CALIFORNIA NORTHSTATE UNIVERSITY

KEYNOTE SPEAKER

DR. JAN NOLTA, PHD

Institute for Regenerative Cures

UC Davis

"Cell and Gene Therapies - The Medicines of the Future"

CALIFORNIA NORTHSTATE UNIVERSITY

2025

RESEARCH SYMPOSIUM

SATURDAY, MARCH 22ND, 2025

COLLEGE of MEDICINE | COLLEGE of PSYCHOLOGY | COLLEGE of PHARMACY | COLLEGE of DENTAL MEDICINE | COLLEGE of GRADUATE STUDIES | COLLEGE of HEALTH SCIENCES

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KEYNOTE SPEAKER

Jan A. Nolta, Ph.D.

Jan A. Nolta, Ph.D., is the Director of the Stem Cell Program at University of California Davis School of Medicine and directs the Institute for Regenerative Cures and the UC Davis Gene Therapy Center. She is the Scientific Director of the large UC Davis Good Manufacturing Practice Facility, and PI of the California State Umbilical Cord Blood Collection Program. Through the California Institute for Regenerative Medicine funded Alpha Clinic the team administers FDA-approved cell and gene therapies. Dr. Nolta is helping UC Davis teams develop numerous clinical trials, with 59 stem cell and/or gene therapy clinical trials currently ongoing, and over twenty in the pipeline.

A scientist with 30 years' experience with human Hematopoietic and Mesenchymal stem cells, CAR-T, gene therapy, and clinical trial development, Dr. Nolta has published over 200 peer-reviewed manuscripts in the stem cell field, with over 19,000 citations and an H factor of 74 and has authored 30+ book chapters. She has been Editor-in-Chief for the Journal "Stem Cells" for the past decade. In 2023 she was awarded the International Society of Cell Therapy Career Achievement Award in Cell and Gene Therapy.

A native of a small town in Northern California (Willows), Dr. Nolta is dedicated to training and mentoring First-Gen students like herself. She is happily married, has two small dogs, and in her "spare time" she enjoys fishkeeping and is on the board of the Sacramento Aquarium Society, a non-profit club of aquarium enthusiasts who meet monthly.

PODIUM PRESENTATIONS

ABSTRACTS

Podium Group 1

Category	Public Health, Community, and Policy Research
Affiliation	College of Dental Medicine
Submitter	Moe Aye Maung
Authors	Moe Aye Maung, Rashida Wiley
Title	Efficacy of Treatment Modalities Used for Oral Submucous Fibrosis in Relation to Betel Nut Quid Consumption: A Systematic Review of the Literature
Abstract	Introduction Betel-nut chewing is a form of smokeless tobacco that is the leading international cause of oral submucous fibrosis. Since BNQ consumption plays an immovable role in cultural practice, religious rituals, and social customs, it remains necessary to investigate prevention or treatment efficacy to manage malignant complications. This study aimed to evaluate n=7 systematic reviews and meta-analyses on preventive measures to identify key risk factors and assess the leading treatment modalities of oral submucous fibrosis culminating from betel nut quid consumption. Methods The electronic and retrieval system PubMed was used to review a collection of meta-analyses and systematic reviews to assess improvement in trismus and burning sensation from various treatment methods. Studies were included if they fulfilled the criteria:(i) human studies, (ii) case-controlled, (iii) cross-sectional studies, (iv) systematic review, (v) randomized controlled trials, and (vi) peer-reviewed research. Exclusion criteria inclued:(i) books, (ii) clinical trials, (iv) case reports, (v) duplicate studies, (vi) laboratory-based studies, and (vii) editorials. The Critical Appraisal Skills Programme checklist was used to review the literature systematically. Findings From the 7 studies that met the inclusion criteria, a concurrent triple regiment modality (i.e., conventional therapy, systemic drugs, antioxidants, or herbal remedies) was associated with the most significant improvement in mouth opening dimensions and reduction in burning sensation. In addition, laser therapy fibrotomies have different success rates based on the type of soft or hard tissue laser. Physiotherapy remained a first-line treatment for low-grade fibrosis. Interestingly, cultural differences in the preparation or recipe of betel nut quid were a dependent factor for risk of oral squamous fibrosis. Conclusions Curcumin is an important and accessible treatment modality to manage and prevent oral submucous fibrosis where habitual betel quid chewing is prevalent.

Podium Group 2

Title: Targeting Mitochondrial LONP1 to Induce Immunogenic Cell Death in Melanoma

Authors: Jordan Darling[1], Brandon Bol[2], Jonathan Clement[2], Petros Raygoza[2], and Eslam Mohamed[1,2]

Affiliations: College of Graduate Studies[1], College of Medicine[2]

Category: Basic and Translational Research

Study Purpose: Mitochondria are essential organelles for cell survival and energy expenditure. Because of these pivotal roles, mitochondria have protective mechanisms against stress, including Endoplasmic Reticulum (ER) stress. LONP1 is an ATP-dependent protease that promotes carcinogenesis by regulating mitochondrial homeostasis and metabolism. However, its role under ER stress in cancer remains unclear. This study investigates the role of ER stress-driven LONP1 in carcinogenesis and tests if blocking LONP1 activity pharmacologically can induce immunogenic cell death (ICD) in melanoma cells. Methods: TIMER 2.0 is a public database that was used to analyze correlations between LONP1, patient survival, and immune infiltration across cancer types. Western blot and RT-PCR detected LONP1 expression levels in B16 melanoma cells treated with the ER stressors, Thapsigargin and Tunicamycin. CDDO-ME, a synthetic terpenoid, was utilized to inhibit LONP1 activity. Flow cytometry analyzed surface markers like MHC I and Calreticulin (CALR), mitochondrial permeability, cell cycle, and micropinocytosis flux. A bioluminescence assay was performed to investigate extracellular ATP levels. **Results:** TIMER 2.0 shows a negative correlation between LONP1 and CD8+ T-cell infiltration across different cancers. In metastatic cutaneous melanoma, LONP1 positively correlated with poor survival. In ER-stressed B16 melanoma, blocking LONP1 activity caused an arrest in sub-G1 phase of the cell cycle and promoted surface CALR exposure together with extracellular ATP release, hallmarks of ICD. Also, we found that LONP1 inhibition reversed the downregulation of surface MHC I induced by ER stress. Next, we wanted to explore the mechanism by which B16 cells undergo ICD. We found that blocking LONP1 activity in B16 cells undergoing ER stress triggered a halt of autophagic flux as shown by p62 accumulation and heightened LC3-II levels. This interruption was confirmed by a significant decrease in the exocytosis of dextran-FITC cargo. **Conclusion**: These findings demonstrate LONP1 is pivotal for survival and immune evasion of B16 cells under ER stress and emphasize that inhibiting LONP1 imposes a vulnerability for tumor cells facing stress conditions. This highlights the clinical and therapeutic potential of targeting LONP1 as a novel approach for cancer treatment, particularly in tumors characterized by high levels of cellular stress.

Podium Group 3

Resistance to HIV-1 Infection Conferred by a CCR5Δ32 Heterozygosity

Authors: Mary Jabari; Bashar Alkhatib; Shymaa Bilasy; Husni Abdul-Rahman; Kamal Sandhu; Stephen Lai; Ghalib Alkhatib

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Affiliations: Department of Basic Sciences, California Northstate University College of Medicine

Abstract

Background: Homozygosity for a 32-base pair deletion (Δ32) in the human CCR5 gene is strongly associated with resistance to HIV-1 infection due to the lack of a functional CCR5 receptor on immune cells, which prevents viral entry. Stem cell transplantation of CCR5-deficient cells derived from the limited number of homozygous subjects resulted in HIV cure However, the protective effect of the CCR5 heterozygous genotype remains controversial. Some studies suggest heterozygosity may slow disease progression by reducing receptor density, while others find no significant impact, highlighting the need for further research.

Methods: Peripheral blood mononuclear cells (PBMCs) from same-gender couples discordant with their HIV status were used to determine the CCR5 genotypes and analyze protein expression. The mutant's cells were infected with HIV in vitro, cloned, and fusion and viral entry into the cells were analyzed following HIV exposure. Subject GS is HIV seropositive while his receptive partner SC is HIV seronegative despite multiple exposures.

Results: CCR5 genotyping identified SC as a CCR5 heterozygous. Sequence analysis of the CCR5 cDNA identified a T58A polymorphism in the SC CCR5 open reading frame. The point mutation resulted in the loss of the cysteine residue in the CCR5 amino terminus. R5 infection of GS PBMCs resulted in high p24 production, high R5 envelope-mediated fusion, and MIP-1β-induced chemotaxis. In contrast, the seronegative SC PBMCs showed significant resistance to R5 infection, and R5 fusion and had no chemotactic response to CCL4 (MIP-1β).

Conclusions: The data demonstrate in vivo evidence that CCR5 heterozygosity's resistance to HIV-1 is associated with the loss of CCR5 coreceptor function. This finding is important because a high percentage of the CCR5 heterozygous population is among a cohort of exposed/uninfected individuals. Determining how these heterozygotes resist HIV-1 will provide a significant number of donors for stem cell transplantation, which aims to cure HIV.

Research Category: Basic and Translational Sciences

Podium Group 4

The experience of making behavioral observations during neuropsychological assessment of dementia: A conventional content analysis

Lodovica Bicego; Eric Vogel; Kathleen Kendra
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: Behavioral observation, also known as process observation, is a critical yet underexplored component of neuropsychological assessment. While research acknowledges its importance in assessing cognitive deficits, particularly in dementia, little research has focused on how neuropsychologists utilize behavioral observations in practice. This study explored how clinical neuropsychologists experience making behavioral observations and incorporating these into their assessments. Methods: A qualitative study employing conventional content analysis was conducted with a purposive sample of 10 licensed clinical neuropsychologists (Hsieh & Shannon, 2005). Participants engaged in semi-structured interviews exploring their experiences of using behavioral observations in dementia assessments and related issues. A coding scheme was created inductively, with themes emerging from the review of the interview data, ultimately yielding several categories of common experiences across participants. Results: 14 categories were identified, illustrating neuropsychologists' motivations, training experiences, methods for refining behavioral observation skills, and their perceptions of its critical role in contextualizing neuropsychological test results. Participants emphasized that behavioral observations enhance the interpretation of test performance, improve report clarity, and aid in feedback delivery. However, challenges such as ambiguity in interpretation, limitations in training, and forensic complexities were noted. Participants largely viewed behavioral observation as integral to neuropsychological evaluations and highlighted the need for more structured training methods. Conclusion: This study provides insights into the complexities of how neuropsychologists employ behavioral observations in dementia assessments, reinforcing its value while highlighting the prominent role that individualized mentorship plays in transmitting observational skills from one generation of neuropsychologists to the next. Findings suggest the need for more regularized forms of multimodal experiential training to improve consistency and reliability; however, they also suggest that by their very nature, behavioral observation practices may not be easily standardizable. Future research may explore structured methods to integrate behavioral observations systematically within neuropsychological practice.

Podium Group 5

Title: Service-Learning Programs for Building Bridges with Local Migrant Communities

Authors: Theresa Xiong; Emily Lee; Tarek Kassem; Islam Mohamed

Affiliation: CNUCOP

Category: Public Health, Community, and Policy Research

Objective:
This study evaluates the impact of service-learning programs on the cultural competency and DEIA (Diversity, Equity, Inclusion, and Accessibility) skills of healthcare students engaging with local migrant and refugee communities.

Methods:
Health fairs are organized with student leaders, offering services like blood screenings, chronic disease education, and vaccine clinics. Engagement is promoted through flyers, social media, and in-class announcements. A modified SAPLCC survey assesses students' cultural competency before their first event and at the year's end. The pre-survey is completed before the initial event, with ongoing data collection as new students join. The survey is administered anonymously via Microsoft Forms, and Cronbach's alpha and a paired t-test evaluate reliability and changes in cultural competency.

Results:
A total of 43 students completed the SAPLCC survey prior to their initial outreach event. The aggregated data from this sample was analyzed to assess the survey's reliability, revealing strong internal consistency (Cronbach's Alpha was above 0.7).
Preliminary findings showed 84% of students rated hands-on training for diverse underserved populations as "Very Important," and 81% identified poverty as a key factor in health disparities. In contrast, 40% reported no knowledge of healing traditions like Ayurvedic and Traditional Chinese Medicine.
For items assessing students' skills and confidence in working with diverse populations, few selected "Very Skilled" or "Very Confident," indicating room for improvement. Future analyses will compare these baseline results with post-survey data collected after the final outreach event.

Conclusion:
Preliminary findings indicate that the Modified SAPLCC survey is a reliable tool for measuring cultural competence among healthcare students. Continued data collection will assess the effectiveness of service-learning programs in enhancing students' DEIA-related skills. Future outreach efforts will focus on strengthening partnerships, including collaboration with the Refugee Enrichment and Development Association (REDA), to expand community engagement and provide students with deeper, hands-on experiences in culturally responsive care.

Podium Group 6

Epitranscriptomic mechanisms of chronic pain induced by systemic lupus erythematosus

Authors: Sugamjot Kaur Badhan; Saumya Bipin; and Han-Rong Weng

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Affiliations: Department of Basic Sciences, California Northstate University College of Medicine, Elk Grove, California, USA

Study objective: Patients with systemic lupus erythematosus (SLE) often suffer from chronic pain due to the limited efficacy and safety profile of current analgesics. There is an urgent need to identify new and effective molecular targets for managing SLE-associated chronic pain. YTHDF2 RNA-binding protein is implicated in the development of many neurological diseases through epitranscriptomic regulation of protein expression. The aim of this study is to investigate whether and how YTHDF2 regulates chronic pain induced by SLE.

Methods: The study utilized Female MRL/lpr mice as a SLE model, along with MRL mice as controls. Behavioral assessments, western blotting, and immunohistochemistry were employed.

Results: MRL/lpr mice exhibited signs of arthritis in the hind paw, beginning at 12 weeks of age. Concurrently, these lupus mice developed hypersensitivity to heat (thermal hyperalgesia) and mechanical (mechanical allodynia) stimuli between 12 and 16 weeks. Western blot analysis revealed a significant reduction in YTHDF2 protein levels in the spinal dorsal horn of MRL/lpr mice compared to control mice. Immunohistochemical analysis demonstrated that YTHDF2 protein is present in neurons, astrocytes, and microglia within the dorsal horn. Suppressing YTHDF2 protein expression in the dorsal horn of control mice via intrathecal administration of YTHDF2 siRNA (1 μg/injection, twice daily for two days) led to the development of thermal hyperalgesia and mechanical allodynia. This was concurrently associated with heightened neuronal activation, and activation of both microglial and astrocytes. Additionally, phosphorylated P38 levels were elevated, along with increased IL-1beta and IL-18 cytokine expression, while glial glutamate transporter-1 protein levels were reduced in the same region. The molecular and behavioral changes following spinal YTHDF2 knockdown closely resembled those observed in lupus mice.

Conclusions: Our findings indicate that reduced YTHDF2 expression in the spinal dorsal horn plays a role in the development of lupus-induced chronic pain by modulating spinal neuroinflammation and neuronal activity.

Research Category: Basic and Translational Sciences

Podium Group 7

Category	Health Informatics and Literature Reviews
Affiliation	College of Dental Medicine
Submitter	Ali Shahcheraghi
Authors	Ali Shahcheraghi; Ariga Sarkissian; Pinelopi Xenoudi
Title	Evaluating the Efficacy of Laser-Assisted Therapy in Surgical and Non-Surgical Treatment of Periodontitis: A Comprehensive Review
Abstract	Study Objective: Periodontitis is a chronic, inflammatory disease that leads to bone loss and if left untreated to tooth loss. It requires effective treatments that include non-surgical and in advanced cases surgical treatment modalities. Lasers have emerged as a promising adjunct to improve the outcomes of periodontal therapy. This study aimed to evaluate the efficacy of carbon-dioxide (CO2), neodymium-doped yttrium aluminum garnet (Nd:YAG), erbium-doped yttrium aluminum garnet (Er:YAG), and diode lasers in both non-surgical and surgical therapy for periodontitis. Methods: A comprehensive search was conducted using PubMed, Cochrane Library, ResearchGate, Google Scholar, Ovid, and ScienceDirect databases. After applying inclusion and exclusion criteria, a refined selection process yielded 36 articles for a thorough review of the efficacy of laser therapy in surgical and non-surgical periodontal treatments. Results: The literature review indicates that, in non-surgical therapy, lasers used with scaling and root planing (SRP), led to reductions in probing pocket depths (PPD) and bacterial load, with the most improvements in deep pockets. In surgical treatments, all four laser types reduced PPD and improved clinical attachment levels (CAL), in moderate (4-6 mm) and deep pockets (≥7 mm). While all lasers led to enhanced treatment outcomes, their effectiveness varied. Surgical approaches offered regenerative benefits, while non-surgical methods excelled in bacterial reduction and inflammation control. However, concerns about long-term stability and variability in operator skill and energy settings persist. Conclusions: The reviewed literature suggests that incorporating lasers in periodontal therapy can potentially enhance the periodontal treatment outcome in both surgical and non-surgical modalities. Further research is essential to understand the underlying mechanisms and long-term effects.

