2025 Medical & Dental Student Research Day

February 27th, 2025
8:00AM – 1:00PM

Academic Rotunda & Academic Lobby

Click on a heading below to navigate directly to the relevant section in the booklet.

Schedule of Events

February 27, 2025
8:00AM – 1:00PM
Academic Rotunda & Academic Lobby

Welcome:

8:00 AM | Bruce Liang, MD & Steven Lepowsky, DDS
Dean, SOM & Dean, SDM

Medical & Dental Research Day Posters:

8:15 – 9:45AM | ODD Numbered Presentations
(15-min Transition)
10:00 – 11:30AM | EVEN Numbered Presentations

Keynote Introduction:

11:45AM| Rajesh Lalla, DDS, PhD
Associate Dean for Research, SDM

Keynote Address:

12:00PM| Wenyuan Shi, PhD
Chief Executive Officer, The ADA Forsyth Institute
"The Emerging Technologies That Will Shape the Future of Health Care"

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Keynote Address

Wenyuan Shi, PhD

Chief Executive Officer
The ADA Forsyth Institute

"The Emerging Technologies That Will Shape the Future of Health Care"

Dr. Wenyuan Shi is currently the Chief Executive Officer of The ADA Forsyth Institute, a world class dental research institute. Prior to this position, Dr. Shi was the chairman and professor of Oral Biology at UCLA School of Dentistry as well as the Professor of Microbiology, Immunology and Molecular Genetics at UCLA School of Medicine for 23 years, then joined The Forsyth Institute as the president and CEO in 2017.

Scientifically, Dr. Shi has been leading 20+ NIH grants to use multidisciplinary approaches to study oral microbial pathogenesis with a specific focus on oral microbiome, bacterial inter-species interaction and signal transduction.

Technologically, Dr. Shi is actively involved in the development of next generation of diagnostic and therapeutic tools against oral microbial infections, including saliva diagnosis of oral pathogens and peptide based targeted antimicrobial therapeutics. These translational research efforts have resulted in novel technologies that were licensed and developed by major pharmaceutical, dental and biotech companies. He is co-author and co-inventor of over 280 scientific articles and 40+ patents and patent applications.

Dr. Shi has been leading a three-pillared strategic plan at the Forsyth Institute for its cutting-edge dental research, technology development and global expansion since 2017. In Oct. 2023, Dr. Shi led the Forsyth Institute to be integrated with American Dental Association to create the ADA Forsyth Institute.

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2025 Medical & Dental Student Research Day Participants

Click on any name to be directed to its corresponding abstract.

Abalyan, Victoria
Acselrod, Sarah
Airoldi, Marissa
Ajayi, Olasubomi
Anderson, Megan
Angus, Christopher
Ansari, Emile
Arroyo Rodriguez, Veronica
Ashkenazi, Avishag
Attre, Anusha
Baker, Stephen
Balakumar, Poorna
Bassani, Alessandra
Berberian, Caroline
Bernstein, Ross
Biron, Sarah
Brocke, Daniel
Brown, Peter
Budzinski, Christina
Carrasquillo, Lorens Clariana
Chang, Claire
Cheriska, Chelsea
Chi, Ling
Chinwo, Stephanie
Chivukula, Ajitha
Christian, Bryson
Clifford, Charlotte
Costa, Marcus
Dievenich Braes, Flora
Dubovik, Vlada
Farias, Kaitlin
Ferdus, Shaharia
Figuenick, Alexandra
Fox, Brian
Fregene, John
Galske, James
Gao, Jiachen
Garcia, Christopher
Handali, Nicholas
Hill-Ricciuti, Alexandra
Irshad, Niha
Isaac, Paul
Jackson, Katrina
Jakubowski, Maia
Jenkins, Julia
Jones, Cameron
Kehoe, Delaney
Kilian, Emily
Kim, Yee Won
Knapp, Ethan
Koscielski, Claire Ann
Kosover, Michael
Kotait, Daniel
Koziol, Arlie
Lamm, Ellen
LaMothe, Adam
Lattanzi, Jakob
Lawrence, Caitlin
Leavitt, Autumn
Li, Chloe
Link, Francesca
Lum, Avery
Mallari, Samantha Mae
Mallon, Erica
Marczuk, Stefan
Martin, Meghan
Mattioli, Nicholas
Mehta, Uma
Meka, Nicolette
Mishalani, Leila
Mittelman, Daniel
Montefalco, Haven
Nagpal, Jai
Nasim, Sahal Bin
Navrange, Nishika
Nembo, Yann-Raphael
Nemesure, Allison
Peng, Tara
Peterson, Alyssa
Radke, Taylor
Rendon, Alfredo
Rive, Ana
Robel, Andrew
Rodrigues, Gabriel
Romano, Leo
Rosenberg, Bradley
Ryan, Patrick
Sakheim, Madison
Salama, Abdullah
Salcines, Stephanie
Sankar, Sadhana
Shaffer, Henry
Sharma, Mehak
Shea, Luke
Shlafstein, Maximillian
Singh, Manjot
Staunton, MaryKate
Sztachelski, Patrycja
Thompson, Christopher
Torres, Lucas
Vazquez, Michael
Viswanathan, Sailakshmi
White, Kelly
Williams, Asha-Layla
Williams, Maeve
Witt, Madison
You, Donny
Yu, Alice

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With sincere appreciation to the supportive mentors, collaborators, and contributors to their success on this journey.

Agresta, Thomas
Amatruda, James
Arnold, Andrew
Asad, Syed Daniyal
Azami, Niloufar
Benjamin, Ristau
Bezold, Mariah
Briggs-Gowan, Margaret
Bysani, Pooja
Campbell, Brendan
Chen, I-Ping
Chirravur, Prazwala
Choudhary, Dharamainder
Costa, Jessica
Coyner, Katherine
Dealy, Caroline
DeGroff, Shannon
Delaney, Cara
Deymier, Alix
Dieckhaus, Kevin
Diniz, Breno
Dutra, Eliane
Ek, Kirsten
Feng, Hao
Ferneini, Elie
Figgie, Caroline
Freilich, Martin
Gaffar, Majida
Gettel, Cameron
Ghosh, Mallika
Guertin, Kristin
Harnisch, Brooke
Herbst, Meghan
Hersh, David
Hinson, John
Hinson, Travis
Hunter, Amy
Kamath, Jayesh
Kaplan, Daniel
Kim, Adam
Kim, Agnes
Kumbar, Sangamesh
Lu, Jun
Lucas, Ruth
Manning, Kevin
Manz, David
Mohan, Royce
Mortensen, Eric
Nakanishi, Masako
Nichols, Frank
Parham, Kourosh
Podraza, Katherine
Qasba, Neena
Rash, Carla
Ravi, Yazhini
Roberts, Daniel
Salmon, Adrian
Santos, Melissa
Schafer, Allison
Schulman, Gary
Shafer, David
Shields, Andrea
Smilowitz, Henry
Sobel, Andrew
Staveley-O'Carroll, Kevin
Tadinada, Aditya
Taylor, Richard Andrew
Trakhtenberg, Feliks
Tran, Ryan
Upadhyay, Madhur
Uribe, Flavio
Verma, Rajkumar
Weston, Gillian
Wu, Helen
Zhou, Dong

Thank you!

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Christina Budzinski, David Manz

3 | CDC73 Mutations Associated with Hyperparathyroidism-Jaw Tumor Syndrome and Dental Manifestations
Lorens Clariana Carrasquillo, Jessica Costa

4 | Age-Dependent Degeneration in TMJ Cartilage of Female Mice: A Histological Study
Bryson Christian, Eliane Dutra

5 | Investigating the Role of Prebiotics in Modulating Biofilm Formation in Oral Bacteria Associated with Orthodontic White Spot Lesions
Marcus Costa, Flavio Uribe

6 | Evaluating the Efficacy of PEKK Antimicrobial Coatings to Mitigate Bacterial Growth in a Dental Implant System
Alexandra Figuenick, Martin Freilich

7 | Anatomical Foundations for Safe and Effective Tear Trough Augmentation with Dermal Fillers
John Fregene, Elie Ferneini, Aditya Tadinada

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Claire Ann Koscielski, Frank Nichols

11 | Mincle-mediated Inflammatory Responses in Apical Periodontitis in a Mouse Model for Cherubism
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12 | Part 2: Exploring And Unveiling Clinical Students' Awareness Of Osteoradionecrosis
Ellen Lamm, Prazwala Chirravur

13 | Evaluation of a low dose 180° CBCT acquisition protocol and conventional 360° CBCT protocol for evaluating simulated maxillary sinus pathology
Erica Mallon, Pooja Bysani, Aditya Tadinada

14 | Comparison of Direct 3D Printed Aligners and In-House Thermoformed Aligners
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15 | Distribution of the 3-OH isobranched C17:0 Fatty Acid in the Aqueous and Organic Extracts of Porphyromonas gingivalis Density Fractions
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17 | VR in Medicine and Oncology: Clinical Dental Students' Perspectives on Oral Cancer Education: Part 2
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30 | A Detailed Methodology for Evaluating tTTN Gene Variants and Their Correlation to Atrial Fibrillation in the UK Biobank
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87 | Examining Resilience, Apathy, and Anhedonia as Moderators in the Relationship between Frailty and Depression in Older Adults
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98 | Safe Steps Home: Pediatric Femur Fracture Discharge and Injury Prevention
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Evaluations

After viewing the medical student presentations, kindly take a moment to complete an evaluation. The evaluations are organized in numerical order by poster number and title. Please note that these evaluations do not include dental medicine students.

Faculty Poster Judging:
https://uconn.co1.qualtrics.com/jfe/form/SV_exuyl88jFBPdBZQ

Student Peer Evaluation:
https://uconn.co1.qualtrics.com/jfe/form/SV_cUCfh1COCUA9t2e

Once you submit the evaluation, a new blank form will automatically appear. Rest assured, your previous submission has been saved, and you can proceed to evaluate another presentation.

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School of Dental Medicine

2025 Abstracts

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4. Christian, Bryson
5. Costa, Marcus
6. Figuenick, Alexandra
7. Fregene, John
8. Irshad, Niha
9. Jenkins, Julia
10. Koscielski, Claire Ann
11. Kotait, Daniel
12. Lamm, Ellen
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19. Salcines, Stephanie
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23. Witt, Madison
24. You, Donny

Click on any name to be directed to its corresponding abstract.

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Clinically Oriented, Multifactorial Approach to Evidence-Based Decision Making

Marissa Airoldi[1], Fares Yaziji[2], David H. Manz[2]
[1]University of Connecticut School of Dental Medicine, UConn Health, Farmington, CT
[2]Department of General Dentistry, UConn Health, Farmington, CT

Objectives
The objective of this study is to determine if an increased exposure to clinical application of EBDM will affect clinician's knowledge, attitudes, access, and confidence in EBDM. Our first aim is to determine the impact of post-graduate clinical experience on previous trainee's knowledge, attitudes, access, and confidence in EBDM. Our second aim is to determine if an emphasis on clinical applications of EBDM will improve current trainee's knowledge, attitudes, access, and confidence in EBDM.

Methods
To assess trainee's knowledge, attitudes, access, and confidence in EBDM we employ the previously validated evaluation instrument KACE (Knowledge, Attitudes, Access, and Confidence Evaluation). To assess aim one of our study, we will administer the KACE survey to the cohort of The University of Connecticut School of Dental Medicine (SODM) student previous surveyed by Lalla et al.; this cohort now has 8-9 years of post-graduate experience. In this cross-sectional study, we will include additional questions to assess post-graduate activities including additional years of training and post-graduate years of clinical practice. To assess aim two of our study, we intend to modify the curriculum of the EBDM training offered to SODM students and residents in the Advanced Education in General Dentistry (AEGD) program to incorporate increased clinical focus. The effectiveness of the curriculum change will be evaluated by the KACE survey in a pre-post survey design.

Results
Our study is currently in the pilot phase. Pilot data suggest a high response rate for the survey from current trainees and indicate that the unique identifier generation method may need to be more robust to facilitate paired comparisons.

Conclusions
Further optimization of survey logistics and curriculum design may be indicated following complete data collection from the pilot cohort.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Marginal Sealing of Resin Composite Restorations with Resin Infiltration

Christina Budzinski[1], David H. Manz[1,2]
[1]*University of Connecticut School of Dental Medicine, UConn Health, Farmington, CT*
[2]*University of Connecticut, Department of General Dentistry, School of Dental Medicine, UConn Health, Farmington, CT*

Objectives
While resin composite restorations offer advantageous properties, this class of material is prone to compromised marginal integrity which plays an important role in the development of secondary caries. We hypothesize that marginal sealing of resin composite restorations with infiltrating resin will improve marginal integrity, leading to reduced microbial adherence, and subsequently reduce recurrent caries. This study will establish the validity of this proposed mechanism by characterizing the patient population in the UConn SODM dental clinics and by testing the effect of resin infiltration on marginal sealing.

Methods
axiUm records for the past 11 years will be reviewed for charted recurrent caries on resin composite restorations. Data will be collected on a per year and overall basis for incidence, prevalence, time to recurrent caries, tooth/surface location of recurrent caries, caries risk status of the patient, and demographics. Statistical analysis will include independent t-tests and multivariate analysis. Teeth extracted in the AEGD or EMG clinics will be collected for multiple group comparisons with each group having a sample size of n=8. Resin infiltration will be performed either before or after a conventional Class V resin composite restoration according to a developed protocol based on established Icon (DMG) protocol with adjustments. Samples will be randomized prior to finishing and polishing. Samples will be analyzed by dye penetration and scanning electron microscopy (SEM) in conjunction with the EM core facility. Subsequent statistical analysis will include independent t-tests.

Current Progress
Several extracted teeth have been selected to undergo a conventional Class V preparation and either underwent resin infiltration before or after a conventional Class V restoration in order to develop a protocol for bonding studies. Review of current literature has allowed for the development of a protocol for microleakage analysis following bonding studies.

Future Directions
Next steps involve (1) collecting specimens to undergo bonding studies and subsequent microleakage studies, (2) retrospective axiUm chart review to identify prevalence and incidence of secondary caries on existing resin composite restorations, and (3) statistical analysis of findings.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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CDC73 Mutations Associated with Hyperparathyroidism-Jaw Tumor Syndrome and Dental Manifestations

Lorens Carrasquillo[1], Jessica Costa[2]
[1]*University of Connecticut School of Dental Medicine, UConn Health, Farmington, CT*

Objectives
To summarize current knowledge on jaw tumors in patients with Hyperparathyroidism- Jaw Tumor syndrome, HPT-JT, and evaluate the accompanying genetic information associated with *CDC73* mutations. Germline loss-of-function mutations of the *CDC73* gene, encoding parafibromin, a protein with antiproliferative properties, underlie the syndrome. This project focuses on the jaw tumors associated with HPT-JT, as the dental manifestations remain poorly understood.

Methods
A comprehensive review of literature on HPT-JT syndrome and ossifying fibromas, with a focus on clinical presentation, was performed. Published data from 87 individuals with *CDC73* mutation was reviewed.

Results
Across the literature, only 34% of HPT-JT patients present with ossifying fibroma. These patients typically harbor point mutations or deletions in the *CDC73* gene, with exon 1 the most common mutation site.

Conclusions
Most of the HPT-JT mutations found in cases that present with ossifying fibromas have a point mutation or a deletion in their *CDC73* gene. Exon 1 appears to be a mutational “hotspot” for ossifying fibroma.

Future Directions
Future studies could focus on identifying specific molecular mechanisms through which *CDC73* mutations drive the development of jaw tumors, with the goal of uncovering potential therapeutic targets.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Age-Dependent Degeneration in TMJ Cartilage of Female Mice: A Histological Study

Bryson Christian[1], Christina Casciani[2], Eliane Dutra[2]
[1]*University of Connecticut School of Dental Medicine, UConn Health, Farmington, CT*
[2]*Division of Orthodontics, UConn Health, Farmington, CT*

Objectives
Our preliminary studies have demonstrated the involvement of specific FGFs for TMJ cartilage development and degeneration. This study aims to characterize the downstream degeneration markers to FGF signaling in the TMJ cartilage of female mice from different age groups. We hypothesize that downstream markers to FGF signaling will show differential expression patterns influencing cartilage integrity across the lifespan.

Methods
Mandibular condyles were collected from female mice at 1, 6, 12, and 18 months (n=3 per group) and analyzed using histological and immunohistochemical stains. Toluidine Blue (TB) and Safranin-O (SafO) were used to assess proteoglycan and glycosaminoglycan (GAG) content, respectively. Tartrate-resistant acid phosphatase (TRAP) identified osteoclastic activity, while MMP13, Runx2, and TIMP1 were assessed as markers of cartilage matrix breakdown, chondrocyte hypertrophy, and matrix regulation.

Results
TB and SafO staining intensity decreased progressively with age, indicating reduced proteoglycan and GAG content in older samples. However, SafO intensity did increase in the 18-month old mice. TRAP staining intensity, a marker of osteoclast activity, peaked at 1 month, then decreased drastically in 6- and 12-month old mice, before slightly increasing in 18-month old mice. MMP13 expression increased with age, indicating cartilage matrix degradation during aging. Runx2 staining demonstrated an increase in chondrocyte hypertrophy with age. Expression of TIMP1, an inhibitor of MMPs, was highest in 6-month old mice and decreased in older samples.

Conclusions
TMJ cartilage showed decreased integrity, increased osteoclast activity, and increased matrix degradation with aging. These findings show preliminary evidence of cartilage degradation and give insight into the roles of MMP13 and TIMP1 in the maintenance and degeneration of TMJ cartilage.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Investigating the Role of Prebiotics in Modulating Biofilm Formation in Oral Bacteria Associated with Orthodontic White Spot Lesions

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Objectives
The oral microbiome plays a key role in dental diseases like caries, but the effect of prebiotics on biofilm formation in orthodontic patients is not well understood. This study evaluates how various prebiotics modulate the oral microbiome to prevent biofilm development and white-spot lesions, with the long-term goal of developing a prebiotic-based chewing gum for oral health.

Methods
Four bacterial strains were selected: *Streptococcus mutans* (pathogenic), *Streptococcus anginosus* (pathogenic), *Streptococcus salivarius* (commensal in newborns), and *Streptococcus sanguinis* (commensal in adults). A mixed bacterial culture was incubated on experimental plates containing calcium carbonate, hydroxyapatite, casein, L-arginine, sodium bicarbonate, xylitol, or coconut oil. After 48 hours of anaerobic incubation, bacterial growth was assessed by qPCR, and statistical analysis was performed using ANOVA.

Results
Specific prebiotics significantly modulated the oral bacterial landscape. L-arginine and sodium bicarbonate individually reduced pathogenic bacteria, with the combination showing a synergistic effect against *S. mutans* and *S. anginosus* without affecting *S. sanguinis*. Hydroxyapatite also decreased both pathogenic bacteria. Coconut oil and xylitol promoted *S. sanguinis* growth without increasing pathogenic bacteria. Unexpectedly, several prebiotics inhibited *S. salivarius* growth.

Conclusions
Prebiotics such as L-arginine, sodium bicarbonate, hydroxyapatite, coconut oil, and xylitol can modulate the oral microbiome and show promise for development into an oral health product. However, the inhibition of *S. salivarius* suggests that prebiotic treatments may not be suitable for infants.

Future Directions
Future studies will test a prebiotic-based chewing gum in the UConn Orthodontic Clinic and pursue a patent application with UConn Technology Commercialization Services.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship and UConn School of Dental Medicine Orthodontic Department*

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Evaluating the Efficacy of PEKK Antimicrobial Coatings to Mitigate Bacterial Growth in a Dental Implant System

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Objectives

Xerostomia, the most common form of dry mouth affects around 64 million people in the United States. Those who have xerostomia often have difficulty with mastication, swallowing and speech. In severe cases of xerostomia, it can increase the development of dental decay, oral fungal infections, demineralization of teeth and tooth sensitivity. (1, 2) One of the possible methods to treat Xerostomia includes the creation of a dental implant system that has the ability of moving interstitial fluid from the mandibular and maxillary bone marrow spaces into the mouth. Our study aims to research the efficacy of an implant antimicrobial coating, polyetherketoneketone (PEKK), to prevent antimicrobial growth from occurring. The data obtained from these experiments will be beneficial in helping determine how antibacterial coatings will be used in future vivo studies. (Applications/designs of implants)

Methods

First, lubricin was placed on top of the discs. *Streptococcus mutans* was then inoculated into the Brain Heart Infusion (BHI) media and grown overnight. The cultures were transferred to four groups: M-type titanium discs with PEKK, SLA titanium discs with PEKK, complete PEKK discs, and titanium discs for the control group. These titanium discs are from Straumann group, which is the identical metal of our dental implants. The cells were removed at various time intervals, centrifuged, and then placed onto agar plates. The plates were incubated, and bacterial growth was calculated by counting the bacterial colony forming units (CFU's). Statistical analysis was performed using a paired T test.

Results

Survival fractions were calculated in CFU/mL at each time point for all samples. All four discs started off with the same amount of CFU's at 0 hours. The two discs that had the greatest decline in bacterial growth were the M-type and the PEKK discs.

Conclusions

M-type discs and PEKK discs killed the highest number of bacteria at the 24-hour mark. S-PEKK and M-PEKK discs killed the least number of bacteria at the 24-hour mark and moderately leveled off at the 48-hour mark. The control discs (M Type Ti) leveled off at the 48-hour mark. The PEKK discs showed the highest amount of bacterial killed at the 48-hour mark. All discs showed a relative decline overall but did not completely kill all bacteria in the given timeframe. PEKK polymer showed the greatest antibacterial effect out of the discs tested. For next time, we need to ensure more sterile lab techniques are used to ensure reliable results.

Future Directions

Next steps involve performing a 90-day study to test the efficacy of PEKK to prevent the growth of *S. mutans.*

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Anatomical Foundations for Safe and Effective Tear Trough Augmentation with Dermal Fillers

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Objectives
To evaluate the anatomical considerations critical for tear trough augmentation with dermal fillers, focusing on the role of the orbicularis oculi muscle, optimal injection depths, and the location of nerves and arteries. This study aims to enhance procedural safety and achieve natural, aesthetically pleasing outcomes.

Methods
A systematic review examined the anatomical and procedural factors in treating tear trough deformities, emphasizing the role of the orbicularis oculi muscle and its attachment to the retaining ligament. It highlighted subperiosteal and supraperiosteal filler techniques to minimize complications and improve aesthetics. The angular vein and artery near the infraorbital foramen were identified as critical structures to avoid, stressing the need for precise anatomical knowledge to ensure safe, effective outcomes.

Results
Targeted filler placement within or beneath the orbicularis oculi muscle minimizes tear trough irregularities by aligning distribution with muscle dynamics, reducing asymmetry. Subperiosteal placement provides structural support and avoids complications, while conservative volumes (0.2–0.3 mL) in the supraperiosteal layer work well for patients with thin skin. Maintaining a 4–6 mm depth below the orbital rim, confirmed by Doppler imaging, reduces risks like vascular occlusion. Anatomical precision and tailored techniques are essential for safe and effective tear trough treatments

Conclusions
Clinical evidence highlights the importance of precise anatomical knowledge for safe and effective tear trough augmentation. Subperiosteal filler placement ensures natural contours, minimizes irregularities, and avoids vascular complications. Integrating imaging technologies and standardized training will further enhance injector confidence, safety, and aesthetic outcomes.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship and Ferneini Maxillofacial Surgical Institute for clinical photos*

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A Deep Learning-Based Approach for Enhancing Diagnostic Accuracy and Treatment in Orthodontics

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Objectives
This study utilizes deep learning and bounding box regression to improve orthodontic diagnosis and treatment planning. Goals include:

1. Automating the identification of key landmarks on cephalometric X-rays for precise diagnosis.
2. Optimizing the placement of orthodontic appliances for personalized treatment.
3. Evaluating non-maximum suppression techniques to reduce redundant detections in complex images.

Methods
A dataset of 30,000 images, including intraoral scans, facial profiles, and radiographs, was annotated using Label Studio software. Bounding boxes were created to isolate dental structures while excluding gingiva, tongue, and lips. The Faster R-CNN object detection model was employed to ensure accuracy in identifying landmarks and dental structures.

Results
Annotations were reviewed by orthodontic experts. The Faster R-CNN model demonstrated high precision in detecting teeth and gingival inflammation. Panoramic and cephalometric images were used to provide a comprehensive patient overview but not for bounding box regression. Data collection is ongoing.

Conclusions
Preliminary findings suggest that AI-driven bounding box algorithms can effectively automate dentition cropping and enhance orthodontic treatment planning.

Future Directions
The study will continue to expand its dataset and refine the deep learning model with collaboration from engineers, aiming to implement AI software for clinical use.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Part 1: Unveiling Pre-Clinical Students' Awareness of Osteoradionecrosis

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Objectives

Osteoradionecrosis (ORN) is a debilitating complication of radiotherapy in head and neck cancer patients, characterized by irradiated bone that fails to heal for at least three months without tumor recurrence. Factors such as compromised vascular perfusion, hypoxia, hypocellularity, and dysregulated bone turnover contribute to its pathophysiology, impairing bone healing after radiation therapy. Despite its clinical significance, ORN is underrepresented in dental education compared to other conditions like medication-related osteonecrosis of the jaw. This study aims to assess pre-clinical dental students' knowledge of ORN, identify educational gaps, and propose strategies to enhance training, thereby improving diagnostic skills and patient outcomes.

Methods

An anonymous survey was conducted among 33 pre-clinical dental students to evaluate their knowledge of ORN and identify educational needs. The survey included Likert-scale questions and optional short-answer responses, administered via Qualtrics through UConn Health (IRB#: 25X-015-1).

Results

The survey highlighted significant knowledge gaps. While 58% of students reported being taught about ORN diagnosis, 85% recognized the need for additional education to improve their clinical proficiency. Key areas requiring attention included diagnostic criteria (73%), radiation dose levels (79%), clinical staging (70%), and treatment options (76%). Furthermore, 48% expressed neutrality regarding the adequacy of their current education, indicating an opportunity for targeted interventions.

Conclusions

A layered educational approach is proposed to address these gaps. Didactic learning for first- and second-year students should incorporate interactive tools such as animations, inquiry-based learning, and 3D models to enhance engagement and comprehension. These lessons can be reinforced through clinical exposure to ORN cases and hands-on virtual or augmented reality simulations. By integrating innovative methods, dental students can develop a robust understanding of ORN, ensuring they are well-prepared to deliver high-quality patient care.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Distribution of Lipids Within *Porphyromonas gingivalis* Fractions Separated by Density Gradient Centrifugation

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Objectives

Porphyromonas gingivalis is a Gram-negative anaerobic bacterium recognized as a significant pathogen in human chronic adult periodontitis, which is a chronic inflammatory disease associated with loss of attachment and bone around teeth. *P. gingivalis* produces many novel lipids but little is known about how these lipids are distributed within bacteria particularly as the organism grows for increasing time in culture. This study evaluated the lipid distributions within *P. gingivalis* bacterial pellets and centrifuged broth separated by density gradient centrifugation.

Methods

Duplicate tubes of *P. gingivalis* were grown in brain heart infusion broth culture for 7 days, with OD600 measured daily before centrifugation. Bacteria were pelleted by centrifugation, and the clarified broth was read at OD600, removed, and broth samples were lyophilized. Portions of each pellet and broth sample were applied to discontinuous sucrose cushions, centrifuged, and the bands were aspirated. The lipids were extracted into chloroform after acidifying with acetic acid, dried under nitrogen, and analyzed by LC-MS using multiple reaction monitoring.

Results

P. gingivalis growth peaks by 2 days as determined by OD600 and gradually decreases thereafter. When comparing the distribution of the lipids over 7 days, phosphatidylethanolamine (PEA) was more prevalent in the lower bands from the bacterial pellets, whereas the lipids recovered in the lower bands of centrifuged broth samples were more variable in distribution. L1256 and L654 were also more prevalent in the upper and lower bands for samples from day 3 and 4 cultures.

