medical school. My experience in research so far has primarily been in enzyme structure and DNA replication.

impairment also leads to decreased production of erythropoietin (EPO), while hyperproliferation of plasma cells causes destruction of erythroid progenitor cells. These two factors contribute to anemia. Additionally, the increased production of light chains can result in hyperviscosity syndrome, where thickened blood increases the risk of complications such as stroke.

Diagnosis and treatment

Taking all of this into account, the dentist's next step for a patient like Mr. M is to refer to a physician for formal diagnosis. The best initial test is a Serum Protein Electrophoresis (SPEP) or free light chain assay, which will show monoclonal spikes of protein or light chain. 24-Hour Urine protein electrophoresis can also be used and will show an increased amount of Bence-Jones protein. A bone marrow biopsy showing plasma cell dyscrasia is the confirmatory test. Lab tests such as CBC and metabolic panel should be performed to assess for complications like anemia and renal dysfunction. Additional imaging to assess the extent bone lesions should also be done.

The median overall survival for patients like Mr. M is 24-30 months with treatment. Treatment options for Multiple Myeloma have increased in the past several years. Curative treatment is autologous stem cell transplant (ASCT). Patients ineligible for ASCT have several pharmacological treatment options. Chemotherapy regimens may include drugs such as doxorubicin, cyclophosphamide, etoposide, and melphalan. Other options include immunomodulators like thalidomide, or proteasome inhibitors like bortezomib and carfilzomib.

There are also symptomatic treatments for MM. For anemia, treatment includes G-CSF and EPO injections which help stimulate the bone marrow to produce more white and red blood cells, as well as blood transfusions. For bone pain and osteolysis, treatment is typically with IV bisphosphonates.

DDX FOR FACIAL SWELLING

- Trauma
- Salivary gland blockage / tumor
- Abscess

CASE DEFINITION OF MRONJ

1. Current or previous treatment with antiresorptive therapy alone or in combination with immune modulators or antiangiogenic medications.
2. Exposed bone or bone that can be probed through an intraoral or extraoral fistula(e) in the maxillofacial region that has persisted for more than eight weeks.
3. No history of radiation therapy to the jaws or metastatic disease to the jaws.

The dentist's role

Early diagnosis is crucial to management and successful treatment of MM. Dentists can help facilitate early diagnosis by keeping the dental signs and symptoms in mind. Similarly, keep an eye out for hypodense, 'punched-out' lesions and thickened lamina dura on X-ray imaging.

Additionally, you may encounter MM patients who are on bisphosphonate for symptomatic treatment. Bisphosphonates increase the risk of Medication-Related Osteonecrosis of the Jaw (MRONJ), so it is especially important for medical and dental teams to coordinate care. The incidence of MRONJ in cancer patients exposed to zoledronate ranges up to 18%, and up to 6.9% for those exposed to denosumab.

Dentists are uniquely equipped to help these patients, foremost through patient education about dental hygiene and dental risks associated with bisphosphonate use. Dentoalveolar surgery poses a significant risk of MRONJ to the patients, so it is important to optimize patient dental health before starting therapy. Medical and dental teams should work together to improve patients' quality of life and optimize treatment. ■

"Dentists are uniquely equipped to help these patients, foremost through patient education"

Diversity in PUBLIC HEALTH Research

AEMIN KIM
Writer '25



DENTAL STUDENTS can learn so much from public health research. To become better healthcare providers, students should understand the barriers that exist in accessing oral healthcare. Dr. Ana Neumann is Professor and Director of Dental Public Health, and her research interests include access to health, smoking cessation, and others. In her research with collaborators, they provide dentists with public health information so that providers can make the most informed decision.

Diverse populations: significance and potential to overcome challenges

Dr. Neumann and Dr. Dalnim Cho from M.D. Anderson Cancer Center in the Department of Health Disparities Research are investigating the factors that influence African American men's oral health. This project is funded by the UTHealth-M.D. Anderson Population Health Initiative. Black men have disproportionately poor oral health, lower oral cancer survival rates, and lower rates of dental visits compared to white men. Many also do not have dental insurance. Dr. Neumann, Dr. Cho, and their team studying the oral

health of African American men in the Houston community to have a better understanding on how to provide better, high-quality access to care. The primary aim of this interprofessional study is to identify factors across individual, social, and systemic levels of influence that are associated with regular dental check-ups among Black men. The secondary aims are to identify Black men's opinions on other evidence-based health practices and describe the prevalence of oral health behaviors like brushing and flossing in relation to their quality of life.