Podium Group 8

Title: Utilizing Artificial Intelligence to Predict the Risk of Adverse Pregnancy Outcomes

Authors: Noah Kim*, Ria Kumar*, Uzoamaka Okwuosa*, Ahmed El-Shamy

Affiliations: College of Graduate Studies

Category: Health Informatics and Literature Review

In this article, we propose a predictive AI model that assesses a patient's risk of developing adverse pregnancy outcomes: gestational diabetes, preterm birth, preeclampsia, placental abruption. Maternal and neonatal mortality are greatly increased by these situations. Complications including fetal development restriction, organ damage, preterm birth, and elevated long-term health risks for both mother and child are possible outcomes. Conventional risk assessment techniques frequently ignore the genetic components that contribute to these disorders. Our proposed AI model, Risk Assessment Neural Network (RANN), is a predictive model that utilizes deep learning to anticipate potential adverse pregnancy outcomes and assist physicians with creating tailored treatment plans for individual patients. RANN would incorporate a combination of epidemiological, genomic, and clinical databases to develop an accurate assessment of a patient's risk of adverse pregnancy outcomes. Epidemiological and genomic data would be gathered from available online databases, while a clinical database would have to be obtained by partnering with a clinical site. During efficacy training RANN demonstrated high predictive accuracy for gestational diabetes, preterm birth, pre-eclampsia, and placental abruption by integrating genomic, clinical, and epidemiological data. Cross-validation and external validation using the UK Biobank confirmed model robustness and generalizability. Ethical considerations, such as data privacy and potential biases, were addressed to ensure fair and responsible deployment. The RANN model effectively predicted adverse pregnancy outcomes by incorporating genetic and clinical risk factors. It has the potential to outperform traditional models that exclude genomic data. This personalized risk assessment approach supports tailored interventions, potentially reducing maternal and neonatal complications. Future research should focus on expanding genomic datasets and enhancing model transparency for clinical adoption.

Podium Group 9

Unilateral Abnormalities of the Anterior Neck Musculature: A Case Report

Authors: Tianyu (Cindy) Luo, B.S.; Shikha Patel, M.S.; Mikayla Stabile, B.S.; Sarah Swerdlow, B.A.; Aishwarya Vemulapalli, B.S.; Logan Rodgers, M.S.; and Mohamed Ahmed. MD, MSc

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Research Category: Clinical and Case-based Research

Study Objective

Anatomical variations of the infrahyoid muscles have been well-documented, particularly in the omohyoid and sternohyoid muscles. These variations have clinical implications in surgical planning, especially in procedures involving the anterior neck. We report a novel, unilateral muscular variant lateral to the sternohyoid muscle identified during cadaveric dissection, contributing to existing anatomical knowledge.

Methods

A 65-year-old male cadaver from a willed body program was dissected during cadaveric dissections for first-year medical students. The anterior neck musculature was examined using a systematic layered dissection. The variant muscle was documented, photographed, and analyzed for its anatomical relationships, including origin, insertion, and spatial positioning relative to known infrahyoid muscles.

Results

A unilateral, previously unreported muscle was identified lateral and slightly deep to the sternohyoid muscle on the left side of the cadaver. It originated from the medial clavicle and inserted onto the hyoid bone, paralleling the sternohyoid. Unlike prior reports of bilateral variants, this muscle was isolated to one side and formed a distinct anatomical plane beneath the omohyoid and sternohyoid muscles. No associated vascular or neural anomalies were observed in literature up to date.

Conclusions: This novel unilateral muscular variant provides insight into the diversity of anterior neck musculature. Recognizing such anomalies is critical in surgical navigation, especially for thyroidectomy and tracheostomy. Thorough knowledge of different muscle compositions is crucial to achieve ideal surgical outcomes, minimize complications, and ensure patient safety and post-operative recovery.

Podium Group 10

Developmental associations between crystalized cognition and verbal knowledge among individuals with intellectual and developmental disability

Numfon Vilay; Andrew, J. Dakopolos; Iris Chen; David Hessl
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: Intellectual and developmental disability (IDD) affects up to 3% of people in the U.S. (Tassé et al., 2025) and includes significant impairments in adaptive and cognitive functioning (Shields et al., 2020). Language can be difficult to measure in IDD. The NIH Toolbox Cognition Battery (NIHTB-CB) was developed to assess domains like crystallized language skills (Weintraub et al., 2013), showing promising feasibility and sensitivity to developmental change (Shields et al., 2023). However, whether gains in NIHTB-CB Crystallized Cognition reflect broader verbal abilities remains understudied. Methods: A multi-site longitudinal study recruited 318 individuals ages 6–26 with suspected or confirmed IDD. After exclusions, 263 remained. Participants completed the NIHTB-CB Crystallized Cognition subtests (Picture Vocabulary, Oral Reading) and Stanford-Binet 5 (Verbal Knowledge, Verbal Fluid Reasoning) at baseline and two-year follow-up. Bivariate latent change score models (Dakopolos et al., 2024) tested whether changes in NIHTB-CB crystallized cognition paralleled changes in verbal reasoning, controlling for age and time between visits. Results: Both models showed good fit. Changes in Crystallized Cognition significantly correlated with changes in Verbal Knowledge (β=7.92, p=.009) and Verbal Fluid Reasoning (β=4.91, p=.018). Higher baseline Crystallized Cognition predicted greater improvement in these verbal domains, while higher initial verbal scores also predicted more Crystallized Cognition growth. These findings suggest individuals with stronger baseline skills may be particularly responsive to targeted language interventions. Conclusion: NIHTB-CB Crystallized Cognition demonstrated a strong relationship with broader verbal reasoning measures, highlighting its utility as a sensitive outcome measure in IDD research. Despite limitations (e.g., short interval, possible practice effects, and untracked interventions), these results underscore its clinical potential. Future studies should replicate these findings with larger, more diverse samples, longer follow-up, and explicit tracking of interventions. Overall, the NIHTB-CB can advance our understanding of language development and inform better intervention strategies for individuals with IDD.

Podium Group 11

Title: Development of a Virtual Reality Platform to Compliment Pharmacy Student IV Sterile Compounding Laboratory Experiences

Authors: Sang Vuong; Hieu Huynh; Welly Mente

Affiliation: CNUCOP

Category: Educational and Quality Improvement Research

STUDY OBJECTIVE
Virtual reality (VR) provides additional opportunities to reinforce concepts taught in intravenous (IV) sterile compounding through pharmacy school's didactic or laboratory curricula. The main goal is to determine the feasibility and provide a VR platform that compliments pharmacy students experience for IV sterile compounding.

METHODS
The VR program was created with Unreal Engine 5.4.3 application coding for the Meta Oculus 3 Headset. Model creations for the IV sterile compounding simulation were created using Blender 4.1. CNU pharmacy students were given ten pre- and post- survey statements regarding virtual reality as an alternative platform. Statements asked students to rank responses according to: strongly disagree = 1, disagree = 2, neither agree nor disagree = 3, agree = 4, or strongly agree = 5. Survey statement responses were analyzed for reliability and internal consistency using Cronbach's alpha. Comparison between the pre- and post- survey utilized a t-test with an alpha value of 0.05 to determine a change in scores have occurred.

RESULTS
The IV sterile compounding survey statement responses were captured and summarized from current CNUCOP pharmacy students (n=18) that have completed at least the 1st year of practicum laboratory skills assessments in IV sterile compounding. There were 18 CNU pharmacy students who completed pre- and post-survey statements resulting in an average score of 4.31 and 4.49, respectively.

CONCLUSIONS
VR technology can potentially grow into an immersive and interactive learning environment that may play an integral role in future pharmacy education. This study shows the potential feasibility towards implementation of VR for use outside of the traditional mock IV laboratory. Virtual environments for learning and practicing can be considered and may address some of the financial constraints and space allocation needs of having to design and build physical space for teaching.

Podium Group 12

Effectiveness of Video Learning Materials for the Spine and Gait Physical Examination for Medical Skills

Authors: Rebecca Phelan; Shannon Dwyer; Rojin Sharaflari; Jose Puglisi PhD; Sarah Preiss-Farzanegan MD

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Affiliations: California Northstate University College of Medicine

Research Category: Educational and Quality Improvement Research

Objective: Objective structured clinical examinations (OSCEs) are integral to medical education, simulating real clinical practice more accurately than written exams. There is increasing interest in optimal methods for teaching musculoskeletal (MSK) content, as existing literature indicates low confidence in MSK exam instruction. Given the lack of studies on the best way to implement teaching the spine and gait physical exam, we investigated if a video demonstrating the exam, with integrated clinical correlations, would be the most effective teaching tool. We hypothesize a video including embedded clinical correlations to teach the spine and gait physical exam provides the best learning opportunity for medical students.

Methods: 80 first-year students at California Northstate University College of Medicine, enrolled in the Medical Skills course, consented to participate and were evenly randomized into either the control or intervention group. The intervention group received the experimental video alongside the textbook material provided to the control group. An anonymous post-class survey received 63 responses, with 6 responses excluded due to incorrect survey completion. The responses were analyzed using an unpaired t-test.

Results: Participants who viewed the video reported significantly higher confidence in their ability to perform the spine and gait physical examination, when compared to the control group ($p=0.0005$). In particular, participants rate the clarity of the video in explaining relevant anatomy with a highly significant confidence level ($p<0.0001$). In addition, the effectiveness of the video in clarifying special tests and participants' ability to elucidate pathological mechanisms related to special tests is extremely significant ($p<0.0001$). Participants also expressed a significant likelihood of revisiting the pre-classroom materials for review compared to other supplemental materials ($p=0.0002$).

Conclusion: A video demonstrating the spine and gait physical exam, with embedded clinical correlations, proves to be a significantly more effective teaching method for medical students.

POSTER PRESENTATIONS

ABSTRACTS

(Clinical and Case-Based Research)

SESSION A

COLLEGE OF PSYCHOLOGY

Poster #A1

Breaking the cycle: Exploring the impact of childhood maltreatment on future parenting satisfaction

Fola Okeyemi; Ashlene Kaur Sandhu
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objectives: Studies have shown that a history of maltreatment can elevate the risk of prospective maltreatment toward one's own child. This study examines the relationship between childhood maltreatment and subsequent parenting satisfaction. Methods: This study uses data from 5,111 middle and high school participants in the longitudinal AddHealth study. The sample consisted of diverse ethnic groups, such as individuals from Cuba, Puerto Rico, and China, as well as twins, siblings, unrelated individuals in the same household, African Americans with highly educated parents, and individuals who identified as disabled. Results: Results indicated that lower levels of childhood maltreatment were associated with greater happiness in the parental role. A weak but positive correlation was found between maltreatment and depression ($r = .182$, $p < .001$), with maltreatment accounting for only 3.3% of the variance in depression scores ($R2 = 0.033$). The relationship between maltreatment and depression remained significant after controlling for biological sex, with females showing higher depression rates ($OR = 1.719$, $p < .001$). Happiness in the parental role was strongly associated with lower depression ($OR = 1.947$, $p < .001$) than biological sex. A chi-square analysis revealed a moderating effect of race/ethnicity on the relationship between maltreatment and biological sex for white individuals, but not for other racial/ethnic groups. Conclusions: These findings underscore the need for targeted interventions that equip individuals with a history of abuse with effective parenting strategies that will enhance parental satisfaction in hopes to strengthen the parent-child relationship and ultimately disrupt the cycle of childhood maltreatment. Future research should explore additional variables, such as trauma resilience, that may help mitigate the impact of childhood maltreatment on parenting satisfaction, particularly among diverse racial/ethnic groups.

Poster #A2

The sleeping smoker: The relationship between smoking tobacco and sleep patterns

Hector Aaron Isas
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: A significant association between cigarette smokers and decreased sleep quality has been identified in recent research. The aim of this study was to identify if higher tobacco use, in the form of cigarettes, is associated with increased sleep disturbances and maladaptive sleep patterns. It also evaluated if reported participant biological sex and race differed in sleep latency and quality. Methods: The study sample was comprised of 15,197 adolescents, between 7th and 12th grade, from Wave IV of the National Longitudinal Study of Adolescent Health. Variables were measured at the individual level of adolescent participants including Number of Cigarettes smoked per day, whether snoring or stopped breathing during sleep occurred, biological sex, and race. Results: Results of this study show participants who reported smoking higher amounts of cigarettes per day, also experienced snoring and stopped breathing during sleep. However, results also identified that female identifying participants were more likely to have higher frequency of trouble falling asleep per week. Finally, participant reported race was not associated with frequency of trouble sleeping per week. Conclusions: In this sample, the number of cigarettes smoked per day is clinically relevant to maladaptive sleep patterns caused by disturbances in sleep, like snoring and stoppage of breathing. Future research is recommended to be directed toward tobacco cessation and further exploration of sleep interventions that are specific to sleep patterns of tobacco smokers.

Poster #A3

The relationship between relationship dissatisfaction, parental dissatisfaction, and substance use frequency

Payton Lee; Jason Lillis
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: The purpose of the study was to examine the association between relationship satisfaction/dissatisfaction with more frequent monthly substance use; and to further examine if parental dissatisfaction serves as a confound for this relationship. Methods: This study utilized data from the fourth wave of the National Longitudinal Study of Adolescent Health, consisting of adults aged 24-34 years (AddHealth; 2008). AddHealth is a school-based longitudinal study of a nationally-represented sample of adolescents in grades 7-12 who have been followed for more than 20 years. Relationship satisfaction combined several items and then was dichotomized into “Satisfied” or “dissatisfied.” Monthly substance use was measured as a sum score based on past month use of cigarettes, chewing tobacco, alcohol, injected drugs, marijuana, and/ or their drug of choice. An analysis of variance (ANOVA) was performed to examine the association between relationship satisfaction and monthly substance use frequency. A multiple regression model was then performed to examine the potential confounding factor of parental dissatisfaction.
Results: Participants experiencing relationship dissatisfaction had more frequent monthly substance use ($M=13.39$) when compared to those experiencing relationship satisfaction ($M=10.62$). This was a significant difference ($F=42.316$; $df=1, 4836$; $p<.001$). Multiple regression analysis revealed parental dissatisfaction partially explains the relationship; however, relationship dissatisfaction remained significant ($p<.001$), indicating an independent effect on substance use frequency. Conclusion: The results of this study indicate that parental dissatisfaction could potentially influence the association between relationship dissatisfaction and substance use frequency, but not entirely. Research should aim to investigate interventions that consider relationship dissatisfaction in the treatment of substance use disorders, while also considering possible effects of previous parental dissatisfaction. Furthermore, researchers should continue to hypothesize about the mechanisms that underly the relationship between relationship dissatisfaction and substance use frequency.

Poster #A4

Higher neuroticism is weakly associated with an increase in sleep problems, regardless of biological sex.
Quinton Castleberry; Jason Lillis
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: Risk of sleep disturbances depends on individuals' personality, and a large body of evidence indicates that individuals prone to neuroticism are more likely to experience them (Krizan et al., 2024). This study aims to provide additional evidence that higher levels of neuroticism have a positive correlation with reported sleep problems. Methods: Data used for analysis came from the AddHealth Wave 4 data set, a longitudinal study collecting vast arrays of data over 5 years. A bivariate correlational analysis was used to determine the association between neuroticism and sleep problems. A Chi-Square moderation analysis was used to determine if biological sex was a moderating factor in said relationship. Results: The correlation between sleep problems and neuroticism was r=.244 (p<.001), a statistically significant, low correlation, suggesting that about 6% (r2=.06) of the variance in sleep problems is explained by neuroticism in this sample. The significant relationship between neuroticism and sleep problems remained after adding biological sex as a moderating factor, showing no change in strength or direction. Therefore, biological sex has no moderating effect on this correlation. Conclusion: Higher levels of neuroticism were associated with an increase in sleep problems.

Poster #A5

Examining the relationship between childhood maltreatment, incarceration age, and anger

Smyrna Agib; Jason Lillis
Affiliation(s): CNUPSY
Category: Clinical and Case-based Research

Objective: The purpose of this research was to explore the relationship between childhood maltreatment and criminal behavior (age of first incarceration); and furthermore to examine the potential moderating role of anger/hostility personality trait. Methods: This study used data from the fourth wave of the National Longitudinal Study of Adolescent Health and consists of 5,114 adults aged 24-34 years (AddHealth; 2008). Add Health is a school-based longitudinal study of a nationally-represented sample of adolescents in grades 7-12 who have been followed for more than 20 years. An analysis of variance (ANOVA) was performed to examine the association between childhood maltreatment and age of first incarceration; a moderation analysis was then performed for anger/hostility personality trait. Results: Results of an ANOVA test show that individuals with high instances of childhood maltreatment have a lower average age at first incarceration (M=16.78, sd=5.019) compared to those with none, low, and moderate instances. This difference was found to be significant (F=5.611; df=3, 372; p<.001). After running separate ANOVAs for each level, anger/hostility personality trait was found to be a moderator of the relationship between childhood maltreatment and age of first incarceration. Conclusion: The results of this study show mixed findings. Childhood maltreatment appears to be associated with an earlier age of first incarceration and is moderated by anger/hostility. However, there is no linearity to the moderation effect, making it difficult to interpret the relationship. Therefore, further research is needed to clarify the interrelationships of these variables to better influence the development of future interventions.

COLLEGE OF DENTAL MEDICINE

Poster #A6

Category	Clinical and Case-based Research
Affiliation	College of Dental Medicine
Submitter	Nisha Manila
Authors	1. Nisha Manila, 2. Marketa Leisure
Title	Pediatric Pituitary Microadenoma: A Case Report
Abstract	Objective: Pituitary adenomas, usually benign, are less frequent in children compared to adults. Within the general population, they comprise 2.6-8.5% of all pituitary tumors. In children, these tumors account for less than 3% of intracranial tumors. While both microadenomas and macroadenomas exist in this age group, microadenomas are significantly more prevalent and often discovered incidentally. Defined by a size less than 10mm and confinement to the sella turcica, microadenomas are frequently diagnosed during investigations for hormonal imbalances. Treatment selection hinges primarily on lesion size and hormonal status, encompassing medical therapy, surgery, or radiation therapy, or a combination. For non-functioning microadenomas or cystic pituitary lesions under 10mm, follow-up programs with clinical evaluation and repeated MRIs are common to monitor potential growth in the short and long term. This case report presents a rare instance of long-term follow-up for a microadenoma initially presenting with symptoms at age 5 in an 11-year-old patient. Case Presentation: At the age of 5, the patient was presented with concerns about growth and frequent headaches. Evaluation revealed growth hormone deficiency. A bone age study confirmed a discrepancy between the child's chronological age and skeletal maturity. An MRI scan of the brain and pituitary gland with contrast was performed. While the craniocervical junction showed no signs of Chiari malformation, a 2mm hypointense lesion was identified in the mid-portion of the pituitary gland. There was no evidence of recent stroke, mass effect, or fluid collections. Normal intracranial flow voids were observed. These radiographic findings suggested either a pituitary microadenoma or a pars intermedia cyst. Based on the clinical and imaging characteristics, the diagnosis of a pituitary microadenoma was confirmed. Conclusion: In conclusion, the 11 yrs. old patient who was diagnosed with pituitary microadenoma is experiencing normal growth following growth hormone therapy. MRI scans have demonstrated stability in the size and characteristics of the lesion. This case emphasizes the importance of maintaining a high index of suspicion for pituitary microadenomas in children, despite their rare presentation. Early diagnosis and targeted treatment are critical for achieving best outcomes.