Conclusions

The lipid distribution within *P. gingivalis* changes dramatically over 7 days of culture. Lipid classes dominant in diseased gingival tissues appear in the lower bands for days 2-4 bacterial and broth samples, with PEA and L654 also present. High L430 levels in pelleted bacteria and broth from days 5-7 suggests lipid hydrolysis occurs later in culture. However, L430 is also significant in bacteria pellet and centrifuged broth samples of days 2 and 4, indicating ongoing lipid hydrolysis even as other lipid classes increase. Therefore, cell death would be expected to occur even while cells are growing rapidly and producing lipids characteristic of *P. gingivalis*.

Future Directions

Evaluation of the lipid composition of broth products and their disease promoting potential.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Mincle-mediated Inflammatory Responses in Apical Periodontitis in a Mouse Model for Cherubism

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Objectives

More than 15 million people per year require root canal treatment to treat or prevent apical periodontitis (AP) in the USA. Patients with autoimmune disorders have higher prevalence of AP. We found exacerbated AP after pulp exposure in a knock-in (KI) mouse model for cherubism (CBM), an autoimmune disorder caused by mutant *Sh3bp2*. Increased expression of *Clec4e* (*Mincle*), a C-type lectin pathogen recognition receptor (*Clec*) gene, suggests that Mincle may play a role in regulating endodontic infection in CBM mutant mice. Here, we aim to examine whether deletion of *Mincle* can ameliorate AP in *Sh3bp2*$^{+/KI}$ mice.

Methods

We crossed *Sh3bp2*$^{+/KI}$*Mincle*$^{+/KO}$ x *Sh3bp2*$^{+/KI}$*Mincle*$^{+/KO}$ mice to obtain control (*Sh3bp2*$^{+/+}$*Mincle*$^{+/+}$, *Sh3bp2*$^{+/KI}$*Mincle*$^{+/+}$) and experimental (*Sh3bp2*$^{+/KI}$*Mincle*$^{KO/KO}$) mice. At ages of 5-6 weeks, pulp of lower 1st molars on left side was exposed by dental drilling (n=3-6 per group). Mice were analyzed after pulp exposure by weighing, radiographs, μCT, and quantitative PCR (qPCR)/Immunoblots for expression of *Clec* family genes and proinflammatory markers.

Results

Pulp exposure resulted in AP in all mice. Comparable body weight changes indicated that all mice tolerated the procedure well. *Sh3bp2*$^{+/KI}$*Mincle*$^{+/+}$ and *Sh3bp2*$^{+/KI}$*Mincle*$^{KO/KO}$ mice developed exacerbated AP compared to *Sh3bp2*$^{+/+}$*Mincle*$^{+/+}$ mice. Unexpectedly, *Sh3bp2*$^{+/KI}$ *Mincle*$^{+/+}$ and *Sh3bp2*$^{+/KI}$*Mincle*$^{KO/KO}$ mice showed comparable response to pulp exposure, including jawbone expansion, decreased bone volume/total volume (BV/TV), and increased expression of *NOS*, *IL-1*β, and *TNF*α. *Mincle* was significantly decreased, but not completely deleted, whereas *Clec4a* and *Clec4d*, *Clec* family genes that are closely linked with *Clec4e* on Chr6, were upregulated in *Sh3bp2*$^{+/KI}$*Mincle*$^{KO/KO}$ mice.

Conclusions

These data suggest the existence of a compensatory mechanism within *Clec* family genes. Additional tools are required to dissect out the role of Mincle in endodontic infection.

Future Directions

We will study the role of *Clec* family members in endodontic infection by using Mincle-binding DNA aptamers, which can inhibit multiple *Clec* targets.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Part 2: Exploring And Unveiling Clinical Students' Awareness Of Osteoradionecrosis

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Objectives

1) Assess the knowledge of 3rd and 4th year dental students at UConn on the pathophysiology, prevention, and treatment of ORNJ.
2) Determine the adequacy of current education on ORNJ and provide insights into the necessity for educational enhancement on ORNJ among dental students based on the findings.

Methods

This study surveyed third- and fourth-year UConn dental students on their understanding of ORN using a 10-question questionnaire. The IRB-approved survey was distributed to anonymous participants via the UConn Health email database, with only completed surveys included in the analysis.

Results

A total of 27 students participated in the survey, with 78% (n = 21) in their third year and 23% (n = 7) in their fourth year. Regarding risk factors for ORN, 78% (n = 21) reported having a sufficient understanding of the condition and 70% (n = 19) expressed confidence in discussing ORN risks with patients. 41% (n = 11) had observed patients with ORN, and 15% (n = 4) felt equipped to manage the condition

Conclusions

The results show that over 60% of students understand ORN risks and feel confident counseling patients, and more than 50% can identify its clinical manifestations, likely due to the case-based discussions and rotations in oral medicine and oncology. While these initiatives show positive results, the data reveals that few students feel confident treating ORN patients, and over half have had no direct exposure. A novel clinical program could be introduced to incorporate VR-simulation and 3D models for hands on learning to enhance both clinical and preclinical education.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Evaluation of a Low Dose 180^0 CBCT Acquisition Protocol and Conventional 360^0 CBCT Protocol for Evaluating Simulated Maxillary Sinus Pathology

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Objectives
The objective of this study was to compare the diagnostic ability of a 180-degree low dose cone beam CT (CBCT) acquisition protocol compared to a conventional 360-degree CBCT scan.

Materials and Methods
A total of 32 maxillary sinuses from 16 dry skulls were used to simulate a variety of maxillary sinus pathologies. Mucous retention cysts and mucous thickening were randomly simulated on the floor, medial wall, lateral wall and roof of the sinus by using dental inlay wax. Some of the simulations were done more anteriorly in the sinus and some were randomly simulated on the posterior aspect. A 180-degree CBCT scan was acquired and without changing the setup, conventional 360- degree CBCT was done for all the skulls. The raters were blinded to the acquisition protocol and the images were scored by 3 raters to identify the presence or absence of simulated mucosal thickening to evaluate the diagnostic efficacy. The raters scored the scans using the following criteria. 1. Clearly visualized and diagnostic, 2. Visible but not well visualized, 3. Not well visualized and non-diagnostic.

Results
Inter and intra rater reliability was done using the Cronbach Alpha statistic. The overall interrater reliability was 96% for both the acquisition protocols. The statistical significance between the 2 imaging protocols was calculated using the student t-test. There was no statistically significant difference (P>.05) between the diagnostic ability of the 2 acquisition protocols.
All the raters agreed that they could not detect any difference in the overall resolution of the scans as they were blinded to the scan's acquisition protocol while scoring.

Conclusions
In this ex vivo study with simulated maxillary sinus pathology, we found that the diagnostic ability of 180-degree low dose Cone Beam CT acquisition protocol was comparable to the conventional 360-degree acquisition protocol.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Comparison of Direct 3D Printed Aligners and In-House Thermoformed Aligners

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Objectives
The objective of this study is to develop a novel method for precisely comparing the accuracy of aligners from traditional thermoforming and emerging direct-print workflows.

Methods
To identify micro-CT as the optimal tool for comparing the dimensional accuracy of aligners, we first sought to define a gold standard. Recognizing the inconsistency of scanning patients' mouths, we eliminated this error entirely from the workflow by exploring UConn Health's micro-CT technology. Inclusion criteria were limited to mandibles measuring 56 mm or less in width, excluding those with third molars. Models were standardized by trimming the distal half of the mandibular second molar's distal cusps to ensure proper fit within the micro-CT device.

The finalized workflow for converting micro-CT DICOM image files to 3D rendered STL files incorporated the following applications: ImageJ (DICOM cleaning), 3D Slicer (DICOM to STL conversion), MeshMixer (aligner intaglio extraction), Blender (manual pre-alignment), and Cloud Compare (superimposition and comparative analysis). Direct print aligners and in-house thermoformed aligners are to be scanned and compared against the gold-standard reference model using this workflow.

Results
A fully developed and validated workflow was established to analyze the dimensional accuracy of orthodontic aligners. Initial findings highlight the utility of this methodology in comparing aligners from various workflows, demonstrating consistent and precise results with the potential to identify subtle differences between aligners.

Conclusions
This novel workflow establishes a new gold standard for aligner evaluation, paving the way for future comparative studies across aligner brands, materials, and fabrication methods. With emerging direct-print aligner brands such as Graphy and LuxCreo, alongside advancements in smart materials and next-generation printers, this approach offers exciting potential for assessing aligner design, optimizing tooth movement, and enhancing patient outcomes.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Distribution of the 3-OH isobranched $C_{17:0}$ Fatty Acid in the Aqueous and Organic Extracts of *Porphyromonas gingivalis* Density Fractions

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Objectives
Prior work indicates that LPS of *P. gingivalis* is negligible in diseased gingival tissues but complex lipids of *P. gingivalis* are prevalent. The novel fatty acid, 3-OH isobranched (*iso*) $C_{17:0}$, is amide-linked in the lipid A of *P. gingivalis* LPS but is also found in two major lipid classes of *P. gingivalis.* Using lipid extraction, LPS and complex lipids can be indirectly quantified by measuring 3-OH *iso* $C_{17:0}$ in both phases. This study assessed the distribution of 3-OH *iso* $C_{17:0}$ in the aqueous or organic solvent extracts of *P. gingivalis* grown for up to 7 days in culture.

Methods
Duplicate tubes of *P. gingivalis* were grown for up to 7 days with OD600 determined daily. Bacteria were then pelleted by centrifugation and the remaining culture broth was read at OD600 and centrifuged. Both bacterial pellets and centrifuged broths were applied to sucrose density gradients, centrifuged, and separated into upper and lower bands, which were extracted using the Bligh and Dyer (B&D) method. Extracts were supplemented with D_9 3-OH $C_{17:0}$ internal standard, treated with KOH, hydrolyzed, and extracted with hexane under acidic conditions. Free fatty acids were converted to TMS derivatives and analyzed by GC-MS. For comparison, *P. gingivalis* was grown for 4 days, and processed as described above.

Results
3-OH iso $C_{17:0}$ was consistently higher in the organic extracts of bacterial pellets and was elevated in most culture broth samples after centrifuging the bacteria. The lower bands contained elevated 3-OH *iso* $C_{17:0}$ in organic extracts compared to the upper bands. The same trend was observed for the centrifuged culture broth samples. The *P. gingivalis* sample that was not fractionated by density gradient centrifugation showed only 1.4% of the total 3-OH *iso* $C_{17:0}$ in *P. gingivalis* is contained in LPS while the remainder is held in complex lipids.

Conclusions
Based on the recovery of 3-OH *iso* $C_{17:0}$ in both extracts of *P. gingivalis*, this study demonstrates that *P. gingivalis* preferentially produces more complex lipids than LPS. It should be noted that each lipid A moiety of *P. gingivalis* LPS contains two 3-OH iso $C_{17:0}$ fatty acids whereas most lipids of *P. gingivalis* contains only one single 3-OH *iso* $C_{17:0}$ fatty acid. Thus, the molar abundance of LPS is even less than that of than the molar abundance of complex lipids.

Future Directions
Future work should emphasize the biological properties of *P. gingivalis* lipids over LPS.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Assessing the Relationship Between Hand Sesamoid Bone Morphology and Patient Characteristics

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Objectives
To investigate the prevalence, anatomical distribution, and morphological characteristics of digital sesamoid bones in the metacarpophalangeal (MCP) and interphalangeal (IP) joints of all five digits using high-resolution computed tomography (CT) imaging. This study focused on precise two-axis (length × width) measurements and volumetric analyses to establish standardized baseline data. Additionally, the potential associations between sesamoid bone morphology and demographic factors were explored to provide insights into their clinical and functional significance.

Methods
Electronic medical records were queried for patients aged 18+ undergoing hand CT scans from 5/4/2018 to 7/19/2024 for any clinical reason (e.g., fracture evaluation). Demographic and clinical data, including BMI, age, sex, smoking status, and occupation, were collected. CT scans were assessed for the presence, anatomical location, and number of sesamoid bones. Length and width measurements (mm) of the sesamoid bones were recorded, and volumes (mm^3) were calculated based on slice thickness. To ensure accuracy, measurements were normalized to patient BMI. Statistical analysis included descriptive statistics.

Results
A total of 145 patients had hand CTs between 5/4/2018 to 7/19/2024. Of these, 60 scans were reviewed for the current analysis. 83.3% (n=50) of the scans had at least one sesamoid bone present, with the most common location being the MCP1 joint (n=112, 77.2%). The median number of sesamoid bones observed per scan was 1 (IQR 1-2) with an average area of 27.96 mm^2 and volume of 174.32 mm^3. Measurements were standardized by BMI to enhance accuracy.

Conclusions
Most patients had sesamoid bones at MCP1, MCP2, and MCP5 joints, consistent with prior studies. These findings establish foundational data on sesamoid bone morphology.

Future Directions
Analyzing the full data set of 150 patients may reveal correlations between occupation and sesamoid volume. Incorporating advanced imaging techniques, such as CBCT, could enhance volumetric analysis and provide greater insight into the clinical implications of sesamoid bones. Future studies should assess how physicians (e.g., orthopedists and radiologists) view the importance of the sesamoid bone.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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VR in Medicine and Oncology: Clinical Dental Students' Perspectives on Oral Cancer Education: Part 2

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Objectives
This study investigates the attitudes of 3rd and 4th-year dental students toward VR-based oral cancer education. By identifying barriers, benefits, and readiness for VR integration, the research aims to inform the development of accessible, tailored VR tools for dental training.

Background
Virtual Reality (VR) has emerged as a transformative tool in dental education, offering immersive, interactive learning experiences that improve knowledge retention and skill acquisition. While VR has been effectively applied in oral and maxillofacial surgery, its potential in oral cancer education remains underexplored. Challenges such as limited familiarity, usability concerns, and accessibility barriers underscore the need to examine dental students' perceptions to enhance VR adoption in curricula and clinical practice.

Methods
An anonymous Qualtrics survey was distributed to 3rd and 4th-year dental students, comprising carefully designed questions to evaluate their perceptions, familiarity, and willingness to adopt VR for oral cancer education. Descriptive and statistical analyses were performed to identify trends and insights.

Results
The survey revealed diverse perspectives on VR adoption. While 57% of respondents expressed a willingness to use VR simulations, 50% supported incorporating VR into dental curricula. However, only 50% were likely to use VR in future practice, citing concerns about comfort (43%) and technological limitations (43%). Positively, 43% believed VR could enhance clinical skills in oral cancer detection. Notably, familiarity with VR was moderate, with 43% hesitant to use the devices despite acknowledging their potential benefits.

Conclusions
The findings highlight VR's promise as a valuable educational tool, balanced by concerns about usability and accessibility. To unlock VR's full potential, efforts must focus on improving user comfort, addressing technological challenges, and fostering familiarity among students. Customized VR applications in oral cancer training could revolutionize dental education, enhancing clinical preparedness and promoting preventive care.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Microscale Mechanical Analysis of the Dentin-Enamel Junction within a Dentinogenesis Imperfecta Murine Model

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Objectives

The dentin-enamel junction (DEJ), despite connecting two mechanically dissimilar materials, is remarkably resistant to mechanical failure. However, it is prone to cracking in patients with dentinogenesis imperfecta (DGI). My study sought to clarify the effect of DGI on the mechanical properties across the DEJ to elucidate the ways in which this interface maintains its toughness.

Methods

We compared the incisor DEJs from Col1a2 OIM (DGI, n=3) mice exhibiting a type I DGI phenotype with their wild-type (WT, n=3) littermates. Incisors were embedded and tested using an NHT^3 nano-indenter. 3 x 15 indents were made across each DEJ using an applied load of 1.5 to 4 mN. Elasticity and hardness were calculated at each indent and plotted as a function of position showing a gradient in properties across the DEJ. Values from 5 indents in the enamel and 10 in the dentin were averaged for each line to obtain DEJ adjacent tissue mechanics. The width of the gradient for each sample was determined by a skilled observer. Two-Sample T-Tests were used to determine significance (where DGI/WT act as factors).

Results

Both the enamel elastic modulus (E) and hardness (H) were significantly higher in the DGI group than in the WT controls (E: 67.6 ± 6.6 vs 42.2 ± 6.2 GPa, H: 4.3 ± 0.5 vs 2.9 ± 1.1 GPa). The dentin modulus and hardness were unaffected by DGI (E: 24.6 ± 4.3 vs 24.1 ± 1.6 GPa, H:1.2 ± 0.1 vs. 1.2 ± 0.3 GPa). There was no statistical difference between DGI and WT gradient widths and an overall average value of 19.47 ± 4.01 μm was recorded.

Conclusions

We expected DGI to primarily affect dentin; however, the enamel mechanics were more significantly modified supporting the idea that DGI disrupts reciprocal epithelial-mesenchymal interactions. The increased E and H are associated with increased brittleness possibly explaining the higher incidence of fracture. Contrarily, gradient width was unaffected and likely does not affect mechanics. This width is on par with previous measures of density gradients suggesting that the mechanics are primarily controlled by tissue mineral content and porosity.

Future Directions

Next steps involve (1) increasing statistical power through more samples. (2) Analyze “peak width” as lines of data often exhibited an inflecting trend. (3) Mechanically test murine molars.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship and the NIDCR through grant R03DE030228*

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Ethnic and Gender Variations in Root-to-Crown Ratios

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Objectives
The root-to-crown (R/C) ratio is a critical determinant of dental prognosis and can influence treatment complexity. Short dental roots or unfavorable R/C ratios, including short root anomaly (SRA), may increase the risk of tooth loss and treatment failure. While studies suggest that ethnicity plays a role in dental development, limited research has focused on tooth and root length variations across different ethnic groups. This study aimed to address this gap by investigating the R/C ratios in Asian and Hispanic populations. Understanding these variations is essential for improving diagnosis and tailoring dental treatments to diverse patient populations. Additionally, this study examined gender differences in R/C ratios and analyzed the prevalence of SRA among the different ethnic groups.

Methods
CBCT scans of 100 patients (50 per group) were analyzed. R/C ratios were calculated by measuring crown and root lengths mesial to the second molars using InVivo software. Statistical analysis was performed to examine ethnic and gender differences and identify cases of SRA (R/C ratio <1).

Results
The R/C ratios varied between 1.05 (maxillary lateral incisor) and 1.67 (maxillary canine). A significant ethnic difference was observed only in the maxillary lateral incisor, where the Asian population had a higher mean R/C ratio (1.22±0.33) compared to the Hispanic population (1.08±0.02, P=0.03). Gender differences were seen in the Hispanic population in tooth #5 (P=0.001) and #6 (P=0.001). Furthermore, females showed a higher prevalence of SRA, particularly in the Hispanic group.

Conclusions
Overall, R/C ratios showed minimal ethnic differences, except for maxillary lateral incisor, where the Asian group had higher ratios. Gender differences were observed in specific teeth, with females exhibiting a higher prevalence of SRA. These findings suggest that while ethnic differences in R/C ratios are minimal, gender specific variations, particularly among Hispanic populations, are noteworthy and should be considered in dental assessments.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Targeting EGFR Signals to Reverse MCC Degeneration in TMJ-OA

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Objectives
The Temporomandibular joint (TMJ) is the most-used joint in the human body, and it is essential for various functions such as speech, mastication, and breathing. The articulating surface of the TMJ is the mandibular condylar cartilage (MCC), a specialized structure composed of fibro-hyaline cartilage that covers the mandibular condylar bone. Patients with osteoarthritis can experience degeneration of the MCC, which causes severe pain and greatly impairs quality of life. MCC degeneration is incurable and cannot be surgically treated. Therefore, a method to regenerate cartilage in patients with Temporomandibular Joint Osteoarthritis (TMJ-OA) is necessary. The goal of this study is to define Heparin-binding Epidermal Growth Factor's (HB-EGF) mechanism of action in either stimulating anabolic responses or suppressing catabolic responses in a clinically relevant pig MCC explant model.

Methods
Osteochondral explants were obtained from the MCCs of healthy pigs and pretreated with IL-1B for 13 days to induce MCC degeneration. Half of the explants were then maintained in basal media and the other half were treated with HB-EGF for 28 days. Matrix response was evaluated through tissue staining with Safranin-O and quantified through digital imaging.

Results
After IL-1B treatment, MCC matrix (measured by Safranin-O staining) was reduced ($p<0.05$), consistent with the loss of MCC cartilage characteristic of TMJ-OA. MCC matrix remained unchanged after the 28 day treatment in control media. However, after 28 days in HB-EGF-treated media, Safranin-O staining increased, suggesting that HB-EGF stimulates anabolic responses in the pig MCC and potentially reverses MCC matrix loss induced by IL-1B.

Conclusions
Future studies using this strategy to reverse MCC degradation could lead to the development of an injectable treatment for TMJ-OA.

Future Directions
Next steps involve (1) developing a sustained-release formulation of HB-EGF for clinically feasible injection into the jaw joint and (2) testing this formulation in a living animal model of TMJ-OA.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Coronin1A Mediates Macrophage-driven Injury-Repair Dynamics to Shape AKI outcomes

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Objectives
Acute kidney injury (AKI) is a clinical condition characterized by damage primarily to the proximal convoluted tubules of the kidney, often resulting from ischemic or nephrotoxic insults. The prognosis of AKI is directly dependent on the extent of damage to the renal tubular epithelium, which has a modest and variable regenerative capacity. It is now well established that the quality of the immune response, in conjunction with the activity of other support cells in the kidney microenvironment, is a key determinant of the repair-injury balance. In this series of experiments, we aimed to explore the role of Coronin1A, a differentially expressed protein in the kidney following AKI, in regulating this delicate balance.

Methods
Coronin1A knockout mice (Coro1A -/-) were developed to observe the phenotype of Coro1A deletion in AKI. Two animal models of AKI were employed to verify Coronin1A involvement in AKI: damage to the tubular epithelium was induced via cisplatin injection and ischemia-reperfusion injury (IRI), following methods described elsewhere. Flow cytometry was used to characterize the quality of the immune response in both wild-type (WT) and Coro1A -/- mouse strains following AKI. Bone marrow-derived macrophages (BMDMs) were utilized to create an ex vivo model of AKI and compare inflammatory markers between WT and Coro1A -/- groups. mRNA isolation and qPCR were extensively employed to quantify Coro1A and related gene expression across multiple experiments. Western blotting was performed to quantify Coronin1A protein expression. Human kidney biopsy samples were obtained from the Department of Pathology at the University of Pittsburgh.

Results
Coronin1A demonstrated increased expression in human patients and animal models following acute kidney injury. Coronin1A knockout was renoprotective in the context of AKI: Coro1A -/- mice exhibited less severe elevations in serum creatinine (SCr) and blood urea nitrogen (BUN), as well as decreased markers of cell damage. Markers of tubular cell regeneration were improved in Coro1A -/- animals. Single-cell sequencing revealed that Coronin1A is enriched in macrophages and T cells in murine kidneys. qPCR of mRNA isolates from kidney lysates showed significant increases in markers of macrophage M2 polarization, but not T-reg activation, in the Coro1A -/- group. Flow cytometry confirmed that M2 macrophage activity was increased in Coro1A -/- mice, while T-reg markers were not. Furthermore, Coro1A -/- knockout reduced the severity of AKI-induced kidney fibrosis, as Coronin1A knockout macrophages protected cultured tubular cells from apoptosis in the ex vivo model. This provides further evidence that Coronin1A activity within macrophages is a key regulator of the injury-repair balance following AKI.

Conclusions
Coronin1A is locally upregulated in response to acute kidney injury, and deletion of Coro1A improves markers of both short- and long-term kidney function following ischemic insult. In sum, our work identifies a novel role for Coronin1A—namely, as a key regulator of macrophage polarization and the local inflammatory microenvironment following acute kidney injury.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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VR in Oral Medicine and Oncology: Pre-Clinical Dental Students' Insights on Oral Cancer Simulation: Part 1

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Objectives
To evaluate preclinical dental students' perceptions of virtual reality (VR) as a tool for enhancing skills in oral cancer diagnosis, screening, and biopsy techniques.

Methods
An IRB-approved 11-question survey was distributed to first- and second-year dental students at the University of Connecticut School of Dental Medicine. Anonymous responses were collected via the institutional email database, focusing on engagement, comprehension, and the applicability of VR in dental education.

Results
Of the respondents, 86% indicated VR would improve learning engagement, 82% believed it would enhance comprehension of diagnostic and biopsy techniques, and 79% reported VR would refine screening abilities. Additionally, 72% felt confident diagnosing lesions in VR simulations, 69% found VR more immersive than traditional methods, and 59% advocated for VR's integration into the curriculum. Despite enthusiasm, 45% were neutral about the learning curve, highlighting room for optimization.

Conclusions
The study underscores VR's potential to enrich oral cancer education, providing an interactive and engaging platform for skill development. The results highlight the promising potential of VR technology in dental education, particularly for enhancing the learning experience in oral cancer diagnosis and treatment. While participants recognized its ability to make complex topics more engaging and interactive, concerns were raised about overreliance on VR at the expense of foundational clinical experience. Issues like the need for strong IT support, real-life application, and balancing traditional methods with VR were noted. These findings stress the importance of a strategic, integrated approach to VR implementation, ensuring it complements conventional didactic and clinical training. Innovative additions, such as simulated patient interactions for diagnosis and surgical procedures, could further enhance student concentration, dexterity, and real-world preparedness.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Oral Health Care for the Adult Special Needs Population- Understanding the Lack of Access to Care

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Objectives
Individuals with special healthcare needs (SHCN) may lack access to oral healthcare upon transitioning from pediatric to adult care. It is crucial to identify the barriers that contribute to the lack of access to care in order to develop solutions for this issue. Additionally, it is important to understand previously proposed solutions. Therefore, a literature review was performed to evaluate articles that pertain to these topics.

Methods
This study was divided into three sections. The first section examined articles that describe the lack of access to oral healthcare for patients with SHCN. The second section examined the transition for special needs individuals from pediatric to adult dental care. The last section was dedicated to examining potential solutions that have been previously proposed.

Results
The examination of the literature elicited some barriers preventing patients with special healthcare needs from receiving optimal oral healthcare. These barriers included insufficient advocacy, financial reasons (e.g., insurance reimbursement rates) and varying training requirements at predoctoral/postdoctoral dental programs. The literature also describes problematic transitions from pediatric to adult healthcare. A variety of multifaceted solutions to this problem have been proposed. However, there is no literature that describes programs or initiatives that have successfully eradicated the lack of access to care for patients with SHCN.

Conclusions
Identifying the disparities, barriers to care, contributing factors, transitional challenges and solutions are essential to best understand the provision of oral health care to adult patients with special health care needs. The literature effectively describes the disparities, barriers and solutions to the problem of access to oral health care for adult patients with SHCN.
Evidence is lacking however that accurately describes the prevalence of dental disease and the actual limitations that exist in accessing care for patients with SHCN. Studies can better describe the problem and help to develop solutions such as those already recommended or new solutions.

Future Directions
Next steps involve: (1) developing a retrospective or prospective study to analyze the prevalence of dental disease and the solutions being used among adult patients with special needs and (2) gathering input from the many parties involved in the provision of oral healthcare for these patients, especially on a local level.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Exploring Oral Maxillofacial Surgeons' Perceptions and Adoption Potential of AI Chatbot Technology in Practice: A District 1 Survey Study

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Objectives
Artificial intelligence (AI) chatbots, such as ChatGPT, have emerged as powerful tools capable of transforming communication and workflow in various fields, including healthcare.[1] Within oral and maxillofacial surgery (OMFS), these technologies hold promise for improving patient education, streamlining communication, and reducing administrative burdens.[2] This study aims to assess perceptions, identify barriers, and evaluate the adoption potential of AI chatbot technology among OMFS practitioners in District 1.

Methods
A comprehensive survey was developed using Qualtrics and disseminated to OMFS surgeons in District 1 (CT, NH, NY, MA, ME, RI, VT). The questionnaire included sixteen questions in which assessed demographic details, chatbot experience, impact on patient education, perceived barriers, and desired improvements of AI chatbots. Participants were asked to evaluate the questions using a Likert scale or open-text responses. Quantitative data were analyzed using descriptive and inferential statistics, while thematic analysis was applied to qualitative data.