There is a significant need for public health studies such as Dr. Neumann's study. Studying diverse patient populations is critical because of how poor oral and systemic health disproportionately affect minorities and lower income communities. The purpose is "to identify what is the vulnerable population and how we tailor intervention because there is no one-size-fits-all solution," said Dr. Neumann. Understanding the factors that affect oral health in a vulnerable population allow healthcare providers to tailor evidence-based methods to specific patient groups. Additionally, public health studies allow researchers and healthcare providers to identify the social factors that hinder underserved populations from accessing available resources. While inequality in access to healthcare is a complex issue, one way to make progress can be to increase awareness of available resources.

Furthermore, well-designed public health studies provide high-quality information to dentists for treating patients. Misinformation about health circulates widely on the Internet and erodes trust in health providers for certain communities. Dr. Neumann said that evidence-based dentistry is a powerful tool for dental professionals to combat misinformation and design intervention strategies according to patient risk level.

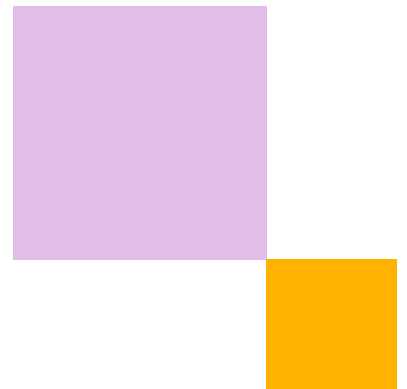
"Evidence-based dentistry is a powerful tool for dental professionals to combat misinformation"

Diversity and inclusion from within

Public health research benefits not only from studying a diverse population but also from having a diverse and interprofessional collaborative team. Researchers from different backgrounds collectively overcome personal blindspots that each individual may otherwise have, which ultimately benefits the community of interest. "We need to learn from each other, complement each other, and synergistically work towards a common goal: to improve oral health and overall health," said Dr. Neumann. Dr. Neumann has been working on interprofessional collaboration in a study funded by the M.D. Anderson HPV Initiative Program. It joins the forces of UTSD, Cizik School of Nursing, and the Texas State Health Department. The two-year project optimizes the electronic health records to identify patients at UTSD who are eligible for the HPV vaccine but have not received it, and also delivers vaccines to children aged 9-14 years old. UTSD patients may have more frequent interactions with their dentist than with their general practitioner, so this interprofessional collaboration offers the opportunity to elevate the health of the community. Dr. Neumann also said it is wonderful to watch nurses learn about oral health and dentists learn more about overall health. "The diversity in professions and backgrounds is crucial, said Dr. Neumann, "to learn from each other and also build collaborations." ■



Dr. Ana Neumann is Director and Professor of General Practice and Dental Public Health.



Non-surgical treatment of **MALOCCLUSIONS** with **MEAW** technique

JINMIN KIM
Writer '25

DR. YOON CHANG is an orthodontist at E Line Orthodontics in Frisco, Texas. After graduating from Cayetano Heredia Peruvian University with his DDS, he pursued TMJ dysfunction training at University of Rochester, and obtained a certificate in orthodontics with a MS at Marquette University. According to his website, he is the only orthodontist implementing the Multiloop Edgewise Archwire, or MEAW, technique in his practice. His motivation to incorporate the MEAW orthodontic technique into his practice was for a patient who was recommended to have orthodontic treatment in combination with two orthognathic surgeries for this class III malocclusion. However, the patient inquired about possible alternatives to avoid jaw surgery due to its associated risks. Dr. Chang then looked into the MEAW technique as a method to bypass surgery. Subsequently, he has used this technique in his practice to treat other patients.

Background

The Multiloop Edgewise Archwire technique was introduced in 1967 by Dr. Young H. Kim to treat anterior open bite malocclusions. Treatment of these patients often include orthognathic surgery, but Dr. Kim's innovative non-surgical technique was developed and found to produce successful results as described in his 2001 paper in World Journal of Orthodontics.

Concurrently, Dr. Sadao Sato applied principles of the MEAW appliance to effectively treat severe malocclusions. Presently, the technique has advanced further for application to any malocclusion, particularly Class III malocclusion, as detailed in a systematic review by Tabancis et al. published in 2020 by Head & Face Medicine.