COLLEGE OF GRADUATE STUDIES

Poster #A7

Title: Pregnancy Challenges in Sickle Cell Disease

Authors: Stella Yao[1], Uzoamaka Okwuosa[1], Ashraf M. Mohieldin[1]

Affiliations: College of Graduate Studies

Category: Clinical and Case-Based Research

Objective: Sickle cell disease (SCD) and sickle cell trait (SCT) both result from genetic variations in the hemoglobin beta gene but differ in clinical severity. SCD, an autosomal recessive disorder, causes sickle-shaped red blood cells, leading to severe complications such as multi-organ damage and vaso-occlusive crises, while SCT is generally milder with a less severe health impact. Both SCD and SCT are associated with an increased risk of pregnancy complications compared to the healthy population. However, the full extent of maternal and fetal risks associated with SCD and SCT during pregnancy remains unclear. **Methods:** This systematic review of 67 studies analyzed data from 2,271 mothers (Control: 1,318, SCT: 242, SCD: 711) and 1,926 fetuses (Control: 1,214, SCT: 130, SCD: 582), using two-way chi-squared tests to compare pregnancy complications across all groups. **Results:** Our results indicate a significantly higher prevalence of maternal complications, including pre-eclampsia, cesarean section rates, and intrauterine growth restriction (IUGR), in SCT and SCD compared to the control group. Similarly, fetal complications, including low birth weight (LBW), fetal mortality, and neonatal intensive care unit (NICU) admissions, are more common in SCT and SCD pregnancies compared to the control group. **Conclusion:** In summary, this review offers comprehensive analyses of previously understudied populations, identifying key risk factors and providing insights to improve clinical management for mothers and fetuses affected by SCT and SCD

Poster #A8

Title: Genetic Associations with Substance Use and Behavioral Disinhibition in a Twin Cohort

Authors: Jiahua Zhou; Ahmed ElShamy

Affiliations: College of Medicine, College of Graduate Studies

Category: Clinical and Case-Based Research

Objective: We investigate genetic associations with addiction phenotypes in a large twin cohort, utilizing genome-wide association analysis (GWAS) to identify predictive loci. **Methods**: We analyzed data from the Minnesota Center for Twin and Family Research, comprising 7,188 offspring and parents, including monozygotic and dizygotic twins. Genotyping was performed using Illumina's Human660W-Quad Array (561,490 SNP markers). Data preprocessing included filtering SNPs with call rates <99%, minor allele frequency <1%, and deviation from Hardy-Weinberg equilibrium at p < 1e-7 using PLINK. GWAS were conducted using GEMMA unix package based on linear mixed model (LMM), which accounts for population stratification via a kinship matrix. Covariates included age, sex, birth year, and generation. Multiple linear regressions using R were performed to estimate SNP contributions while controlling for covariates. **Results:** No SNPs reached genome-wide significance (p < 5x10^-8), but multiple loci met predictive significance (p < 5x10^-6) for nicotine use, alcohol consumption, alcohol dependence, illicit drug use, and behavioral disinhibition. Bonferroni-significant results included:
Behavioral disinhibition (11 SNPs): rs9309065_G, rs4470367_A (DYSF, linked to height, intelligence/ADHD/autism pleiotropy), rs1995888_G, rs7648557_A, rs1503603_G, rs2055613_A, rs282472_G, rs4871455_A, rs10979023_A, rs10857606_A, rs7940871_A (PRDM11, linked to thyroid-stimulating hormone levels)
Alcohol consumption (11 SNPs): rs10096148_G, rs2589232_A, rs8048568_A, rs6041762_A, rs321558_G, rs6432310_C, rs13103626_G, rs16901165_A, rs12517872_A, rs6898675_A, rs6461470_A
Nicotine (9 SNPs): rs856084_C, rs1279186_A, rs2313565_A, rs2059121_A, rs6458065_G, rs6923361_G, rs11139710_A, rs4149276_G, rs324325_A
Alcohol dependence (1 SNP): rs7940871_A (PRDM11, linked to thyroid-stimulating hormone levels)
Illicit drugs (8 SNPs): rs10488013_A, rs3944154_G, rs1867306_C, rs3790014_G, rs918402_C (LINC00290/NDUFB5P1, linked to schizophrenia, bipolar disorder, nicotine dependence, and depressive symptoms), rs11968408_A, rs1782627_G (PLG/MAP3K4-AS1, linked to lipid measurements and smoking initiation), rs540524_G (SPC25, linked to fasting glucose and drinks per week). **Conclusion:** Our findings provide preliminary evidence of genetic influences on substance use and behavioral disinhibition. Further validation and replication are in progress to determine the external validity of these findings.

COLLEGE OF PHARMACY

Poster #A9

Title: Barberry Compounds Target Mitochondrial Sirtuin-3 and subsequent pathway to Induce Apoptosis in LNCaP Prostate Cancer Cells

Authors: Cliff Ly*#, Giang Tran*#, Tram Hoang*, Melanie Rose*, Tibebe Woldemariam*, Linh Ho*##

Affiliations: CNUCOP

Category: Clinical and Case-Based Research

Objective:
Prostate cancer is the second leading cause of cancer-related deaths in males. It is androgen-dependent in nature and mainly treated by androgen deprivation therapy (ADT). However, advanced prostate cancer is not currently curable because at this stage, prostate cancer cells are able to survive and proliferate without the signals normally provided by circulating androgens. Therefore, new therapeutic agents are urgently needed for chemoresistant prostate cancer cells. The objective of this study was to assess whether barberry compounds modulate Sirt3 to inhibit proliferation and viability of LNCaP prostate cancer cells.

Methods:
Fluorometric assay and immunoblotting were used to measure and validate the effect of barberry compounds on Sirt3 activity. Cell proliferation and cytotoxicity were assessed using a Dojindo CCK-8 kit. Scratch assay was used to determine the inhibition of cell migration. Western blotting was used to explore the molecular pathways underlying the inhibitory effect of barberry compounds on LNCaP cancer cells.

Results:
Barberry compounds exerted inhibitory effects on Sirt3 activity resulting from decreased deacetylate activity significantly at 50 and 100μg/ml. This inhibitory effect was confirmed by immunobloting showing a decreased Sirt3 expression as barberry concentrations increased. Treatment with barberry compounds at concentrations of 5, 10, 20, 40, 80, 160, and 320μg/ml inhibited cell proliferation in dose dependence manner. Interestingly, phosphorylation levels of protein kinase B (P-AKT) and mTOR decreased when concentrations of barberry compounds increased. In contrast, phosphorylation of AMPK and ACC as well as PGC1-alpha expression were enhanced at higher concentrations than 80μg/ml. VDAC expression representing as mitochondrial content was decreased correlating with increased concentration of barberry compounds.

Conclusion:
In conclusion, barberry compounds inhibit proliferation and viability and migration of LNCaP cancer cells via inhibiting Sirt3 activity and subsequent metabolic pathway. Particularly, barberry compounds promote AMPK and mitochondrial biogenesis, meanwhile inhibit AKT-mTOR pathway and mitochondrial content to induce cytotoxicity and apoptosis in LNCaP cancer cells.

Poster #A10

Title: Three-Dimensional Cultures Model Study of Type 2 Diabetes Induced Adipose Remodeling

Authors: Giang Tran*#, Cliff Ly*#, Sakib Moinuddin*, Fakhrul Ahsan*, Linh Ho*##
# C.L. and G.T. contributed equally to this work.

Affiliations: CNUCOP

Category: Clinical and Case-Based Research

Objectives

Chronic low-grade inflammation of adipose tissue is implicated in the pathogenesis of metabolic diseases and the development of organ-specific complications in individuals with overweight and obesity. Adipose tissue remodeling involves more than adipocytes and is the interplay of angiogenesis, adipogenesis, hypoxia and inflammation, and its related disorders. Traditionally, two dimensional (2D) transwell culture plates have been used to study the interaction of microvascular cells, adipocytes, and immune cells in adipose remodeling; however, the static 2D culture nature of this approach fails to mimic the physiological environment of adipose remodeling. The present study aims to establish a three-dimensional (3D) co-culture system that provides uniform nutrient delivery to faithfully reflect the microvascular networks of the in vivo environment in adipose remodeling.

Methods

Human adipose-microvascular epithelial cells (HAMECs), peripheral blood mononuclear cells (PBMCs), and human mesenchymal stem cells (HMSCs) or human preadipocyte cells (HPREAs) were cultured in 3D matrix on microchips and in transwells in 96-well plate in parallel as a proof of concept and serving as a control. Angiogenesis and adipogenesis were assessed. This project has been collaborating with Dr. Ahsan's lab.

Results

We successfully cocultured HMSCs or HPRECs with HAMECs and PBMCs, demonstrating angiogenesis and adipogenesis in 3D culture systems. Data showed adipocyte formation in both 96-well plates and microfluidic chips.

Conclusion

Our preliminary data suggest that the cells successfully differentiate into adipocytes and that the microchips maintain viability. Upon achieving sufficient culture growth, we will investigate modulators of angiogenesis and adipogenesis, evaluate the effects of pharmaceutical agents on these processes, and further explore the pathogenesis of diseases involving fat remodeling.

Additionally, we will confirm and analyze inflammatory markers within a 3D matrix using microchips and transwells to enhance our understanding of cellular interactions in this model system.

Poster #A11

Title: Oncolytic Immunovirotherapy: A recipe to convert immunologically cold tumors into hot ones

Authors: Noah Yang, Dipongkor Saha

Affiliation: CNUCOP

Category: Clinical and Case-Based Research

Objectives:

To evaluate the potential of oncolytic herpes simplex virus (oHSV) expressing interleukin-2 (IL-2) and/or IL-12 in transforming "cold" tumors into "hot" tumors, enhancing the anti-tumor immune response, and minimizing systemic toxicities. Additionally, we aim to assess the efficacy of a double-armed oHSV expressing both IL-2 and IL-12 in promoting tumor eradication, particularly in immunologically resistant cancers such as glioblastoma.

Methods:

We conducted a comprehensive review of the current literature on the use of oncolytic herpes simplex virus (oHSV) for localized expression of IL-2 and IL-12 within tumors. Our analysis focused on evaluating the effects of individual cytokine expression on immune activation in the tumor microenvironment and the reduction of systemic toxicities. Additionally, we explored the theoretical potential of a double-armed oHSV expressing both IL-2 and IL-12, examining how this combination might amplify the immune response and overcome the limitations of monotherapies, particularly in the treatment of “cold” tumors like glioblastoma.

Results:

Localized expression of IL-2 or IL-12 via oHSV increased immune activity within the tumor, converting the tumor microenvironment into an “immunologically hot” state. This enhanced anti-tumor immunity while minimizing systemic toxicities, such as cytokine release syndrome. However, monotherapy with either cytokine did not result in complete tumor eradication, particularly in glioblastoma, a typically “cold” tumor resistant to immune checkpoint blockade. The double-armed oHSV expressing both IL-2 and IL-12 has potential to amplify the immune response and demonstrates the capacity for enhanced tumor eradication.

Conclusions:

Localized expression of IL-2 and IL-12 by oHSV can generate an immunologically active tumor microenvironment and reduce systemic toxicity. A double-armed oHSV expressing both cytokines has the potential to overcome the limitations of individual cytokine therapies, transforming "cold" tumors into "super-hot" tumors and improving the prospects for tumor eradication, particularly in challenging cancers like glioblastoma. Further research and rigorous testing are required to confirm the efficacy of this approach.

COLLEGE OF MEDICINE

Poster #A12

Challenging the Keloid Diagnosis: Uncovering Dermatofibrosarcoma Protuberans

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Research Category: Clinical and Case-based Research

Dermatofibrosarcoma protuberans (DFSP) is a rare, locally aggressive soft tissue sarcoma originating from the dermis, accounting for less than 0.1% of all malignancies. It typically presents as a slow-growing, painless nodule in adults aged 20-50 but poses unique diagnostic challenges due to its clinical and histopathological variability, which often leads to misdiagnosis as a benign lesion, delaying treatment.

We present the case of a 39-year-old female with a lesion on her lower back, initially misdiagnosed as a keloid. The lesion grew in size and darkened despite corticosteroid injections. A shave biopsy revealed features consistent with DFSP, including spindle cell proliferation and a honeycomb pattern in subcutaneous fat. Immunohistochemistry confirmed CD34 positivity and S100 and Factor XIII-A negativity, distinguishing DFSP from other conditions. The patient underwent successful Mohs surgery with clear margins.

This case highlights the diagnostic complexity of DFSP, particularly when it mimics conditions such as keloids. The overlap in clinical presentation between DFSP and benign conditions like keloids and acne keloidalis can lead to delayed diagnosis, emphasizing the importance of histopathological evaluation and immunohistochemistry for accurate identification. Early detection and appropriate surgical management, such as wide local excision or Mohs surgery, are critical in preventing recurrence and achieving optimal outcomes.

Poster #A13

Factors Associated with Suprachoroidal Space Thickness in Healthy Human Eyes

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Research Category: Clinical and Case-based Research

Objective: The suprachoroidal space (SCS) is a potential space between the choroid and sclera that can be accessed for drug delivery and gene therapy. Here, we establish a nomogram for SCS measurements and analyze demographic and ocular factors associated with SCS visibility and thickness on enhanced-depth optical coherence tomography (EDI-OCT) in healthy human eyes without ocular diseases.

Methods: We analyzed medical records and EDI-OCT images of 624 normal eyes of 624 patients with no known ocular diseases. We measured SCS visibility and thickness, as well as choroidal thickness using the Duke Optical Coherence Tomography Retinal Analysis Program (DOCTRAP). We determined the association of SCS visibility and thickness with demographic and ocular factors such as age, sex, race, and refractive error using binary logistic and linear regression analyses.

Results: We found that 462 of 624 normal eyes (74%) had a visible choroid-sclera junction (CSJ) on EDI-OCT, among which 221 eyes (48%) had a visible SCS. The SCS was more likely to be visible in older patients ($p < 0.001$) and Whites/Caucasians ($p = 0.001$). Among eyes with a visible SCS, the mean SCS thickness at the fovea was 33.79 µm. SCS thickness increased with age (0.229 µm/year; $p < 0.001$) and hyperopic refractive error (0.081 µm/diopter; $p = 0.163$) at the fovea, with similar significant associations observed at 5 mm and 6 mm around the fovea ($p = 0.031$ - 0.041). Mean SCS thickness at the fovea was greater in White/Caucasian patients than other races (18.64 µm vs. 9.99 µm; $p = 0.015$) but did not differ by sex ($p = 0.510$).

Conclusions: SCS visibility and thickness varies with age, race, and refractive error. Understanding demographic and ocular factors associated with SCS measurements could help identify optimal candidates and monitor anatomic changes for SCS injections for drug delivery or gene therapy.

Poster #A14

First Case Report of Late-Onset OHSS with Right-Sided Pleural Effusions Following a Spontaneous Pregnancy During a Luteal Phase Ovarian Stimulation Cycle

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Research Category: Clinical and Case-based Research

OBJECTIVE: The purpose of this report is to present a case of late-onset ovarian hyperstimulation syndrome (OHSS) with isolated pleural effusion in a 36-year-old woman who conceived spontaneously during an IVF cycle without exogenous hCG administration. This case underscores the need for vigilant monitoring during luteal phase stimulation and early detection of complications in assisted reproductive technology.
MATERIALS AND METHODS: A 36-year-old woman with a 15-month history of primary infertility underwent her second IVF cycle during the luteal phase. Ovarian stimulation was performed with menotropins, follitropin alfa, letrozole, and somatropin, yielding 17 follicles by day 11. Her estradiol level reached 279 pg/mL. The cycle was canceled after a positive urine pregnancy test and a serum β-hCG level of 53 mIU/mL. Two days later, her β-hCG rose to 231 mIU/mL, while progesterone measured 39.7 ng/mL. Over the following weeks, she presented to the emergency department with dyspnea and recurrent right-sided pleural effusions that required multiple thoracenteses.
RESULTS: Initially, 1,500 cc of straw-colored fluid was drained from a large pleural effusion. Two subsequent thoracenteses removed 1,800 cc and 1,400 cc of fluid, respectively. Laboratory tests showed mild hyponatremia, hypocalcemia, and hypoalbuminemia. Ultimately, a pigtail catheter was placed to drain 1,600 cc of fluid. A follow-up ultrasound confirmed a viable singleton pregnancy carried to 32 weeks and 4 days, culminating in a successful delivery.
CONCLUSION: This case illustrates that spontaneous conception during an IVF cycle can trigger endogenous hCG production, leading to VEGF release and OHSS complications even without exogenous hCG. Clinicians and patients must remain alert during luteal phase stimulation to detect and manage complications early. Close monitoring and prompt intervention are essential to ensure patient safety and improve treatment outcomes. These findings highlight the critical role of proactive care.

Poster #A15

Recurrent spontaneous pneumothorax in an adolescent patient with hereditary multiple osteochondromas: A case report.