Results
A total of 44 surgeons participated and had the following opinions on AI chatbots. Of the 44 participants, 26 (59%) agreed that the quality of information is accurate, 25 (57%) agreed AI enhances communication, 29 (66%) believed it could reduce workload, and 27 (61%) expressed interest in integrating AI into their practice workflows. On the other side, 32 (73%) feared bias in responses generated by AI, 21 (48%) are concerned with the potential impact of AI on patient privacy, and 28 (64%) would need an OMFS tailor chatbot to fully trust and integrate AI into their practice. Interestingly, participants with higher usage frequency of AI chatbots showed more positive perceptions, including enhanced communication and a greater willingness to integrate AI into their workflows, while also reporting fewer concerns about issues such as bias in AI responses.

Conclusions
Most respondents acknowledged the potential of AI chatbots to improve patient care and practice efficiency. However, privacy concerns and a lack of tailored solutions remain significant barriers.

Future Directions
To enhance adoption, future efforts should prioritize developing specialized AI tailored for OMFS with comprehensive security measures to protect patient privacy and minimize bias.

Supported by: *UConn School of Dental Medicine Summer Research Fellowship*

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Quantitative Sensory Testing of Pain Sensitivity Relationship to Postpartum Pain

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Background/Objectives
Quantitative sensory testing (QST) is a tool used to objectively assess pain sensitivity. Objective measurement of pain after birth and during breastfeeding via QST is understudied. We explored the relationship between pain sensitivity measured by QST and pain intensity in women within 48 hours postpartum.

Methods
Secondary analysis of participants (N=238) from the Promoting Self-Management of Breast and Nipple Pain with Biomarkers and Technology for Breastfeeding Women (PROMPT) study. Spearman's rank correlation was used to evaluate the relationship between QST measurements (mechanical detection threshold (MDT), mechanical pain threshold (MPT), mechanical pain sensitivity (MPS), dynamic mechanical allodynia (ALL), windup ratio (WUR), vibration detection threshold (VDT), pressure pain threshold (PPT)) and postpartum pain scores measured by the visual analogue scale (VAS), (0-100), Brief Pain Inventory (BPI), and the short-form McGill Pain Questionnaire. Linear regression was used to determine the effect of ethnicity, race, and route of delivery on pain scores.

Results
Participants self-identified as White, non-Hispanic (49%), Black, non-Hispanic (16%), Hispanic (29%), and Other (6%), two-thirds (69%) had a vaginal birth, and mean age was 30.38 +/- 4.9 (19-45). Average pain scores were 38.2 +/- 25 VAS, 3.3 +/- 1.8 BPI, and 26.47 +/- 24.7 McGill. MPS scores were correlated with higher VAS scores, (ρ = .188, p <.01), higher BPI scores (ρ =.178, p < .01), and higher McGill scores (ρ =.216, p <.01). Route of delivery was significantly associated with the VAS (p = 0.044) and the BPI pain scores (p = 0.009). Ethnicity was significantly associated with the McGill pain scores (p=.001).

Conclusions
Mechanical pain sensitivity is associated with self-reported pain scores measured by three pain questionnaires. Pain scores were higher in self-identified Hispanic women. Mechanical pain sensitivity may be used to predict pain sensitivity in women in the immediate postpartum period.

Supported by: *UConn School of Medicine Summer Research Fellowship, Promoting Self-Management of Breast and Nipple Pain with Biomarkers and Technology for Breastfeeding Women (PROMPT)(R56NR020041)*

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Effect of Age and Age at Diabetes Diagnosis on Disordered Eating and Weight Bias Internalization in Adolescents with Type I Diabetes Mellitus

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Background/objectives

This study aims to evaluate the prevalence of disordered eating and weight bias internalization in adolescents with type I diabetes mellitus and determine whether these rates vary based on patient age and age at diabetes diagnosis.

Methods

Over 7 months, adolescent patients were recruited during outpatient endocrinology appointments. Participants completed a survey in the clinic using REDCap, which collected basic demographic data and responses to several validated screening tools used to assess disordered eating (DESPR), weight bias internalization (WBISM), and weight-based teasing (WBT questions from Project EAT). Each screening tool had a defined minimum score to indicate a concerning finding. Participants were grouped by age at participation (early teens: 11-15 years; late teens: 16-18 years) and by age at diabetes diagnosis (before puberty: <9 years; after the onset of puberty: ≥9 years). Chi squared tests were used to compare the prevalence of concerning findings between groups.

Results

Among the 189 participants, 24% showed some eating or weight-based concern, as indicated by elevated scores on the DEPSR, WBISM, or WBT tools. There was no signficant difference in the prevalence of concerns between the early teens (n=126) and late teens (n=63) (24.6% vs 22.2%, p=0.796). Similarly, no difference was observed between those diagnosed before puberty (n=97) and those diagnosed after puberty (n=92) (21.6% vs 26.1%, p= 0.532).

Conclusions

The findings suggest no apparent correlation between disordered eating and weight bias internalization with either age or age at diabetes diagnosis in adolescents with type I DM. These results highlight the importance of screening all adolescents, regardless of age or age at diagnosis, for problematic relationships with body image and food. Further research is needed to explore other factors influencing these outcomes.

Supported By**:** *UConn School of Medicine Summer Research Fellowship*

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Evaluation of antenatal syphilis screening in Gulu and Kisoro, Uganda

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Background/Objectives:
Adverse birth outcomes in Uganda remain high, with maternal syphilis a significant contributor. Despite Ugandan guidelines recommending universal syphilis screening at the first antenatal care (ANC) visit, gaps in adherence persist, potentially leading to preventable outcomes. This study evaluated knowledge, attitudes, and barriers to syphilis screening among ANC providers in Kisoro and Gulu districts. By comparing urban (Gulu) and rural (Kisoro) health care (HC) settings, we sought to identify site-specific challenges to guideline adherence that would inform interventions to increase screening rates and improve birth outcomes.

Methods:
Between June and August 2024, data were collected from 150 ANC providers across level 2–5 health centers in Kisoro and Gulu selected for geographic and facility diversity. Participants completed a 20-minute survey assessing knowledge, attitudes, practices, and barriers to syphilis screening within the context of Uganda guidelines.

Results:
Knowledge of appropriate screening and treatment for gestational syphilis was high, with 93.3% and 97.3% of respondents in Gulu and Kisoro, respectively, identifying the correct treatment. Providers in both districts generally felt their training adequately prepared them to treat syphilis in pregnant women. Overall, a higher HC level was significantly associated with greater understanding of the importance of informing patients about screening. Providers at higher HC levels in Gulu reported lower levels of partner testing of seropositive patients. Significant barriers to screening remain, including testing availability and lack of testing of children and partners of women with untreated syphilis. Evaluation of neonates for congenital syphilis was limited.

Conclusions:
Significant associations were observed between facility level and providers' beliefs about informing patients and encouraging partner testing. Overall, providers in Gulu reported more barriers to syphilis screening than those in Kisoro. Further investigation of the efficacy of Uganda treatment guidelines in preventing congenital syphilis is needed. Targeted interventions should address identified barriers and improve adherence to screening and treatment protocols.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Pediatric Sinogenic and Otogenic Intracranial Infections Requiring Neurosurgical Intervention in the Era of COVID-19: A North American Multicenter Study

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Background/Objectives: The CDC identified an increase in pediatric intracranial infections following the COVID-19 pandemic. However, the analysis relied on an administrative database that lacked patient-level data. Given the potential complications of inadequate or delayed treatment of bacterial sinusitis or otitis media, determining the true impact of SARS-CoV-2 on the incidence and severity of secondary intracranial bacterial infections will guide optimal diagnostic and therapeutic regimens. The goal of this project was to study the incidence and severity of sinogenic and otogenic intracranial infections before and during the COVID-19 pandemic.

Methods: A retrospective, 31-center, repeated cross-sectional North American study. Pediatric patients who underwent a neurosurgical procedure for a sinogenic or otogenic intracranial infection from January 2015-March 2023 were identified. Information about demographics, hospitalization, and outcomes was collated. An interrupted time-series analysis was used to determine the incidence of pediatric sinogenic or otogenic intracranial infections requiring neurosurgical intervention.

Results: Of 638 patients who met inclusion criteria, 279 (43.7%) presented over a 5-year period pre-COVID-19 and 359 (56.3%) presented over a 3-year period during the COVID-19 pandemic. There were no differences in age, sex, race or ethnicity. More patients had public insurance during COVID-19 ($p=0.004$). Patients presented with facial swelling ($p=0.034$) and/or confusion ($p<0.001$) more frequently during COVID-19. During the pandemic, there were more otolaryngological procedures performed in addition to neurosurgical procedures ($p=0.026$), and more craniectomies were performed as the initial neurosurgical procedure ($p=0.016$). Overall, outcomes between the periods were similar.

Conclusions: This North American multicenter study demonstrated a significant increase in the incidence of sinogenic and otogenic intracranial infections requiring neurosurgical intervention during the COVID-19 pandemic. Patients had more complex clinical presentations, were more likely to undergo otolaryngological intervention, and were more likely to develop septic CVST during the pandemic, but it remains to be seen if these changes will be transient.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Addressing Health-Related Social Needs in HIV-Positive Patients: A Quality Improvement Initiative

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Background/Objectives
HIV-positive individuals face significant health-related social needs (HRSNs), such as housing instability, food insecurity, and financial hardship, which adversely affect health outcomes (Aidala et al., 2016). Despite the support of programs like the Ryan White HIV/AIDS Program, a lack of comprehensive data on HRSNs hinders targeted resource allocation (HRSA, 2023). At the UConn Health HIV clinic, screenings for HRSNs are done on select individuals. We launched a quality improvement initiative to identify and address HRSNs on a population scale, aiming to improve care delivery and equity.

Methods:
From June to October 2024, all HIV-positive patients receiving care at the UConn Health Infectious Disease Clinic were included in this quality improvement initiative. The validated PRAPARE (Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences) tool was used to systematically screen for HRSNs. Screenings were conducted in the clinic during patients' medical appointments, by two trained medical students.

Results:
During the study period, 120 patients were screened, with 70% (n = 83) reporting at least one unmet HRSN. The most common needs included food insecurity (49%; n = 59), difficulty paying healthcare or medications (43%; n = 52), and challenges paying utility bills (42%; n = 51). Additionally, 18% (n = 22) experienced transportation barriers to medical appointments, and 16.5% (n = 20) face housing insecurity. Among those with unmet needs, 75% (n = 62) requested assistance and were referred to case management.

Conclusion:
This QI initiative demonstrated the feasibility and impact of integrating systematic HRSN screening and resource referrals into routine HIV care. The involvement of trained medical students ensured effective screening and patient connection to localized resources. While existing community resources addressed many needs, gaps remain in areas like housing and transportation. Future efforts will focus on building targeted interventions to address unmet needs, enhancing equity and sustainability in HIV care.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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A Detailed Methodology for Evaluating tTTN Gene Variants and Their Correlation to Atrial Fibrillation in the UK Biobank

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Abstract

Atrial fibrillation (AFib) is a common condition among adult patients. Currently, there exists minimal published information regarding variants of genes encoding major sarcomere proteins and their association with AFib, especially titin (TTN) gene variants. Our study investigates the association between truncating titin (tTTN) gene variants and atrial fibrillation (AFib) in adult patients. Using data from the UK Biobank, we aim to determine if patients with AFib have a higher prevalence of tTTN variants compared to those without AFib. We will compare patients with AFib and tTTN variants to those without AFib and tTTN variants, considering age (18-49 vs. 50-80 years old) and sex (male vs. female) as moderating variables. Statistical analysis will include chi-squared tests, odds ratio estimation, and logistic regression models. Our hypothesis suggests an increased prevalence of tTTN variants in patients with AFib. This research contributes to understanding the genetic underpinnings of AFib, potentially informing personalized treatment strategies.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Exploring the Impact of Artificial Intelligence Integration in Pediatric Healthcare for Patient Education

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Background/Objectives:

Patient centered care has been at the forefront of healthcare initiatives, with comprehensive patient education being a key component. Patient education is crucial in pediatric healthcare, ensuring caregivers are well-informed about their child's condition and treatment options. However, there is a large gap in health education for this population. Current education materials lack personalization and accessibility, leading to caregivers feeling overwhelmed and poorly informed about their child's medical condition. This lack of understanding can lead to miscommunication between provider and patient, potentially causing inadequate care and poor health outcomes. Artificial intelligence (AI) may offer potential solutions towards bridging gaps in pediatric patient education. Despite this extensive potential, the perception and acceptance of AI-generated education materials in pediatric healthcare settings remains unclear.

Methods:

Through this exploratory research study, key informant interviews and focus groups were used to assess providers' perceptions of gaps in pediatric patient education, gauge understanding of AI and its growing presence in healthcare and evaluate the potential for AI to bridge any identified gaps in pediatric patient education.

Results:

Analysis of key informant interviews and focus groups revealed several themes. Effective communication was identified as a cornerstone of successful patient education. However, participants noted significant gaps, including time constraints, language barriers, and low health literacy, which limit the effectiveness of current educational efforts. While familiarity with AI varied, those acquainted with the technology expressed optimism about its potential to alleviate time burdens and support personalized education. Despite this promise, concerns were raised about implementation challenges, fears of patient hesitancy to adopt AI-generated content and the risk of overreliance on technology.

Conclusions:

The insights gained from this study underscore both the potential and challenges of integrating AI into pediatric patient education. Ultimately, this study highlights the promise of AI to enhance educational practices while reinforcing the need to address key barriers to its successful implementation.

Supported by: The UConn School of Medicine Summer Research Fellowship

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An Exploration of the Relationship Between COVID-19 and Cancer Recurrence at a Small Connecticut Hospital

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Background/Objectives
Cancer tumor cells can enter a state of dormancy, becoming undetectable on routine tests. An exit from dormancy equates to cancer recurrence, the mechanism of which is not yet fully understood. Inflammation may disrupt tissue homeostasis and establishes an unstable environment, allowing cancer cells to reactivate. Our aim was to investigate the relationship between COVID-19 and cancer recurrence to add to the growing literature surrounding COVID-19's far reaching impacts.

Methods
We performed a chart review through EPIC of 2,643 patients who were diagnosed with cancer at JDH between January 1, 2017 – December 31, 2023. Cancer diagnoses and recurrences were recorded based on ICD-10 codes. Positive COVID-19 results were recorded based on in-person and self-reported documentation. Only patients who had a recurrence after March 9, 2020 – when COVID-19 testing was readily available in America – were included in the analysis. Analyses included comparisons of demographics, cancer type, cancer recurrence, COVID-19 status, and time to recurrence. Appropriate statistical tests and corrections were made.

Results
625 patients had a positive COVID-19 test (23.7%), 99 patients' cancer recurred (3.8%), and patients who experienced a recurrence in their cancer were less likely to have a positive COVID-19 test (12.1% versus 24.1% of patients without recurrence, p=0.03). Patients with a positive COVID-19 test were 0.39 times as likely to experience a recurrence in their cancer (p=0.003). The median time to recurrence was twice as long for patients with a positive COVID-19 test compared to patients with a negative test or none on record.

Conclusions
We found a negative correlation between COVID-19 infection and cancer recurrence. Substantially more patients with cancer who had documented COVID-19 infections, compared to those who did not, did *not* have their cancers recur. This may be due to a protective effect of inflammation and potential increased immune surveillance in the inflammatory context.

Supported By: *UConn School of Medicine Summer Research Fellowship*

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Analyzing Racial and Ethnic Disparities in Obstetric Emergency Department Visit Outcomes Before and During the Coronavirus Pandemic

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Background/Objectives:

BIPOC communities face a higher risk of pregnancy-induced hypertension (PIH) and gestational diabetes (GDM). Both increase the risk for fetal/neonatal/maternal complications and death. Research on how COVID-19 impacted pregnancy-related outcomes is limited. This study analyzed pregnant females 18-35 years old captured in the Nationwide Emergency Department Sample (NEDS) to determine racial and ethnic disparities in obstetric-related ED visits before (2019) and during (2020) the COVID-19 pandemic.

Methods:

Descriptive statistics were calculated using univariate and bivariate analysis. Rates were calculated per 1,000 ED visits. Racial disproportionality was measured using the disproportionality representation index (DRI). Racial disparity was measured using the disparity index (DI).

Results:

NEDS captured 61.1 million ED visits in 2019 and 2020, representing 266 million ED visits. Of these, 6,649,312 (2.5%) were pregnancy-related. Pregnancy occurred most in NHW (40.4%); the median age was 26 years. Total and pregnancy-related ED visits decreased between 2019 and 2020; there was an increase in the rate of pregnancy-related ED visits among individuals identifying as Other (7.6%) and Hispanic (5.2%).
Before COVID-19, all BIPOCs were more likely to have a GDM-related ED visit compared to NHW. The disparity was exacerbated for all racial/ethnic groups except AIAN during COVID-19. NHB and Hispanic individuals were more likely than NHW to have a PIH-related ED visits before and during COVID-19. All others were less likely than NHW to have a PIH-related ED visit before and during COVID-19.

Conclusions:

This study showed the negative impact of COVID-19 on preexisting disparities in obstetric ED utilization for GDM and PIH. While there are variations in DIs between racial/ethnic groups over time, the data shows these outcomes may be aggravated during public health emergencies. In the future, strategies to reduce morbidity in public health emergencies must incorporate cultural competency and cultural humility to reach disproportionately impacted groups.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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A Retrospective Chart Review of Respiratory Syncytial Virus Epidemiology in Adults

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Background:
Respiratory syncytial virus (RSV) causes significant morbidity across all age groups, with annual U.S. peaks in late fall to early spring. It is a leading cause of pediatric hospitalizations and poses a substantial burden on older adults, resulting in up to 160,000 hospitalizations and 10,000 deaths annually. This study examined clinical manifestations, risk factors, and outcomes of RSV in hospitalized adults in Hartford, Connecticut, over four RSV seasons.

Methods:
A retrospective chart review was conducted on 118 laboratory-confirmed RSV-positive adult patients (≥18 years) hospitalized at UConn John Dempsey Hospital from July 2020 to June 2024. Data were extracted from electronic medical records, including only adults with complete inpatient records and RSV confirmed via Rapid Antigen, CEPHEID, or Panther Fusion tests.

Results:
Patients were stratified into four risk groups: Immunocompromised (n=9), Comorbid Lung Disease (n=46), Older Adults aged ≥65 (n=43), and Other Adults (n=20). The median age of those hospitalized was 77 years, with males comprising 43%. Dyspnea was notably prominent in Comorbid Lung Disease patients (76%) and Older Adults (58%). Never-smokers (n=66) had longer average hospital stays (5.9 vs. 5.3 days) and higher ICU admission rates (15.2% vs. 13.5%) than ever-smokers.

Older Adults and Comorbid Lung Disease patients experienced the greatest clinical burden, with prolonged hospital stays (>3 days) being most common in these groups (n=30 and n=28, respectively). ICU admissions occurred in 14% of cases, highest among Immunocompromised patients (22%) and Older Adults (16%). High supplemental oxygen use (78% in Comorbid Lung Disease, 67% in Older Adults) and extended antibiotic treatment underscored RSV severity and risks of secondary infections.

Conclusion:

RSV significantly impacts hospitalized adults, particularly those with comorbid lung disease and older adults. Findings underscore the importance of vaccination, early detection, and risk stratification to mitigate morbidity and optimize outcomes.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Improving Early Pregnancy Care at UConn Health with Patient's Accessing the Emergency Department

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Background/Objectives:
Patients with early pregnancy problems often seek care in the Emergency Department (ED). Previous studies have indicated poorer perceptions of miscarriage care in the ED versus in outpatient clinics. The purpose of this quality improvement study was to collect baseline data of early pregnancy care in the ED to design a program that addresses patient satisfaction, ensures safe and timely care and is cognizant of health disparities.

Methods:
As per the Plan-Do-Study-Act framework, baseline data was obtained through electronic medical record review of ED encounters from 01/01/2023 - 12/31/2023 with primary diagnoses of threated and confirmed miscarriages in patients < 12 weeks gestational age. Data included demographics, attempted outpatient phone calls, previous miscarriage history and previous UConn Health patient. Phone interviews provided qualitative data regarding reasons for accessing care through the ED versus outpatient settings.

Results:
There were 95 total chart reviews for 64 unique patients with mean age of 28: 53.1% of patients identified as "Hispanic or Latino" ethnicity. While almost 6 out of 10 patients were previously established at UConn Health, only 21.1% of encounters had attempted phone calls before their ED visit and most ED visits occurred outside of standard clinic hours. For follow-up, 66% had outpatient follow-up at UConn Health, but 17% had multiple ED visits before that follow-up. One patient had a ruptured ectopic 6 days after an initial ED visit. Qualitative interviews revealed that patients present to the ED due to ease of access, hours/availability and lack of knowledge of outpatient urgent openings.

Conclusions:
Patients with early pregnancy problems were more likely to not call before an ED visit, regardless of whether they were a UConn patient or not. Future directions include developing standardized follow-up for patients presenting to the ED, educating established patients about the EPAU and improving care for patients of Hispanic or Latino ethnicity. (300)

Supported by: UConn School of Medicine Summer Research Fellowship

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Impact of Donor Cause of Death and Geographic Location on Recipient Mortality Post Heart Transplant- a UNOS Database Review

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Background/Objectives

It is unclear whether heart donor cause of death (CoD) influences recipient mortality and if cardiovascular risk varies by region. By analyzing the UNOS database, it can be determined if donor CoD impacts recipient post-transplant mortality and if regional differences influence cardiovascular health.

Methods

The United Network for Organ Sharing (UNOS) registry was queried for adult heart transplant recipients and donors from 1987 to 2023 in Southern, Western, Northeastern, and Midwest states. Donors were grouped by CoD, including anoxia, gunshot wounds/trauma (GSW), intracranial bleed/stroke (IS/B), and other causes of death. Unadjusted and adjusted mortality was compared.

Results

Of the 51,591 patients included, GSW donors accounted for the smallest number of donors (17.3%, $p < 0.001$), female donors (6.70%, $p < 0.001$), and the youngest patients (28.54 ± 9.09, $p < 0.001$). IS/B donors had the highest donor age (41.06 ± 10.43, $p < 0.001$) and female donors (48.13%, $p < 0.001$). Mortality at 30 days, 1 year, and 5 years varied significantly according to CoD ($p<0.001$). Recipients of IS/B hearts had worse mortality rates 30 days, 1 year, and 5 years post-transplant (6.54%, 14.68%, and 30.12%) while recipients from GSW donors had the best mortality rates (4.55%, 11.63%, and 26.73%). When adjusting for covariables and mortality by region compared to the Northeast, the South had the increased mortality (hazard ratio [HR] = 1.1, 95% confidence interval [CI] = 1.06-1.14, $p < 0.001$) and the West had decreased mortality (HR = 0.93, 95% CI = 0.89-0.97, $p < 0.001$). When comparing other donor CoD to GSW, IS/B, and anoxia within each region, there were no significant differences in mortality.

Conclusions

This study looked at geographical differences in donor CoD and mortality rates. The mortality of heart transplant recipients varies according to donor CoD, even when adjusted for different regions. No significant differences were observed when analyzing regions individually according to donor CoD.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Assessing Feasibility and Attitudes Towards a 90-Second Animated Gestational Diabetes Mellitus Video in Women Recently Diagnosed with Gestational Diabetes Mellitus

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Background/Objectives:
Currently, educational materials for gestational diabetes are primarily brochures or pamphlets, which may be difficult to understand for patients with lower health literacy or those for whom English is a second language. Previous studies have shown that animated health materials are more engaging and effective in educating individuals with varying levels of health literacy. This study aimed to evaluate the feasibility and patient attitudes toward using animated videos for education on gestational diabetes.

Methods:
Women diagnosed with gestational diabetes mellitus who received care at UConn Health Maternal-Fetal Medicine were recruited over 6 weeks. 8 participants were included in the study. Participants were asked to rate their general medical knowledge, their knowledge of gestational diabetes, and their preference for animated educational videos versus informative websites. They were then shown a short animated video about gestational diabetes, followed by the ACOG brochure on gestational diabetes. Afterward, participant ratings of the animated video's and brochure's creativity, informativeness, interest, reassurance, appeal, and pleasantness were scored using a 7-point Likert scale. Paired T-tests determined if the difference in scores of appeal, creativity, and informativeness for the animated video and ACOG brochure were statistically significant.

Results:
The average creativity score for the video was 6.0 (n = 8), while the brochure's average score was 5.5 (n = 8). This difference was not statistically significant (p = 0.1036). Regarding reassurance, the video scored an average of 6.0 (n = 8), compared to 5.875 for the brochure (n = 8), with no statistically significant difference in participants' perceptions of reassurance (p = 0.3506). Lastly, there was no statistically significant difference in participants' preference for animated educational materials over brochures in terms of engagement (p = 0.3506).

Conclusions:
In contrast to previous studies, there was no statistically significant difference in patient preference for animated educational materials versus educational brochures.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Determining the Mechanism by Which Maternal Illness Uncertainty Contributes to Child Illness Uncertainty in Children and Adolescents with Epilepsy

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Background/Rationale
Illness uncertainty occurs when illness-related events are unclear to patients and families, Epilepsy is a very uncertain disease with inconsistent symptoms and breakthrough seizures of multiple classes. Research has shown a positive correlation between increased levels of illness uncertainty and psychological stress in chronic illnesses. 25% of children with epilepsy experiencing depression, but this rate is grossly under-reported. This study aims to solidify the relationship between maternal illness uncertainty and depressive symptoms in pediatric epilepsy patients, and to identify the link between maternal and pediatric illness uncertainty.

Methods
The pediatric patients (N=100) will complete surveys assessing depressive symptoms (CES-DC) and illness uncertainty (CUIS), while the patient's mothers (N=100) will complete surveys assessing illness uncertainty (PUIS), experiences (PECI), and miscarried helping (HHI). The scales are scored as followed:

CES-DC: 0-60 | CUIS: 23-155 | PUIS: 23-155 | PECI: 0-100 | HHI: 5-75

Statistical analysis will involve serial mediation models between maternal uncertainty and child uncertainty through the both the HHI and PECI surveys. Regression analysis will be used to identify relationships between uncertainty scores and the associated surveys for the child and mother. There is an optional interview assessing how children perceive their mother's experiences that will explore themes of a lack of knowledge, perceived noncontingency between treatment and outcomes, and dissatisfaction with care. This will be analyzed through thematic qualitative analysis.
This method utilized surveys only validated for ages 7-17 and only recruited patient-mother dyads.

Impact
This method will provide a new framework for healthcare professionals to assess epileptic patient's experience. If patients screen positive on existing screening tools, such as the PHQ-9, this will signal providers to assess their patients' understanding of epilepsy and ensure complete understanding.
Investigating ways to reduce depressive symptoms is important as 25% of patients with epilepsy express suicide ideation and have a 3X higher completed suicide rate.

Supported by: *UConn School of Medicine Summer Research Fellowship, American Academy of Neurology Institute Medical Student Research Scholarship*

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Characteristics of Patients with Residual Hypersomnia and Obstructive Sleep Apnea Treated with PAP Therapy

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Background/Objectives
Excessive daytime sleepiness is a significant symptom of obstructive sleep apnea (OSA) defined as unintentional sleepiness or inability to stay awake during the day, leading to adverse effects on mood, cognition, and daily functioning. Positive airway pressure (PAP) therapy is the primary treatment for OSA; however, 9-22% of patients continue to experience residual excessive sleepiness (RES) despite adherence. This study evaluated OSA patients with and without hypersomnolence treated with PAP therapy, focusing on demography and wake-promoting agent/CNS stimulant use to improve RES recognition and management.

Methods
This descriptive retrospective chart review included adult patients (≥18 years) seen at the UConn Health Pulmonary/Sleep Medicine Clinic from January 2021 to July 2024. This study included patients diagnosed with OSA and hypersomnolence and excluded patients with other sleep disorders. PAP therapy adherence was defined as “adherent” (≥70% of nights for >4 hours), “effective” (Apnea-Hypopnea Index <5), and “adequate” (both adherent and effective). Data were collected using EPIC SlicerDicer and analyzed with Microsoft Excel. Fisher’s exact tests explored differences between patients with and without hypersomnolence, adjusting for multiple comparisons with the Hommel method.