The underlying concept of treatment is that changes in the inclination of the occlusal plane can accommodate malocclusions by using the adaptability of the temporomandibular joint. MEAW arches are made with 15-inch 0.016" x 0.022" steel wire in an ideal arch shape with five L-shaped loops in each quadrant. The loops allow for three-dimensional control of individual teeth and low load deflection rate for gentle but continual forces. The entire occlusal plane can be shifted by altering the angulation of posterior teeth by tip-back activations of three to five degrees of each tooth. Vertical dimensions can also be controlled by wire bending the loops up or down and elastics are provided to complement the arch wire activation.





Source: elineortho.com

Dr. Yoon Chang is an
orthodontist at E Line
Orthodontics in Frisco,
Texas.



Advantages

Dr. Chang explained that the biggest advantage of using MEAW technique over traditional orthodontics is the high control over the vertical dimension and the possibility to take full advantage of the craniomandibular complex adaptation and compensation capacity. For example, it is quite common that a patient with a high angle class II and open bite is treated with either jaw surgery and/or temporary anchorage devices in combination with molar or bicuspid extractions. Whether jaw surgery or TADs are used, a reduction of the vertical dimension is desired to rotate the mandible counterclockwise and close the open bite. One of the key orthodontic movements attained using the MEAW technique is the tip back inclination of the entire dentition with or without an intrusive component of the posterior teeth.

The second advantage is that the tip back mechanics creates interdental spaces. As the posterior teeth position upright, spaces will appear between them, and crowded cases may be treated without the need for bicuspid extractions and/or interproximal tooth reduction helping to achieve an ideal antero-posterior and transverse width, tongue space, and exuberant smile. Finally, the MEAW orthodontic technique is based on the dynamic nature of the human craniomandibular complex and practicing this concept makes you interpret malocclusion from an integrative and holistic perspective where dental occlusion acclimates to the environmental demands and body patterns.

"The biggest challenge behind the MEAW orthodontic technique is not the complex wire bending, as intimidating as it seems"

Disadvantages

When utilizing the MEAW method, orthodontists need to have a proper knowledge as well as proficiency with wire manipulation. However, Dr. Chang said that the biggest challenge behind the MEAW orthodontic technique is not the complex wire bending, as intimidating as it seems. Rather, the difficulty comes from the unfamiliarity of the method because it can feel different from traditional archwires. As with any other orthodontics, oral hygiene may also become more time consuming and difficult. Therefore, patient compliance would be critical for effective treatment.

Outlook

Treatment with the MEAW technique appears to be effective and versatile for many types of malocclusions. Dr. Chang also said that while surgery may be the only viable treatment option for some, a non-surgical treatment approach would fulfill orthodontic and health expectations for many. "With the increasingly advancing knowledge and techniques, future dentists regardless of their scope of practice will have the choice to practice dentistry within a highly integrated environment and help patients solve not only their dental complaints but their overall health far beyond what is being practiced today."

As Dr. Chang has demonstrated, dentists are lifelong learners and are obliged to keep skills current in delivering care to patients. Research is the critical component that allows for growth and enrichment of these skills. Thus, with the MEAW technique being a fairly new technique compared to traditional orthodontics, it does not have many published articles and reviews. However, it does seem to have potential for promising results as well as a need for deeper understanding in order to progress in the field of dentistry. ■

Using **DIGITAL DENTISTRY** to create *best-fitting restorations*

CODY ATTACK
Writer '25



MY CURRENT RESEARCH project with Dr. Aaron Glick is focused on comparing 3D printed crowns with milled crowns. I hope this research will contribute to creating the best-fitting restorations for our patients. Marginal integrity is important for the success of a restoration in preventing secondary caries, preventing fracture or failure by falling off, and restoring nearly ideal form and function to the patient's dentition. Digital technology holds incredible promise for the future of restorative dentistry.