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Research Category: Clinical and Case-based Research

Background: Hereditary multiple osteochondromas (HMO) is an autosomal dominant condition characterized by multiple cartilage-capped bone tumors, primarily affecting long bones and rarely the ribs. This case report presents a pediatric patient with chronic HMO and a confounding Marfanoid habitus who experienced recurrent spontaneous pneumothoraxes (RSP) due to an undiagnosed costal osteochondroma. The case highlights the importance of follow-up testing and diagnostic approaches for pediatric RSP.

Case Presentation: A 14-year-old male with Marfanoid habitus and chronic HMO presented with three days of left-sided pleuritic chest pain and mild cough. Physical exam and ultrasound confirmed a left-sided pneumothorax, managed with chest tube placement. The pneumothorax resolved by the third hospitalization day.
3 months after the index hospitalization, he returned with exercise-induced left-sided chest pain, and a second pneumothorax was confirmed and treated similarly. Twenty-six days after this second encounter, a similar episode occurred following physical activity, and a third left-sided pneumothorax was diagnosed. During his third ER encounter, a CT scan of the chest revealed a left fifth rib osteochondroma projecting toward the lung. A Video-Assisted Thoracoscopic Surgery was performed to resect the tumor, with subsequent pathology confirming the diagnosis of osteochondroma.
The patient remained asymptomatic 14 days following the procedure. Subsequent genetic testing ruled out Marfan syndrome but identified a maternally inherited EXT2 mutation, confirming HMO.

Conclusions: This case underscores the importance of revising RSP diagnostics. While Marfan syndrome and Ehlers-Danlos are common RSP causes, this patient's presumed Marfan diagnosis delayed identification of his costal osteochondroma. Although CT scans of the chest are not indicated when radiograph films provide adequate diagnostic information, incorporating additional imaging into the diagnostic workup for RSP can facilitate prompt identification of bony abnormalities, preventing recurrent hospitalizations and complications. Furthermore, genetic testing plays a crucial role in differentiating overlapping syndromic features, ensuring accurate diagnoses and personalized management plans.

Poster #A16

Ferumoxytol-Enhanced Magnetic Resonance Imaging (MRI) for Monitoring Tumor Response to Radiotherapy

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Research Category: Clinical and Case-based Research

Purpose: Ferumoxytol is an IV-administered, FDA-approved iron supplement consisting of iron oxide nanoparticles of a diameter less than 50 nm. In vivo ferumoxytol is phagocytosed by and accumulates in macrophages. As it consists of iron, ferumoxytol can be detected by magnetic resonance imaging. We sought to determine the potential of ferumoxytol MRI as a non-invasive method to monitor radiation-induced macrophage recruitment in cancer patients treated with radiotherapy.

Methods: We identified cancer patients who were treated with focal radiotherapy at Stanford University and underwent ferumoxytol MRI scans within 1 month prior to the start of radiation and within 6 months following completion of radiation. Patients were excluded if they were treated with total body irradiation or total lymphoid irradiation. The ferumoxytol MRI scans acquired before and after the radiation treatment were analyzed to determine the change in R2* relaxation rate, which increases with increasing ferumoxytol concentration at the irradiated site.

Results: We identified 9 patients treated with 18 courses of focal radiation. These patients were diagnosed with osteosarcoma (n=9), Ewing sarcoma (n=4), rhabdomyosarcoma (n=3), nasopharyngeal squamous cell carcinoma (n=1), and Wilms tumor (n=1). The median treatment dose was 26Gy, and the doses ranged from 18Gy in a single fraction to 70Gy in 33 fractions. Almost all courses were delivered as a hypofractionated regimen with dose per fraction >2.2Gy (n=17). We evaluated the histogram of R2* in the high dose volume, revealing an increase in R2* signal in treatment sites after radiation treatment across multiple tumor sites. This increase in R2* signal was additionally independent of histology, anatomic location, dose fractionation, and treatment modalities.

Conclusions: We observed a measurable increase in R2* in ferumoxytol MRI of tumor sites following focal treatment with radiation therapy. This suggests this imaging modality can be used as a non-invasive means of measuring macrophage infiltration in vivo.

Poster #A17

Impact of Probiotics on Atopy and Food Hypersensitivity Allergy and IgE-mediated disorders in Pediatric Patients

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Research Category: Clinical and Case-based Research

Objective(s)
Probiotics have been proposed to be effective in treating and preventing atopic diseases in pediatric patients. However, this evidence remains inconclusive, and much variability exists between studies. Atopic dermatitis is defined as a chronic, inflammatory form of eczema characterized by skin changes and has been quantitatively and qualitatively characterized by the SCORAD scale (SCOring atopic dermatitis). This project aims to compare the efficacy of various probiotic treatments (Lactobacilli, Bifidobacterium, etc.) for children with atopic dermatitis to identify if probiotic supplementation can decrease SCORAD indices in children receiving them and alleviate symptoms.

Methods
Through a systematic literature review of multiple electronic databases through October 9th, 2024, we identified randomized controlled trials (RCTs) in pediatric patients with an established diagnosis of atopic dermatitis. Our search strategy was as follows: "((atopy) OR (dermatitis) OR (hypersensitivity)) AND pediatric AND probiotic" yielding 31 total studies. Patients were treated with either a probiotic regimen or placebo and assessed for levels of IgE, cytokines (CD4, CD8, IL-10, TGF-B), eosinophils, and SCORAD indices.

Results
15 RCTs were extracted looking at the impact of probiotics on atopic dermatitis. 12 studies showed statistically significant decreases in SCORAD indices with p values ranging from 0.0283 to less than 0.001. Three studies did not report significant decreases in SCORAD indices; one study reported lack of between-group analysis and thus the true effect of probiotics could not be demonstrated. Another study mentioned that potential probiotic contamination could not be completely ruled out as many infant formulas and milk products are supplemented with probiotics, which can mask the effect of the probiotic in the treatment group.

Conclusions
Probiotics are positively correlated with the reduction of SCORAD indices warranting further statistical analysis. An adjusted multiple logistic regression analysis will be performed across all studies extracted to better contextualize these findings.

Poster #A18

Case Report: Novel KCNJ10 Mutation Identified in Patient with Paroxysmal Kinesigenic Dyskinesias (PKD)

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Research Category: Clinical and Case-based Research

Study Objective Paroxysmal Kinesigenic Dyskinesia (PKD) is a rare movement disorder in which abrupt voluntary movements trigger involuntary movements such as dystonia, chorea, or ballism. While mutations in the PRRT2 or TMEM151A gene are known causes, recent studies suggest variants in the KCNJ10 gene can also be causative. In this case report, we introduce a PKD patient with a novel pathogenic variant in the KCNJ10 gene.

Methods The patient is a 15-year-old male first diagnosed with PKD at 12 years old.

Results Our patient's symptoms are characterized by loss of control of his body and involuntary movement of his tongue up to his palate. These episodes occur 10-12 times a week, last up to 6 seconds, are preceded by aura, and are triggered by sudden movements like standing up quickly after prolonged inactivity. Family history is positive for PKD, and episodes are controlled on oxcarbazepine. MRI and EEG results were normal but an Invitae Epilepsy Panel found a pathogenic mutation on exon 2 of the KCNJ10 gene (c.331C>T p.Gln111*), which has yet to be reported in existing literature.

Conclusions PKD diagnosis is largely clinical and the pathophysiology is still unclear. While the function of TMEM151A remains unclear, PRRT2 is known to inhibit the sodium channels Nav1.2 and Nav1.6, which are present in excitatory neurons. Thus, pathogenic variants of PRRT2 result in hyperexcitability through disinhibition. KCNJ10 encodes Kir4.1 potassium channels found on glial cells, playing a role in maintaining potassium homeostasis. Pathogenic mutations have been found to disrupt potassium homeostasis, depolarizing resting membrane potentials on nearby neurons and causing a hyperexcitable state. Our report on a new pathogenic KCNJ10 variant corroborates recent findings that KCNJ10 mutations are causative for PKD and prompts the need for further investigation into the relationship between KCNJ10 mutations and PKD.

Poster #A19

Necrotizing Cellulitis of the Finger; A Case Report

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Research Category: Clinical and Case-based Research

Study objectives: Constrictive ring embedment can lead to progressive ischemia, tissue necrosis, and infection. While cases of embedded rings have been reported, the need for digital amputation as a direct consequence remains largely undocumented.

Methods: This is a case report of a patient with skin and tissue necrosis of the right ring finger due to ring embedment.

Results/Case Description: A 62-year-old female presented to the emergency department with a 5 day history of cellulitis of the right finger due to prolonged ring erosion extending to the bone. The patient had pain, fever, and weakness and presented septic and tachycardic. Physical examination revealed crepitus, though radiographic imaging showed no subcutaneous air. Given the severity of ischemic tissue damage and the risk of reperfusion injury, the patient was transferred to the orthopedic service for digital amputation and to the ICU for further monitoring.

Conclusion: Prolonged pressure from the embedded ring resulted in local capillary occlusion, ischemia, and necrosis, creating an environment conducive to bacterial infection. The Braden Scale classified the patient as high risk for pressure ulcers, highlighting the need for early intervention. Additionally, ischemia-driven tissue hypoxia impaired bacterial clearance and wound healing. The risk of reperfusion injury upon restoring circulation further complicated management, necessitating a cautious approach. Hyperbaric oxygen therapy (HBOT) has shown promise in enhancing wound healing and mitigating ischemic damage, though its role in similar cases warrants further investigation. This case underscores the importance of early recognition and intervention in ring-associated ischemic injuries. Clinicians should be aware of the potential for severe vascular compromise, infection, and reperfusion injury in constrictive ring injuries.

Poster #A20

Do Younger Patients Truly Fair Better than Older Patients Following Hip Resurfacing Arthroplasty? A Systematic Review and Meta-Analysis.

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Introduction
Activity levels and bone quality are key factors in selecting patients for hip resurfacing arthroplasty (HRA). Younger patients typically have fewer complications, lower revision rates, and better outcomes than older patients due to age-related factors like activity levels and comorbidities. This review examines whether older age should be a contraindication for HRA and explores if active older patients with good bone quality can still benefit from the procedure.

Methods
A literature search was conducted using PubMed, Embase, and Scopus databases using keywords related to HRA and age. Studies were screened for eligibility, and data on demographics, complications, survivorship, and PROMs were extracted. A meta-analysis compared UCLA scores and odds of prosthesis survivorship between younger (<50 years of age) and older (>50 years of age) patients with significance set as a 95% confidence interval (CI) that does not include 1.

Results
Of the 1286 articles, 31 met inclusion criteria, encompassing 22,691 patients. Analysis revealed a pooled mean age of 33.65 years for the younger cohort and 63 years for the older cohort, and a complication rate of 5.37% in younger compared to 3.83% ($p = 0.498$) in older hips. The difference in postoperative UCLA scores was deemed statistically insignificant based on meta-analysis. However, the difference in mean survivorship rates was found to be statistically significant at 86% for younger and 94.9% for older patients via univariate analysis ($p < 0.001$) and meta-analysis.

Conclusion
This review shows no significant difference in outcomes between younger and older patients undergoing HRA, with older patients even having higher prosthesis survivorship. Age alone should not contraindicate HRA, as active older patients with good bone quality can achieve similar results to younger counterparts. Future research should compare younger and older cohorts to refine the age limits for HRA benefits.

Poster #A21

Postoperative Outcomes after Total Hip Arthroplasty and Total Knee Arthroplasty Among Solid Organ Transplant Patients: A Systematic Review and Meta-Analysis

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Research Category: Clinical and Case-based Research

Introduction: Improvements in surgical methods and immunosuppressive therapy have significantly prolonged the survival of solid organ transplant (SOT) recipients. As a result, many of these patients are opting for procedures like total knee arthroplasty (TKA) and total hip arthroplasty (THA) to improve their quality of life. This systematic review evaluates whether clinical outcomes differ between SOT patients undergoing TKA and THA.

Methods: A systematic search across PubMed, Embase, and Scopus yielded 521 studies addressing TKA and THA in SOT patients. After applying the inclusion criteria, eligible articles were analyzed for perioperative outcomes and patient-reported outcome measures (PROMs), such as the Harris Hip Score (HHS) and Knee Society Score (KSS). Data from these studies were included in a meta-analysis to synthesize findings.

Results: Six studies, comprising data on 229 SOT patients who underwent THA and 108 who underwent TKA, were included. Analysis revealed that body mass index (BMI) was notably higher in SOT patients undergoing TKA compared to THA ($d=1.34$, $SE=0.42$, 95% CI [0.52, 2.16], $p < 0.001$). PROMs showed that SOT patients who underwent THA had significantly better functional outcomes compared to those who underwent TKA ($d=-2.79$, $SE=0.31$, 95% CI [-3.39, -2.19], $p < 0.001$). No significant differences were observed between the two groups in age, postoperative infection rates, revision surgeries, blood transfusion requirements, hospital length of stay, or perioperative complications.

Conclusion: This review highlights that SOT patients undergoing THA generally achieve superior postoperative satisfaction and functional outcomes compared to those undergoing TKA. These findings may help guide clinicians with decision-making for SOT patients who are considering arthroplasty procedures in the future.

Poster #A22

Does Melatonin Impact Postoperative Sleep following Total Joint Arthroplasty?: A Systematic Review and Meta-analysis of Randomized Controlled Trials

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Objective: Melatonin is a commonly used sleep aid, though its effects on postoperative sleep after total joint arthroplasty (TJA) remains unclear. Therefore, the objective of this study was to evaluate the effect of melatonin on subjective and objective sleep measures of postoperative sleep after TJA.

Methods: A search was performed utilizing the Boolean search phrase "(melatonin OR ramelteon OR tasimelteon OR agomelatine) AND (joint OR hip OR knee) AND (replacement OR arthroplasty)." Sleep duration, nightly awakenings, and patient-reported sleep outcomes were recorded when available. Pittsburgh Sleep Quality Index (PSQI) scores at six weeks were compared between intervention and control groups with a random-effects proportion meta-analysis weighted for individual study size. Across the 4 included randomized controlled trials, 455 patients were identified, of which 227 received melatonin and 228 received a placebo. Melatonin dosage was five milligrams (mg) in three studies and six mg in one.

Results: Melatonin did not significantly impact subjective or objective postoperative sleep outcomes. While Clarkson et al. reported transient worsening in PSQI scores at 2 weeks, no differences were seen at 6 weeks between placebo and melatonin groups. Haider et al. observed a trend toward fewer awakenings and increased sleep duration over the first three postoperative days (POD), though these differences were not statistically significant and did not persist on or after POD4. Kirksey et al. reported similar non-significant improvements in sleep efficiency and sleep time, while Lebrun et al. found no significant differences in sleep measures between placebo and melatonin groups. PSQI scores at six weeks were non-significantly improved in the melatonin group ($P = 0.74$).

Conclusion: Melatonin does not appear to have a significant impact on postoperative sleep following TJA. Further investigation is warranted to address other factors such as pain and environmental disturbances to improve sleep quality.

Poster #A23

Increased Operative Time yet Enhanced Accuracy in Computer-Assisted versus Mechanical Hip Resurfacing Arthroplasty: An Updated Systematic Review and Meta-Analysis

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Objectives
Hip resurfacing arthroplasty (HRA) is a complex procedure requiring advanced training beyond total hip arthroplasty (THA). It offers advantages like a larger femoral head, improved range of motion, and better replication of natural hip mechanics, making it ideal for active patients with good bone quality. With the advent of computer-assisted navigation, some surgeons use it to enhance accuracy, while others rely on mechanical techniques. This study reviews radiographic and clinical outcomes to assess navigation's effectiveness in HRA, potentially supporting its routine use where available.

Methods
A literature search was conducted using PubMed, Embase, and Scopus using keywords related to HRA, computer navigation, outcomes, and positioning. Studies were screened for eligibility, and data on demographics, radiography, and PROMs were extracted. A meta-analysis was performed to compare operative time, odds of complications, and odds of outliers between patients undergoing HRA with and without the use of computer assisted navigation. Statistical significance was defined as a 95% confidence interval (CI) that does not include 1.

Results
Of 223 articles, 13 met inclusion criteria, encompassing 1,287 patients. Complication rates were 5.29% for the mechanical group and 3.35% for the navigation group. Outlier rates were 31.96% for the mechanical group and 8.76% for the computer-assisted HRA group. Operative time averaged 110.95 minutes with navigation and 101.16 minutes for traditional HRA. The meta-analysis revealed no statistically significant differences in overall complications. However, the navigation-based HRA cohort demonstrated a significantly lower likelihood of prosthetic placement outliers and a longer operative time.

Conclusion
The use of computer-assisted navigation continues to result in a more accurate femoral component positioning. Unfortunately, no significant difference was found in terms of clinical outcomes. Future research is needed to demonstrate that the increased accuracy offered by computer-assisted navigation translates into superior clinical outcomes for patients.

Poster #A24

Should Surgeons Target Equal Medial-lateral Compartment Gaps in Robotic Total Knee Arthroplasty? A Systematic Review and Meta-Analysis of the Existing Gap Literature

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Objective
The choice between symmetric versus asymmetric medial and lateral compartment gap balancing in total knee arthroplasty (TKA) remains debated. Symmetric balancing aims for equal gaps throughout the range of motion to enhance stability and implant longevity. In contrast, asymmetric balancing seeks to recreate native knee kinematics and improve patient-reported outcomes (PROMs). Despite widespread use, the effectiveness of these approaches is unclear, with studies yielding mixed results. This review evaluates postoperative outcomes, including PROMs and range of motion, to compare symmetric and asymmetric TKA techniques.

Methods
A literature search was conducted using PubMed, Embase, and Scopus databases using keywords related to gap balance, and robotic TKA. Studies were screened for eligibility, and data on demographics, complications, kinematics, and PROMs were extracted. A meta-analysis compared mean range of motion, Knee Society Knee scores, and Knee Society Function scores of patients undergoing primary TKA using a symmetric versus an asymmetric gap balance philosophy. Statistical significance was defined as a 95% confidence interval (CI) that does not include 0.