Results
Of 4247 OSA office visits over 3.5 years, 549 patients were also diagnosed with hypersomnolence. Patients with hypersomnolence were 1.6x more likely to be 35-45 years old ($p=0.002$), 1.3x more likely female ($p=0.02$), 1.4x more likely divorced/separated ($p=0.05$), and 1.3-1.7x more likely to lack insurance information ($p<0.04$). These patients were 2x more likely to be prescribed WPAs ($p=0.03$) but showed no difference in CNS stimulant use ($p=0.65$). Further analysis on RES and PAP adherence is ongoing.

Conclusion
Preliminary data suggest patients with hypersomnolence in OSA are more likely to be female, aged 35-45, divorced/separated, lack insurance information, and be prescribed WPAs. Ongoing analysis aims to clarify pharmacologic treatment effects and identify high-risk profiles to improve RES recognition and management in OSA patients.

Supported By: *UConn School of Medicine Summer Research Fellowship*

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The Impact of Socioeconomic Factors on Reported Pain Outcomes in Patients with Knee Osteoarthritis Indicated for Steroid Intra-Articular Injection

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Background/Objectives
Knee osteoarthritis (OA) is a prevalent and debilitating condition affecting millions in the United States. Intra-articular steroid injection (IASI) is a common nonsurgical management for symptom relief, yet outcomes vary based on patient characteristics. Socioeconomic status, quantified using the Area Deprivation Index (ADI), has been associated with health disparities, including chronic pain. This study aims to evaluate the relationship between ADI and reported pain outcomes following IASI in patients with knee OA. We hypothesize that patients from disadvantaged neighborhoods, as measured by higher ADI scores, will experience less pain relief after IASI.

Methods
This study is a prospective observational cohort design involving adult patients diagnosed with symptomatic knee OA and scheduled for unilateral IASI at UConn Health. Pain intensity will be assessed using the validated Numerical Rating Scale (NRS) at baseline and at 24 hours, 2 weeks, 4 weeks, and 8 weeks post-injection. Patient socioeconomic status will be determined using the Area Deprivation Index (ADI), which incorporates factors such as income, education, housing quality, and employment to quantify neighborhood disadvantage. Participants will be enrolled through Dr. Schafer's and Dr. Hall's clinics and consented prior to their treatment. A total of 50 participants will be recruited to ensure adequate power for detecting meaningful associations. Statistical analyses, including Spearman's correlation and multivariable regression modeling, will evaluate the relationship between ADI and changes in NRS scores over time.

Results
Preliminary data collection is underway, and results may be available by the Research Day.

Conclusions
This study will elucidate whether ADI serves as a reliable predictor of pain relief following IASI for knee OA. Findings may inform personalized treatment approaches and policy initiatives to address health disparities in OA management.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Rescue of Corneal Schwann Cell and Axon Networks by Tobradex in Chemical Injury

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Background & Objectives

Current approaches for management of chemical injury focus on the restoration of corneal fibrosis. However, corneal sensory dysfunction is also a major unmet medical need in chemical injury. Here we examine a potent dexamethasone formulation, Tobradex (TBX) for its effects on axons and corneal Schwann cells (cSC) in nitrogen mustard (NM) injury.

Methods

Proteolipid protein 1 enhanced green fluorescent protein transgenic mice of both sexes aged 4-6 months were injured using topical 1% NM. Corneal mechanosensitivity (CM) was assessed via Cochet-Bonnet esthesiometry. Injured mice (n=16, 8/group) received topical TBX (0.3% Tobramycin, 0.1% Dexamethasone) or tobramycin 2x/day for 4 weeks. Mice underwent weekly CM testing and slit lamp microscopy on days 7- 28. cSC and axon networks were assessed via immunostained corneal whole mounts and composite images assembled with Leica software. Data was analyzed using two-tailed unpaired T-tests, and Mann-Whitney U-Tests.

Results

TBX-treated mice exhibited significant restoration of CM compared to Tobramycin at all time points: day 7 (5.86 vs. 5.34, $p=0.0052$), day 14 (5.78 vs. 4.81, $p=0.029$), day 21 (5.78 vs. 4.41, $p=0.002$), and day 28 (5.75 vs. 4.19, $p<0.001$). TBX-treated mice exhibited significantly lower corneal opacity compared to the tobramycin group: day 7 (0.25 vs. 1.75, $p<0.0002$), day 14 (0.13 vs. 2.25, $p<0.00002$), day 21 (0.38 vs. 2.88, $p<0.0001$), and day 28 (0.38 vs. 2.75, $p<0.0005$). On day 28, TBX significantly restored stromal axon length (310.80 vs 158.99, $p=0.0079$) and cSC network length (201.64 vs 90.25, $p=0.0476$) compared to tobramycin. No sex-specific differences were found in effects of TBX or tobramycin.

Conclusions

TBX treatment provides a significant, continuous benefit to recovery of CM following NM injury through improvement of both cSC and axon network length. This suggests that TBX promotes enhanced preservation and regeneration of cSC and axonal networks after damage, supporting their possible role in maintaining and restoring corneal sensory function.

Supported by: R21EY035976 grant, *The UConn School of Medicine Summer Research Fellowship*

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Patient Experiences in Accessing Reproductive Health Services Across the Reproductive Health Life Course for Women with Cognitive, Intellectual, and Developmental Disabilities: A Systematic Review

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Objective:
Utilizing a life course perspective and socio-ecological model to evaluate the experiences of individuals with cognitive, intellectual, and developmental disabilities accessing sexual reproductive health services.

Methods:
A systematic search was conducted in databases including PubMed, EMBASE, Scopus, CINAHL, BIOSIS Citation Index, and Academic Search Premier, as well as grey literature including CDC, WHO, and AAIDD for studies published between January 2010 through June 2024 and written in English. Risk of bias was assessed using several tools: NIH Quality Evaluation Tool), Critical Skills Appraisal Program Checklist, and the Mixed-Method Appraisal Tool. Certainty of evidence was assessed using Grading of Recommendations, Assessment, Development, and Evaluations for quantitative studies and Confidence in the Evidence from Reviews of Qualitative Research for qualitative studies.

Results:
The final data synthesis included 26 articles. SRH service categories included preventative care (8 studies), puberty/menarche (1 study), family planning (8 studies), pregnancy and fertility (7 studies), reproductive cancer treatment (1 study), and general SRH services (1 study). Studies reported lower rates of receipt of preventative care services, decreased use of contraception, increased rates of sterilization, and worse obstetric outcomes for individuals with cognitive, intellectual, or developmental disabilities. The role of caregiver support was a strong interpersonal factor in the studies and caregiver perspectives were well represented in the literature. Patient perspectives were underrepresented in the literature.

Conclusions:
This review revealed a need for more studies exploring the patient perspective of individuals with intellectual, developmental, or cognitive disabilities accessing sexual reproductive health services as well as a paucity of research on the crucial life stages of puberty/menarche and menopause. Policy implications include increasing availability of formal supports for caregivers.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Knowledge, Attitudes, Barriers, and Practices Survey on Therapeutic Hypothermia for Perinatal Asphyxia among Healthcare Professionals in the Kisoro and Gulu districts of Uganda

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Background/Objectives: Perinatal asphyxia significantly threatens newborns, particularly in regions with limited maternal-fetal care. Neonatal hypoxic-ischemic encephalopathy (HIE), a consequence of perinatal asphyxia, can cause severe neurological damage if untreated. Therapeutic hypothermia is an effective intervention for HIE, demonstrated by the Brain Rescue of Infant with Graded Hypothermia Therapy (BRIGHT) program in Kampala, Uganda. However, this treatment remains inaccessible in many other regions of Uganda. This study assessed healthcare providers' knowledge, attitudes, and practices (KAP) regarding birth asphyxia management and therapeutic hypothermia in the rural district of Kisoro and the urban district of Gulu.

Methods: A KAP survey was administered to 200 healthcare providers (75 in Kisoro, 125 in Gulu) from June to August 2024. Data included knowledge, attitudes, and practices regarding neonatal care, alongside demographics. Providers under 18 or non-English speaking were excluded. Composite scores for major concepts were calculated. SPSS v.29 was used for data analysis, including descriptive statistics, independent t-tests to compare responses between Kisoro and Gulu, and Pearson's r correlations to explore relationships.

Results: While most participants demonstrated high knowledge of birth asphyxia (mean scores: 13.15 Kisoro, 13.06 Gulu; $p < .001$), gaps in therapeutic hypothermia knowledge persisted. Providers showed willingness to improve HIE management (mean scores: 12.99 Kisoro, 12.42 Gulu; $p < .001$). However, fatalistic beliefs potentially hindered interventions (mean scores: 5.20 Kisoro, 4.97 Gulu; $p < .001$). Reports of barriers to care were found to be more significant in Kisoro, with providers expressing concerns about therapeutic hypothermia feasibility (mean scores: 3.60 Kisoro, 3.08 Gulu; $p = 0.041$).

Conclusions: Knowledge gaps, resource limitations, and fatalistic beliefs challenge therapeutic hypothermia implementation, with barriers more pronounced in rural Kisoro. Addressing these through targeted training and resource improvements is critical to enhancing neonatal care in Uganda.

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Identifying Deprescribing Opportunities with Large Language Models in Older Adults

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Background/Objectives
Polypharmacy, the concurrent use of multiple medications, is common in older adults and associated with increased risks for adverse drug events (ADEs). Deprescribing is the systematic process of discontinuing potentially inappropriate medications (PIMs). This study evaluates the performance of a large language model (LLM)-based pipeline in identifying deprescribing opportunities for older emergency department (ED) patients, using 3 different sets of criteria: Beers, Screening Tool of Older People's Prescriptions (STOPP), and GEMS-Rx.

Methods
We conducted a retrospective cohort study of older adults presenting to a large academic medical center ED in New Haven, CT from January-March 2022. A random, convenience sample of 100 patients (712 total oral medications) was selected. The LLM pipeline consisted of two steps: (1) filtering relevant high-yield deprescribing criteria, and (2) applying criteria to patient data to recommend deprescribing. Model recommendations were compared to those of senior medical students, with discrepancies adjudicated by ED physicians.

Results
The LLM had high accuracy in identifying deprescribing criteria (PPV: 0.83; NPV: 0.93) but was less accurate in making specific deprescribing recommendations (PPV: 0.47; NPV: 0.93). Adjudication showed the model excelled at identifying deprescribing criterion relevant to the patient's medications, but it struggled with applying that criterion to the specific patient case due to complex inclusion/exclusion criteria (54.5% of errors) and ambiguous clinical contexts (e.g. missing information; 39.3% of errors).

Conclusion
This study highlights the potential of LLMs to support deprescribing decisions in the ED by effectively filtering relevant criteria. However, there are still challenges with applying these criteria to complex clinical scenarios, as the LLM demonstrated poor performance on more intricate decision-making tasks. The findings underscore the need for clearer deprescribing guidelines, improved LLM calibration for real-world use, and integration of human-AI workflows to balance AI recommendations with clinician judgment.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Monocyte-Derived Macrophages Regulate the Progression of Metabolic Dysfunction-associated Steatotic Liver Disease

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Background/Objectives: Metabolic dysfunction-associated steatotic liver disease (MASLD) becomes the most common type of chronic liver disease worldwide, affecting more than 25% of the global population. Cellular and molecular mechanisms underlying the pathogenesis and progression of MASLD remains to be studied.

Methods: Wild-type C57BL/6J mice were fed with a choline-low high-fat and high-sugar diet (CL-HFS) to induce the mouse MASLD model. Real-time PCR (qPCR) was applied to check different gene expression in liver tissues. Flow cytometry analysis was applied for measuring cellular change during MASLD progression from isolated liver non-parenchymal cells (NPCs). Hematoxylin and eosin (H&E), Sirius red staining, and immunohistochemical (IHC) staining were applied to check histological changes of MASH livers. Statistical analysis of data was performed by Mann–Whitney test (two-tailed) or one-way ANOVA with Tukey's multiple comparison test using GraphPad Prism 8 software.

Results: CL-HFS consumption induced MASH in mice at week 12, with typical features human MASH: (1) the infiltration of inflammatory cells, accumulation of lipid droplets, and hepatocyte ballooning detected by H&E staining; (2) significantly increased production of collagen, Sirius red staining detected; (3) significantly increased expression of α-SMA protein detected by IHC, a marker of activated hepatic stellate cells. qPCR detected a significant increase in mRNA expression of extracellular matrix genes including *Col1a1*, *Col4a1*, and *Acta2* and inflammatory cytokine genes including *IL1b*, *Tgfb1*, and *Tnfa* during MASLD progression ($p < 0.05$). Flow cytometry assay revealed that the total population of pan-macrophages was increased in MASLD due to an infiltration of monocyte-derived macrophages ($CD11b^{high}F4/80^{low}$ cells), whereas the frequency of liver resident Kupffer cells was decreased. This increase was associated with the expression of proinflammatory and profibrotic cytokines such as IFN-γ and TGF-β1, which can regulate mouse macrophage cell line RAW264.7 cell polarization.

Conclusions: Monocyte-derived macrophages can replace liver-resident Kupffer cells to contribute the progression of MASLD.

Supported by: *The UConn School of Medicine Summer Research Fellowship, Start-up Funds, and NIH R01 grants.*

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Care-ier to be Screened Today? An Insight on Partner Genetic Screening Uptake Rates

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Objective

We aimed to analyze uptake rates for genetic carrier screening in partners of pregnant people with abnormal carrier screens and investigate reasons for deferred screening.

Study Design

A retrospective cohort analysis was conducted on pregnant patients with positive carrier screens and their partners at a tertiary academic medical center between 6/1/2021 and 5/31/2024 that offers universal access to screening. Inclusion criteria were pregnant people(18+) who tested positive for an autosomal recessive condition in the first or second trimester and underwent genetic counseling. The primary outcome was uptake rates for genetic screening in partners of pregnant people with positive carrier screens. Secondary outcomes were reasons for deferring partner screening. Baseline characteristics were summarized using frequencies and percentages for categorical variables and mean and standard deviation for continuous variables.

Results

During the study period, 701 abnormal genetic screens were identified, of which 587 met inclusion criteria. Most abnormal screens(56.4%) were identified from pan-ethnic screening. The uptake rate of partner screening was 48.04% (33.3% targeted screenings and 60% pan-ethnic panels). 38.9% of partners had discordant positive carrier results for conditions unrelated to pregnant person’s condition. Genetic screening by blood samples occurred in 76.7% of partner tests, the rest being saliva samples. The most common reasons partners deferred genetic screening included perceived low risk of inheritance for the condition(61%) and busy work schedules/life factors(21%).

Conclusion

Our results show that nearly half of partners of pregnant individuals who receive genetic counseling for abnormal carrier screens accept targeted or enhanced genetic screening, mostly through blood sampling. Partners’ perceptions of risk and screening convenience significantly influenced their decisions to defer screening.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Evaluation of antenatal syphilis screening in Gulu and Kisoro, Uganda

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Background/Objectives:
Adverse birth outcomes in Uganda remain high, with maternal syphilis a significant contributor. Despite Ugandan guidelines recommending universal syphilis screening at the first antenatal care (ANC) visit, gaps in adherence persist, potentially leading to preventable outcomes. This study evaluated knowledge, attitudes, and barriers to syphilis screening among ANC providers in Kisoro and Gulu districts. By comparing urban (Gulu) and rural (Kisoro) health care (HC) settings, we sought to identify site-specific challenges to guideline adherence that would inform interventions to increase screening rates and improve birth outcomes.

Methods:
Between June and August 2024, data were collected from 150 ANC providers across level 2–5 health centers in Kisoro and Gulu selected for geographic and facility diversity. Participants completed a 20-minute survey assessing knowledge, attitudes, practices, and barriers to syphilis screening within the context of Uganda guidelines.

Results:
Knowledge of appropriate screening and treatment for gestational syphilis was high, with 93.3% and 97.3% of respondents in Gulu and Kisoro, respectively, identifying the correct treatment. Providers in both districts generally felt their training adequately prepared them to treat syphilis in pregnant women. Overall, a higher HC level was significantly associated with greater understanding of the importance of informing patients about screening. Providers at higher HC levels in Gulu reported lower levels of partner testing of seropositive patients. Significant barriers to screening remain, including testing availability and lack of testing of children and partners of women with untreated syphilis. Evaluation of neonates for congenital syphilis was limited.

Conclusions:
Significant associations were observed between facility level and providers' beliefs about informing patients and encouraging partner testing. Overall, providers in Gulu reported more barriers to syphilis screening than those in Kisoro. Further investigation of the efficacy of Uganda treatment guidelines in preventing congenital syphilis is needed. Targeted interventions should address identified barriers and improve adherence to screening and treatment protocols.

Supported by: The UConn School of Medicine Summer Research Fellowship

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In vivo modeling of a novel TEK:GAB2 fusion oncogene reveals targetable oncogenic signaling pathways in angiosarcoma

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Background/Objectives
Angiosarcomas are rare tumors of endothelial origin with limited treatment options and poor clinical outcomes. In a pediatric patient presenting with a high grade angiosarcoma, a novel TEK::GAB2 oncogenic fusion was discovered by RNA sequencing. To study the TEK::GAB2 fusion in vivo, we successfully created a zebrafish mosaic model that incorporates this gene fusion and develops tumor-like endothelial outgrowths. We sought to characterize molecular features of this fusion oncogene and identify possible therapeutic targets for clinical use.

Methods
Fli1:eGFP endothelial reporter zebrafish embryos were injected with a TEK::GAB2 transposon at the 1-cell stage. Fish were sorted based on early endothelial outgrowth phenotypes and followed throughout development. Protein expression in tissue from fish that developed endothelial masses was analyzed by western blot. Drug treatments using several small molecule inhibitors were performed and incidence, size of outgrowths, and whole-organism toxicity was quantified and compared to control TEK::GAB2 fish treated with DMSO.

Results
TEK::GAB2 transgenic fish develop abnormal endothelial cell masses and act as an in vivo angiosarcoma model with RAS/RAF/MAPK and PI3K/AKT signaling pathway upregulation. Early embryonic drug treatments indicate that several small molecule inhibitors targeting these pathways are effective at reducing outgrowths in a dose-dependent manner.

Conclusions
Zebrafish models are a promising avenue for studying rare gene mutations and selecting effective targeted cancer therapies. Our TEK::GAB2 model reveals a novel fusion oncogene that drives development of abnormal endothelial cell masses and tumors in zebrafish. We describe a targetable oncogenic signaling pathway in angiosarcoma and identify two small molecule inhibitors that show therapeutic responses in vivo which may have clinical efficacy for our pediatric patient.

Supported by:
USC/CHLA Summer Oncology Research Fellowship
NIH R25 CA225513
Samuelsson Foundation
Debbie and Rick Powell and the Concern Foundation for Cancer Research

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Software Versus Cognitive Fusion for the Detection of Clinically Significant Prostate Cancer: Does 'Lesion Density' Matter?

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Background/Objectives
Prior studies have not identified differences in detection rates of clinically significant prostate cancer (csPC) between software-based and cognitive-based targeting during MRI-guided transperineal prostate biopsy (TP-B). We previously reported that software fusion outperformed cognitive fusion in patients with a prior negative biopsy (PNB). We sought to identify variables that may explain improved csPC detection using software fusion in men with PNB.

Methods
Prospectively maintained TP-B databases from five institutions were analyzed. Data on targeting technique (software or cognitive) and reason for biopsy (biopsy naïve [BN], PNB, or active surveillance [AS]) were obtained. Covariates included age, race, PSA, prostate volume, PIRADS score, maximum targeted lesion size, and number of targeted biopsy cores. csPC was defined as grade group ≥ 2 cancer in the targeted biopsy. Multivariable logistic regression was performed.

Results
1,946 patients underwent TP-B (742 software, 1,131 cognitive). In the multivariable model, patients with PNB had a higher rate of csPC detection with software fusion versus cognitive fusion (OR 5.35, 95% CI 1.76-16.27, $p < 0.01$), and no significant differences in detection in BN or AS groups. Prostate size was larger in the PNB group (median 60cc, IQR 40-85) versus the BN (45cc, IQR 32-62) or AS (46cc, IQR 33-65) groups ($p < 0.001$). MRI lesion size relative to total prostate size was smaller in the PNB group (0.020mm/cc, IQR 0.013-0.036) compared to the BN (0.030mm/cc, IQR 0.019-0.046) and AS (0.026mm/cc, IQR 0.017-0.041) groups.

Conclusions
Though software and cognitive fusion TP-B performed similarly in AS and BN cohorts, software fusion identified more csPC in patients with a PNB. Maximum lesion size relative to total prostate size was smaller in the PNB group compared to the BN and AS groups which may explain the observed difference. For patients with a PNB and persistent concern for csPC, clinicians may consider preferential use of software-based fusion techniques.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Initiation and Continuation Rates of Breastfeeding in Patients with Sickle Cell Disease up to One Year Postpartum

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Background/Objectives:
Sickle Cell Disease (SCD) is the most common hemoglobinopathy in the United States. The standard of care for SCD has improved, and thus, more women with SCD are reaching reproductive age and electing to have children. Many adverse events can complicate pregnancy with SCD. Those with SCD are at about a 10-fold increase in their risk of maternal and fetal morbidity and mortality compared to those without SCD.[1] The challenges posed by these maternal complications as well as treatments create barriers to breastfeeding and raise critical questions regarding the initiation and continuation rates of breastfeeding among patients with SCD.

Methods:
A retrospective cohort study (January 1, 2018–July 31, 2023) at UConn John Dempsey Hospital examined breastfeeding initiation and continuation in postpartum patients with and without SCD. Initiation was defined as exclusive breastfeeding postpartum, excluding formula use, and continuation as successful breastfeeding with intent to continue at the 6-week postpartum visit. Two non-SCD patients were matched to each SCD patient. Breastfeeding rates were compared using independent t-tests and chi-square analysis.

Results:
A cohort of 25 SCD patients with singleton pregnancies who received up to one year of postpartum care at UConn Health was identified. Baseline demographics, such as age, parity, and insurance, were similar to the non-SCD group, though SCD patients were more likely to identify as non-Hispanic Black. Breastfeeding intention was comparable (96% vs. 94%, p=0.9523), as was initiation within 7 days postpartum (88% vs. 90%, p=0.9045). However, breastfeeding continuation at 6 weeks postpartum was lower in SCD patients (48% vs. 70%), though not statistically significant (p=0.0629).

Conclusions:
Although we did not observe a difference in breastfeeding intention, initiation, or discontinuation rates between mothers with sickle cell disease and those without, there was a noticeable trend in breastfeeding discontinuation at 6 weeks among SCD patients, which warrants further investigation with a larger population.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Rates of Screening and Treatment of Depression Among Hospitalized Stroke Patients

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Background and Objectives:
Post-stroke depression, with an incidence of 29%, is associated with undesired outcomes and is suggested to be monitored and treated as needed. Since screening practices using PHQ-9 have not been suggested in guidelines, we sought to explore PHQ-9 administration rate, antidepressant prescriptions, and predictors of antidepressants among stroke patients admitted to acute rehabilitation.

Methods:
In this retrospective study, adult stroke patients at a large urban hospital discharged to acute rehabilitation between 01/01/2019 and 06/30/2024 were included. Post-stroke screening was defined as PHQ-9 administration in the acute rehabilitation setting; a ≥5 PHQ-9 score was considered positive for depression and need for antidepressant prescriptions. Descriptive statistics and a multivariate logistic regression of antidepressant prescriptions were performed; a two-sided alpha level of 0.05 was used for hypothesis testing.

Results:
Of 764 qualified patients, the PHQ-9 administration rate was 31.4% (n=240), with no statistically significant difference between ischemic and hemorrhagic stroke (30.8% vs. 33.8%; p = 0.489). Patients admitted to the hospital for stroke from non-healthcare facilities (76.7% vs. 63.4%; p<0.001) and those with extended stays in acute rehabilitation (median 13.0 vs. 12.7 days; p=0.003) were more likely to have PHQ-9 administered. Of 240 with PHQ-9 score(s), 43 (17.9%) had a PHQ-9 ≥5. Of 43 confirmed depression cases, 20 (46.5%) were on ≥1 antidepressant(s). Younger age of stroke, depression history (p=0.003), PHQ-9 administration (odds ratio [OR]: 2.2; p=0.016), and extended acute rehabilitation (OR: 1.1; p<0.001) were positively associated with the likelihood of antidepressant prescriptions during acute rehabilitation.

Conclusions:
PHQ-9 administration for post-stroke depression screening was about 30%. Patients admitted from non-healthcare facilities or with extended stays in acute rehabilitation were more likely to receive PHQ-9 evaluation. Younger age, longer hospitalization, and longer rehabilitation also predicted antidepressant prescription. Findings suggest that post-stroke depression screening could be improved for early diagnosis and treatment, especially among younger stroke patients.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Financial Strain as a Contributor to Cognitive Impairment in Late Life Depression

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Background/Objectives

Major depression in older adults, or Late Life Depression (LLD), is a common debilitating illness that doubles the risk of receiving a dementia diagnosis later in life. Chronic stress and associated hypothalamic-pituitary-axis (HPA) dysfunction is thought to contribute to cognitive decline in LLD. However, the potential effect of an everyday stressor - financial strain - on cognitive impairment in LLD remains understudied. The current study examined the association between financial strain and global cognitive decline in older adults with LLD.

Methods

This is a longitudinal analysis of the association between financial strain and cognitive function using data from two prospective studies investigating psychosocial and neurocognitive predictors of dementia risk in LLD (PI: Steffens). Participants were divided into four groups of financial strain based on the support provided from their money and ability to manage payments; group 1 had no financial strain, groups 2 and 3 had moderate financial strain, and group 4 had maximal financial strain. CERAD score was the measure of global cognition. We examined baseline CERAD and three year change in CERAD between financial strain groups using a one-way Analysis of Covariance (ANCOVA).

Results

Of 502 LLD participants, 242 had complete data at three years and were used in the current analysis. When controlling for age, sex, race, education, and baseline MADRS score, CERAD scores did not significantly vary between groups at baseline. However, ANCOVA did reveal a significant association between financial strain and three year CERAD change score ($p=0.044$); patients with no or little financial strain actually demonstrated statistically significant modest improvement in cognitive performance over time compared to the most financially strained group, which declined in cognitive performance.

Conclusions

Financial strain is a risk factor for cognitive decline in LLD. If stressors like financial strain are mitigated, it may improve global cognition in older adults with LLD over time.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Visit characteristics from emergency departments caring for persons living with dementia: a nationally representative sample

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Background
Persons with Alzheimer's Disease and Related Dementias (ADRD) have increasingly high rates of emergency department (ED) utilization, driven by comorbid conditions, cognitive impairment, and barriers to outpatient care. Understanding demographic factors associated with ED visits among this population is critical to developing targeted interventions, while identifying EDs that frequently manage ADRD patients can help prioritize resource allocation to support their care.

Methods
We conducted a cross-sectional study using 2019 Medicare Part B claims data to quantify ED visits by Medicare beneficiaries with ADRD. Persons with ADRD were identified using the validated 1-year Bynum-Standard Algorithm, and demographic characteristics (age, sex, race/ethnicity, dual-eligibility status) and ED-level factors (geographic region, urbanization, hospital size, teaching status, private equity ownership, and geriatric accreditation) were analyzed. Group differences assessed using Mann-Whitney U and Kruskal-Wallis tests.

Results
Among 3,178 EDs, Medicare beneficiaries with ADRD accounted for a median of 15.6% of all ED visits among beneficiaries. Utilization was highest among beneficiaries aged 85+ (32.2%; $p < 0.0001$), female sex (16.6%; $p < 0.0001$), and those with dual eligibility for Medicare and Medicaid (30.6%; $p < 0.0001$). ED visits by Medicare beneficiaries with ADRD were proportionately greater with larger hospital size (small: 14.8%, medium: 15.9%, large: 15.6%; $p < 0.0001$) and teaching status (teaching hospitals: 14.8%, non-teaching hospitals: 15.7%; $p = 0.0009$).