The protocol

After preparing a tooth mounted to a typodont, we digitally scanned this tooth and used a software to design a crown. This software created a standard tessellation file (STL) file that can be used to either mill or 3D print a crown to fit on the tooth. Tessellation is the process of covering a surface with geometric shapes called tiles that do not overlap or have gaps. In our case, the object being digitally tessellated is the crown of a tooth. This STL file is the geometric file that will tell both our 3D printer and our mill how to make the new crown that will fit onto our prepared tooth. Our measurements will be on the mesial, buccal, distal, and lingual margins to measure how well each crown fits the tooth. We will measure

each of these using a microscope. Millimeter measurements will be included and then a statistical analysis will be run to see if there is any significant difference between milled or printed crowns. We will also be measuring interproximal contacts. We will do this by inserting shim stock that has been attached to a scale. The newton amount will be measured between the teeth, therefore recording the amount of pressure present between teeth. We will analyze the data again to see if there are significant results. So far in this project, we have scanned, designed, and 3D printed the crowns. Our next step is to mill the crowns for comparison and begin measurements.

Future steps

We are also curious if the accuracy of our restorations will be consistent throughout our samples. In other words, we are assessing whether the first and last milled crowns are identical or if there are other variables that need to be considered, such as burr wear. Further research could assess other parameters that could be controlled while doing milling or printing. For example, when 3D printing, one can choose in which orientation in space the crown will be printed. To illustrate this idea further, you can print the crown with supports coming off of any tooth surface. These decisions could have significant effects on the accuracy of the crown. One could also adjust the thickness of the layers that are printed and cured which could also have effects on printing accuracy. Further research could also aim to study the testing accuracy or weathering of different materials such as wear and staining resistance. With this in mind, we aspire to reach a conclusion in regard to whether 3D printing or milling crowns are significantly different in their performance.

How I ended up doing research

When I started my dental school journey, I did not plan on doing research. However, the opportunity presented itself and I'm glad it did. When we were waxing teeth during our dental anatomy lab at the beginning of our second semester of our first year, I was missing one of the teeth to wax on. I went to the bookstore and they also did not have any extras I could buy. Ashamed and afraid, I went to the faculty at the front of the room to tell them I was unprepared. Dr. Frey kindly took me under his wing and up to his office to find a tooth I could wax on for this assignment. While in his office, I examined very interesting looking models and wax bridges. I asked him what these were and he explained to me that it was a clinical trial he was involved in. This clinical trial explored the interface of transferring old techniques like waxing to newer digital techniques. I was fascinated and emailed him the following day asking if I could be kept in the loop on how the case went because I found the topic so interesting. One thing lead to another and soon enough I was doing a research project that had me working with multiple experienced clinicians who took time teaching me how to scan, design, mill, and print crowns. I am so grateful for the doctors and programs that got me into this awesome learning opportunity. ■

"When I started my dental school journey, I did not plan on doing research. However, the opportunity presented itself and I'm glad it did"

Aaron Glick is Adjunct Assistant Professor in the department of General Practice and Dental Public Health and part of the PACE, Professional Resource Team.



Analyzing 3D structures for SALIVARY TISSUE ENGINEERING

LAURA ARSTO
Secretary '23



THE 11TH ANNUAL Student Research Showcase took place virtually on December 3, 2021. Six student researchers, winners of the “Best Abstract Award” in each of their departments, gave their oral presentations. The only first year dental student of the group, Cara Zou '25 gave her presentation titled “Digital Image Analysis of 3D Structures for Salivary Tissue Engineering,” her project under the mentorship of Dr. Daniel Harrington. Here, she shares her experience and thoughts on student research.

As the “School of Dentists” Issue of *Incisal Edge*, we want to learn more about the people behind research. How did you end up in dental school in Houston?

I was born in China and then 3 months later I moved to Canada. I lived in Canada for 8 years then I moved to Houston, Texas. When I was in 9th grade I moved to Malaysia for 1.5 years. After that I moved to Singapore and lived there for 2 years. In college I moved back to Texas and went to University of Texas in Austin.

“I understood some topics better because I did research, and I was able to meet multiple students in my class”

What is your research project about?

My research was on digital analysis of 3D structures for salivary tissue engineering. For people who receive head and neck radiation due to cancer can have loss of salivary gland function. To help restore salivary gland function we are trying to tissue engineer salivary gland cells in hydrogels. The issue with this is that *in vivo* the salivary gland cells have a branched structure which we do not see in the hydrogels. We can use a subtractive method to carve branched salivary gland structure. My research mostly focused on digitally analyzing the quality of carvings in the hydrogels for branched pattern/structures.

What was it like working with your mentor?