Results
From an initial pool of 725 articles, 13 met inclusion criteria, encompassing 4001 knees in 3871 patients. Analysis revealed a pooled mean age of 70.06 years for the symmetric and 69.74 years for the asymmetric group. Average follow up time was 31.10 months. Meta-analysis revealed no significant differences in range of motion, Forgotten Joint Score, or Oxford Knee Score. However, it did identify a notably higher Knee Society Knee Score in the symmetric cohort.

Conclusion
These findings suggest that symmetric medio-lateral compartment balance may provide modestly better outcomes than the asymmetric approach. The asymmetric group, however, encompassed a spectrum of medio-lateral compartment gap tightness, including both relative tight medial and lateral gaps. Thus, further research is needed to clarify how specific asymmetries affect outcomes and to identify patients best suited for each approach.

Poster #A25

Stump Appendicitis After Partial Laparoscopic Appendectomy

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Research Category: Clinical and Case-based Research

Objective: This paper details a case of retrocecal stump appendicitis, a rare post-appendectomy complication that occurs in 1 in 50,000 cases and can present as a diagnostic challenge for physicians. Early recognition is important, as the mortality rate of perforated appendicitis is estimated to be 4.8%. This case serves as an educational tool for physicians to recognize this rare entity. Additionally, this case highlights the importance of patient education in the case of complex appendectomy.

Methods: A case report of retrocecal stump appendicitis in a 31 year old male with a history of partial laparoscopic appendectomy is presented.

Results: The presenting case of stump appendicitis is consistent with typical clinical presentations of a perforated, acute stump appendicitis, including periumbilical to right lower quadrant abdominal pain, leukocytosis, and the wide time range between appendectomy and stump appendicitis. Complete resection of the appendix may have been prevented due to its retrocecal anatomical variation. The patient decided against medical advice to return for additional surgery after initial appendectomy, highlighting the importance of patient-physician communication for effective care and treatment.

Conclusions: This case highlights the role of anatomical variations and patient-physician miscommunication in the development of acute stump appendicitis. Incomplete resection due to technical challenges or anatomical complexity can leave a residual stump susceptible to recurrent inflammation. Additionally, this case illustrates how common barriers to postoperative patient-physician communication, such as inadequate follow-up instructions or misaligned expectations, can delay critical secondary procedures. In this instance, the patient's failure to return for a planned completion appendectomy led to an emergency admission for perforated stump appendicitis.

Poster #A26

Unilateral Facial Paralysis with Facial Nerve Enhancement on MRI in a Guillain-Barré Patient: A Case Report

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Research Category: Clinical and Case-based Research

Background: Guillain-Barre Syndrome (GBS) describes a heterogeneous group of post-infectious inflammatory disorders characterized by autoimmune demyelination of peripheral nerves. The classic presentation begins several weeks after a respiratory or diarrheal illness with symmetric ascending paresthesia and paralysis, though several variants have been documented to exhibit distinct symptom constellations. The present study contributes to a very small number of cases in which a unilateral facial weakness arose weeks after initial presentation, in this case after completion of immunoglobulin therapy.

Case Summary: This case report describes a 66-year-old male who developed numbness in his fingers and toes three weeks after an upper respiratory infection. His symptoms progressed to bilateral lower extremity weakness and diminished deep tendon reflexes in the upper and lower extremities. Lumbar puncture confirmed Guillain-Barré Syndrome (GBS), and he was treated with a five-day course of intravenous immunoglobulin (IVIG) which resulted in improvement of his lower extremity numbness and weakness.

Two days after completing IVIG, he developed right-sided facial droop, slurred speech, and right eye nystagmus. MRI revealed a focal enhancement in the lateral right internal auditory canal, suggestive of infectious, post-infectious, or inflammatory neuritis of the right facial nerve. Treatment included an eye patch, carboxymethylcellulose eye drops, and a 10-day course of oral prednisone. He was discharged to inpatient rehabilitation and later transitioned home with ongoing physical therapy.

Conclusions: While bilateral facial paralysis is a well-known feature of GBS, unilateral facial involvement is less common as only 28 cases of delayed-onset facial paralysis over 7 studies reported in 2021. Additionally, facial nerve enhancement on MRI is not typically found in GBS and this finding may mimic other conditions such as Bell's palsy or Lyme disease, leading to potential misdiagnosis. We believe our report will broaden the awareness of rare presentations of GBS and spark timely treatment of these patients.

Poster #A27

Identification of TP53 expression profile in Breast cancers patients by Immunocytochemistry in Saint Vincents and the Grenadines from 2007 to 2017.

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Research Category: Clinical and Case-based Research

Objectives:

- To identify and classify malignant breast cancer diagnosed in Saint Vincents and the Grenadines from 2007 to 2017 using the 2019 WHO classification as a guideline.
- To update the literature on the pattern of primary breast cancers.

Method/Materials:

- A retrospective evaluation of seventy-six histological sections by p53 expression profile using immunohistochemistry.
- Manufacturer-recommended protocols (i.e., mouse monoclonal anti-p53 antibody, Clone: DO-7, PI 5846 Rev. D-p53. Manufactured by Bio SB, Santa Barbara, USA) stain all samples that meet the inclusion criteria.
- The cases were reviewed(stratified/graded) based on histological patterns using the guideline.
- The data obtained were analyzed using SPSS (Statistical Package for Social Sciences) version 29 Software. Tests for statistically significant relationships (Chi-square and Fisher's exact) are set at $p \leq 0.05$.

Results/Discussion:

The invasive carcinoma of NST(Ductal carcinoma) and age(41-60) have the highest frequency and variability of positive(mean:4.17, SD:6.77) and negative P53 profile(mean :8.5, SD:12), with CI:23.82% and 48.52%).There is a moderate variability in p53 expression across different age ranges(mean =6.50 -13.75, SD=3.57 -7.16).P53 expression profile shows a large disparity between gender (SD =12 to 17).Higher positive p53 expression with age groups (20–40 and >60) and females (37.3% vs. 11.1% in males).

No statistically significant association exists between histological type and negative p53 expression (Pearson's Chi-Square p = 0.242) with potential trend based on linear-by-linear association (p= 0.064, Fisher's Exact Test(p)=1]. Most subtypes have a mitotic score of one (CI: 25.17%-48.61%).

Conclusion:

There is no statistically significant association between histological type and p53 expression. However, the borderline p-values (0.061 and 0.064) suggest a weak trend that may become significant with a larger sample size. Exploring other prognostic biomarkers that will be valuable in managing BC is imperative.

Poster #A28

Silent Surge: Uncovering the Hidden Rise in Pulmonary Thromboembolism in Post-COVID Saint Vincent and the Grenadines in the Caribbean.

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Research Category: Clinical and Case-based Research

Study objectives:
Pulmonary thromboembolism (PTE) is a silent but deadly cardiovascular condition that poses a significant threat to life. The COVID-19 pandemic, with its propensity to trigger clotting disorders, has been linked to an increase in thromboembolic events. This study explored the trends and demographic shifts in PTE-related mortality in Saint Vincent and the Grenadines over 11 years, exploring both pre- and post-COVID eras.

Methods: Data were gathered from the Kingstown death registration system, capturing PTE-related deaths from 2013 to 2023. Crude mortality rates were computed each year, and joinpoint regression analysis was utilized to detect pivotal changes in mortality trends. The study also highlighted demographic shifts across various age groups and genders.

Results: Over the study period, 209 individuals died from PTE, with a noticeable pattern: 56.5% of them were men, and 24.9% were individuals aged 51-60 years. The crude mortality rate for PTE saw a striking 66.5% rise from the pre-COVID era (2013-2019) to the COVID/post-COVID era (2020-2023). Joinpoint regression revealed a significant annual percent change (APC) in PTE mortality: 11.5% (95% CI −1.2 to 25.89, P = 0.99) for males and 13.85% (95% CI −2.58 to 33.07, P = 0.83) for females. PTE deaths peaked in 2020, followed by a gradual decline from 2021-2023.

Conclusion: The trend of PTE mortality in Saint Vincent and the Grenadines is one of stark contrasts: an alarming rise during the COVID-19 era, particularly among men and those in their early fifties, followed by a notable decline post-2020. This decline may reflect improved medical management and the impact of widespread vaccination. However, the full picture remains unclear, necessitating further research. This study calls for focused interventions to reduce PTE risks and enhance outcomes for those most at risk during and after pandemics.

Poster #A29

Implant-based Breast Reconstruction in Previously Augmented Patients: An algorithmic Approach and A Systematic Review and Meta-analysis

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Background: The popularity of breast augmentation has continued to trend upwards. Concurrently, the prevalence of breast cancer diagnosis persists, affecting one in eight women. Thus, there is a projected rise in breast cancer patients with prior implant augmentation. Post-mastectomy reconstruction is complicated by altered anatomy, however, there is a paucity of literature on best clinical management of previously augmented (PA) patients and outcomes. This study reviews current breast reconstruction options for PA patients and presents an algorithm for pre-operative and intraoperative decision-making in implant-based reconstruction.

Methods: A literature review up until April 2024 was conducted through PubMed, Web of Science, and Embase databases, following PRISMA guidelines. Articles reviewed included mastectomy with subsequent implant-based or autologous reconstruction for PA patients.

Results: 22 studies met the inclusion criteria, identifying 479 patients and 372 breasts. The mean age was 49.1 ± 4.28 years with a mean Body Mass Index of 22.6 kg/m2 ± 1.77. Implant-based reconstruction was the most common (79.7%), followed by hybrid (11.7%) and autologous (7.64%) reconstruction. Immediate implant-based reconstruction was performed in 86.6% of cases; delayed two-stage approach was used in 11.9%. The submuscular plane was most popular in initial augmentation (55.6%) versus subglandular plane (27.0%), with the reconstruction plane often matching prior augmentation plane. The overall complication rate was 33.8%, with 10.8% of patients requiring reoperation and 7.26% developing capsular contracture.

Conclusion: Implant-based reconstruction is the preferred route of postmastectomy reconstruction in PA patients. The chosen plane of reconstruction mirrored the previous augmentation plane in the majority of included studies, although most patients preferred maintaining or switching to the submuscular plane during reconstruction.

Poster #A30

Impact of Vitamin D Supplementation on Quality of Life in Multiple Sclerosis: A Systematic Review and Meta-Analysis

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Objective: Multiple Sclerosis (MS) is a chronic autoimmune disorder characterized by central nervous system demyelination, significantly impacting physical, cognitive, and emotional well-being. Although no cure currently exists, emerging therapeutic and nutritional interventions have aimed to enhance the quality of life (QoL) in people with MS (PwMS). This meta-analysis systematically reviews the impact of vitamin D supplementation on QoL in PwMS.

Methods: A systematic review and meta-analysis were conducted, including 16 studies with a total of 8,908 PwMS (18.84% male, 79.10% female; mean age range: 27.05–52.6 years). The primary outcome was the effect of vitamin D supplementation on overall QoL, assessed using standardized health-related QoL measures. Meta-analytic methods were applied to determine mean differences with 95% confidence intervals (CIs), and heterogeneity was evaluated using the I^2 statistic.

Results: The pooled analysis indicated a non-significant improvement in overall QoL with vitamin D supplementation (mean difference: 3.69; 95% CI: -1.65, 9.03; P = 0.18), with high heterogeneity (I^2 = 98%). Physical health composite scores showed a borderline significant improvement (mean difference: 3.28; 95% CI: -0.06 to 6.61; P = 0.05; I^2 = 96%). Mental health composite scores demonstrated a significant positive effect (mean difference: 2.62; 95% CI: 0.61 to 4.63; P = 0.01), with moderate heterogeneity (I^2 = 71%).

Conclusion: While vitamin D supplementation does not significantly enhance overall QoL or physical health scores in PwMS, it may offer a moderate yet consistent benefit for mental health. However, the high heterogeneity across studies underscores the need for further investigation into study design variations, population characteristics, and vitamin D dosing regimens.

Keywords: Vitamin D, Quality of Life, Multiple Sclerosis, Supplements, Disability

~~Poster #A31~~ (WITHDRAWN)

First Report of Adipose-Derived Stem Cell Therapy for Skull Base Osteoradionecrosis in Clival Chondroma

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Research Category: Clinical and Case-based Research

Objective: Radiation therapy is a cornerstone in the treatment of skull base tumors; however, it can lead to severe complications such as osteoradionecrosis (ORN), which pose significant management challenges. Mesenchymal stem cell therapy, particularly adipose-derived stem cells (ASCs), has shown promise in the management of radiation-induced tissue damage, but its application in ORN of the skull base has not been previously reported. This case presents the first documented use of ASCs for radiation-induced ORN in a patient with a skull base tumor and explores their potential role in promoting tissue regeneration.

Methods: We report the case of a 60-year-old male with a history of clival chondroma, a skull base tumor, treated with stereotactic body radiation therapy (SBRT), who subsequently developed progressive ORN. Initial conservative management with antibiotics, PENTOCLO therapy, and surgical debridement failed to halt disease progression. The patient then underwent endoscopic skull base debridement, autologous fat grafting, and targeted ASC injections into the prevertebral musculature and defect margins.

Results: Postoperatively, the patient exhibited marked clinical improvement, with enhanced tissue regeneration, reduced necrotic progression, and healthier surrounding tissue at the injection site. Follow-up examinations revealed viable turbinate flaps, robust granulation tissue, and partial fat graft integration, suggesting a positive regenerative response to ASC therapy.

Conclusion: This case demonstrates the first reported application of ASCs for ORN in a patient with a clival chondroma, providing preliminary evidence for their regenerative potential in radiation-induced bone and soft tissue damage of the skull base. While these findings are promising, further research is required to establish standardized protocols, assess long-term efficacy, and explore broader clinical applications of ASC therapy in radiation-induced complications of skull base tumors.

Poster #A32

BC or BCC? A Case of Breast Cancer Misdiagnosed as Basal Cell Carcinoma

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Research Category: Clinical and Case-based Research

Introduction We present a diagnostically challenging case involving a non-healing ulcer on the skin of the right breast that received care from multiple subspecialties.

Case Description A 66-year-old woman presented to Mohs surgery with a slowly enlarging ulceration on the right breast over a 1-year period. Eight months prior, she was diagnosed with invasive ductal carcinoma with metastases to the axillary lymph nodes and bone and was undergoing systemic treatment with ribociclib and letrozole. She sought care from an out-of-network physician for wound management, who advised a biopsy. A subsequent skin biopsy at her in-network dermatology department showed BCC. She was referred to general surgery, which recommended mastectomy, but she declined. Based on discussions with the out-of-network dermatologist, she sought opinions from in-network Mohs surgery and plastic surgery.

Examination revealed a 3x5 cm ulcer on the right breast with sclerotic stranding. The Mohs surgeon reviewed the biopsy slides and found histology inconsistent with BCC. Re-evaluation by the original pathologist led to a revised diagnosis of breast cancer. The patient was deemed inappropriate for Mohs surgery and remains on systemic therapy, with consideration for palliative resection.

Conclusion This case highlights the impact of diagnostic uncertainty in multidisciplinary care. Mohs surgeons may encounter complex cases requiring clinicopathologic correlation. Given the rarity of synchronous BCC and breast cancer, confirming the diagnosis before treatment was critical. Reviewing biopsy slides in multidisciplinary cases can prevent mismanagement. Additionally, this case underscores systemic challenges in healthcare fragmentation, where reliance on electronic medical records may limit direct physician communication. Improved collaboration could mitigate delays and enhance patient care.

Poster #A33

Weight Modulation and Its Impact On Metabolic-Dysfunction Associated Hepatosteatosis: A Pediatric Case Series

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Objectives: Metabolic Dysfunction-Associated Steatotic Liver Disease (MASLD) is characterized by hepatic steatosis without significant alcohol consumption or other secondary causes of liver injury. MASLD encompasses a spectrum ranging from simple steatosis to Metabolic Dysfunction Associated Steatohepatitis (MASH), which can progress to fibrosis and subsequently cirrhosis. Risk factors include metabolic syndrome, hypertriglyceridemia, and type 2 diabetes mellitus. Diagnosis typically requires imaging or biopsy and weight management is a cornerstone of treatment, but outcomes vary based on patient treatment adherence and underlying metabolic factors.

Methods: We present a case series examining the outcomes of two distinct groups of pediatric patients with MASLD. Data was collected retrospectively, including demographic profiles, baseline liver enzyme levels, imaging findings, pathology reports, body mass index (BMI), and lifestyle interventions. Outcomes were compared to identify factors influencing disease trajectory.

Results: Patients in Group 1 demonstrated improvement in weight with diet modifications subsequently exhibiting improvements in liver imaging and liver enzymes, likely due to reductions in visceral fat and improvement in insulin sensitivity. Conversely, Group 2 showed an increase in BMI which correlated to progression of disease with fatty infiltration of the liver. Risk factors such as poor dietary adherence, sedentary behavior, and metabolic syndrome features were more prevalent in Group 2. Ethnic background and genetic predisposition may have also contributed to differential outcomes.
This case series highlights the critical role of weight modulation in managing MASLD. Sustained weight loss appears to reverse steatosis, while weight gain contributes to disease progression. Future studies should explore the use of education platforms to pediatric patients and their families to optimize positive MASLD outcomes.

Conclusion: This work underscores the need for early detection and culturally tailored lifestyle interventions to mitigate the rising prevalence of MASLD, especially in high-risk populations.

Poster #A34

Outcomes of NPWT in the Surgical Treatment of Hidradenitis Suppurativa: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: Hidradenitis suppurativa (HS) is a chronic inflammatory condition characterized by painful nodules, abscesses, and sinus tracts, commonly affecting the axilla, groin, perineum, and inframammary folds.[1] Surgical excision is the standard treatment for advanced cases, but creates a large defect which can lead to high rates of complications and recurrence.[2] Negative pressure wound therapy (NPWT) has been shown to improve wound healing by creating a protective barrier, removing edema, and stimulating angiogenesis.[3] This study aims to evaluate the role of NPWT in the surgical management of HS, with a focus on its impact on healing time, recurrence, complications, and overall outcomes.