Conclusions
Our study reveals that approximately 16% of ED visits among Medicare beneficiaries are attributed to those with ADRD, with significantly higher utilization observed among older age groups and dual-eligible beneficiaries. These findings suggest that ED interventions and policy initiatives designed to reduce utilization and enhance ED care should prioritize these subpopulations.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Investigation of Factors Affecting Treatment Adherence Using Mobile Health (mHealth) Technology

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Background/Objectives:
Major depressive disorder (MDD) treatment has high dropout rates within the first four weeks of initiation, often due to preventable reasons. Early therapeutic response during this period is critical for long-term positive outcomes. Mobile health (mHealth) technologies offer real-time monitoring and support for improving adherence. This study examines factors affecting adherence in the initial four weeks of treatment using mHealth technology data from an ongoing study, DepWatch.

Methods:
The DepWatch study, funded by the National Institute of Mental Health (NIMH), enrolled participants with moderate depression (QIDS ≥11) starting new antidepressants at UConn Health clinics. Participants were adults (≥18 years old), English-speaking, with MDD, and no diagnoses of bipolar disorder, psychotic disorders, or severe substance use disorder. DepWatch, a smartphone application, facilitated daily assessments of mood and anxiety, weekly depression symptom tracking (QIDS), and evaluations of medication safety and tolerability. Data were analyzed using stepwise regression and generalized estimating equations in bivariate analysis of treatment adherence and adherence factors, including treatment response, safety and tolerability, antidepressant class, demographics, and overall health. Significant factors were subsequently included in a multivariate model.

Results:
Eighty participants (mean age: 34.1; 85% female) were analyzed. Non-adherence was associated with greater daily anxiety and QIDS scores (OR: 1.45 and 3.00, respectively; $p<0.10$) and negative safety and tolerability ratings (OR: 4.81, 2.22, 2.92; $p<0.10$). Norepinephrine and dopamine reuptake inhibitors (NDRIs) increased non-adherence odds (2.59) compared to SSRIs ($p<0.10$). Better general health scores reduced non-adherence ($p<0.05$), and males had lower odds of non-adherence (0.11; $p<0.10$).

Conclusions:
Depression management should consider traditional adherence factors such as medication class, treatment response, safety, tolerability, as well as non-traditional factors like gender and overall health. mHealth technologies like DepWatch are valuable tools for real-time adherence monitoring and intervention.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Effect of 4-Aminopyridine and Smoothened Agonist on Osteogenic Differentiation of Human Mesenchymal Stem Cells

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Background/Objectives: Bone defects affect millions globally, creating significant healthcare and financial burdens. Large-gap defects often lead to non-unions, requiring interventions such as grafts or biologics, though current strategies often lack optimal tissue regeneration. The Sonic Hedgehog (SHH) pathway, activated via smoothened (Smo) receptor agonists like SAG, has shown promise in promoting osteogenesis. Combining SAG with Nell-1, a potent bone-regenerative factor recently characterized to upregulate neural markers, has demonstrated synergistic effects on bone healing. Given the neurovascular-bone connection, 4-aminopyridine (4-AP), a voltage-gated K+ channel antagonist known for enhancing axon regeneration and angiogenesis, may also contribute to bone repair. This study explores the effects of combined 4-AP and SAG treatment on osteogenesis.

Methods: Human and mouse mesenchymal stem cells were cultured in osteogenic media supplemented with 4-AP, SAG, 4-AP+SAG, or osteogenic media without supplementation (OM). Optimal concentrations for 4-AP and SAG were determined using an MTS proliferation assay. Osteogenesis was evaluated via Alizarin Red staining for calcium deposition, qRT-PCR for RUNX2, ALP, SP-7, OCN, BSP, and NGF expression, and immunostaining for RUNX2, BSP, and collagen (COL). Experiments were conducted in triplicate, except immunofluorescence, which had a sample size of 5.

Results: Optimal concentrations of 1 µg/mL for 4-AP and 0.6 µg/mL for SAG were identified. SAG significantly increased NGF expression (day 7), while 4-AP+SAG enhanced late-stage osteogenic markers OCN and BSP (day 21). Mineralization was significantly greater in SAG and 4-AP+SAG treatments compared to 4-AP or control. Immunofluorescence showed increased BSP and COL with SAG and enhanced RUNX2 with 4-AP.

Conclusion: The combination of 4-AP+SAG demonstrates synergistic effects on osteogenesis, supporting its potential in bone defect repair strategies. However, variability between experiments suggests the need for further investigation. Future studies with larger sample sizes and in vivo models will further validate these findings and elucidate the neurovascular-bone connection

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Monocytes and Transcriptional Memory Following IFN-γ Activation

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Background/Objectives: Interferon-gamma (IFN-γ) is a cytokine that can be overproduced in inflammatory illnesses and lead to cytokine-induced organ damage. Research on IFN-γ has suggested an ability to induce 'transcriptional memory' in HeLa cells, whereby IFN-γ inducible genes have a stronger response following exposure to IFN-γ three days prior. This project seeks to induce this potentiation in human-derived monocytes through initially exposing cells to IFN-γ or bacterial lipopolysaccharide (LPS), another potent inflammatory stimulus. These modifications aim to better understand the interplay between memory and inflammation, while gaining insight into the role IFN-γ plays in mediating the acute and chronic immune response.

Methods: THP1-Dual Cells are a monocyte line with two inducible reporters: secreted embryonic alkaline phosphatase (SEAP) regulated by NF-κB, and Luciferase (LUCIA) regulated by Interferon Regulatory Factor (IRF), both of which respond to LPS and IFN-γ. We treated cells in medium containing either IFN-γ (50 ng/mL), LPS (100 pg/mL) or a control for 24-hours, read SEAP and Luciferase from supernatant, and then washed cells into fresh media. After resting for 48-hours, cells were reinduced with IFN-γ, LPS or control for 24-hours, followed by a final measurement.

Results: In both the NF-κB and IRF pathways, monocytes that were pre-exposed to IFN-γ had a greater response ($p<0.001$) to both LPS and IFN-γ ($p<0.02$) than those that had no initial treatment. IFN-γ activation increased responsiveness ranging from two-fold to ten-fold, which is more expansive than the pathways that each stimulus activates alone. Cells pre-exposed to LPS did not show elevated responses to either pathway.

Conclusions: IFN-γ has a strong influence in determining the response of human monocytes to inflammation resulting from foreign LPS and the endogenous cytokine escalation of IFN-γ. LPS as an initial stimulus displayed no escalation of response, suggesting that IFN-γ is special in its ability to induce memory through both IRF and NF-κB signaling.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Awareness of Rheumatic Heart Disease (RHD) and Treatment of Strep Throat in Kisoro and Gulu Districts, Uganda

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BACKGROUND/OBJECTIVES

RHD continues to create significant morbidity and mortality in low- and middle-income countries, despite availability of penicillin to treat Group A streptococcal (GAS) infections. Understanding approaches to pharyngitis management, including 'traditional' non-allopathic methods (e.g., local tonsillectomy) and RHD awareness may lead to targeted interventions to eliminate RHD.

METHODS

Parents of children <16 years of age, recruited from health clinics in Gulu and Kisoro Districts of Uganda, were administered an oral survey designed to evaluate knowledge, attitudes, barriers, and practices of pharyngitis treatment, including use of traditional medicine. Chi-square was used to examine associations between baseline characteristics (e.g., education) and responses to selected questions.

RESULTS

A total of 300 parents (n=150 Gulu, n=150 Kisoro) were recruited from July-August 2024. Most (86%) had heard of strep throat, but few (21%) knew it was caused by bacteria; 70% identified appropriate treatment. Many agreed untreated pharyngitis could lead to heart conditions (56%) or organ dysfunction (46%), but very few had heard of RHD (34%). Most disagreed (77%) local tonsillectomies were effective methods of treating sore throats, but most (60%) knew someone who had been treated with one. Most (58%) agreed allopathic health providers treat those who have sought local tonsillectomy poorly. Lower education was associated with decreased knowledge of appropriate pharyngitis treatment (p=0.04), but not with decreased awareness of RHD (p=0.20).

CONCLUSIONS

Among parents in Gulu and Kisoro Districts, we identified low knowledge of proper treatment for strep throat, low awareness of severe sequelae of untreated pharyngitis (e.g., heart disease), and low awareness of RHD overall. We also found high usage of traditional medicine for pharyngitis and belief that allopathic providers treat those using traditional medicine poorly, which may represent treatment barriers. These data can inform community level primary prevention strategies. Future studies should address pharyngitis treatment and RHD diagnosis practices among healthcare providers in these districts.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Survey Connecticut Providers on the Process of Making Patient Referrals to Community-Based Organizations

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Background/Objectives:

Social determinants of health (SDOH) data are vital for improving health equity and quality of care. However, the process for capturing and storing such information is challenging due to technological barriers and lack of resources for patients who screen positive. We were contracted by Connie, Connecticut's state-designated health information exchange (HIE), to to help assess providers' perspective on this topic and identify services Connie can provide to help overcome these barriers.

Methods:

A 35 question Qualtrics survey was distributed to all providers listed in the CT PDMP prescriber registry. The survey contained MCQ, Likert, ranking, and open-ended questions about demographics, SDOH collection, Connie familiarity, and SDOH referral process. SPSS Statistics was used to run statistics.

Results:

N = 209 responses were collected, with 78 respondents fully completing the survey. Most respondents were physicians (53%). Some respondents used a standardized SDOH screening tool (43%), but the majority used informal or non-standardized means. Most respondents recorded SDOH data in notes (65%), and most had never heard of Connie (59%). Lastly, most providers still use handouts to refer patients for SDOH needs (48%), even though 211 is available. This shows a strong need for implementation of a standard SDOH screening tool in the EHR and development of a referral tool that can leverage the strengths of 211 to connect patients with CBOs.

Conclusions:

There are significant gaps in Connecticut providers' ability to successfully address SDOH needs which Connie can fill in the form of an EHR integrated standardized SDOH screening tool and closed loop feedback referral system. Many providers only heard about Connie from this survey, even though every provider is mandated to participate in it. More efforts to educate providers about Connie and how it can enhance patient care should be made.

Supported by: Grant funding from Connie, Connecticut's State-designated HIE

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Compliance with Post Vasectomy Semen Analysis: Comparison of in office fresh testing with scheduled office visit vs. fresh laboratory drop off alone

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Introduction

Post vasectomy semen analysis (PVSA) is a critical component to postoperative care following vasectomy surgery, yet compliance continues to be low. There are no guidelines on the best form of PVSA (whether in office, in a lab or home testing and/or mail in testing). Compliance with fresh sample collection (in office, or fresh at a laboratory) has been shown to range from 28-87% in earlier studies. The aim of this study was to determine whether fresh office-based microscopy or fresh lab-based test format offer the best compliance in our practice.

Methods

A retrospective cohort study was conducted at an academic institution who utilize either office-based microscopy with an in person visit or lab-based tests with no defined follow up visit. Patients were separated into lab-based test (Surgeon 1) and office-based microscopy (Surgeon 2). Patient compliance was defined as completion of a PVSA test and either an in-office or phone call confirming the results by the surgeon. Demographics, completion of PVSA test, length of time between vasectomy and PVSA test, and success of procedure were all recorded. Comparison of compliance was done using a bivariate analysis.

Results

Over a period of 5 years, a total of 291 vasectomies were reviewed, with Phone call (Surgeon 1) cohort (N=178) and In-Office (Surgeon 2) cohort (N=113). The compliance rate was 57.30% for the phone call cohort and 78.76 % for the in-office cohort (p=.000172*). The mean length of time between vasectomy and PVSA test for Surgeon 1 and 2 was 105.26 and 122.84, respectively.

Conclusion

In this retrospective chart review, PVSA office-based microscopy with a scheduled postoperative visit on the same day was associated with increased compliance when compared to lab-based testing followed by a telephone. It is unclear as to whether compliance was better based on in-office microscopy or a scheduled post-operative visit or both. Further studies that delineate differences between these will be valuable to further evaluate how to improve compliance rates.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Evaluating the Potential Pathogenicity of a *GCM2* Germline Variant in an *in vivo* Model System

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Background/Objectives:
Causes of familial isolated primary hyperparathyroidism (FIHP) are incompletely understood. Germline variants in *GCM2* were reported in a subset of FIHP kindreds, but their pathogenicity and implications for clinical management are uncertain. One such variant, Gcm2 1383M, was associated with a severe phenotype including tumorigenesis in one kindred. I aim to determine if Gcm2 I383M in a mouse model might contribute to pathogenesis by enhancing the hyperparathyroid phenotype of an established tumor driver, cyclin D1. Gcm2 I383M knock-in mice and eventually Gcm2 I383M crossed with PTH-cyclin D1 mice will be evaluated for malignant features, improving understanding of the potential pathogenic role of *GCM2* variants in primary hyperparathyroidism.

Methods:
Genetically engineered mice with a Gcm2 I383M mutation were compared to wildtype littermate controls. Mice lived to a terminal timepoint of 18 months, at which parathyroid gland was excised and serum was collected. Markers of hyperparathyroidism and tumorigenesis were evaluated, including parathyroid gland size, analyzed from 5-µm-thick paraffin tissue sections, and cellular proliferation using Ki67 immunohistochemical staining – a marker for rapidly dividing cells. Serological markers for hyperparathyroidism and tumorigenesis were evaluated by measuring levels of serum calcium and PTH.

Results:
Total volume of parathyroid glands and Ki67 proliferation score in four Gcm2 I383M mutant and six wildtype mice were measured at necropsy, with p-values of 0.44 and 0.68, respectively. Serum calcium was measured in 29 wildtype and 23 Gcm2 I383M mice (p=0.06). Serum PTH was measured in 21 wildtype and 19 Gcm2 I383M mice (p=0.84).

Conclusions:
The Gcm2 I383M mutant mouse model alone does not show a significantly different phenotype of hyperparathyroidism or tumorigenesis based on parathyroid gland size, rapid cellular proliferation, serum calcium, or serum PTH when compared to wildtype mice. However, examining its pathogenic role when combined with cyclin D1 may highlight the interplay of more than one genetic factor in cancer development.

Supported by: *Research Experiences for Graduate and Medical Students (REGMS) award from the Endocrine Society and the UConn School of Medicine Summer Research Fellowship*

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The Role of Extracellular Matrix Protein 1 in Chronic Kidney Disease

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Background/Objectives:

Chronic Kidney Disease (CKD) is a prevalent, progressive, and irreversible pathology associated with a substantial human and financial cost. The putative mechanism of functional decline in CKD is aberrant activation of organ repair pathways leading to excessive matrix deposition and disrupted parenchymal organization. Characterization of early signals which initiate fibrosis is necessary for development of targeted disease modifying therapies. Extracellular Matrix Protein 1 (ECM1) is transiently produced by renal fibroblasts early after renal injury. We sought to investigate the relevance of ECM1 to initiation of fibrosis in a transgenic murine model of CKD.

Methods:

Knockdown of ECM1 was achieved in male BALB/c mice injected with an adenoviral vector producing ECM1 shRNA (AAV9-ECM1) or control scramble shRNA (AAV9-Sc). Two conditional ECM1 knockout strains were generated with SERM inducible Cre-loxP mediated recombination under promoter control of Col1α2 or Pdgfr-β. These mice were subjected to unilateral ischemia reperfusion injury (UIRI) with contralateral nephrectomy or unilateral ureteral obstruction (UUO). Following sacrifice serum and tissue samples were collected and analyzed via ELISA, Western blot, RT-qPCR, global proteomic analysis, and light microscopy.

Results:

UUO and IRI induced ECM1 deposition into the interstitial space with accompanying fibrosis. AAV9-ECM1 administration effectively blocked expression of ECM1 induced by UIRI and UUO. Knockdown resulted in lower BUN and SCr following IRI. Histology staining and Western blots for Col1α1 and fibronectin demonstrated decreased matrix deposition following IRI and UUO in shECM1 mice compared to AAV9-Sc counterparts. Proteomic analysis demonstrated robust upregulation of electron transport chain complexes and downregulation of the integrin α2β1/ RhoC pathway in shECM1 CKD mice relative to NC CKD. These findings were validated in Western blot and qPCR assays and replicated in fibroblast specific ECM1-cKO mice.

Conclusions:

Early activated ECM1 interacts with integrin α2β1/ RhoC to modulate mitochondrial oxidative phosphorylation and fibrosis in CKD.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Use of Point-of-Care Bladder Ultrasound to Predict Clinically Significant Urinary Tract Infection

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Introduction

There is a need for a less invasive tool for diagnosing UTI in patients that may be unable to communicate their symptoms or easily provide a urine sample. Ultrasound is a safe, minimally invasive tool used at the bedside in diagnosing urinary pathologies, but there has not yet been an established sonographic technique used for diagnosis of UTI in emergency departments.

Our study seeks investigate the correlation between bladder wall thickness and debris, as seen in point-of-care ultrasound (POCUS) and the presence of clinically significant UTI. We aim to provide evidence to support the use of POCUS in detecting and managing UTI to improve patient outcomes and optimize resource utilization in a variety of clinical settings and practices.

Methods

This study was a prospective cohort study, enrolling a convenience sample of patients in the Emergency Department at John Dempsey Hospital. The sample population was any patient over three months of age with a UA ordered while in the ED. Transabdominal POCUS was performed on 292 participants. Sagittal and transverse fanning clips and micro-fanning views of the anterior bladder wall were collected. Emergency medicine physicians reviewed the POCUS images to determine the presence or absence of echogenic debris within the bladder, bladder wall thickness, and bladder volume. Retrospective chart review showed UA and urine culture results.

Preliminary Findings

The initial stages of data analysis have not revealed a significant relationship between UTI and bladder wall thickness nor bladder debris. Mean epithelial thickness was not significantly different between positive and negative UTI results. Epithelial thickness had a significant negative relationship with bladder volume. There was a significant negative relationship between epithelial thickness and distended bladder volume. Future analysis will include multivariable analysis of variance between the UTI result groups and bladder wall measurements of total, epithelial, muscle, and serosa thickness.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Free Biometric Gun Safes Program Amongst Healthcare Workers

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Background: In 2020, firearm-related injury became the leading cause of death among 1–19-year-olds. Parental counseling is the current best practice for reducing unintentional pediatric firearm injuries. However, the effectiveness of such interventions remains poorly understood, with most being education-based. Surveys reveal that U.S. healthcare workers own firearms at rates comparable to the general population and often store them loaded and accessible. This program aims to reduce pediatric firearm injuries by equipping healthcare workers with biometric gun safes and safety training.

Methods: A survey tool will identify handgun owners within a healthcare system. A pilot program involving 25–40 participants will evaluate the intervention's efficacy. Current firearm storage practices will be assessed via a pre-intervention survey. Participants will receive biometric gun safes and are allotted four weeks to submit a photo demonstrating their use. Incentives will encourage participation and continuity.

Results: Implementation challenges include legal concerns, confidentiality, and peer perception. Distributing safes at the workplace may deter participation due to concerns about stigma or employment consequences. Financial investment in biometric safes may also pose a barrier. However, healthcare workers demonstrate higher receptiveness to public health interventions compared to the general population.

Conclusions: By targeting healthcare workers, this program has the potential to significantly reduce the prevalence of unlocked firearms in homes, thereby protecting children from unintentional injury. This initiative encourages public health organizations to adopt innovative approaches to address pediatric firearm injuries. Identifying an appropriate initial population for intervention can facilitate the broader implementation of impactful public health measures.

Supported By: UConn School of Medicine Summer Research Fellowship and Donald W. Hight Endowed Chair in Pediatric Surgery

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The Spread of Information Regarding Chronic Spontaneous Urticaria on Social Media

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Background/Objectives
Chronic spontaneous urticaria (CSU) is a skin disorder of unknown cause, characterized by wheals, angioedema, or both, lasting over six weeks. Despite its prevalence, CSU remains understudied and undertreated. Many patients increasingly use social media to share experiences and seek information for this reason. This study evaluates how CSU is discussed on social media, the accuracy of shared information, and its implications for health literacy, helping providers and patients better utilize this data-rich medium.

Methods
A retrospective analysis of social media posts on CSU was conducted across X (formerly Twitter), Instagram, Facebook, Reddit, and YouTube. Using terms like “chronic spontaneous urticaria” and “hives,” 150 posts per platform were captured and categorized by user description (i.e., patient, healthcare professional) and content type (i.e., educational, anecdotal, advice). Other social media metrics (i.e., likes, comments) were collected as well.

Results
Instagram was dominated by anecdotal (25.33%) and educational (37.33%) posts, with 60% from patients and significant visualization content on skin presentations. Facebook posts were primarily by patients (45.33%), with 38% educational and 34% anecdotal; private groups (n = 13) limited some analysis. Reddit posts were mostly from patients (77.33%) seeking advice (48%), with healthcare professionals engaging frequently in comments. X posts were predominantly educational (76.67%) and from healthcare professionals (38.76%). YouTube videos, primarily from organizations like the Allergy and Asthma Network, were overwhelmingly educational (89.33%), featuring lectures and podcasts.

Conclusions
Social media provides valuable insights into CSU management and public information sharing. Platforms offer varied benefits: visualization on Instagram, physician-patient interaction on Reddit, and expert-led education and research dissemination on X and YouTube. This highlights the potential of social media as a resource for health information, enabling tailored use by both patients and providers.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Impact of Post-Operative Protocol Changes and Adjunctive Virtual Reality on Recovery following Pediatric Idiopathic Scoliosis Surgery

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Background:
Scoliosis, defined as a lateral spinal curvature of ≥10 degrees, affects between 0.5%-5.2% of children, with 3.9-9.8 per 100,000 requiring surgery. Effective post-operative pain management and physical therapy are critical for improved clinical outcomes. The rise of new technologies, such as virtual reality (VR), are being studied as a strategy to improve post-operative recovery.

Methods:
This retrospective chart review analyzed 38 pediatric IS patients at Connecticut Children's Medical Center (CCMC) who underwent corrective surgery between 03/21/2023 and 09/23/2024. Patients were categorized into three groups: pre-protocol change (n=18), post-protocol change (n=10), and post-protocol change + VR (n=10). The main changes in the recovery protocol included the removal of ropivacaine epidural injections, reduced diazepam dosage, and the addition of OT. VR therapy involved 20-minute sessions using the Ocean Rift application on the Meta Oculus Quest 2 up to 2x daily, for up to 3-days post-op. A one-way ANOVA was used to compare the mean normalized number of patient-controlled analgesia (PCA) doses and the mean time to discharge across the three groups.

Results:
The study cohort (average age 15.24 ± 1.65 (SD) included 31 females and 7 males. Average PCA doses were 13.0 ± 1.41 (SEM) before the protocol change, 18.6 ± 3.45 (SEM) after the change and 16.3 ± 2.45 (SEM) after the change + VR. Average time to discharge was 2.83 ± 0.20 (SEM) before the change, 3.10 ± 0.35 (SEM) after the change, and 2.60 ± 0.22 (SEM) after the change + VR. No significant differences were observed between groups.

Conclusions:
The implementation of the new post-operative protocol and VR intervention found no statistically significant changes in PCA opiate doses or time to discharge. However, since VR was well-received by both patients and providers, its utility in post-operative management seems promising and should be further explored.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Utility of Point-of-Care Ultrasound for Guiding Operative Management in Emergency Department Patients with Atraumatic Joint Pain

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Background/Objectives:
Atraumatic joint pain is a common ED complaint, accounting for up to 13,000 visits annually in the United States. Septic arthritis is one of the most serious differential diagnoses, carrying a mortality rate of 3-25% if untreated. Given the overlapping clinical features and potentially severe outcomes of patients presenting with atraumatic joint pain, rapid diagnosis and intervention reduces the risk of significant morbidity and mortality. Point-of-care ultrasound (PoCUS) is a diagnostic tool commonly used by emergency physicians to evaluate joints and overlying soft tissue for effusion, abscess, or cellulitis. This study aims to evaluate the test characteristics of PoCUS in identifying cases requiring surgical intervention among patients with atraumatic joint pain.

Methods:
This single-site prospective cohort study was conducted at an academic medical center, enrolling consecutive ED patients presenting with atraumatic joint pain from June 1-30, 2024. Included patients received ultrasound imaging independent of their clinical course during their ED visit. The study received Institutional Review Board approval. Participants (n=51) included consenting adults (≥18 years) with atraumatic joint pain. Scanned joints included the shoulder, elbow, wrist, hip, knee, ankle, and joints of the hands and feet. Exclusion criteria included: prior ED visits for the same joint, prior joint arthroplasty, pregnancy, incarceration, or critical illness.

Results:
No patients with a negative ultrasound result underwent surgical intervention, whereas two patients with a negative X-ray underwent surgical intervention. A positive ultrasound was 100% (95% CI 54.1%-100%) sensitive and 64.4% (95% CI 48.8%-78.1%) specific for operative management. X-ray imaging was 66.7% (95% CI 22.3%-95.7%) sensitive and 65.8% (95% CI 45.7%-80.4%) specific for surgical management.

Conclusions:
For ED patients presenting with joint pain in the absence of trauma, emergency clinicians should utilize PoCUS as a first line diagnostic tool to determine the need for additional workup and potential operative management.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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An Exploration of the Relationship Between COVID-19 and Cancer Recurrence at a Small Connecticut Hospital

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Background/Objectives
Cancer tumor cells can enter a state of dormancy, becoming undetectable on routine tests. An exit from dormancy equates to cancer recurrence, the mechanism of which is not yet fully understood. Inflammation may disrupt tissue homeostasis and establishes an unstable environment, allowing cancer cells to reactivate. Our aim was to investigate the relationship between COVID-19 and cancer recurrence to add to the growing literature surrounding COVID-19's far reaching impacts.

Methods
We performed a chart review through EPIC of 2,643 patients who were diagnosed with cancer at JDH between January 1, 2017 – December 31, 2023. Cancer diagnoses and recurrences were recorded based on ICD-10 codes. Positive COVID-19 results were recorded based on in-person and self-reported documentation. Only patients who had a recurrence after March 9, 2020 – when COVID-19 testing was readily available in America – were included in the analysis. Analyses included comparisons of demographics, cancer type, cancer recurrence, COVID-19 status, and time to recurrence. Appropriate statistical tests and corrections were made.

Results
625 patients had a positive COVID-19 test (23.7%), 99 patients' cancer recurred (3.8%), and patients who experienced a recurrence in their cancer were less likely to have a positive COVID-19 test (12.1% versus 24.1% of patients without recurrence, p=0.03). Patients with a positive COVID-19 test were 0.39 times as likely to experience a recurrence in their cancer (p=0.003). The median time to recurrence was twice as long for patients with a positive COVID-19 test compared to patients with a negative test or none on record.

Conclusions
We found a negative correlation between COVID-19 infection and cancer recurrence. Substantially more patients with cancer who had documented COVID-19 infections, compared to those who did not, did *not* have their cancers recur. This may be due to a protective effect of inflammation and potential increased immune surveillance in the inflammatory context.

Supported By: *UConn School of Medicine Summer Research Fellowship*

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AIRE Hartford: A Three-Pronged Approach to Indoor Air Quality

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Background/Objectives:
In Hartford, poorly ventilated living spaces from aging infrastructure, poverty and proximity to highways and incinerators are risk factors for poor indoor air quality. According to Connecticut Institute for Resilience & Climate Adaptation (CIRCA), both North Hartford (NH) and South Hartford (SH) have high pollution burden and populations with high sensitivity to pollution.

Aire Hartford is a cross-sectional study focused on Hartford residents' perceptions of IAQ, home rent/own status, respiratory conditions, sources of indoor air pollution, and rental property maintenance insufficiencies.

Methods:
Throughout August and September of 2024, in partnership with the Hispanic Health Council and Blue Hills Civic Association, a survey gathering information about various sources of pollution in residential spaces, IAQ perception, and rent/own status was deployed, using Qualtrics.
Inclusion criteria: consenting Hartford residents aged >18. The survey included Likert perception of IAQ, ordinal data on pollution source, and nominal data on respiratory conditions.
We assessed the regional distribution of pollutant source, rent/own status, respiratory conditions, and respiratory symptoms in the city of Hartford.