My mentor was I worked with Dr. Daniel Harrington from the Diagnostic and Biomedical Sciences department. I had a great experience working with him. He was very encouraging and had great feedback. He was constantly motivating me and always willing to answer any questions I had.

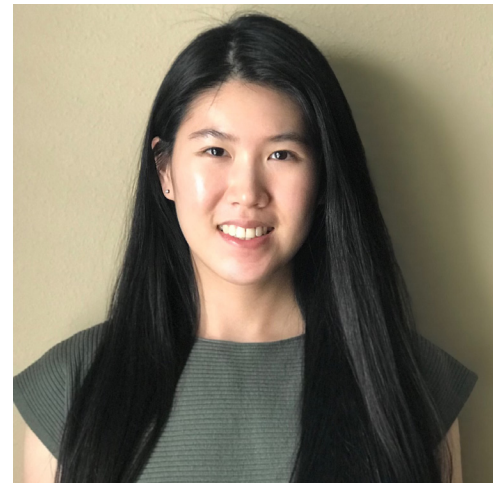
What made you want to do research as a first year?

I did research in undergraduate school and I really enjoyed and wanted to continue that. I wanted to focus on doing research in something related to dentistry, and so I joined the Summer Research Program. I really enjoyed it and I got to meet a lot of people. It gave me a sneak peek into what we would be learning in dental school. I understood some topics better because I did research, and I was able to meet multiple students in my class. My favorite part about doing research was learning new skills. I was able to learn a new software, how to make a poster and how to present my project.

I also learned more about dentistry through research. Dental technology is constantly improving, so we need to keep learning to provide the best possible care for our patients.

What is advice you would give to a students interested in research?

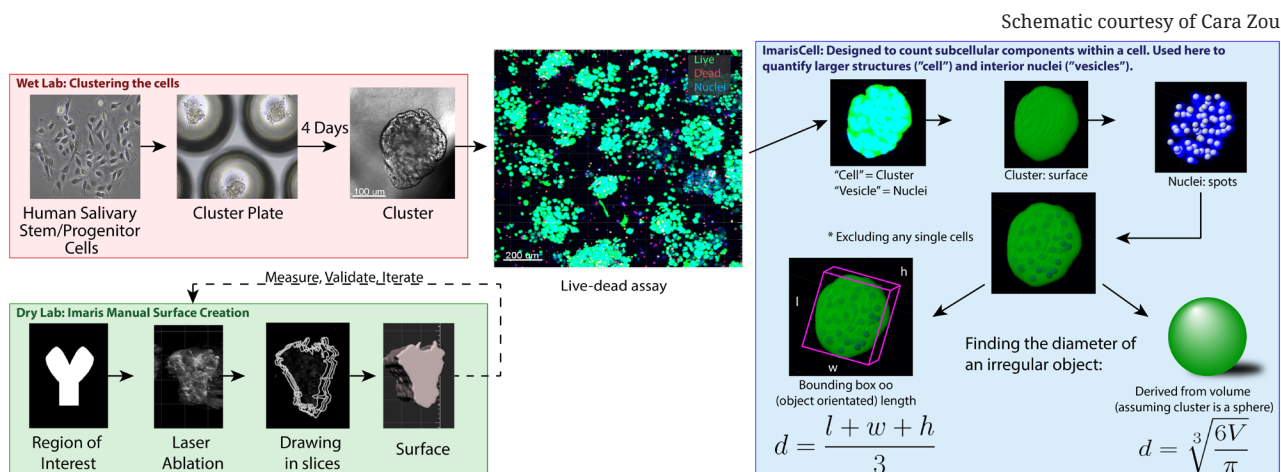
I would definitely encourage them to do research. I would encourage them to reach out to professors that are doing research that interests them. ■



Cara Zou '25 won "Best Abstract Award" in her department for the 11th Annual Student Research.



Dr. Daniel Harrington, PhD is Assistant Professor in the department of Diagnostic and Biomedical Sciences.



ACKNOWLEDGMENTS

I would like to thank the following people.
Their help made this publication a reality:

Thank you to all the writers for your hard work. Thank you to the researchers who gave us time for an interview.

Thank you to the entire SRG leadership, Dr. Dharini van der Hoeven, and Sandra Jung.

Thank you Dr. Kyle Gopffarth for your expert opinion.

Finally, thank you Dr. Kimberly Ruona for making me a better editor.