Methods: A systematic literature search of Pubmed, Embase, and Cochrane Library was performed using terms related to use of NPWT related terms in the surgical management of HS. After screening studies for relevance and eligibility, studies that met the inclusion criteria were further analyzed.

Results: Initial review yielded 83 articles, with 13 meeting inclusion criteria, for a total 484 patients with 1,283 HS operative sites. Studies with comparative data showed an average decrease in healing time of 53%. Additionally, patients treated with NPWT demonstrated decreased recurrence, complications and pain, as well as improved function.

Conclusions: Our systematic review indicates favorable improvement in surgical outcomes of HS with the use of NPWT through improvement in wound healing and function, along with decreased complications and pain. Future directions should explore a randomized, controlled trial to directly compare NPWT-treated HS lesions with standard wound care methods.

Poster #A35

Use of Biologics for Patients Undergoing Excision for Hidradenitis Suppurativa: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: Hidradenitis suppurativa (HS) is a chronic debilitating skin condition that adversely affects a patient's quality of life. Medical and surgical management is commonly performed to improve symptoms, with varying degrees of success. The use of biologics in combination with surgery has the potential to improve outcomes for HS patients relative to surgery alone. We sought to provide a systematic review of existing literature on the perioperative use of biologics to investigate optimal therapy for HS patients.

Methods: Following the Patient Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) guidelines, a comprehensive search was conducted across PubMed, Web of Science, and Embase. Review articles, case reports < 2 patients, laboratory studies, and articles written before the year 2000 were excluded.

Results: After screening 438 records, a total of 8 studies published between 2012 and 2023 were included. These studies included a combined total of 253 patients preoperatively receiving biologics. Biologics used included adalimumab (80%), infliximab (14%), unspecified TNF-a inhibitors (4%), and ustekinumab (2%). Clinical outcomes reported decreased rates of disease progression, greater improvement in quality of life scores, decreased pain scores, and decreased number of active nodules compared to patients who underwent surgery without biologic treatment. At least 15% of patients experienced some form of recurrence.

Conclusion: Our systematic review showcased favorable improvements in HS surgical outcomes with the perioperative use of biologics compared to without. Future studies should explore the efficacy of different biologics and dosages across the same cohort, as well as the best specific timing of biologic treatment relative to surgery.

~~Poster #A36~~ (WITHDRAWN)

Utilization of Dermal Regeneration Templates in the Surgical Management of Hidradenitis Suppurativa: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: Hidradenitis suppurativa (HS) is a chronic inflammatory disease characterized by painful abscesses and sinus tracts of flexural regions of the axilla, groin, perineum, and inframammary folds.[1] Common surgical interventions range from incision and drainage to reconstruction with split-thickness skin grafts. However, effects of using dermal regeneration templates (DRTs) in HS has yet to be explored. The aims of this study are to examine the use of DRTs in surgical management of HS, and their impact on reduction in healing time, functional and cosmetic satisfaction, improved wound closure time, and quality of life.
Methods: A systematic literature search of Pubmed, Web of Science, and Embase was performed using terms related to use of DRTs in the surgical management of hidradenitis suppurativa. The titles and abstracts of identified articles were screened by the authors for relevance and eligibility; studies that met the inclusion criteria were further analyzed.
Results:29 articles were found; 8 met inclusion criteria with 116 patients and 136 HS sites. DRTs were used in 62 patients and 82 sites. Various DRTs were used, including but not limited to: Integra (n=32, 51.61%), human-derived acellular dermal matrix (n=9, 15.52%), and ovine forestomach matrix (n=6, 9.68%). DRTs improved flap healing and aesthetics through increased scar tissue elasticity.[2] [3] Some authors reported excellent postoperative range of motion (ROM), and significantly reduced patient-reported pain scores.[4] [5] There was no recurrence of disease during follow-up. The success of DRTs may be due to their ability to minimize dead space.
Conclusions: Our systematic review suggests promising improvement in surgical outcomes of HS with the use of DRTs. These findings highlight an innovative approach to enhance outcomes through improvement in range of motion, healing time, pain, aesthetics, and limited recurrence of disease. Future studies should investigate a direct comparison between the use of DRTs and other traditional wound healing methods.

Poster #A37

Amniotic Allograft Membrane Injections for Chronic Arthritides

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Objective: This review endeavors to systematically review the effect of allograft amniotic membrane injections for chronic arthritides.

Background: Amniotic membranes contain stem cells, anti-inflammatory factors, and extracellular matrix proteins that facilitate tissue healing, especially in the treatment of chronic wounds. Given this potential for tissue repair, the use of preserved amniotic membranes is potentially indicated in other diseases of impaired healing, such as osteoarthritis and other arthropathies. Corticosteroids have been used to address arthropathy-associated pain and inflammation in the short-term, but they lack long-term efficacy. Given the propensity of amniotic membranes for immune modulation and tissue growth promotion, they present a potential solution for a reliable longer-term therapy for arthropathies. This paper reviews experiments that investigate the use of amniotic membrane injections in the healing of joints affected by arthropathies.

Methods: We conducted a systematic review of 4 databases: PubMed, EBSCOHost, Google Scholar, and OVID according to guidelines established by PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) using the terms: 'Amniotic Membrane Chronic Pain', 'Amniotic Membrane Chronic Joint Pain', 'Amniotic' and 'Chronic Pain.' We uploaded 416 articles. Using PRISMA standard method, we filtered out 361 because they did not investigate joint pain. Of the remaining 55, we selected papers investigating pain reduction following amniotic membrane allograft injections into affected joint spaces of patients with chronic joint pain. Following further screening, we were left with 24 papers.

Results: The following outcomes will be analyzed: numerical pain scales, visual analog scale (VAS), joint-specific pain measures, and change in use of outside pain medications. Results will be stratified by the specific joint injected: knee, spine, hip, temporomandibular joint. We will use a Random Effects model to analyze the clinical data.

Conclusion: Intra-articular injections of amniotic membrane tissues appear to significantly approve pain and function levels of joints in people experiencing arthropathies.

Poster #A38

Valve-Agnostic Cranial Implant (InvisiShunt®) in Normal Pressure 1 Hydrocephalus Ventriculoperitoneal Shunting: A Case Series

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Research Category: Clinical and Case-based Research

Objective Our study aims to examine the efficacy of Valve-Agnostic Cranial Implant (VACI) in improving outcomes, including shunt revision rates, in patients with normal pressure hydrocephalus (NPH) treated with a ventriculoperitoneal shunt. As VACI has only recently been introduced as a low-profile option to limit the need for shunt revision, with its first in-human implantation performed in 2019 and subsequent limited literature on efficacy, this case series seeks to further explore its potential benefits.

Methods This case series was conducted at Hoag Medical Center, Newport Beach, CA. 150 patients diagnosed with NPH, who underwent ventriculoperitoneal shunt procedure incorporating the Valve-Agnostic Cranial Implant (InvisiShunt®), were included in the study. Patient demographics, comorbidities, preoperative symptoms, surgical details, postoperative outcomes, and complications were collected and analyzed.

Results The implantation of VACI in this cohort demonstrated a potential benefit in reducing the profile of the shunt, which may help mitigate risks like infection or extrusion that typically lead to shunt revision surgeries.

Conclusions The use of VACI in the ventriculoperitoneal shunt procedure is associated with better outcomes and fewer observed complications in this case series. With a larger sample size compared to a prior clinical trial on VACI, our findings support the potential of VACI as a more viable and safer alternative to traditional shunt systems for NPH treatment. Further research with extended follow-up is needed to confirm these preliminary results and evaluate long-term efficacy.

Poster #A39

A case and literature review of non-arteritic anterior ischemic optic neuropathy secondary to semaglutide use

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Research Category: Clinical and Case-based Research

Introduction: Non-arteritic anterior ischemic optic neuropathy (NAION) results from hypoperfusion of the optic nerve head leading to sudden, painless vision loss. While some investigational treatments have suggested benefits, no therapy has been proven to be effective, with recovery rare and permanent vision loss more common. Recent studies suggest that semaglutide, widely used in type 2 diabetes management, may be associated with the development of NAION. We present a rare case of NAION in a 30-year-old male, potentially exacerbated by semaglutide use.

Case Presentation: A 30-year-old male with obesity, managed with once-weekly semaglutide for 10 months, presented with sudden, painless vision loss in his left eye. Initial evaluation of the left eye revealed diminished visual acuity, and visual field testing demonstrated a superotemporal arcuate scotoma spanning three quadrants. Magnetic resonance imaging and laboratory studies excluded alternative etiologies such as optic neuritis, demyelinating disease, and infectious or autoimmune processes. Semaglutide was discontinued, and the patient was treated with a six-week taper of oral prednisone. Over the ensuing months, his visual acuity improved, ultimately recovering to 20/20 in the affected eye, accompanied by a reduction in the size of the visual field defect.

Discussion and Conclusion: The patient's sudden, painless monocular vision loss and findings on ocular imaging supported a diagnosis of NAION. The patient's risk factors for NAION included male sex and a crowded cup-to-disc ratio, but lacked major risk factors such as hypertension or diabetes. The temporal relationship between semaglutide use and NAION strengthens the suspected association. This case contributes to the growing literature linking semaglutide use with the development of NAION. Physicians need to maintain a high index of suspicion for this rare but serious ocular side effect of this medication, and ophthalmologic screening may be warranted in at-risk individuals undergoing semaglutide treatment.

Poster #A40

Discoid lupus erythematosus lesions presenting as molluscum contagiosum-like papules

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Research Category: Clinical and Case-based Research

Objective: Chronic cutaneous lupus erythematosus (CCLE) is a heterogeneous and multifactorial autoimmune skin disease typically characterized by erythematous plaques with adherent follicular hyperkeratosis. We present the case of a thirty-one year old female with an unusual presentation of discoid lupus erythematosus (DLE) – a form of CCLE, manifesting as molluscum contagiosum – a benign poxvirus skin infection that systemic fungal infections are known to mimic.
Methods: Single-center case study
Results: Skin biopsy showed no signs of viral or fungal infection, but was consistent with a flare of discoid lupus erythematosus and resolved with topical corticosteroids.
Conclusion: Physicians should be aware of this rare presentation of DLE, as early diagnosis can affect treatment management and patient outcomes.

Poster #A41

Recurrence of Mogamulizumab-Associated Rash (MAR) in Relapsed Erythrodermic Cutaneous T-Cell Lymphoma (CTCL) After Retreatment with Mogamulizumab

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Research Category: Clinical and Case-based Research

Objective: To determine whether re-treatment with moga after MAR is safe and effective in patients with relapsed CTCL.

Methods: This is a retrospective longitudinal chart review of patients with erythrodermic CTCL retreated with moga from 2019-2024 at a single comprehensive cancer referral center. We collected data on patient demographics, treatment course, and outcomes, including development of MAR. All staging was assessed using clinical response criteria by Olsen E. et al. for CTCL. MAR was graded by CTCAE criteria version 5.0, using skin and subcutaneous tissue disorder.

Results: Four patients with erythrodermic CTCL (mycosis fungoides/ Sézary syndrome), clinical stages IIIB - IVA2 were included. The median age at CTCL diagnosis was 79.5 years. All patients were given moga intravenously administered as standard of care. All four patients developed MAR and reobtained clinical remission after their first treatment with moga. All four patients eventually experienced CTCL relapse and were treated with moga a second time. Three patients developed MAR after the second treatment with moga, two of which were able to reobtain CR, while one achieved partial remission (PR). One patient did not experience MAR after the second treatment with moga, yet was able to reobtain CR. The patient who achieved PR after the second moga treatment eventually experienced progressive disease and underwent a third treatment with Moga, without subsequent MAR, and was ultimately switched to a different treatment due to disease resistance.

Conclusion: In all cases presented, a combination of temporary moga cessation, corticosteroids, and methotrexate proved to be efficacious in treating MAR. In summary, retreatment with moga is safe, but may cause recurrent MAR that can be mitigated with topical steroids, systemic steroids, and/or methotrexate.

Poster #A42

Comparing Outcomes of Elective Sacroiliac Implant Removal in Patients with Pelvic Ring Fractures

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Research Category: Clinical and Case-based Research

Objective: Fractures involving the sacroiliac (SI) joint may be stabilized with iliosacral screws. Persistent pain secondary to symptomatic implants, however, is a common reason for the removal of SI implants. The primary goals of this study were to identify variables that could potentially contribute to patients undergoing screw removal and to evaluate the outcomes of these patients.

Methods: In this retrospective chart review of anterior and posterior pelvic ring fracture patients from 2014-2023, we compared the outcomes of individuals who underwent SI screw removal (HWR, n=17) to a matched cohort of those who did not (NHWR, n=76). Information was collected regarding general patient demographics, mechanism of injury, fracture type, procedure characteristics, and complications. Data analysis was performed using chi square and Fishers exact tests.

Results: Compared to NHWR patients, HWR patients were more likely to have a complex fracture (47%, 9%) and less likely to have a lateral compression fracture (24%, 50%; p=0.0038). Regarding specific surgical approaches, 18% of HWR patients underwent posterior reduction via an open technique compared to 14% of NHWR patients, although this was not statistically significant (p=0.59). In the subset of patients that had posterior pelvic ring fixation, the HWR cohort was more likely to have undergone fixation with only an S1 iliosacral screw (IS) (57%, 29%) or only a S1 transsacral screw (TS) (43%, 3%). NHWR patients were more likely to have been treated with a combination of fixation approaches or multiple screws in one corridor. Postoperatively, both groups had similar weight bearing statuses (p=0.65) and rates of nonunion, wound infection, and deep infection.

Conclusion: This retrospective study of pelvic fracture patients from 2014-2023 found that the initial fracture classifications and types of implants used, were predictors of whether patients would subsequently have their screws removed.

Poster #A43

Bilateral Leg Amputation as a Rare Complication of Severe Bullous Pemphigoid

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Research Category: Clinical and Case-based Research

Objective: Bullous pemphigoid (BP) is an autoimmune blistering disease, most common in the elderly, with potential for significant morbidity from infectious complications. Herein we detail a severe case of bullous pemphigoid in a 72-year-old female with other comorbidities that deteriorated the skin barrier and slowed wound healing.
Methods: Single center case report
Results: Despite aggressive treatment with corticosteroids, immunomodulating agents, and IVIG, the patient's bullous pemphigoid was complicated by necrotizing fasciitis requiring bilateral leg amputation.
Conclusion: This case highlights the importance of recognizing patient risk factors for infectious complications of BP, and tailored therapeutic approach balancing the risks and benefits of immunosuppressants - a mainstay of treatment for severe bullous pemphigoid.

Poster #A44

Novel CUX-2 Mutation Identified in Patient with Suspected Paroxysmal Nonkinesigenic Dyskinesia

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Research Category: Clinical and Case-based Research

Objective Paroxysmal nonkinesigenic dyskinesias (PNKD) are characterized by acute–lasting minutes to hours–attacks of chorea and dystonia triggered by factors unrelated to physical activity, such as stress or caffeine. PNKD has previously been linked to mutations in the MR-1 (PNKD) gene, but no association has been made between PNKD and mutations in CUX-2, which have been shown to cause epilepsy and epileptic encephalopathy. In this case, we present a novel mutation in the regulatory region for CUX-2 that may be associated with PNKD.

Methods We present an 18-year-old male with a variant of uncertain significance (VUS) in the regulatory region of the CUX-2 gene (c.-4 C>T) and suspected PNKD.

Results Our patient has a history of paroxysmal episodes of dystonia when he becomes excited, during which his eyes roll upwards, his jaw locks, and he is unable to eat or speak. While episodes initially lasted several hours, they now last 15-20 minutes following management with oxcarbazepine, clonazepam, and clonidine. Attempts to wean off oxcarbazepine resulted in return of episode severity and frequency. Notably, both continuous and ambulatory EEG have shown no abnormalities during these episodes and MRI Brain and MRI Sella have shown no structural abnormalities. A Comprehensive Dystonia gene panel did not reveal any mutations associated with paroxysmal movement disorders, but upon whole exome sequencing a novel variant in the regulatory region of the CUX-2 gene was uncovered.

Conclusion The CUX-2 gene produces a transcription factor that regulates the development of dendrites and synapses. With this case, we propose a novel mutation in CUX-2 that precipitates the development of PNKD. Many genetic disorders initially linked to epilepsy have now been also implicated in paroxysmal movement disorders. We believe this is a plausible connection considering the established link between CUX-2 mutations and epilepsy and seizures.

Poster #A45

Delayed Presentation and Rupture of an Intracranial Pseudoaneurysm Following Penetrating Trauma: A Case Report

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Research Category: Clinical and Case-based Research

Introduction: Pseudoaneurysms are rare vascular lesions that can form following injury to an artery. Damage to the artery can result in a hematoma surrounded by a layer of coagulation products. Intracranial pseudoaneurysms are particularly uncommon, comprising less than one percent of all aneurysms, and are often associated with traumatic brain injuries.

Case Description: A 37-year-old male presented with two stab wounds, one to the right cheek which extended intracranially. Initial imaging revealed extensive intracranial hemorrhage and a possible right posterior cerebral artery pseudoaneurysm. The patient underwent surgical decompression. Notably, the pseudoaneurysm was not seen on postoperative imaging. He remained neurologically stable until postoperative day 19 when he acutely declined and was found to have a new hemorrhage associated with the right posterior cerebral artery pseudoaneurysm. Despite successful coil embolization of the pseudoaneurysm, his condition deteriorated due to worsening vasospasm and ischemia. His family decided to pursue comfort care and compassionate extubation.