Results:
An average of 57% of residents surveyed in the Hartford region report being dissatisfied with their IAQ. 31.6% of renters list uncleaned vents as a primary concern for poor air circulation. 63.5% of respondents report one or more people in their household have a diagnosed respiratory health concern, 84% of which indicated asthma.

Conclusions:

Residents surveyed in Hartford are unsatisfied with their indoor air quality and are experiencing concerningly high rates of respiratory disease and respiratory symptoms, with many self-reporting symptoms are induced while in the home. Presentation of results to city officials and the EPA could guide common sense changes to residential infrastructure to improve indoor air quality, yielding positive outcomes for respiratory health.

Supported By: *UConn School of Medicine Summer Research Fellowship, Environmental Protection Agency Grant.*

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Structural Comparison of Inner-Ear Biomarker, Prestin, to Related Proteins: Implications for Antibody Development

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Background/Objectives:
Prestin, a protein localized to the outer hair cells of the cochlea, plays a vital role in amplifying sound vibrations and has potential to serve as a biomarker for early detection of ototoxicity and acoustic trauma. Past research has shown that, in addition to prestin, other inner-ear proteins are quantifiable in the blood. Therefore, antibody specificity remains a challenge for the development of prestin as a biomarker, as cross-reactivity with structurally similar proteins could affect diagnostic accuracy. We aimed to evaluate the structural characteristics of prestin and related proteins to inform the development of more specific antibodies, thereby enhancing the clinical utility of prestin as a biomarker for acquired sensorineural hearing loss.

Methods:
We utilized a bioinformatics approach to compare the structures of prestin and related proteins. The analysis included 17 proteins in total. Specifically, these were prestin (SLC26A5), nine other members of the SLC26 family of proteins (SLC26A1-9, SLC26A11), and seven inner-ear proteins (otolin-1, otoconin-90, otoancorin, otogelin, alpha-tectorin, beta-tectorin, cochlin).

BLAST software was used to determine percent identity between the proteins. This data was employed to create a percent identity matrix, which serves as a concise representation of sequence conservation. Jalview multiple sequence alignment (MSA) software was used to directly compare amino acid sequences of proteins. Sequence alignment was assessed specifically at the regions of the prestin sequence that are targeted by two known anti-prestin antibodies, INVT and SCBT.

Results:
Inner-ear proteins otolin-1, otoconin-90, otoancorin, otogelin, alpha-tectorin, beta-tectorin, and cochlin had 0% identity with prestin. The only inner-ear protein that had identity with prestin was pendrin at 38.4%. Prestin (SLC26A5) and pendrin (SLC26A4) are both members of the SLC26 family of proteins. Percent identity of prestin to other SLC26 members ranged from 28% to 41%. The two highest identities were SLC26A3 at 39.1% and SLC26A6 at 41.2%.

The INVT target region includes positions 351-400 of the prestin sequence. When MSA was used to compare sequences at this location, there was notably more alignment. Conservation scores ranged from 4 to 6 out of 10, which suggests that the INVT antibody may be less specific for prestin. The SCBT target region includes positions 646-744 of the prestin sequence. When MSA was used to compare sequences at this location, there was less alignment. Conservation scores were most frequently 0 out of 10, which suggests that the SCBT antibody may be more specific for prestin.

Conclusions:
Apart from pendrin, prestin has no significant matches with other inner-ear proteins. However, prestin shares about 40% similarity in amino acid sequences with two related proteins expressed outside the inner ear. MSA showed greater similarity with related proteins at the INVT antibody target region, suggesting lower specificity for prestin. In contrast, the SCBT antibody target region exhibited minimal similarity, indicating higher specificity.

Supported by: The Uconn School of Medicine Summer Research Fellowship

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Assessing Dengue Vaccine Acceptance In Pediatric Caregivers In Kandy, Sri Lanka

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Background/Objectives:
Dengue fever is a significant public health concern, with over 100 million cases and 20,000–25,000 deaths annually. Sri Lanka experiences 60,000–100,000 cases per year, with high morbidity and financial burden. Despite the introduction of the DENGVAXIA® and qDenga vaccines in the United States, vaccine hesitancy persists in certain regions due to safety concerns for seronegative individuals. A dengue vaccine has not yet been made available in Sri Lanka, and no prior studies have explored dengue vaccine acceptance in Sri Lanka. This study assessed caregiver knowledge and attitudes toward dengue vaccination in hospitalized pediatric patients, identifying factors influencing vaccine acceptance.

Methods:
A cross-sectional survey of 340 caregivers of hospitalized children (ages 0–16) was conducted in Kandy, Sri Lanka, during the dengue high season (June–August). Participants completed self-administered questionnaires available in English, Sinhala, and Tamil, with translators and researchers present. The survey assessed demographics, knowledge, attitudes, and practices regarding dengue and vaccination. Ethical approval was obtained from the University of Peradeniya and UConn Health. Statistical analyses included chi-square tests to identify relationships between demographic variables and vaccine attitudes.

Results:
Caregivers with higher educational attainment were significantly more likely to express willingness to vaccinate their child than those with lower education levels ($p = 0.0024$). Trust in physicians ($p = 0.001$), fear of dengue ($p = 0.001$), and positive general vaccine attitudes ($p < 0.001$) were also associated with higher willingness to vaccinate. Despite 50% of participants being unaware of a dengue vaccine, 57% expressed willingness to vaccinate if available, expressing high rates of physician trust (83%). No significant relationships were found between caregiver age, child age, or income and willingness to vaccinate.

Conclusions:
Caregivers' willingness to vaccinate their children against dengue was influenced by physician trust, education level, and general vaccine attitudes. Findings highlight the importance of physician-led education campaigns to address vaccine hesitancy and promote vaccine safety. Future research should involve a larger, more diverse cohort and explore attitudes of caregivers who remain neutral toward vaccination.

Supported by: UConn School of Medicine Summer Research Fellowship, Benjamin H. Kean Travel Fellowship in Tropical Medicine, ISDA Grants For Emerging Researchers/Clinicians Mentorship Program

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Effects of Social Determinants of Health and Maternal Stress on Infant Emotional Regulation

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Background/Objectives

Childhood adversities are associated with significant negative health outcomes. Social determinants of health (SDoH) are one important life adversity. SDoH has been shown to negatively affect children's behavior and stress levels (van Oort et al., 2011; Adynski et al., 2023). Chronic stress caused by SDoH barriers affects emotional and physical health outcomes (Senanayake et al., 2020). The current study examines the influence of SDoH and stress on social-emotional problems in infants born during the COVID-19 pandemic.

Methods

Mothers who gave birth during the pandemic completed surveys as part of the PIPS study. (N=1,505). Mean child age was 15.5 months (SD=3.9). 53.4% were boys and 46.6% were girls. An SDoH Index was created following existing guidelines (Hagan et al. 2023). Mothers completed the Perceived Stress Scale (PSS) and EPII pandemic-related stress measure. Social-emotional problems were assessed on the BITSEA (Briggs-Gowan & Carter, 2006). Regression analysis tested for direct effects of SDoH and stress on BITSEA problems and indirect effects of SDoH through stress.

Results

Results of the regression model indicated that the SDoH Index had a significant, positive association with BITSEA Problems, b=1.465, se=.174, p<.001. Perceived maternal stress was significantly and positively associated with BITSEA scores (b=.572, se=.054, p<.001) but pandemic stress was not, b=.259, se=.173, p=.14. The SDoH Index was not significantly associated with perceived maternal stress (b=.167, se=.089, p=.06) but it was significantly and positively associated with pandemic stress, b=.094, se=.028, p<.001. The indirect effects of the SDoH Index on BITSEA scores via both stress pathways were not significant, p>.05.

Conclusions

SDoH and perceived stress demonstrated direct, positive relationships with infant-toddler social-emotional problems, consistent with previous studies (Eugenia et al., 2013; Blair et al., 2013). The was no indirect effect of SDoH via stress calling for further research to uncover mediating factors between SDoH barriers and infant emotional-social development.

Supported by: *UConn School of Medicine Summer Research Fellowship. The PIPS study was funded by NICHD (R01HD106617, MPIs Grasso & Briggs-Gowan).*

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Exploration of Demographic and Socioeconomic Differences in Pediatric Long COVID-19 Severity

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Background/Objectives
Long COVID, or post-acute sequelae of SARS-CoV-2 infection (PASC), describes persistent symptoms following acute COVID-19. While children experience milder acute infections and lower prevalence of PASC than adults, it remains a significant burden. Prevalence estimates range from 1% to 25%, with symptoms such as mood disorders, fatigue, sleep disturbances, and nonspecific pain. Despite growing research, the impact of demographic and socioeconomic factors on pediatric long COVID severity remains underexplored. This study explores how long COVID presents in children, specifically in how it affects patients' quality of life (QoL) and how they interact with the healthcare system itself.

Methods
A single-center retrospective cohort study was conducted via chart review with children aged 0–21 years (n = 172) treated at Connecticut Children's Medical Center between October 1, 2021, and August 1, 2024 with a U09.9 ICD code. Patients with pre-existing chronic conditions were excluded. Long COVID severity was assessed using the Long COVID Quality of Life Inventory and Healthcare Utilization Survey. Demographic and socioeconomic variables were collected. Data were analyzed using descriptive statistics and ANOVA to assess the association between demographic and socioeconomic factors, QoL and healthcare utilization.

Results
The cohort consisted primarily of white, non-Hispanic/Latinx female adolescents with private insurance. No significant differences in QoL or healthcare utilization were observed across sex, gender, race, ethnicity, or insurance type. However, privately insured individuals had higher healthcare encounter rates, while uninsured individuals had lower rates. On average, only 3.22 of 8 QoL questions were documented, with "decreased interactions with friends" captured least frequently. Geospatial analysis showed greater healthcare utilization in rural areas, such as Mansfield and Middlebury, CT.

Conclusion
Findings reveal gaps in documenting QoL metrics and variability in healthcare utilization among pediatric long COVID patients. Future research should address these disparities and explore geospatial trends to improve outcomes.

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High-Risk Pregnancy and BMI, and Its Impact on Breastfeeding Continuity Rates

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Background/Objectives

The AAP and CDC now recommend breastfeeding for up to two years, due to its numerous benefits, including decreasing risk of type 2 diabetes in both mothers and infants, as well as obesity in children. However, in 2019, only 62.6% of mothers were exclusively breastfeeding, and only 24.9% were still breastfeeding at 6 months. It is thought that perceived amount of control during pregnancy has an impact on the likelihood of mothers to breastfeed. This study attempted to identify if mothers with an elevated pre-pregnancy BMI were more likely to have high-risk pregnancies and less-like to exclusively breastfeed due to a perceived lack of control.

Methods

Mothers who delivered at UConn John Dempsey Hospital between January 2018 and August 2024 were sent a short survey, with questions about length of breastfeeding and reasons for stopping breastfeeding. Upon completion of survey, a retrospective chart review was performed, and using ICD-10 codes, mothers and infants were sorted into groups based on high-risk pregnancies or low risk pregnancies.

Results

Of 61 mothers, 57 pre-pregnancy BMIs were collected. The average BMI of the high-risk pregnancy group was noted to be 28.65 kg/m^2, while the average BMI of the low-risk pregnancy group was 24.57 kg/m^2. The average length of breastfeeding in mothers with a BMI under 25 kg/m^2 was 54.09 weeks, and an average of 47.73 weeks in mothers with a BMI over 25 kg/m^2.

Conclusions

There was a statistically significant difference found between the average BMI for high-risk and low-risk pregnancies. Mothers with a BMI over 25 kg/m^2 were more likely to be diagnosed with a high-risk pregnancy. There was no statistical or clinical significance between length of breastfeeding between mothers with a BMI under 25 kg/m^2 and mothers with a BMI over 25 kg/m^2.

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Outer and Middle Ear Microbiomes in Healthy and Diseased States

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Background/Objectives:
Otitis externa (OE) and otitis media (OM) are common pathological processes of the ear canal associated with bacterial infection. Given their potential for chronicity and the growing concern surrounding antibiotic overprescription, exploration of treatment methods is desirable. Comparing ear microbiomes in disease states to non-pathologic counterparts provides the opportunity to identify protective bacterial species that may have clinical use in restoring healthy microbiomes. Previous research at UConn suggests a decreased *Propionibacterium* abundance in chronic OE, potentially indicating a role of the genus in healthy-state preservation. This study aims to describe these ear microbiomes further and characterize the *Propionibacterium* finding in a more nuanced fashion.

Methods:
Participants include UConn Health patients presenting for ear-related appointments. Pertinent patient information including diagnosis, medications, and previous surgeries is collected from consenting participants. Samples are collected during appointments by rubbing a sterile collection swab along the ear canal site. Swabs are placed in 2 mL tubes and stored at -80ºC before sequencing. Samples will be sequenced using full-length 16S rRNA sequencing and the results analyzed to identify genera or species of interest.

Results:
25 patients were sampled, including 12 healthy outer ear (mean age 69.2), 10 diseased middle ear (mean age 52.2), 2 diseased outer ear, and 1 healthy middle ear. The healthy outer ear patients largely had hearing loss or balance/dizziness issues. Patients with middle ear disease presented with chronic OM or canal wall down mastoidectomy. Diseased outer ear samples are from those with chronic OE, and healthy middle ears will be mainly from patients receiving cochlear implants. Samples have not yet been sequenced, and collection is ongoing.

Conclusion:
By comparing the microbiomes of healthy versus diseased ear canals, we seek to contribute to the understanding of etiology and identify bacteria that may play a role in promoting or maintaining health.

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Fibroblast-Specific Smoothened Regulates the Development of Kidney Fibrosis

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Background/Objectives:
A distinct characteristic of CKD progression is renal fibrosis, which depends on the Sonic Hedgehog (SHH) signaling pathway. Renal tubule-derived Hh promotes kidney fibrosis, while Smoothened (Smo) facilitates SHH between renal tubules and fibroblasts during kidney injury. Furthermore, tubular epithelial cells (TECs) reprogram their metabolism due to increased energy demand post-kidney injury. Despite the known association between SHH and kidney fibrosis, the roles of fibroblast-specific Smo in fibrogenesis and fibroblasts in metabolic reprogramming after kidney injury are not well studied. Research aims are to determine (1) the phenotype and subsequent impact on kidney function and fibrosis of Gli-1-Smo-/- mice, and (2) the role and mechanisms of fibroblast Smo associated with metabolic reprogramming post-kidney injury.

Methods:
Two strains of fibroblast Smo KO mice were created by Cre/LoxP system. Mice kidneys were harvested after being subjected to either renal ischemic reperfusion injury (IRI) or unilateral ureter obstruction (UUO). Phenotype of the models were determined by BUN and serum creatinine, immunohistochemical staining, Trichrome staining, western blot, and qPCR. Metabolic mechanisms impacted by Smo KO were determined by proteomic studies.

Results:
Fibroblast-specific Smo KO mice had preserved kidney function (decreased BUN,SCr) and decreased fibrosis compared to Smo WT mice. KEGG pathway enrichment analysis identified upregulation of fatty acid oxidation (FAO) and amino acid catabolism pathways (AACP) in Smo KO. Specifically, increased expression of Acat1 was found to upregulate tubular FAO and AACP, increasing ATP production post-injury.

Conclusions:
Knockout of fibroblast-specific Smo reduces the severity of kidney fibrosis in mice after IRI or UUO and is associated with enhanced fatty acid oxidation and amino acid catabolism in TECs.

Future studies aim to identify key extracellular matrix proteins and signaling pathways involved in the regulation between fibroblast-specific Smo and tubular metabolism. Knowledge on the mechanisms involved with kidney fibrosis may potentially guide therapies for CKD.

Supported by: *The UConn School of Dental Medicine Summer Research Fellowship*

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Modifying Inpatient Workflows to Improve Incidental Finding Documentation

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Background/Objectives

Inpatient incidental finding (IF) documentation at UConn Health currently occurs at the discretion of the discharging provider. This quality improvement study implemented a dot phrase prompting specific documentation of IFs found during hospital stays which would increase the frequency of IF tracking from the inpatient environment back to primary care providers.

Methods

Inpatient charts from John Dempsey Hospital were obtained based on imaging reports tagged by radiologists as containing an “actionable (incidental) finding,” or “AF^1” between 4/1/2024 and 11/22/2024, with the intervention being implemented on 8/8/2024. Problem lists (PL), after visit summaries (AVS), and discharge summaries (DC) were analyzed for IF documentation, with PL and AVS metrics categorized as yes/no and DC metrics scored on a 3-point scheme based on specificity and follow-up plan. Demographics and PCP status were also included as variables in logistic regression tests.

Results

Mean age of patients across both groups was 66.9±1.2 (23-98), and 52% were male. Unadjusted bivariate analysis odds ratios and chi-square tests showed patients in the post-intervention group were less likely to have their IFs communicated in their DC (0.72, 95% CI 0.39-1.32, p=0.29), PL (0.33, 95% CI 0.15-0.76, p=0.01), or AVS (0.38, 95% CI 0.14-0.98, p=0.04). Logistic regression yielded similar adjusted odds ratios, with pre-intervention patients still more likely to have proper IF documentation.

Conclusions

The dot phrase intervention was not effective in changing the presence of IF information in patient DC, PL, or AVS. However, the post-intervention decreases in PL/AVS documentation, paired with increased frequency of AF^1 tags, suggests provider discretion is a stronger determinant of documentation than the tagging system in place. These findings warrant further investigation into variables such as radiologist guidelines/preferences as to what findings are deemed incidental, yet actionable, in comparison to discharging provider preferences, graduate medical education regarding IF communication, and institutional policies.

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Assessing the Impact of Pediatric Dengue Hospitalization on Caregiver Stress and Functioning

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Background / Objectives:
Dengue is a common disease endemic to tropic and subtropic regions that is increasing in prevalence and can severely impact all ages. However, literature on the impact of caregivers of pediatric patients with dengue is limited. We explored the factors that significantly impact caregiver stress and the effect on caregiver function to aid in understanding the burden of pediatric Dengue in a holistic lens.

Methods:
Caregivers of pediatric dengue patients at the National Hospital (Kandy), Teaching Hospital (Peradeniya), and Sirimavo Bandaranaike Hospital (Peradeniya) during June-October were asked to complete an in person or written survey. Stress was measured on a Likert scale while the PedsQL Family Impact Module was utilized to quantify overall functioning of the caregiver. Descriptive statistics were done to assess the caregiver's stress, functioning, and perception of their child's illness severity. A Spearman correlation test provided insight into association between these variables with linear regression for significant results.

Results:
Forty caregivers of children with dengue completed the survey. There was no correlation between whether a patient experienced hemorrhagic fever and caregiver's assessment of severity ($p=0.14$). However, the caregiver's interpretation of the dengue severity was significantly impactful on their stress score ($p=0.03$). Caregivers were most stressed regarding fear of child's death and fear the child will get dengue again. Furthermore, caregiver functioning was related to their stress levels with higher scores of stress correlating to negative impact on functioning ($p=0.002$). Physical functioning of caregivers was most effected with the strongest response to feelings of tiredness and anxiety.

Conclusions:
Caregivers are stressed based on their perception of their child's illness which is leading to decreased functioning and high rates of anxiety and fatigue. Further exploration can help create focused interventions to minimize caregiver stress and maximize support provided to the pediatric patient and their caregiver.

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Reassessing Maxillary Sinusitis: Recognizing Odontogenic Origins in the ENT Clinic

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Background

Sinusitis contributes significantly to disease burden, healthcare costs, and antibiotic resistance. Odontogenic sinusitis (OS) can arise from the shared sinus floor between tooth roots and the maxillary sinus, often spreading to other sinuses. Unlike other types of sinusitis, OS is frequently refractory to antibiotics alone, necessitating both dental and sinus surgery. Underdiagnosis of OS stems from inconsistent diagnostic criteria, limited awareness, and inadequate dental-medical referral systems. The objective of this study is to estimate OS prevalence in ENT clinics and identify radiographic features to improve diagnosis and treatment outcomes.

Methods

This retrospective cohort study analyzed 63 de-identified CT scans (84 sinuses) of patients with acute or chronic maxillary sinusitis from an academic ENT clinic. A multidisciplinary team, including an OMF radiologist, an ENT specialist, an ENT specialist-in-training, and a medical student, evaluated the scans. Radiographic indicators of OS included mucosal thickening of the inferior maxillary sinus, large tooth restoration affecting the sinus floor, periapical pathology, oro-antral communication, and widened periodontal ligament (PDL) space. Data were analyzed using descriptive statistics and chi-square tests.

Results

The prevalence of OS in ENT patients with maxillary sinusitis was 60%. Raters unanimously agreed that among the 40 patients with OS, 38 required dental referrals. Statistically significant radiologic criteria with high sensitivity for OS diagnosis included periapical pathology (PPV = 93%), oroantral communication (PPV = 100%), and PDL widening (PPV = 100%).

Conclusions

This study highlights the underestimated prevalence of OS and underscores the importance of improving interdisciplinary care. Our findings contribute to three critical areas: appropriate field of view of sinus CT protocols and the need for high-resolution imaging to detect OS-related changes; knowledge gap, by addressing OS diagnostic criteria; and appropriate referral patterns, by stressing the need for robust dental-medical referral systems.

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Gastric Distention on Ultrasound: Coronal versus Sagittal Approach

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Background/Objectives

Gastric distention awareness is important for aspiration risk stratification. Sagittal ultrasounds are used in preoperative settings to assess antral volume. However, the reliability and accuracy of ultrasound from a coronal approach with unknown prandial status is unclear. We sought to determine the test characteristics of coronal ultrasound for gastric distention in the Emergency Department (ED) setting using computed tomography (CT) as the reference standard and to compare the reliability and confidence of the ultrasound sagittal to coronal views.

Methods

This single-site, prospective cohort study included consenting ED adult patients who underwent abdominal CT imaging in June 2024, excluding patients with prior gastric surgery or hiatal hernia. Investigators performed a six-view gastric ultrasound; two blinded emergency physicians independently reviewed ultrasound images for adequacy, antral dimensions (sagittal), and the presence and appearance of the stomach anterior to the spleen (coronal). Antral dimensions on sagittal images were used to calculate gastric volume (GV) using the Perlas equation. If the GV exceeded the gastric distention threshold (1.5 mL/kg), sagittal distention was considered present. Coronal distention was considered present if a fluid-filled stomach (“starry night” appearance) was visualized. CT images were independently reviewed by a radiologist and dichotomously categorized as distended or non-distended. Test characteristics, Cohen’s kappa (κ), and odds ratio (OR) were calculated using Chi-Square analysis.

Results

Of the 176 consenting patients who met inclusion criteria, 84 (47.7%) had gastric distention on CT. Agreement between investigators was fair for sagittal and moderate for coronal distention (k=0.29, 95%CI -0.04-0.61 and k=0.50, 95%CI 0.32-0.68, respectively). Coronal ultrasound was 98.9% (95% CI 94.1-100.0%) specific with OR 3.3, 95% CI 1.6-7.1 for gastric distention on CT. Sagittal gastric distention on ultrasound was 95.7% (95%CI 89.2-98.8%) specific.

Conclusions

Coronal ultrasound demonstrating stomach distention with a starry appearance is specific for gastric distention and may be more reliably interpreted than sagittal views.

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Identifying Significant Predictors of Hospital Readmission of Pneumonia Patients within 30 days of Discharge Using the National Readmission Database between 2016-2021

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Background/Objectives:
In the United States, pneumonia results in approximately 1.5 million hospitalizations annually, with up to 22% of patients readmitted within 30 days. Identifying risk factors is crucial in reducing pneumonia-associated readmissions, improving health outcomes, and minimizing the cost burden on the healthcare system. We sought to analyze risk factors for readmission between 2016-2021 to identify points of intervention, particularly after the implementation of the Hospital Readmissions Reduction Program. To our knowledge, there has not been a study using nationally representative data with appropriate survey weights to analyze multiple years of pneumonia readmission.

Methods:
We utilized the National Readmission Database to generate descriptive statistics of demographic and clinical characteristics of patients with a non-elective index hospitalization related to pneumonia during 2016. Patients under 18 years of age and those who died during the hospitalization were excluded. We will separate patients with an unplanned hospital readmission within 30 days for further investigation. Future analyses include descriptive statistics, Chi-Square tests, t-tests, and logistic regression models to compare frequencies of clinical and demographic variables between readmitted and control groups from 2016-2021. Statistical analyses will be conducted using STATA using survey weights.

Results:
Mean age of patients (N=309,983) was 68.6 with 53.5% of patients being over 70 years old. 52.9% of the population was female. 69% of the participants had hospital visits paid for by Medicare and 45.3% of patients had a length of stay of 3-5 days.

Conclusions:
Consistent with existing literature, most patients hospitalized for pneumonia in 2016 were over 70 years old and were on Medicare. To identify the most accurate and generalizable risk factors for pneumonia readmission, we must include multiple years of nationally representative data with appropriate survey weights to analyze differences in demographic and clinical characteristics between those who were and were not readmitted within 30 days of an index pneumonia admission.

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Impact of Post-Operative Protocol Changes and Adjunctive Virtual Reality on Recovery following Pediatric Idiopathic Scoliosis Surgery

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Background:
Scoliosis, defined as a lateral spinal curvature of ≥10 degrees, affects between 0.5%-5.2% of children, with 3.9-9.8 per 100,000 requiring surgery. Effective post-operative pain management and physical therapy are critical for improved clinical outcomes. The rise of new technologies, such as virtual reality (VR), are being studied as a strategy to improve post-operative recovery.

Methods:
This retrospective chart review analyzed 38 pediatric IS patients at Connecticut Children's Medical Center (CCMC) who underwent corrective surgery between 03/21/2023 and 09/23/2024. Patients were categorized into three groups: pre-protocol change (n=18), post-protocol change (n=10), and post-protocol change + VR (n=10). The main changes in the recovery protocol included the removal of ropivacaine epidural injections, reduced diazepam dosage, and the addition of OT. VR therapy involved 20-minute sessions using the Ocean Rift application on the Meta Oculus Quest 2 up to 2x daily, for up to 3-days post-op. A one-way ANOVA was used to compare the mean normalized number of patient-controlled analgesia (PCA) doses and the mean time to discharge across the three groups.

Results:
The study cohort (average age 15.24 ± 1.65 (SD) included 31 females and 7 males. Average PCA doses were 13.0 ± 1.41 (SEM) before the protocol change, 18.6 ± 3.45 (SEM) after the change and 16.3 ± 2.45 (SEM) after the change + VR. Average time to discharge was 2.83 ± 0.20 (SEM) before the change, 3.10 ± 0.35 (SEM) after the change, and 2.60 ± 0.22 (SEM) after the change + VR. No significant differences were observed between groups.

Conclusions:
The implementation of the new post-operative protocol and VR intervention found no statistically significant changes in PCA opiate doses or time to discharge. However, since VR was well-received by both patients and providers, its utility in post-operative management seems promising and should be further explored.

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Assessing Treatment Patterns and Outcomes in Nonagenarian Patients with NSTEMI

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Background/Objectives

Nonagenarians (90 and older) represent the fastest growing age-group in the United States and face a high burden of Non-ST-Elevation Myocardial Infarction (NSTEMI). Although primary percutaneous coronary intervention (pPCI) offers proven benefits, its use remains limited in this population, and data on treatment trends and predictors of in-hospital mortality are limited.

Methods

Patients aged ≥90 years with a primary diagnosis of NSTEMI were categorized into two cohorts: those who underwent pPCI and those managed medically. The National Inpatient Sample (NIS) database was used to analyze hospitalization characteristics. Multivariate logistic regression models identified predictors of in-hospital mortality, with model performance evaluated using the area under the receiver operating characteristic curve (AUC).