Discussion: This case emphasizes the importance of early detection and close monitoring of traumatic intracranial pseudoaneurysms. Since rupture can occur days to weeks following the inciting event, it must be considered in the differential diagnosis when an acute neurologic change occurs in patients who sustained a penetrating traumatic brain injury.

Poster #A46

Targeting Hypoxia-Inducible Factor 1-Alpha with 2-Methoxyestradiol as a Potential Treatment for Sepsis-Induced Encephalopathy: A Systematic Review

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Hypoxia-inducible factor 1-alpha (HIF-1-alpha) is a key sepsis biomarker, influencing hypoxic responses, immune cell survival, and inflammation. Sepsis-associated encephalopathy (SAE) is linked to cognitive impairment and increased mortality, driven by cytokine-induced blood-brain barrier disruption, neuroinflammation, microglial activation, impaired cerebral perfusion, and oxidative stress. This systematic review evaluates whether direct inhibition of HIF-1-alpha with 2-methoxyestradiol (2ME2) can alleviate SAE pathogenesis, specifically through rat models of neuroinflammation, and explores potential implications for human treatments.

A systematic search using Covidence review software identified 744 studies from PubMed, Embase, and Scopus with the search terms: "(Hypoxia-Inducible Factor-1-alpha) AND ((neurological) OR (cerebral)) AND ((Outcome) OR (treatment) OR (therapy))." These studies were screened for experimental designs and data on HIF-1-alpha inhibition by 2ME2. Of these, 15 studies met inclusion criteria and underwent full-text screening for 2ME2 administration after neurological injury. Three studies were excluded due to insufficient data, and one did not meet experimental criteria. Data extraction was conducted on the remaining 11 studies.

2ME2 was tested in three rat models: ischemia (n = 5), traumatic brain injury (n = 2), and subarachnoid hemorrhage (n = 4). Across all models, 2ME2 treatment significantly reduced HIF-1-alpha levels, decreased cerebral cell death, reduced blood-brain barrier permeability, alleviated cerebral edema, smaller infarct/contusion volumes, and improved neurological outcomes. Optimal results were observed with 15-20 mg/kg doses, while lower doses offered limited benefits, and higher doses led to increased mortality. 2ME2 was effective when administered from injury onset up to three hours post-insult.

These animal studies suggest 2ME2 is a potential therapeutic agent for SAE and may provide neuroprotective effects through inhibition of pro-inflammatory cytokine release, microglial activation, and blood-brain barrier disruption. Additionally, 2ME2 may be applicable in treating traumatic brain injury and intracranial hemorrhage. However, further research is required to assess its safety and efficacy in animal and human sepsis models.

Poster #A47

Orofacial Granulomatosis: Early Manifestation of Crohn's Disease in a Pediatric Case

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Research Category: Clinical and Case-based Research

Introduction: Crohn's Disease (CD) in the pediatric patient population may present differently than adults. Classical symptoms involve abdominal pain, diarrhea, fever, and hematochezia. CD can also present with extraintestinal manifestations (EIMs). In the pediatric population, the most common EIM signs of oral mucosal inflammation, which include lip swelling, cheilitis, and gingival alterations which often present prior to CD. This phenomenon is known as orofacial granulomatosis (OFG).
Case Presentation: A 14-year-old otherwise healthy male, initially presented in clinic at age seven with parents for evaluation of diffuse upper lip swelling and generalized erythema. At the time, the patient denied any abdominal pain, diarrhea, or hematochezia. He obtained an excisional biopsy of his lips which revealed hyperplastic epithelial inflammation with multifocal pink-colored papillary lesions in the bilateral lower mucosa with poorly formed granulomas consistent with OFG. Subsequent evaluation revealed he was under the 5th percentile for weight. Ileal biopsy from EGD showed neutrophilic infiltrate with granulomas within the surface epithelium indicative of CD.
Discussion: Growth deficiency and impairment is associated with childhood CD, occurring in nearly 85% of patients. As adolescents are in a critical stage of development, lack of treatment or early intervention leads to decreased bone mass, impaired height, weight loss, and pubertal delay. Current diagnostics of CD include a medical history, physical exam, and a series of blood tests, imaging, and biopsy. This often takes a sufficient amount of time to complete if not executed promptly. Therefore, early detection using non-invasive diagnostic tests that are specific for diagnosing CD may prevent these detrimental side effects.
Conclusion: Oral mucosal and external lip swelling, or OFG demonstrates early signs of childhood CD. The identification of CD in this pediatric patient allowed for early intervention and prevented progression of disease during this critical time of growth in a pediatric patient.

Poster #A48

Reduced Versus Standard Dose Craniospinal Irradiation with Chemotherapy to Treat Medulloblastoma: A Systematic Review

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Background: Treatment of medulloblastoma entails surgical resection followed by craniospinal irradiation (CSI) with a radiation boost to the posterior fossa and chemotherapy. However, due to its detrimental neurotoxic effects leading to decreased intelligence quotients (IQ), there have been recent efforts to reduce CSI. We aim to systematically review standard-dose (SD) CSI versus low-dose (LD) CSI for medulloblastoma through analysis of relapse rate, event-free survival (EFS), and overall survival (OS).
Methods: Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines were used to perform a search. Reviewers screened studies for eligible criteria and extracted data on study parameters, patient demographics, EFS, OS, CSI dosage, chemotherapy regimen, relapse rate, and side effects. A thorough literature review was performed. To evaluate if there was a significant difference between the number of relapses between SD and LD CSI, the weighted means were calculated and a t-test with Welch's correction was performed
Results: 24 out of 749 studies identified from the databases were selected for our systematic review. The lowest 5-year EFS was 27.3% and the highest 5-year EFS was 83%. The lowest 5-year OS was 41 ± 8% and the highest 5-year OS was 94.7 ± 3.4%. LD CSI had significantly lower relapse rate (14.5%) than SD CSI (20.6%) ($p = 0.0475$, 95% CI: 2.128 to 32.15) when comparing weighted means between studies. The lowest IQ reported was 71 and the highest IQ reported was 98.6. Studies reported LD CSI to have a lower decline in IQ compared to SD CSI.
Conclusion: Low-dose craniospinal irradiation therapy with the addition of chemotherapy may be sufficient in treating children with medulloblastoma. LD CSI has significantly fewer relapses compared to standard-dose CSI. Future directions further stratifying risk groups based on molecular subtype and histological morphology is warranted.

Poster #A49

Outcomes of Extended Trochanteric Osteotomy in Revision Total Hip Arthroplasty for Well-Fixed Femoral Stems: A Comparative Analysis of Complications and Radiographic Union

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Research Category: Clinical and Case-based Research

Objective
An extended trochanteric osteotomy (ETO) allows surgeons to gain access to the femoral canal for safe and effective extraction of well-fixed implants in revision total hip arthroplasty (rTHA). Newer tools that allow disruption of osseo-integration from the proximal femur have brought into the question the need for ETO. The purpose of this study was to compare the clinical and radiographic outcomes of rTHA performed with versus without ETO.

Methods
A retrospective review of all patients who underwent an rTHA following failure of their primary THA between 2011 and 2023 at a single urban academic center was conducted. Operative notes and pre-operative and post-operative radiographs were manually reviewed to identify femoral revisions of well-fixed femoral stems (n=205). Thirty patients (14.6%) underwent an ETO as part of their rTHA. Demographic information, clinical outcomes, and radiographic union of ETO's were evaluated and analyzed between non-ETO vs ETO groups. Union was determined radiographically by evaluating two orthogonal views of the femur on follow up films.

Results
ETO patients had a longer mean length of stay (2.8 vs 1.6 days, p=<0.001) and operative time (226.3 vs 151.7 minutes, p=<0.001) compared to non-ETO patients. The rate of intra-operative fracture (16.6% vs 6.2%) and post-operative fracture (6.6% vs 5.1%) of any part of the femur was also higher in the ETO group, although neither were statistically significant (p>0.05). The rate of subsequent revision surgeries was also higher in the ETO group (p-value). Radiographic union of the ETO was noted in 13/30 patients (43.3%) by six months postoperatively.

Conclusion
Our study indicates that patients who undergo ETO as part of their rTHA are at a higher risk of intra-operative and post-operative complications. Although ETO may still sometimes be necessary, with the advent of newer femoral stem extraction instruments, femoral revisions with ETO should be avoided.

Poster #A50

Does Vasopressor Administration in the ICU Affect Morbidity and Mortality Following Primary Total Joint Arthroplasty?

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Research Category: Clinical and Case-based Research

Introduction
The subset of patients admitted to the intensive care unit (ICU) following total joint arthroplasty (TJA) is yet to be studied in detail. Specifically, there is little data on the effects of the administration of vasopressors in patients who require critical care after TJA. We sought to characterize patient outcomes and mortality by vasopressor administration in the ICU following primary TJA.

Methods
We retrospectively reviewed 208 patients admitted to the ICU within 14 days after primary, elective, unilateral TJA between 2013 and 2024, from 43,498 TJA cases. Patients were classified by whether they received vasopressor (norepinephrine, phenylephrine, or vasopressin) medication at any point during their ICU stay. Intraoperative use of vasopressor did not qualify. Primary outcomes included 30-day and one-year mortality, 90-day readmission, and revision at any timepoint.

Results
Hypotension (26%) was the most common indication for ICU admission, followed by respiratory failure/hypoxia (14%). Vasopressor use was not associated with a statistically significant increase in 30-day or one-year mortality, (4.3 vs 1.1%, P=0.219; 8.7 vs 2.2%, P=0.082, respectively). No significant differences were observed for all-cause revision or 90-day readmissions (P=0.054, P=0.618, respectively). Dislocations were significantly more common in patients who received vasopressors (13.0 to 1.1%, P<0.001). These patients also had significantly longer lengths of stay (95 vs 47 hours, P<0.001) and significantly more irrigation and debridement procedures (17.4 vs 2.7%, P<0.001).

Conclusion
Patients who received vasopressors in the ICU following TJA had higher rates of 30-day and one-year mortality following surgery compared to ICU patients after TJA that did not receive vasopressors, although these differences did not reach statistical significance. There were no differences in rates of revision due to infection, fracture, or loosening. Vasopressor use was, however, associated with significantly higher rate of revision for dislocation. Further investigation is required to better characterize the prognosis following vasopressor requirement in total joint arthroplasty.

Poster #A51

Polyneuropathy due to Arsenic and Cadmium Toxicity: A Case Report

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Research Category: Clinical and Case-based Research

Objective: Polyneuropathy is a symptom that can be caused by a variety of factors, including environmental, diet, and lifestyle. We present a 71-year-old male with polyneuropathy complicated by arsenic and cadmium toxicity due to increased seafood consumption.

Methods: In this report, we examined the patient's X-rays, clinical notes, and lab findings. We also conducted a literature review to supplement case findings.

Results: This patient had a long-standing history of lower extremity neuropathy and had been regularly followed by Neurology. As part of the patient's routine blood studies for neuropathy, serum cadmium and arsenic levels were tested. The patient showed high cadmium and arsenic levels, and he reported an increased seafood intake, particularly crabs, since his last clinic visit. The patient was advised to avoid seafood for at least two weeks and repeat blood tests. The patient repeated blood tests three weeks later, showing a marked decrease in arsenic and cadmium levels; however, the patient's lower extremity pain persisted.

Conclusion: Heavy metal exposure from seafood consumption is an established environmental health concern. This case demonstrates its relevance to patients experiencing polyneuropathy symptoms. Other factors such as smoking, previous occupational exposure to heavy metals, and pre-diabetes complicated this patient's condition. It is crucial to examine all layers of a patient's condition and possible causes for accurate treatment and effective alleviation of symptoms.

Poster #A52

Dentate Nucleus Hyperintensity: a potential MRI biomarker for GNB1 Syndrome Identification - A Case Report

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Research Category: Clinical and Case-based Research

Study Objective: GNB1 syndrome classically presents with seizures, intellectual disability, and hypotonia. MRI findings related to GNB1 syndrome include ventriculomegaly, decreased cerebral volume, bilateral polymicrogyria, abnormal myelination, and abnormal corpus callosum. Our goal is to elucidate the physical manifestations of hyperintense dentate nuclei in relation to GNB1 syndrome.
Method: We present a 9-year-old right-hand dominant male diagnosed with GNB1 syndrome confirmed with genetic analysis (c.239T>C, p.Ile80Thr). He demonstrates global developmental delay, behavioral challenges, epilepsy, spastic quadriplegia, left hemiparesis/hemi-neglect, wheelchair bound, C6-L1 syrinx, and feeding difficulties. A unique finding on 3T MRI of hyperintense, symmetrical dentate nuclei on T2/FLAIR was first recognized at the age of 8. On revaluation of an MRI at the age of 2, the same imaging results were recognized.
Results: GNB1 syndrome is primarily caused by mutation of the GNB1 gene, which encodes for the Gβ1 subunit of the Gβγ heterodimer. Under normal conditions, the Gβ1 subunit interacts with the Gα subunit to inactivate the G-protein. Polymorphisms of GNB1 have been identified leading to inconsistent phenotypic differences. Interestingly, an identical GNB1 mutation affecting GIRK, a G-protein gated inwardly rectifying potassium channel, was shared between two different patients, however one led to a gain-of-function effect while the other patient had a loss-of-function effect. A hyperintense dentate nucleus can be isolated to a number of neurological disorders related to motor dysfunction such as metronidazole toxicity and multiple sclerosis. Some common findings associated with a hyperintense nucleus include dystonia, seizures, and ataxia.
Conclusion: While not yet entirely understood, further advancements in imaging may allow us to draw a clearer connection between hyperintense dentate nuclei, the patient's dystonia, and GNB1 syndrome. From there, we can possibly develop new methods of improving patient care and symptom treatment.

Poster #A53

Deciphering the Genetic Link between Familial Hypobetalipoproteinemia and Neuromuscular Disorder: A Clinical Case Report

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Research Category: Clinical and Case-based Research

Study objectives: We present a case of a 21-year-old male patient who showed symptoms of both Familial hypobetalipoproteinemia and neuromuscular abnormalities linked to a mutation (c.7564C>T) in the APOB gene in addition to several other mutations identified that are potentially related to neuromuscular disorders. Familial hypobetalipoproteinemia is characterized by low levels of lipids in the blood due to genetic mutations affecting lipoprotein pathways, including the APOB gene. Although muscular atrophy symptoms are less commonly associated with APOB mutations, they were observed in this case. This report emphasizes the importance of recognizing the potential overlap of these two different disorders and other mutations we see in our patients and provides valuable information for clinicians who may encounter similar cases.
Methods: A 21-year-old male patient with a history of mild exercise intolerance and muscle weakness underwent genetic testing via the Invitae Neuromuscular Disorders Panel. As well as an FSHD1 southern blot and labortory panel. This comprehensive panel screens for pathogenic variants associated with neuromuscular diseases. After obtaining informed consent, DNA was sequenced using next-generation sequencing technology. Each mutation was further analyzed for its functional implications, prevalence in databases, and association with the patient's clinical presentation.
Results: The c.7564C>T mutation in the APOB gene, leading to truncated apolipoprotein B, has been documented yet under-studied concerning neuromuscular implications. Further, multiple genetic mutations with uncertain significance were identified, underscoring the complexity of genetic interactions in this patient. Genetic testing, conducted using the Invitae Neuromuscular Disorders Panel, identified several mutations, including AMPD1 c.133C>T (p.Gln45*), DMD c.2681G>C (p.Ser894Thr), MAP3K20 c.1538C>T (p.Thr513Ile), TOP3A c.2264G>A (p.Gly755Asp), and TTN c.106210G>A (p.Val35404Ile), which have varying implications for muscle function and exercise tolerance
Conclusion: This study presents the first reported instance of multiple genetic mutations correlating with a specific set of neuromuscular symptoms. This case presents evidence suggesting that lipid metabolism disorders may contribute to secondary muscular complications, potentially through mechanisms such as lipid accumulation, oxidative stress, and resultant muscle damage. Which underscores the complexity of genetic disorders and the need for further research to clarify the implications of these mutations.The implications of these findings underline the complexity of genetic interactions in neuromuscular disorders and the necessity for more extensive research to elucidate the connections between these mutations and FHBL

Poster #A54

Case Report: Insights on Pathogenetic Mechanisms of Paroxysmal Kinesigenic Dyskinesia

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Objective: Paroxysmal kinesigenic dyskinesia (PKD) is a rare movement disorder characterized by transient episodes of dystonia, chorea, or athetosis triggered by sudden voluntary movements. Attacks are typically short-lived (<1 minute) and do not involve loss of consciousness. PKD is most commonly associated with PRRT2 mutations; however, genetically negative cases remain underreported. Familial clustering of other movement or neurological disorders may suggest a genetic predisposition and provide insights about a shared underlying pathogenetic mechanism.

Methods: A 24-year-old female with an eight-year history of paroxysmal dystonic posturing triggered by sudden movement presented for evaluation. Symptoms began left-sided, later becoming bilateral, and included brief, painless episodes preceded by paresthesia. Medication nonadherence worsened symptoms, occasionally affecting speech. Neurological exams between attacks were normal.

Results: Genetic testing for PRRT2, PNKD, SLC2A1, CACNA1A, and SCN8A was negative. Family history revealed childhood epilepsy (brother) and essential tremor (mother). Carbamazepine 200 mg BID led to complete symptom resolution.

Conclusion: This case presents several unique features of PKD:
Genetically Negative PKD – Suggests involvement of alternative genetic loci (SCN8A, ADCY5, CACNA1A) in familial cases.
Bilateral Progression – Though PKD typically presents unilaterally, bilateral involvement can develop but the pathophysiology remains unclear.
Thalamocortical Circuit Dysfunction – Shared involvement in PKD, epilepsy, and tremor suggests oscillatory circuit dysfunction, implicating cerebellar input.
Therapeutic Implications – Response to sodium channel blockers supports the role of excitatory neurotransmission (voltage-gated/glutamate-mediated sodium currents) in PKD episodes.