Results

Among 122,845 hospitalizations, 9700 (8%) underwent pPCI, while 113,145 (92%) received medical management. From 2015-2019, NSTEMI admissions declined by 17% (p=0.04), with an 18% reduction in medically managed cases (p=0.04). pPCI rates increased from 7% in 2016 to 9% in 2019 (p=0.03). The medical management cohort exhibited significantly higher Elixhauser Comorbidity (EC) scores (p<0.001), 30-day readmission EC scores (p<0.001), in-hospital mortality EC scores (p<0.001) and showed higher in-hospital mortality rate (7.4%) compared to the pPCI group (4.2%; p<0.001). Predictors of mortality in the medical management group included alcohol abuse, chronic blood loss, pulmonary disease, and a history of myocardial infarction, while hypertension, hypothyroidism, and peripheral vascular disease were significant in the pPCI group. The AUC for predicting in-hospital mortality was 0.71 for the medical management group and 0.83 for the pPCI group.

Conclusions

This study highlights the increasing use of pPCI in nonagenarians with NSTEMI and its association with improved in-hospital outcomes. Despite this, pPCI remains underutilized. Understanding the predictors of in-hospital mortality in both treatment groups can inform clinical decision-making and improve care strategies for this vulnerable population.

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The Effectiveness of Stroke Navigators in Managing Stroke Risk Factors

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Background:

The stroke nurse navigator program was created to support patients during their transitions from various points of care and address the needs of stroke survivors and their family members after discharge[1]. Their work consisted of tasks, such as identifying and addressing barriers to medication attainment or providing tailored education on early symptom identification[2]. In this study we sought to explore how stroke nurse navigators impact individual risk factors of stroke, including blood pressure, serum lipid levels, and smoking behavior.

Methods:

Hemorrhagic and ischemic stroke patients were collected from Hartford Hospital based on specific criteria: ages between 18 and 70, diagnosis of hypertension or hyperlipidemia, outpatient follow-up visit at about 2 to 4 months after the stroke. 518 participants were selected during the intervals: 09/01/2016 to 05/31/2017 and 09/01/2017 to 05/31/2018. Each chart on Epic was manually reviewed to collect outcome variables including blood pressure, lipid profile (serum LDL, HDL, and triglyceride), and smoking status at two-time points: baseline (hospital visit) and 3 (2-4) months after discharge. The no-show rate was calculated for those patients who did not attend their first follow-up with their providers within 2 to 4 months after discharge.

Preliminary Results

The study is ongoing, but based on the preliminary data, trends can be observed among demographics of the patients. 381 patients were identified as White or Caucasian, which comprises the majority of the sample. Other ethnic groups are not as highly represented with Black or African American as the next largest racial group at 66 patients. Similarly, male subjects predominate among those who presented to Hartford Hospital with an ischemic or hemorrhagic stroke. Ischemic stroke is more prevalent in the data set with 433 ischemic stroke patients compared to 85 hemorrhagic ones.

Future Goals

Complete review and analysis of patient charts to retrieve the relevant data, including blood pressure, lipid profile data, and smoking status.

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The Impact of Biological Sex on the Association Between Major Depressive Disorder and the Senescence-Associated Secretory Phenotype (SASP)

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Background: Previous studies show that abnormalities in the hallmarks of biological aging are associated with adverse outcomes in later-life depression (LLD). Specifically, a collection of senescence markers known as the Senescence-Associated Secretory Phenotype (SASP) index is elevated in individuals with LLD. However, LLD affects men and women differently. The expression of SASP markers also differs between men and women. Therefore, we aim to evaluate whether sex moderates the association between the SASP index and adverse outcomes in LLD.

Methods: A total of 563 older adults (423 with LLD and 140 controls) were included in this analysis. We measured the plasma levels of SASP biomarkers using multiplex immunoassays in all individuals. We performed a descriptive analysis of our sample to assess normality and parametric distribution of our data. We then evaluated the association between covariates and SASP via chi-square, t-tests, and a Pearson correlation analysis. We used a general linear model to evaluate the interaction effect between diagnosis and sex on SASP index values, including the appropriate covariates and random variables.

Results: Individuals with LLD have higher SASP scores (mean = 0.111, 95% CI [-0.077– 0.299) compared to controls (mean = –0.586, 95% CI [-0.888 – -0.283]). Females have a mean SASP index of –0.324 (95% CI[-0.487 – -0.162]), while males have a higher SASP index of –0.150 (95% CI[-0.406 – 0.105]). We found a significant sex-by-diagnosis interaction where men with LLD have a significantly higher SASP index (mean = 0.610, 95% CI[0.346 – 0.873]) than females with LLD (mean = -0.262, 95% CI[-0.764 –0.240]).

Conclusions: Males with MDD have a significantly higher SASP index. This finding provides insight on how senescence influences depression in a sex-differentiated manner. This information can help identify sex-specific risk factors in LLD and contribute to therapeutic targets specific to older male and female populations.

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The role of the purinergic P2X4 receptor (P2X4R) in microvasculature permeability during ischemic stroke using an ex-vivo trans well migration assay

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Background/Objectives

Stroke is a leading cause of morbidity and mortality globally. A lack of continuous blood supply to brain tissue triggers a series of electrophysiological, metabolic, and molecular damages during stroke. Acute stroke injury in the setting of vascular occlusion and reperfusion is followed by early oxidative/excitotoxic damage and breach of the blood brain barrier (BBB). Consequently, microglia and resident macrophages get activated and release proinflammatory cytokines and chemokines to further induce inflammation and swelling, attracting peripheral immune cells. The purinergic receptors P2X4R are cation channels activated by a surge of ATP released from decaying brain cells. Acute activation of these receptors has been shown to enhance tissue injury. The aim of this study was to test the effect of P2X4R expression on bone marrow derived macrophages (BMDMs) and brain microvascular endothelial cells (ECs) on transmigration in an in vitro/ex vivo model.

Methods

BMDMs were collected from the femurs and tibias of P2X4R knockout (KO) and wild type (WT) mice. Concurrently, ECs were collected from mouse brains. Both cell lines were differentiated and maintained in culture. Prior to experiments, ECs were plated on a transmigration insert to mimic BBB. BMDMs were added to the top chamber and exposed to ATP (50uM). Media containing CCL2 (50uM) chemoattractant was added to the bottom chamber. Cells were allowed to migrate for 3 hours and then were fixed, stained, and counted under the microscope for analysis.

Results

We found a significantly higher migration of WT BMDMs in comparison to P2X4R KO BMDMs ($p<0.05$) in our transmigration assay in absence of ECs and in the presence of P2X4R KO ECs. Ongoing experiments will be completed in the future.

Conclusions

Our findings are consistent with a previously elucidated complex role of P2X4R in propagating the pathogenesis of acute ischemic stroke, evidenced by its knockdown decreasing transmigration of immune cells across the BBB in our models.

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Repetitive Self-Injurious Dermatological Diagnoses in Individuals with Autism Spectrum Disorder: An Association Study

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Background
The intersection between Autism Spectrum Disorder (ASD) and dermatologic conditions with injurious and repetitive behaviors is an area of research that remains underexplored. Our hypothesis posits that a significant association will be uncovered between individuals with ASD and these dermatologic diagnoses. This hypothesis is grounded in case studies highlighting this association as well as prior behavioral studies indicating the presence of repetitive and compulsive patterns of behaviors among individuals ASD, behaviors which have been shown to contribute to repetitive skin-focused behaviors.

Methods
This nested case-control study utilizes the NIH All of Us Research Program database to investigate the odds of these conditions in patients with ASD. Confounding variables, including age, gender, and obsessive-compulsive disorder (OCD) were adjusted for using logistic regression and a matched control group (4:1 ratio), and odds ratios were generated for analysis.

Results
In a cohort of 631 ASD cases compared with 409,758 controls, patients with ASD were more likely to have a diagnosis of trichotillomania but were not significantly more likely to present with dermatitis factitia, nail biting, repetitive self-excoriation, excoriation of skin, and picking own skin compared to controls. Significant association was not uncovered in the matched control analysis.

Conclusions
In the analysis comparing ASD to the larger control group, a significant association was found between trichotillomania and ASD. However, in the matched-control analysis the results were not statistically significant, likely due to the low proportion of those with trichotillomania in both the experimental and control groups (0.63% ASD compared to 0.28% control). Further investigation is indicated with larger sample sizes due to the rarity of the condition, particularly in considering the association between trichotillomania and ASD. Understanding if individuals with ASD are at a higher risk for trichotillomania can help dermatologists anticipate this association and can highlight a need for specific treatment strategies.

Supported by: *UConn School of Medicine Summer Research Fellowship, All of Us Research Program*

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Understanding and Quantifying Digital Patient Engagement Tool Utilization

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Background/Objectives

Digital patient engagement tools (PETs) are increasingly used to track patient-reported outcomes, but utilization rates remain understudied. With Medicaid adopting patient-reported outcomes for reimbursement, patient engagement with PETs is crucial. This study examines engagement rates, differences in outcomes between platforms, and the impact of switching platforms on utilization.

Methods

A retrospective chart review of 104 patients who underwent ACL reconstruction by Dr. Coyner between October 2022 and May 2024 was conducted. Patients treated between October 2022 and July 2023 (56) used the Arthrex SOS platform, while those treated from August 2023 onward (48) used the FORCE Therapeutic System. Data on age, gender, race, and patient-reported outcome measures (PROMs) were collected.

Results

FORCE patients were slightly older (31 vs. 28 years, p=0.0029) and reported a higher VR-12 Physical score (39.2 vs. 37.2, p=0.0446). SOS had more female patients (55% vs. 46%, p=0.44) and a higher pre-op completion rate (95% vs. 89%, p=0.35). SOS had greater representation of Hispanic/Latino (14 vs. 4) and White patients (34 vs. 9). Ethnicity and race data were more complete in SOS, possibly due to its integration with the electronic medical record (EMR).

Conclusions

Integration with EMRs may improve data completeness and demographic representation in PETs. Minimal differences were observed between platforms in patient engagement, suggesting that switching platforms does not decrease adherence. Future studies should explore provider attitudes toward PETs and office workflows to optimize patient engagement.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Understanding UConn Health Dermatology Providers' Attitudes Toward Treatment for Onychomycosis

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Background/Objectives:
Onychomycosis is a common fungal infection of the nail known to negatively impact one's quality of life (QoL), often causing pain and embarrassment. Despite this, treatment rates remain low. Potential reasons for this include long treatment times with topical/oral antifungal medications, low cure rates, high recurrence rates, side effects and/or drug interactions with oral medications, and misconceptions of QoL impact. We sought to explore potential reasons for low treatment rates by surveying UConn Dermatology providers who practice general dermatology to determine these providers' major reasons for not treating patients with onychomycosis and whether these attitudes differ among providers with different educational backgrounds.

Methods:
A 25-question institutional web-based survey of providers of general dermatology care at UConn Health was conducted during the summer of 2024. The survey queried the following domains: clinician demographics, dermatology practice characteristics, impact of patient demographic factors on decision to prescribe treatment for onychomycosis, and clinician level of agreement with different attitudes regarding the diagnosis and treatment of onychomycosis. Descriptive analysis was performed.

Results:
In total, 15 responses were recorded (response rate 45.5%). Although 3 surveys were not complete, all available data points were included in the descriptive analysis due to the small sample size. The majority (86%) of respondents were physicians (57% attendings, 29% residents), and 14% were physician assistants (PA). Physicians responded that they do not typically counsel patients on treatment options for onychomycosis unless the patient brings it up, while PAs responded that they only counsel on options for the condition once the diagnosis is confirmed. Treatment rates appear to differ between professions; on average, PAs reported prescribing a topical solution to 4% versus an oral medication to 92% of their patients with onychomycosis, compared to physicians who reported prescribing a topical solution to 33.5% versus an oral medication to 17% of their patients. PA respondents all agreed that the duration of treatment with topical antifungals is too long, cure rate is not high enough, and recurrence rate is too high to justify use in treating onychomycosis, while physician respondents had varied opinions.

Conclusions:
Our results suggest that treatment rates for onychomycosis may differ based on provider medical training. Patient characteristics may also play a role in treatment rates as our study suggests that severity of disease, involvement of the fingernails, and total number of nails involved appear to be the most important factors for dermatology providers deciding whether to treat onychomycosis, whereas patient gender and health insurance type have the least impact.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Surgical and Non-surgical Treatment of Hand and Wrist Pathology in Women in the Peripartum Period

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Background/ Objectives
Hand and wrist pathology is the second most common musculoskeletal complaint of women in the peripartum period. Peripartum related carpal tunnel syndrome (PR-CTS) and De Quervain's Tenosynovitis (PR-DQ) are the most common pathologies associated with these complaints. The literature has mixed findings on whether these conditions are diseases of pregnancy and thus resolve with delivery or not. Waiting to treat a patient surgically may have an impact on the outcomes of surgical treatment. Thus, the objective of this study was to compare the prevalence of complications of surgical treatment PR-CTS and PR-DQ to non-pregnant patients.

Methods
This study was a retrospective chart review of peripartum women between ages 18-50 undergoing treatment for CTS and DQ by board-certified hand surgeons at the University of Pennsylvania between the years 2017-2023. The peripartum cohort consisted of 242 women who had symptom onset anytime between pregnancy and 2 years postpartum. The same protocol was used for 242 non-pregnant women for a control group.

Results
There is no statistical difference between the surgical complications between peripartum and non-pregnant patients being treated for CTS or DQ. There were more complications for PR-CTS as compared to PR-DQ, while there were more complications for DQ in the non-pregnant cohort as compared to CTS. There was no statistical difference in the proportions of specific complications between the two cohorts.

Conclusions
There is no significant difference between the outcomes of surgical treatment between the peripartum and non-pregnant cohort. We intend to further analyze the data to identify risk factors for persistence of symptoms in postpartum following non-operative treatment, as well as subgroup analysis of complications in pregnant and postpartum patients undergoing surgery. This may help identify peripartum women that are more likely to require surgical treatment due to failure of resolution of symptoms with conservative treatment.

Supported by: *UConn School of Medicine Summer Research Fellowship, and the University of Pennsylvania.*

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Examining Resilience, Apathy, and Anhedonia as Moderators in the Relationship between Frailty and Depression in Older Adults

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Background/Objectives

Depression and frailty are prevalent among older adults, with a positive correlation between the two variables. Factors like resilience, apathy, and anhedonia may influence this relationship, although research is limited. We investigated whether these factors moderate the association between frailty and depression.

Methods

The sample included 80 individuals with late-life depression from the NBOLD study. Depression was measured using the MADRS, the UCHC Frail Scale measured frailty, the BRS measured resilience, the AES measured apathy, and the SHAPS measured anhedonia. The binary outcome of frailty was regressed against depression, anhedonia (or apathy/resilience), and their interaction using logistic regression modeling, controlling for demographics.

Results

The mean age was 71.8 (±7), with 66.3% female, and 92.5% white participants. At baseline, mean MADRS and MADRS without the anhedonia question (MADRS_minus_q8) scores were 19.6 (±6.6) and 17.6 (±5.9), respectively. The mean SHAPS score was 24.3 (±5.9), and 35% were frail. The interaction term, MADRSxSHAPS, in the logistic regression model, had a P value of 0.089, suggesting a possible moderation effect of anhedonia on the frailty-depression association. Further exploration showed that Odds Ratios (OR) estimates of frailty for every unit increase of MADRS differed at various SHAPS levels. OR (95%CI) was 1.0, (0.87-1.15, p=0.97) when the SHAPS score was 19; 1.10 (0.99-1,22, p=0.069) when SHAPS was 25, and 1.17 (1.02-1.34, p=0.021) when SHAPS was 29. Resilience and apathy showed no similar effects.

Conclusion

Anhedonia might have a moderation effect on the relationship between frailty and major depression in older adults. In people experiencing higher anhedonia, worse depression is associated with a higher likelihood of frailty; while, with lower anhedonia, the effect of depression on frailty is weakened. The moderation effects of apathy or resilience seem unlikely. Larger samples are needed to confirm these findings and explore anhedonia's role in frailty among older adults with major depression.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Addressing Health-Related Social Needs in HIV-Positive Patients: A Quality Improvement Initiative

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Background/Objectives
HIV-positive individuals face significant health-related social needs (HRSNs), such as housing instability, food insecurity, and financial hardship, which adversely affect health outcomes (Aidala et al., 2016). Despite the support of programs like the Ryan White HIV/AIDS Program, a lack of comprehensive data on HRSNs hinders targeted resource allocation (HRSA, 2023). At the UConn Health HIV clinic, screenings for HRSNs are done on select individuals. We launched a quality improvement initiative to identify and address HRSNs on a population scale, aiming to improve care delivery and equity.

Methods:
From June to October 2024, all HIV-positive patients receiving care at the UConn Health Infectious Disease Clinic were included in this quality improvement initiative. The validated PRAPARE (Protocol for Responding to and Assessing Patients' Assets, Risks, and Experiences) tool was used to systematically screen for HRSNs. Screenings were conducted in the clinic during patients' medical appointments, by two trained medical students.

Results:
During the study period, 120 patients were screened, with 70% (n = 83) reporting at least one unmet HRSN. The most common needs included food insecurity (49%; n = 59), difficulty paying healthcare or medications (43%; n = 52), and challenges paying utility bills (42%; n = 51). Additionally, 18% (n = 22) experienced transportation barriers to medical appointments, and 16.5% (n = 20) face housing insecurity. Among those with unmet needs, 75% (n = 62) requested assistance and were referred to case management.

Conclusion:
This QI initiative demonstrated the feasibility and impact of integrating systematic HRSN screening and resource referrals into routine HIV care. The involvement of trained medical students ensured effective screening and patient connection to localized resources. While existing community resources addressed many needs, gaps remain in areas like housing and transportation. Future efforts will focus on building targeted interventions to address unmet needs, enhancing equity and sustainability in HIV care.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Surgical Treatment Options for Nasolacrimal Duct Obstruction - A Comparison Study

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Background/Objectives:
Nasolacrimal obstructions affect 6%-20% of newborns, with most resolving on their own within a year. Those that do not resolve are treated with procedures like pushed monocanalicular intubation (Masterka), pulled monocanilcular intubation, balloon dacryoplasty, or bicanalicular intubation. Literature shows the Masterka is faster with an average procedure time of 2-9 minutes and a success rate of 88%-90.9%. Other studies show that methods like balloon dacryoplasty and bicanalicular intubation have slightly lower success rates. We hope to elucidate the effectiveness of the different procedures, specifically looking at the speed, success rate, and complication rate.

Methods:
This is a 6-year retrospective chart review between 2018-2024 regarding patients who were treated for congenital and acquired nasolacrimal obstructions via nasolacrimal duct probing, balloon dacryoplasty, Reitling tube placements, and Masterka probing. Data included demographics, etiology of obstruction, procedure details, and outcome and complications of the first and subsequent procedures. Chi squared/Fisher's exact test will be used to compare success rates between the different procedures. One way ANOVA will be used to compare average length of the procedures. A multivariate regression will be done to account for potential confounding variables and assess associations between procedure type and success rate.

Results:
This study reviewed 85 patient charts and excluded six patients due to presence of a dacryocystocele, presence of a punctal anomaly, or reason for procedure due to trauma. Of the initial procedures, 54 patients received at least one balloon dacryoplasty, 17 received at least one Masterka tube placement, 8 had at least one probing done, and 3 had a Reitling tube placement. The following are average lengths of each procedure: Reitling tube, 54 min; Masterka tube, 39 min; balloon dacryoplasty, 38 min; nasolacrimal probing, 31 min.
Data is pending in-depth statistical analysis.

Conclusions:
No specific conclusion can be drawn now as we are still awaiting in-depth statistical analysis.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Identifying Pediatric Patient Opinions About Weight Loss Strategies to Meet BMI Requirements for Gender-Affirming Surgery

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Background

Transgender and gender-diverse (TGD) youth demonstrate higher rates of obesity compared to their cisgender peers. TGD youth become eligible for many gender-affirming surgeries (GAS) in Connecticut after age 18, and many practices institute a maximum body-mass-index (BMI) for GAS eligibility due to safety concerns. Although GAS is associated with numerous clinical benefits, there is no currently established standard of care for pre-operative weight loss for TGD patients. This study aims to describe TGD pediatric patient and parent opinions regarding various weight loss strategies.

Methods

This qualitative study recruited patients seen at Connecticut Children's Medical Center for endocrinology or weight management services. Pediatric TGD patients and their parents were invited to participate in two 30-minute virtual interviews. Interview topics include previous gender-affirming treatments, weight loss strategies and their perceived advantages/disadvantages, and the mental health impact of BMI as a criterion for GAS eligibility. Due to project delays and limited enrollment to date, methods of participant recruitment and enrollment rate are described. Eligible participants were contacted via phone and/or email up to three times.

Results

Between September and December 2024, 38 potential parent-child pairs were contacted regarding participation. 23 (60.5%) patients were considered "contact failures" after three unsuccessful contact attempts via phone and/or email. 39.5% (15/38) of contacted participants provided a response. 13.3% (2/15) were excluded based on inclusion criteria. Of the 13 eligible participants, 76.9% (10/13) declined. The most common reason for declined participation was child discomfort with the study content (5/10). Three participants were scheduled for consenting and interviews, one of which completed interviews and two requested rescheduling.

Conclusions

This study has faced considerable recruitment challenges due to its parent/child design, contact failures, and patient discomfort with the interview content. Future research is needed to address weight stigma among TGD youth in research settings.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Exploration of the Oxidative Stress Response Time Course in the Retinal Ganglion Cell Soma and Axon Following Optic Nerve Injury

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Background/Objectives
Mammalian central nervous system (CNS) axons fail to regenerate after damage, exhibiting a wave of primary cell death immediately after injury followed by later secondary degeneration.[1, 2] This lack of regenerative capacity is attributed to intrinsic and extrinsic factors that are not yet fully understood. High levels of reactive oxygen species (ROS) have been reported immediately following injury to CNS neurons and have been implicated in subsequent cell death.[1, 3, 4] However, their exact role is still unknown. We aimed to investigate the time course of the neuronal oxidative stress response after optic nerve injury to gain insight into potential targets to promote CNS neuroprotection and axon regeneration.

Methods
Wild type 129S1/SvImJ mice (N = 12) underwent optic nerve crush (ONC) to represent CNS injury. Mice were sacrificed one day, three days, and two weeks post-crush. Levels of oxidative damage in retinal tissues were analyzed via immunofluorescence using the oxidative stress marker nitrotyrosine. Axonal cholera toxin β (CTB) labeling was used to identify injured axons post-crush.

Results
ONC resulted in RGC death and axonal degeneration as shown by declining amounts of RGCs over time and CTB labeling. Immunofluorescence showed nitrotyrosine signal at all time points, though it was difficult to localize the signal to individual RGCs. On preliminary analysis, nitrotyrosine levels look to decrease immediately following ONC and then increase again by 2 weeks. The data is currently being analyzed and quantification of ROS levels is unavailable for presentation.

Conclusions/Future Directions
Nitrotyrosine is present at varying levels in the retina following optic nerve injury at the one-day, three-day, and 2-week post-injury time points. Further analysis to allow for quantification of nitrotyrosine levels as well as investigation into the behavior of other types of ROS will be important to fully characterize the oxidative stress response after optic nerve injury.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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A Retrospective Chart Review of Respiratory Syncytial Virus Epidemiology in Adults

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Background:
Respiratory syncytial virus (RSV) causes significant morbidity across all age groups, with annual U.S. peaks in late fall to early spring. It is a leading cause of pediatric hospitalizations and poses a substantial burden on older adults, resulting in up to 160,000 hospitalizations and 10,000 deaths annually. This study examined clinical manifestations, risk factors, and outcomes of RSV in hospitalized adults in Hartford, Connecticut, over four RSV seasons.

Methods:
A retrospective chart review was conducted on 118 laboratory-confirmed RSV-positive adult patients (≥18 years) hospitalized at UConn John Dempsey Hospital from July 2020 to June 2024. Data were extracted from electronic medical records, including only adults with complete inpatient records and RSV confirmed via Rapid Antigen, CEPHEID, or Panther Fusion tests.

Results:
Patients were stratified into four risk groups: Immunocompromised (n=9), Comorbid Lung Disease (n=46), Older Adults aged ≥65 (n=43), and Other Adults (n=20). The median age of those hospitalized was 77 years, with males comprising 43%. Dyspnea was notably prominent in Comorbid Lung Disease patients (76%) and Older Adults (58%). Never-smokers (n=66) had longer average hospital stays (5.9 vs. 5.3 days) and higher ICU admission rates (15.2% vs. 13.5%) than ever-smokers.

Older Adults and Comorbid Lung Disease patients experienced the greatest clinical burden, with prolonged hospital stays (>3 days) being most common in these groups (n=30 and n=28, respectively). ICU admissions occurred in 14% of cases, highest among Immunocompromised patients (22%) and Older Adults (16%). High supplemental oxygen use (78% in Comorbid Lung Disease, 67% in Older Adults) and extended antibiotic treatment underscored RSV severity and risks of secondary infections.

Conclusion:

RSV significantly impacts hospitalized adults, particularly those with comorbid lung disease and older adults. Findings underscore the importance of vaccination, early detection, and risk stratification to mitigate morbidity and optimize outcomes.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Evaluating the Downstream Wound Healing effects of HIF1-α Stabilization Following PHD2 Inhibitor Delivery by Shear-thinning Hydrogels

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Background/Objectives: In normal wound healing, injury-induced hypoxia activates HIF1-α, a transcription factor that regulates the expression of target genes involved in wound healing, specifically by de-activating PHD2. The Advanced Therapeutics Laboratory has developed shear-thinning hydrogels composed of ROS-reactive nanoparticles (NPs) and hyaluronic acid (HA) that provide controlled delivery of small molecule PHD2 inhibitors, which upregulate HIF1-α and accelerate wound repair. This project will focus on conducting in vitro cell studies to confirm whether the upregulation of HIF1-α by these hydrogels results in wound healing.

Methods: In Aim 1, cytocompatibility and ROS cytoprotectivity assays were conducted with NP/HA hydrogels of various polysulfide chemistries to assess cell viability and the antioxidant strength of the hydrogel therapy. In Aim 2, a 2D Scratch Assay was designed to measure the cell migration that is characteristic of fibroblasts in wound healing. After adding various NP/HA hydrogels with small molecule PHD2 inhibitor, MK-8617, to confluent wells of Luc+ 3T3 fibroblasts, the artificial scratch was monitored at time points using brightfield microscopy. A 3D tube formation assay was used to measure the angiogenic potential of human umbilical vein cells (HUVECs) by treating these cells on matrigel with various hydrogels to visualize tube formation using confocal microscopy.

Results: The cytocompatibility assays in Aim 1 demonstrated comparable levels of high cell viability across all NP/HA hydrogels. In the cytoprotection studies, all 8 NPs demonstrated the greatest cell viability in the presence of the lowest hydrogen peroxide dose and vice versa. The NPs with increasing OH composition demonstrated the greatest cell viability at all peroxide doses. In the 2D scratch assay, fibroblast migration for all treatment groups commenced as early as 2 hours post-scratch compared to the control groups that still had discernable scratches using brightfield microscopy. In the tube formation assay, tube formation was documented in hydroxyl groups, OH20+MK and OH70+MK, hours before any other hydrogel treatment.

Conclusions: The data suggests that NP/HA hydrogels with polysulfides of increasing hydroxyls react more readily to scavenge ROS species compared to hydrogels with increasing benzyl groups. According to the scratch and tube formation assay, the PHD2 inhibitor delivered by NP/HA hydrogels induces cellular migration, proliferation, and angiogenic effects, confirming downstream wound healing effects of HIF1-α stabilization. Specifically, NP/HA hydrogels with polysulfides of increasing hydroxyl composition promote faster cellular migration and tube formation, suggesting that polysulfide chemistry controls the rate of release from hydrogels.

Supported by: *Vanderbilt Student Research Training Program, NIH R01 EB028690, T32 DK101003, National Institute of Diabetes and Digestive and Kidney Diseases, Vanderbilt University Medical Center, ViNSE, Bio Render*

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Conclusion:

RSV significantly impacts hospitalized adults, particularly those with comorbid lung disease and older adults. Findings underscore the importance of vaccination, early detection, and risk stratification to mitigate morbidity and optimize outcomes.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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CD13 Mediates Spontaneous Fusion of Kaposi Sarcoma Cells to M2 Macrophages

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Background/Objectives
Metastatic cancer's high mortality rates illustrate the need for better understandings of mechanisms driving tumor progression and metastasis. Recently, attention has shifted from conventional circulating tumor cells (CTCs) to neoplastic-immune hybrid cells described as circulating hybrid cells (CHCs). CHCs form through macrophage-neoplastic cell fusion and are implicated in the metastatic pathway. Given the close interaction between endothelial and myeloid cells, we aimed to confirm heterotypic fusion events between Kaposi sarcoma (KS) cells and M2 macrophages. Previously, we demonstrated that the transmembrane aminopeptidase CD13 regulates macrophage fusion in foreign body responses and progenitor cell fusion in osteoclastogenesis. In KS cells, CD13 also regulates tunneling nanotubes (TNTs), actin-based structures that facilitate partial and permanent tumor-macrophage fusion.

Methods
U937 monocytic cells were differentiated to M2 macrophages. Heterotypic fusion assays were performed by co-culturing M2 macrophages with KS cells at varying ratios. Fusion events were identified using immunocytochemistry and flow cytometry. CD11b and CD34 were used to distinguish macrophages and endothelial cells, respectively.

Results
Immunofluorescence revealed co-expression of CD34 and CD11b on single cell membranes in co-cultures of WT M2 macrophages and KS cells. These fusion events were quantified using flow cytometry and it was found that the 4:1 U937:WT KS ratio yielded the highest heterotypic fusion rate at 0.29%. When compared to the CD13 KO KS cells at the same ratio, these cells exhibited over five-fold fewer fusion events (0.051%).

Conclusion
This study confirms novel heterotypic fusion between M2 macrophages and KS cells, not previously shown in literature. We propose that CD13-regulated TNT formation is critical for heterotypic fusion events to occur. These findings highlight fusion as a key process in tumor progression, contributing to cellular heterogeneity, immune evasion, and drug resistance. As CHCs comprise up to 90% of circulating tumor cells, understanding fusion mechanisms could identify novel targets for cancer treatment.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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A Methods Based Approach to Exploring Genomic Pathways in Inherited Cardiomyopathies

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Background/Objectives

Hypertrophic cardiomyopathy and dilated cardiomyopathy (DCM) are genetic heart disorders characterized by asymmetric left ventricular hypertrophy, often associated with left ventricular outflow tract obstruction, heart failure, and sudden cardiac death (HCM) or cardiac chamber dilation and reduced ejection fraction, contributing to heart failure and other cardiovascular complications (DCM). Genetic studies have identified pathogenic variants (PVs) in sarcomere-related genes MYH7, MYBPC3, and TTN, as primary drivers of HCM and DCM. These genes account for approximately 40% of HCM cases. Despite this knowledge, significant phenotypic heterogeneity remains unexplained, and the effects of ethnicity on disease penetrance are poorly understood. This study aims to leverage the UK Biobank to identify common genetic modifiers that contribute to the variable penetrance and severity of HCM and DCM among individuals with pathogenic variants and the influence of ethnicity on the prevalence and impact of mutations in HCM and DCM.

Methods

We will utilize the UK Biobank, comprising over 500,000 participants. We will identify individuals with pathogenic variants in TTN, MYH7, and MYBPC3 ($n \approx 5{,}000$) and compare outcomes to a control group of randomly sampled participants without these mutations ($n \approx 2{,}500$) in a 2:1 ratio using ICD-10 codes. Statistical methods, including chi-square tests, odds ratio estimation, ANOVA, and post-hoc analyses, will be used to identify common genetic modifiers associated with hypertrophic and dilated cardiomyopathies and assess their phenotypic variability.

Results

The results are currently pending at the time of this submission.

Conclusions

Conclusions have not been finalized as of this submission.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Real World Efficacy of Certolizumab for the Treatment of Psoriasis

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Background/Objectives:

Psoriasis is an inflammatory condition caused by proliferative cascade of immune cell activation and subsequent cytokine release.[1,2] The anti-TNF drug certolizumab (Cimzia) is not considered a first-line treatment for most patients suffering from psoriasis, but several studies have shown that it had greatly improved the outcomes of patients with moderate-to-severe psoriasis.[3–5] Our study seeks to generate descriptive statistics on patients who were prescribed certolizumab for the treatment of their psoriasis, as well as asses the improvement or worsening of their psoriasis based on change in body surface area (BSA) affected.

Methods:

A retrospective chart review was performed using Epic data from UConn dermatology patients diagnosed with psoriasis who were prescribed certolizumab between 6/2018 and 1/2024. 32 patients were identified that met inclusion criteria. Data collected in the chart review included demographic information, details about previous treatments, details about their trial of certolizumab, and changes in BSA. Descriptive statistics were generated using Excel.

Results:

Of the patients who met criteria, most were female (71.9%), white (81.2%), and non-Hispanic (53.1%). Most patients tried at least 2 treatments for their psoriasis before certolizumab, the most common being Humira (87%) and Enbrel (50%). Most patients took Cimzia for 11 months before stopping, with 3 (9.4%) currently taking Cimzia at the time of analysis. Of the patients who were not lost to follow-up, 16 (72.7%) showed reduction in BSA affected, with an average reduction of 72.1% and 5 patients achieving 0% BSA affected.

Conclusions:

According to our dataset, Cimzia is most used as a 3rd or 4th line treatment for psoriasis. Although most patients stopped Cimzia after a year, most experienced a decrease in BSA with an average decrease of 72.1% of BSA and 5 patients becoming clear. This data may help dermatologists who are considering which biologic to choose for their patient's refractory psoriasis.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Examining Genetic Influences and Role of Gut Microbiome on Colopathy in *Ptges* Deficient Mice

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Center for Molecular Oncology

Background/Objectives:
Non-selective inhibition of the COX-1 pathway associated with NSAID use has attributed to 30-50% of users demonstrating endoscopic lesions. Modified formulations have mediated this, however with subsequent GI toxicities to the lower GI tract. In a previous experiment, genetic deletion of *Ptges*, a terminal synthase for PGE2 production, was shown to cause spontaneous colonic ulceration in sensitive (A/D) mice but not resistant (B6D) mice. Given that NSAIDs result in reduction of PGE2, these mouse models could be utilized to demonstrate the effects of NSAID use. In this study, F1 hybrids generated from sensitive strain A and resistance B6D mice were investigated to examine the impact of gene dosage on colonic ulceration.

Methods:
To determine whether the F1 mice developed spontaneous colonic ulceration, a total of 30 mice (15 males and 15 females) were each sacrificed at 4, 8, 12, 16, and 20 weeks of age within both the control and experimental group (lacking the *Ptges* gene). Their colons were formalin-fixed and embedded in paraffin blocks, and FFPE blocks were later sectioned at 5μm, H&E stained, and evaluated.

Results:
Ulcerations were not observed in the F1 hybrid mice aside from one mouse. However, isolated large lymphoid follicles were noted in several samples, suggesting a potentially robust immune response in the F1 hybrids. Possible germinal centers were also identified, suggesting upregulated mechanisms of adaptive immunity.

Conclusions:
With histological findings of immune complexes and germinal centers in colonic tissues, future experimentation goals include analyzing expression changes of total RNA by quantitative PCR (qPCR) to determine how expression of strain-specific genes changes in the F1 hybrid mice compared to parental mouse lines. This should reveal future research focuses to determine predisposing factors for NSAID-induced colopathy, predicting which patients are at increased risk for developing NSAID-induced lower GI complications within clinical practice.

Supported by: The UConn School of Medicine Summer Research Fellowship

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Cardiomyopathy Genetic Health Screenings At An Academic Health Center

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Background/Objectives:

Cardiomyopathies are disorders of cardiac muscle structure and function that can result in heart failure, arrhythmias, or sudden cardiac death (SCD), often affecting younger individuals and requiring early detection. This study focuses on inherited cardiomyopathies (IC), such as dilated and hypertrophic cardiomyopathies. Genetic testing aids in treatments, familial risk assessment, and understanding true prevalence of IC. Specialized clinics reduce SCD and optimize management, but limited research exists on their impact in smaller geographic areas.

Methods:

A retrospective observational cohort study was conducted at UConn Genetics Cardiology Clinic, covering patients evaluated between January 2016 and March 2024. Inclusion criteria required patients with a history of cardiomyopathy or a family history of cardiomyopathy or SCD. Data was extracted from EPIC EHR system, encompassing demographics, clinical history, and genetic screening results. Descriptive statistics and chi-square tests were utilized.

Results:

The study analyzed 199 patients. The cohort's median age was 50.13, with 66.33% male and 33.67% female. The cohort included 10.55% Hispanic or Latino participants; racially, 65.83% were White, 22.11% Black or African American, 2.51% Asian, and 8.54% other. Dilated cardiomyopathy (DCM) was most prevalent, affecting 44.72% of participants, followed by hypertrophic cardiomyopathy 28.64%. Pathogenic variants were identified in 24.62% of patients, with TTN (18) and MYBPC3 (6) being the most common for DCM and HCM, respectively. No statistically significant differences were found between pathogenic variants and demographics or cardiomyopathy subtype.

Conclusions:

The findings underscore the critical role of genetic screenings in managing IC. By identifying clinical and demographic trends, this study provides actionable insights into the prevalence and genetic basis of IC within a smaller referral population. Expanding research to include other monogenic cardiovascular conditions and diverse populations will enhance diagnostic and therapeutic strategies precision, reduce disparities, and improve care strategies.

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Impact of Post-Operative Protocol Changes and Adjunctive Virtual Reality on Recovery following Pediatric Idiopathic Scoliosis Surgery

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Background:
Scoliosis, defined as a lateral spinal curvature of ≥10 degrees, affects between 0.5%-5.2% of children, with 3.9-9.8 per 100,000 requiring surgery. Effective post-operative pain management and physical therapy are critical for improved clinical outcomes. The rise of new technologies, such as virtual reality (VR), are being studied as a strategy to improve post-operative recovery.

Methods:
This retrospective chart review analyzed 38 pediatric IS patients at Connecticut Children's Medical Center (CCMC) who underwent corrective surgery between 03/21/2023 and 09/23/2024. Patients were categorized into three groups: pre-protocol change (n=18), post-protocol change (n=10), and post-protocol change + VR (n=10). The main changes in the recovery protocol included the removal of ropivacaine epidural injections, reduced diazepam dosage, and the addition of OT. VR therapy involved 20-minute sessions using the Ocean Rift application on the Meta Oculus Quest 2 up to 2x daily, for up to 3-days post-op. A one-way ANOVA was used to compare the mean normalized number of patient-controlled analgesia (PCA) doses and the mean time to discharge across the three groups.

Results:
The study cohort (average age 15.24 ± 1.65 (SD) included 31 females and 7 males. Average PCA doses were 13.0 ± 1.41 (SEM) before the protocol change, 18.6 ± 3.45 (SEM) after the change and 16.3 ± 2.45 (SEM) after the change + VR. Average time to discharge was 2.83 ± 0.20 (SEM) before the change, 3.10 ± 0.35 (SEM) after the change, and 2.60 ± 0.22 (SEM) after the change + VR. No significant differences were observed between groups.

Conclusions:
The implementation of the new post-operative protocol and VR intervention found no statistically significant changes in PCA opiate doses or time to discharge. However, since VR was well-received by both patients and providers, its utility in post-operative management seems promising and should be further explored.

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Preliminary analysis of Optic Nerve Parameters in Migraine

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Background: Migraine is a prevalent neurological disorder characterized by headaches, sensory sensitivities, and visual disturbances such as blurry vision and visual aura. Its pathophysiology involves complex dysregulation of neuronal pain circuits and vascular mechanisms. The eye offers a unique window to study these changes due to its shared neuronal and vascular characteristics with the brain. Optical Coherence Tomography (OCT) and Optical Coherence Tomography Angiography (OCTA) provide non-invasive methods to examine these structures in detail.

Objective: This study aims to assess optic nerve structure in migraine participants, specifically comparing those with migraine with aura (MA) to those without aura (MO), to explore the potential of OCT/OCTA as biomarkers and enhance understanding of migraine pathophysiology.

Methods: Optic nerve scans from a subset of de-identified data previously collected at UCLA Health were analyzed. The study received IRB approval for the original data collection, and the current analysis is IRB exempt. Using the 3D Slicer program, optic nerve OCT/A scans were manually labeled to identify optic disc landmarks. These anatomical markers such as the ILM and Bruch's membrane opening were used to generate optic nerve metrics, including disc area, cup area, neuroretinal rim area, and minimum distance band, processed using Matlab. A mixed linear effects model in R was employed to compare these metrics between MA (n = 17) and MO (n = 10) groups. P values < 0.05 were considered significant.

Results: Preliminary results show no significant differences between migraine groups in optic nerve disc area, cup area, neuroretinal rim area, and minimum distance band. These results are planned to be extended to include additional participants in each group and control groups once all scan analysis is completed. Future scan analysis will also incorporate vascular perfusion metrics in the optic nerve across all groups.

Conclusion: This research may lead to the development of optical imaging biomarkers for migraine and improve our understanding of its mechanisms, potentially aiding in differential diagnosis and tailored treatment strategies.

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Safe Steps Home: Pediatric Femur Fracture Discharge and Injury Prevention

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Background/Objectives
Femur fractures are a common injury among children admitted to U.S. trauma centers, often treated with spica cast stabilization. Guidelines recommend using specialized car seats for transportation post-discharge, but adherence is limited due to institutional resource constraints and care coordination challenges. This study describes the process used at a Level I pediatric trauma center to provide specialized car seats to children in spica casts, evaluates the center's performance, identifies gaps in care, and proposes improvements to enhance discharge safety.

Methods
From September 2021 to December 2023, data were collected on patients under six years old treated for femur fractures with spica cast stabilization. The Injury Prevention Center was notified when a specialized car seat was needed, and Child Passenger Safety Technicians (CPSTs) provided appropriate seats and caregiver training. Operating room case data were compared to Injury Prevention Center records to identify cases of spica cast placement without specialized car seat provision.

Results
Of the 21 children treated during the study period, 71% (n=15) were discharged with a specialized car seat. The average distance from the hospital to home for these patients was 30.5 miles (range: 5–61 miles). The six patients who did not receive specialized seats lived an average of 25.6 miles away (range: 0.2–51 miles). All loaned car seats were returned, with an average loan duration of four months (range: 2–6.5 months).

Conclusions
This study highlights the importance of safe discharge practices using specialized car seats as a quality metric for pediatric trauma care. To improve care coordination, the trauma center plans to implement an EPIC-based notification system to alert CPSTs upon patient admission, facilitating timely seat arrangements and enhancing adherence to discharge safety protocols.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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Exploring the Impact of Race and Ethnicity and Socioeconomic Status on Diabetes Foot Care Practices in Hartford County, CT

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Background

Individuals from certain racial and ethnic groups and lower socioeconomic status (SES) experience a higher burden of diabetes and fare poorer outcomes with diabetes-related lower limb complications. Previous studies have explored barriers around diabetes foot complications, but none have focused on this geographic location or examined racial differences. Given the established link between race, lower SES, and poorer outcomes in diabetic foot ulcers and amputations, it was crucial to explore their relationship with diabetes foot care knowledge and practices to gather insight into patients' current education and practice status and assess the need for increased education on foot care.

Methods

During July and August 2024, anonymous validated diabetes foot care knowledge and practice surveys were administered to eligible patients at two outpatient diabetes clinics and one community event using convenience sampling. Data was analyzed using SAS software program. Descriptive statistics were used to summarize demographic and diabetes history data. Chi-square test and ANOVA were utilized to determine the association between categorical variables and continuous variables.

Results

Of 102 respondents, 64.7% were in the good or excellent knowledge category while 41.3% were in the good or excellent practice category. No statistically significant differences were found between racial and ethnic groups. Higher educational attainment and full-time employment were associated with lower knowledge categories ($p=0.026$, $p=0.001$) while retirement was associated with lower practice categories($p=0.04$).

Conclusion

Preliminary data indicate a potential need for increased patient foot care education based on the overall knowledge and practice scores. While some statistically significant findings were found related to SES status, study is limited by the convenience sampling method and may lack generalizability. As this is a pilot study, future studies will incorporate additional clinical sites to further explore this topic and survey questions will be updated to provide more clarity and improve response rates.

Supported by: *The UConn School of Medicine Summer Research Fellowship*

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Radiographic Landmarks of Medial Patellofemoral Ligament Reconstruction: A Systematic Review of Cadaveric Femoral Tunnel Position

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Background: Current standard practice for choosing femoral tunnel placement for medial patellofemoral ligament reconstruction (MPFLR) utilizes Schöttle's point as it is thought to best recreate ligament isometry. However, the considerable individual variability in MPFL insertion location suggests that Schöttle's point may not be an accurate target for all patients and could contribute to poor postoperative outcomes and even graft failure. This study conducts a systematic review of radiographic landmarks used to identify the femoral tunnel position during MPFLR.

Methods: A meta-analysis was performed of the PubMed, EMBASE, and Scopus databases to identify studies that reported the radiographic position of the MPFLR femoral tunnel. Included studies reported femoral tunnel position relative to the posterior cortical extension line (PCEL) in the anterior-posterior direction and to Blumensaat's line or another radiographic landmark in the proximal-distal direction. Weighted means and standard deviations were calculated in SPSS.

Results: Nine studies met inclusion criteria and were included in the final systematic review. A total of 94 cadaveric knees were analyzed with a mean age of 62.45 ± 11.64 years. The average distance from the PCEL to the MPFLR femoral tunnel was 1.34 ± 4.65 mm anterior [95% CI: 0.40, 2.28, range: 4.80 mm posterior to 8.80 mm anterior]. The average distance from Blumensaat's line was 1.56 ± 1.99 mm proximal [95% CI: 1.12, 2.00, range: 0.90 mm distal to 4.70 mm proximal]. Three studies reported the mean distance from the condylar transition line, averaging 2.90 ± 2.18 mm distal [95% CI: -5.04, -0.54, range: 0.50 mm to 5.70 mm distal].

Conclusion: This systematic review highlights the substantial heterogeneity in the radiographic location of the anatomic origin of the MPFL. The findings underscore the importance of integrating radiographic data with intraoperative landmarks to enhance precision of tunnel placement and optimize graft isometry.

Supported by: *NYU Langone Orthopedic Surgery Summer Externship Program*

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Cannabis Use and Self-Reported Health Among Adults with Type 1 and Type 2 Diabetes Mellitus: Secondary Data Analysis of the 2022 Behavioral Risk Factor Surveillance Survey

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Background/Objectives:

In 2021, 11.6% of the US population had diabetes, and about 19% of Americans used cannabis at least once. While recent studies suggest cannabis use may worsen diabetes self-management and outcomes, the demographic of individuals with Type 1 Diabetes Mellitus (T1D) and Type 2 Diabetes Mellitus (T2D) using cannabis products is poorly understood. This study examined 1) the characteristics of adults with T1D/T2D who use cannabis and 2) whether the level of cannabis use predicts self-reported indices of health and mental health.

Methods:

Adult respondents with T1D/T2D (N = 3,315) in the 2022 Behavioral Risk Factor Surveillance Survey completed standardized questionnaires including cannabis use in the past 30 days, self-rated health status (poor to excellent, 5-point scale), and number of self-reported physically and mentally unhealthy days in the last 30 days categorized as 0, 1-7, 8-14, 15-21, and 22-30. Data were weighted according to BRFSS guidelines.

Results:

Cannabis use was reported by 7.1% of adults with T1D/T2D. In logistic regression, males and those with financial barriers to healthcare were more likely, while those aged 65+ or currently employed were less likely to report cannabis use in the past 30 days. In multiple regression analysis, heavy cannabis use was associated with more physically unhealthy days; light/moderate cannabis use was associated with more mentally unhealthy days. Financial barriers to healthcare, insulin use, current/former cigarette use, and high co-morbidity index were associated with poorer self-reported health.

Conclusions:

All cannabis use levels were associated with more physically and mentally unhealthy days. Though cannabis use among adults with T1D/T2D is less prevalent compared to the US population rates (~19%), healthcare providers should assess for cannabis use in patients with T1D/T2D, given that use at any level in these patients may signal additional physical and mental health concerns.

Supported by: *UConn School of Medicine Summer Research Fellowship*

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School of Dental Medicine

Awards

DEAN'S AWARD: Awarded in recognition of an outstanding presentation demonstrating clinical application and technique relating to dentistry. This award consists of an expense-paid trip as the School of Dental Medicine's representative to the Hinman Student Research Symposium held in Memphis, Tennessee in October 2025.

ASSOCIATE DEAN'S AWARD: Awarded in recognition of an outstanding presentation in basic, clinical, educational, or behavioral science. The award consists of a complimentary meeting registration and travel assistance to present at the AADOCR General Session & Exhibition in 2026.

DENTSPLY-SIRONA STUDENT CLINICIAN AWARD: Awarded in recognition of an outstanding presentation. Includes travel assistance to the 2026 AADOCR General Session & Exhibition/Dentsply-Sirona SCADA Program as the School's representative; allowance for lodging, food and other expenses and a Dentsply-Sirona crystal.

CONNECTICUT HOLISTIC HEALTH ASSOCIATION: Presented by Dr. Michael Basso, this annual award was established to recognize excellence in research in Integrative/ Complementary and Alternative Medicine. Special thanks to Dr. Michael Basso of the Connecticut Holistic Health Association.

HORACE WELLS AWARD FOR INNOVATION IN DENTISTRY: Two awards will be given to dental students in recognition of outstanding research with a focus on innovation in dentistry.This award is supported by the Horace Wells Trust.

JAMES AND ELLA BURR MCMANUS AWARD FOR EXCELLENCE IN DENTAL RESEARCH: Two awards will be given to dental students presenting at the student research day to recognize excellence in research. This award is supported by the James and Ella Burr McManus Trust.

DENTAL STUDENT RESEARCH SOCIETY AWARD: Presented for excellence in a science presentation by dental students at the Student Research Day. Special thanks to Dr. Arthur Hand for supporting this award.

GUSTAVE PERL MEMORIAL AWARD: A scholarship award presented for outstanding original research.

EXCELLENCE IN DENTAL RESEARCH AWARDS: Presented for excellence in dental research by dental students. Special thanks to Dr. William MacDonnell for supporting this award.

OMICRON KAPPA UPSILON-PHI CHI CHAPTER AWARDS:
Two awards given in recognition of outstanding research; the first award is given for basic science research and the second award given for clinical science research.

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School of Medicine

Awards

CONNECTICUT ACADEMY OF FAMILY PRACTICE: One medical student will receive this $200 monetary gift for excellence in Primary Care Research.

CONNECTICUT HOLISTIC HEALTH ASSOCIATION: Awarded by Dr. Michael Basso, this annual award was established to recognize excellence in research in Integrative/ Complementary and Alternative Medicine. A medical student and a dental student will each receive an award of $100. Special thanks go to Dr. Michael Basso of the Connecticut Holistic Health Association.

DEAN'S AWARD: In recognition of two outstanding medical student researchers and their faculty mentors. Awards of $250 each will be presented to the four awardees. The awards to faculty mentors will be used for travel to a scientific meeting.

DR. JEFFREY GROSS ANESTHESIOLOGY SUMMER FELLOWSHIP POSTER AWARD: Dr. and Mrs. Jeffrey Gross established this award. Dr. Jeffrey Gross is Professor Emeritus at UCHC. An award of $250 will be given to the Anesthesiology Summer Fellow who presents the best poster.

DR. AND MRS. JEFFREY GROSS AWARD FOR EXCELLENCE IN RESEARCH ACHIEVEMENT: Dr. and Mrs. Jeffrey Gross established this award. Dr. Jeffrey Gross is Professor Emeritus at UCHC. Awards of $250 each will be given to two medical student researchers who presented excellent studies. One award will go to an oral presentation and one award will go to a poster presentation.

JOHN SHANLEY MEMORIAL GLOBAL HEALTH AWARD: The award is to honor the memory of John D. Shanley, MD, MPH, former Chief of Infectious Disease at the University of Connecticut, and Professor of Preventive Medicine and Public Health and Associate Dean of International Health at the Renaissance School of Medicine at Stony Brook University. This award is sponsored by FNE International and will be given in recognition of a project that best exemplifies collaboration towards sustainable services with an international partner. The student will receive a monetary award of $250.

LAWRENCE G. RAISZ AWARD FOR EXCELLENCE IN MUSCULOSKELETAL RESEARCH:
In honor and memory of Lawrence G. Raisz, M.D., this award of $250 will be given to a medical student researcher who presented outstanding work in the field musculoskeletal research.

PEER RECOGNITION AWARD FOR EXCELLENCE IN RESEARCH:
This award of $200 will be given to a medical student researcher in recognition of an exemplary poster presentation, as determined by peer review.

WILLIAM M. WADLEIGH MEMORIAL AWARD FOR CROSS-CULTURAL AND INTERNATIONAL HEALTH RESEARCH: The award is in honor the memory of William M. Wadleigh, PhD, anthropologist and Associate Director of the Center for International Community Health Studies in the Department of Community Medicine and Health Care. This $250 award is given annually to a medical student whose research exemplifies international and cross-cultural understanding of health issues.

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School of Dental Medicine

Acknowledgements

In acknowledgment of the efforts of our Dental student researchers, their faculty mentors, the members of the Dental Student Research Committees and all those involved in making this day possible.

Dental Student Research Day Organizing Committee:
Dr. Aditya Tadinada, Director of Student Research, Associate Dean for Graduate Research, Education & Training
Gina Saccone, Fiscal Coordinator
Laura Didden, Business Services Manager

Dental School Reviewers/Judges:
A special thanks to our judges for all their hard work in reviewing the abstracts, posters and judging the awards. Your efforts in making the Medical and Dental Student Research Day a resounding success are greatly appreciated.

With Special Appreciation to:
Dr. Steven Lepowsky, Dean, School of Dental Medicine
American Association for Dental, Oral and Craniofacial Research (AADOCR)- Associate Dean's Award
Dentsply-Sirona- Dentsply-Sirona Student Clinician Award
Dr. Arthur Hand- Dental Student Research Society Award
Dr. Michael Basso- Connecticut Holistic Health Association Award
Dr. William A. MacDonnell- Excellence in Dental research Awards
Omicron Kappa Upsilon, Phi Chi Chapter- OKU Awards
The Perl Family- Gustave Perl Memorial Award
The Horace Wells Trust- Horace Wells Awards for Innovation in Dentistry
James & Ella Burr McManus Trust- James and Ella Burr McManus Awards for Excellence in Dental Research
We would also like to thank the Connecticut State Dental Foundation (CSDF) / Connecticut State Dental Association (CSDA), for their generous donations to support student research.

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School of Medicine

Acknowledgements

In acknowledgment of the efforts of our Medical student researchers, their faculty mentors, the members of the Medical Student Research Committees and all those involved in making this day possible.

Medical Student Research Day Team 2025:

Dr. Kristin Guertin | Director, Medical Student Summer Research
Ursula Knapik | Administrative Officer, School of Medicine
Seana Schulz | Administrative Program Coordinator, School of Medicine

Medical School Workshop Facilitators/ Reviewers /Judges

A heartfelt thank you to our workshop facilitators, reviewers, and judges for your dedication and invaluable contributions in guiding students through various research fundamentals, reviewing student proposals, and evaluating abstracts and poster presentations. Your time, expertise, and thoughtful feedback were instrumental in making both the Summer Research Program and Medical and Dental Student Research Day a tremendous success. We deeply appreciate your support in nurturing the next generation of researchers.

With Special Appreciation to:

Dr. Bruce Liang | Dean, School of Medicine
Dr. Melissa Held | Senior Associate Dean for Medical Student Education
Dr. Christine Thatcher | Associate Dean for Medical Education and Assessment
Dr. Laurie Caines | Assistant Dean for Clinical Medical Education
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Drs. Lisa Barry, Helen Swede, Kristyn Zajac | Co-Directors, MDelta - Capstone Project
Dr. James Grady | Biostatistics Advisor – Scholarship & Discovery
Dr. Julian Ford | IRB Advisor – Scholarship & Discovery

A very special thanks to our sponsors:

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