This case emphasizes the importance of broadening genetic testing in PRRT2-negative PKD, particularly in individuals with a family history of movement disorders or other paroxysmal neurological conditions. Bilateral symptom progression suggests a dynamic course that necessitates ongoing follow-up. Additionally, potential sex-related differences in PKD presentation and progression warrant further study. Future research should focus on identifying non-PRRT2 genetic contributors and their role in familial movement disorders, particularly in female patients.

Poster #A55

Evaluating Recovery and Complications after Anterior Cervical Discectomy and Fusion in the Elderly: A Systematic Review and Meta-Analysis

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Research Category: Clinical and Case-based Research

Purpose:
With an aging global population, the prevalence of age-related diseases is rising, increasing the demand on healthcare systems. Cervical spinal stenosis (CSS) is a major concern among the elderly, often treated with Anterior Cervical Discectomy and Fusion (ACDF), the most common surgical procedure for degenerative cervical conditions. While ACDF is known for its safety and efficacy, most studies focus on younger populations. This systematic review assesses postoperative outcomes in the geriatric population (≥65 years), hypothesizing that older age correlates with increased complications.

Methods:
A comprehensive literature search was conducted across PubMed, Embase, and Scopus databases, yielding 193 articles. After applying strict inclusion criteria, eight studies were selected for review. The studies analyzed various postoperative outcomes including infection rates, readmission rates, length of stay, and specific complications.

Results:
The eight included studies from 2015-2023 comprised a total of 55,572 patients (58.6% male, 41.4% female). Results indicated that elderly patients (≥70 years) exhibit higher complication rates and longer hospital stays compared to younger counterparts. Specifically, complications such as dysphagia, myocardial infarction, and urinary tract infections were significantly more prevalent in the older cohort. Meta-analyses confirmed that elderly patients have higher total complication rates (OR: 0.46), dysphagia rates (OR: 0.47), and 90-day readmission rates (OR: 0.49). Univariate and multivariate analysis confirmed these findings. Lastly, power analysis demonstrated sufficient power for all meta-analyses except for mortality rate, for which the results remain statistically inconclusive.

Conclusions:
Older age is a significant risk factor for poor outcomes following ACDF. These findings highlight the need for age-specific preoperative assessments and tailored postoperative care to mitigate risks and improve outcomes in elderly patients. Future research should explore underlying mechanisms contributing to poorer outcomes and develop targeted interventions to address these issues.

Poster #A56

Impact of Preoperative Resilience on Postoperative Outcomes in Total Joint Arthroplasty: A Systematic Review and Meta-Analysis

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Research Category: Clinical and Case-based Research

Purpose:
Total joint arthroplasty (TJA) for severe joint disease often requires a considerable recovery period. Resilience, defined as the ability to positively adapt to adversity, may affect patient perceptions and overall outcomes. In this review, we hypothesize that higher levels of resilience in patients undergoing TJA are associated with more favorable patient-reported outcome measures (PROMs).

Methods:
A search was conducted across PubMed, Embase, and Scopus. Of the 594 yielded articles, nine discussed preoperative resilience and its impact on postoperative outcomes in patients undergoing TJA. Articles meeting inclusion criteria underwent analysis of those factors.

Results:
Nine included studies from 2019-2022 had a total of 1,328 patients and a pooled mean age of 67.5 years, with six studies using the Brief Resilience Scale, and three using the Conor-Davidson resilience scale to measure resilience. Methodological assessment indicated a moderate and low risk of bias in 8 studies and 1 study respectively. Preoperative resilience was found to be significantly associated with: PROMIS-PH and PROMIS MH ($p< 0.001$ respectively), KOOS ($p=0.0098$; $p=0.002$), EQ-5D ($p<0.001$), EQ-VAS ($p < 0.001$), WOMAC ($p=0.008$; $p=0.003$), and length of stay ($p=0.001$). A meta-analysis showed significant association between preoperative resilience and postoperative PROMIS-PH, PROMIS-MH, and KOOS scores. Overall, higher preoperative resilience was associated with improved PROMs after TJA.

Conclusions:
This review highlights the importance of preoperative resilience and improved PROMs. These results emphasize a possible opportunity to improve patient outcomes after TJA by focusing on a holistic preoperative approach. Due to variable methods in the included studies, there is a need to standardize tools for measuring resilience and PROMs. Future studies should explore the precise mechanisms through which resilience impacts recovery, and develop tailored methods to promote increased preoperative resilience.

Poster #A57

Case Report: Atmospheric Pressure and Increased Intracranial Pressure in a Patient with Sanfilippo Syndrome

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Research Category: Clinical and Case-based Research

Study Objective
Sanfilippo Syndrome (mucopolysaccharidosis type III) is a genetic lysosomal storage disorder characterized by progressive neurodegeneration, dystonia, and dysautonomia. It is caused by deficiencies in enzymes responsible for breaking down heparan sulfate, leading to accumulation in brain regions responsible for motor control such as the basal ganglia, thalamus, and brain stem. Increased intracranial pressure (ICP) has been commonly observed in patients with this disorder. This case report describes a patient with symptoms of increased ICP that fluctuates with atmospheric pressure, managed by adjusting doses of acetazolamide.
Methods
We present a 21-year-old male with Sanfilippo Syndrome with progressive autonomic dysfunction, dystonia, and increased ICP.
Results
Our patient with Sanfilippo Syndrome displayed symptoms of worsening dystonia and distress in the setting of environmental factors known to influence ICP. Secondary symptoms include dystonia, spasticity, epilepsy, chronic lung disease, gastroparesis, and ICP. His dystonic symptoms of increased ICP fluctuate with atmospheric pressure and are managed with acetazolamide (125 mg BID), baclofen, and trihexyphenidyl. During episodes of pressure drops, he would experience severe episodes of muscle twisting including whole body and foot twisting, which would improve after an extra half dose of acetazolamide. His epilepsy is controlled with carbamazepine and his autonomic symptoms are managed with glycopyrrolate and symptomatic interventions. He also takes midazolam and diazepam for dystonic storms and spasticity.
Conclusions
This case suggests ICP in Sanfilippo Syndrome is influenced by atmospheric pressure fluctuations, exacerbating dystonia and autonomic dysfunction. Given the known link between barometric pressure, increased ICP in migraines, and increased ICP, acetazolamide can provide relief for patients by reducing CSF production. While acetazolamide is currently used to manage hydrocephalus in Sanfilippo Syndrome, its role in relieving symptoms triggered by barometric pressure changes, to our knowledge, has not yet been described. Further research is needed to explore barometric pressure sensitivity in Sanfilippo Syndrome to optimize treatment strategies.

Poster #A58

Neurocritical Emergency: Severe Lead Toxicity from Hemorrhoid Ointment and Progressive Cerebral Edema

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Lead poisoning poses a significant health risk, particularly in the context of unregulated herbal medicines. This case report details the death of a 59-year-old woman who succumbed to complications from lead poisoning (cerebral edema and encephalopathy) following the use of an herbal cream to treat hemorrhoids. This incident highlights the dangers associated with unregulated herbal products, which can often be contaminated with harmful substances like heavy metals. Despite the perception that herbal remedies are safer and more affordable alternatives to conventional treatments, their natural appeal does not mitigate the risk of contamination. Many herbal plants can accumulate metals from their environment, exacerbating the risk of lead exposure. This case underscores the urgent need for stricter regulations and oversight in the herbal medicine industry to prevent such health hazards. Implementing stronger regulatory measures are essential to ensure that all medicinal and cosmetic products are free from harmful contaminants and to safeguard public health against the significant risks associated with lead poisoning.

Poster #A59

Spontaneous Subdural Hematoma in A Healthy 28-year-old Male During Latissimus Dorsi Pulldowns: A Case Report

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Research Category: Clinical and Case-based Research

Objective: Non-traumatic subdural hematomas (SDH) in healthy, young individuals are rare, with strenuous physical activity occasionally implicated. SDH classically involves the rupture of bridging veins due to sudden increases in intravenous pressure, which can occur during activities such as heavy weightlifting. The following case highlights a unique presentation of SDH in a patient performing latissimus dorsi pulldowns.

Methods: The patient presentation is summarized in the present study.

Results: A 28-year-old male with no pertinent past medical, surgical, or family history presented to the emergency department six days after he was performing latissimus dorsi pulldowns during a workout at approximately 3 am, when he experienced a sudden “pop” sensation in his head followed by transient blindness in his left eye for 20 minutes, dizziness and nausea. On arrival, the patient was alert and oriented with elevated blood pressure (148/92) but otherwise stable vital signs. Non-contrast computed tomography (CT) of the head revealed an 8 mm left frontoparietal SDH with a 5.6 mm rightward midline shift, while CT angiography was unremarkable. He reported dehydration and consumption of a high-caffeine energy drink before his workout. He denied recreational or performance-enhancing drug use, or trauma. He underwent craniotomy with SDH evacuation and subdural drain placement. Postoperative imaging confirmed hematoma evacuation and improved midline shift. His recovery was uneventful and he was discharged on postoperative day five. He reported complete resolution of symptoms at two-week follow-up.

Conclusion: This case illustrates the development of a non-traumatic SDH. The pathophysiology likely involves increased intracranial venous pressure leading to rupture of bridging veins during heavy weightlifting. Few cases of exercise-related SDH have been reported. To our knowledge this is the first case in a patient under the age of 30. This case highlights the importance of taking a comprehensive history, and timely intervention to achieve favorable outcomes in SDH patients.

Poster #A60

Factors Influencing Postoperative Infections in Pediatric Appendectomies

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Research Category: Clinical and Case-based Research

Objective
Pediatric appendectomies have a low mortality rate of 0.26%; however, postoperative infections remain a concern. Our study aimed to identify factors contributing to postoperative infections to improve patient outcomes.

Methods
A literature search was conducted using Embase, Scopus, and PubMed, yielding 720 studies. Inclusion criteria required studies reporting postoperative infection rates in pediatric appendectomies. Exclusion criteria included case reports, review articles, studies with adult populations, small sample sizes (≤5 patients), incomplete infection rate data, non-appendectomy-specific studies, non-U.S. studies, and unrelated studies. Two reviewers conducted a dual-blinded review using Rayyan for data extraction.

Results
A total of 34 studies met inclusion criteria, analyzing 705,776 pediatric appendectomy cases. Of these, 27 studies identified factors significantly associated with postoperative infections. Key findings include:

Laparoscopic appendectomy (LA) had lower infection rates compared to open appendectomy (OA) ($p < 0.001$).
Preoperative antibiotics significantly reduced postoperative infections ($p = 0.0356$).
Delayed appendectomy (>2 days after admission) increased infection rates ($p < 0.01$). Extended hospital stays (>6 days) and symptom duration prior to treatment correlated with higher infection risk ($p = 0.04$, $p = 0.02$, respectively). Longer operative time (30-minute increments) was associated with increased infections ($p < 0.001$).
Weekend procedures had higher infection rates than weekday procedures ($p < 0.001$). Same-day discharge was associated with lower infection rates than delayed discharge ($p < 0.0001$).

Conclusion
Timely diagnosis, prompt surgical intervention, and early discharge play a crucial role in minimizing postoperative infections. Preoperative antibiotic administration, laparoscopic surgery, and efficient operative times significantly reduce infection risk. These findings emphasize the need for optimized perioperative protocols to improve patient outcomes.

Poster #A61

Impact of the COVID-19 Pandemic on In-Hospital Stroke Mortality in California: Trends, Disparities, and Outcomes from 2016 to 2022

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Objective
In 2022, stroke shifted from the fourth to the fifth leading cause of death in the U.S. as COVID-19 temporarily took its place. Despite this change, stroke remains a significant cause of mortality and long-term disability in the U.S. This study analyzes trends in in-hospital mortality among stroke-related hospitalizations in California from 2016 to 2022, with a particular focus on the pandemic years.

Methods
This retrospective analysis utilized patient discharge data from the California Department of Health Care Access and Information, screening nearly 25 million inpatient events for stroke-related ICD-10-CM diagnosis codes (I60-I63) among individuals 20 and older. Multivariate logistic regression (MLR) analysis assessed the impact of the COVID-19 period, gender, and ethnicity on in-hospital mortality. Results were interpreted using Adjusted Odds Ratios.

Results
590,801 stroke-related hospitalizations and 37,512 in-hospital deaths among stroke incidences were identified. Initially, the in-hospital mortality rate decreased from 28.88 per 100,000 in 2016 to 27.38 in 2019. However, with the onset of COVID-19 in 2020, the rate increased to 27.94, peaking in 2021 at 30.78 during the pandemic's height. In 2022, the rate slightly declined to 28.30. MLR revealed an 11.6% increase in mortality during the post-COVID period compared to the pre-COVID period ($p<0.001$). Male mortality was 25.3% higher than female mortality ($p<0.001$). Asian patients had a 53.9% higher prevalence of stroke compared to White patients ($p<0.001$), followed by Blacks patients at 38.8% ($p<0.001$).

Conclusion
The COVID-19 pandemic significantly impacted in-hospital stroke mortality rates in California, particularly during the peak in 2021. The study highlights the differential impact on males, who experienced higher mortality increases, and pronounced racial disparities, with Asian and Black patients showing higher prevalence rates compared to White patients.

Poster #A62

The Effects of Race and Skin Color on the Correlation Between Fitzpatrick Skin Type and Objective Skin Color Measurements

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Research Category: Clinical and Case-based Research

Objective: The Fitzpatrick Skin Type (FST) is used to assess therapy outcomes in clinics and measure diversity within clinical trials. We wanted to determine whether self-reported FST is correlated with objective measures of skin color: melanin index and individual typology angle (ITA).

Methods: During this prospective study, ITA and melanin index were measured from upper inner arm and subjects completed a validated FST assessment questionnaire. This study was performed in Sacramento, USA at Integrative Skin Science and Research and Pacific Skin Institute. The primary outcomes include correlations between FST, melanin index, and ITA. Linear regression analysis was used to determine the Spearman coefficient and p-value associated with each correlation. Results were stratified to assess differences between race and degree of skin color.

Results:201 subjects participated in the study. FST was correlated with ITA ($r = -0.614$, $p < 0.0001$) and melanin index ($r = 0.525$, $p < 0.0001$). Stratification resulted in a weaker correlation between FST and ITA in the non-white subgroup ($r = -0.332$, $p < 0.01$) when compared to the white subgroup ($r = -0.434$, $p < 0.0001$). FST was correlated with melanin index in the white subgroup ($r = 0.333$, $p < 0.01$) but not in the non-white subgroup ($r = 0.232$, $p > 0.05$). Furthermore, there was a correlation between FST and ITA in lighter skin ($r = -0.56$, $p < 0.0001$) but not in darker skin ($r = 0.288$, $p > 0.05$).

Conclusions: These results demonstrate the inaccuracies of the FST, especially in those that identify as non-white and those with objectively darker skin color. Skin colorimeter-based measurements, such as the ITA, are superior when assessing skin color which has important implications for diversity in medicine in both the clinic and in clinical research.

Poster #A63

Quadratus Lumborum Block Provides Similar or Reduced Postoperative Pain and Opioid Consumption Compared to Control Following Hip Arthroscopy: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: To investigate whether the quadratus lumborum (QL) block is associated with reduced postoperative pain and opioid consumption in patients undergoing hip arthroscopy.

Methods: A search following Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines was performed in PubMed, Embase, Scopus, and Cochrane Library databases to identify comparative studies of patients undergoing the QL block prior to hip arthroscopy. The primary outcomes of interest included postoperative pain and opioid consumption.

Results: Eight studies (5 randomized, 3 nonrandomized) with 274 patients receiving the QL block were included. Control groups included no block (3 studies), sham block (2 studies), pericapsular injection of anesthetic (1 study), lumbar plexus (LP) block (1 study), and femoral nerve/fascia iliaca (FN/FI) block (1 study). In one randomized and two nonrandomized studies, the pain scores were significantly lower, at all postoperative time points, in the QL block versus sham, no block, and FN/FI control groups. The same three studies reported significantly less opioid consumption in the QL group at all measured postoperative time points. The remaining five studies reported mostly no significant differences in pain scores and opioid consumption at multiple postoperative time points. In no study did the QL block group have significantly more pain or opioid consumption relative to the control groups.

Conclusions: Compared to a variety of control groups, the QL block provides similar to reduced postoperative pain and opioid consumption in patients undergoing hip arthroscopy.

Poster #A64

Postoperative Infection Following Hip Arthroscopy in Patients Receiving Preoperative Intra-articular Injections: A Systematic Review and Meta-Analysis

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Research Category: Clinical and Case-based Research

Objective: Intra-articular injections prior to hip arthroscopy are often used to diagnose and conservatively manage hip pain. However, recent studies have demonstrated a potential association between injections administered shortly before hip arthroscopy and an elevated risk of postoperative infection. This systematic review aims to assess whether preoperative intra-articular injections prior to hip arthroscopy are associated with an increased risk of postoperative infection and to determine the safety timeframe for administering such injections prior to the procedure.

Methods: A comprehensive search was conducted in the PubMed, Embase, and Cochrane Library databases to identify studies examining the relationship between preoperative intra-articular injections and postoperative infection following hip arthroscopy. A meta-analysis was conducted to compare the risk of infection between patients who received injections prior to hip arthroscopy at varying intervals and those who did not receive any preoperative injections.

Results: Five studies were included (four level III and one level IV) which consisted of 58576 patients (58.4% female). The risk of infection was significantly higher among patients who received injections within three months prior to hip arthroscopy compared to those who did not receive injections ($P = 0.001$). However no significant difference in infection risk was observed when injections were administered more than three months before hip arthroscopy compared to no injections ($P = 0.87$).

Conclusion: The findings suggest that patients undergoing hip arthroscopy who have previously received intra-articular injections may face a statistically higher risk of postoperative infection, particularly when the injection is administered within three months prior to hip arthroscopy. Consequently, surgeons should exercise caution and avoid administering intra-articular injections to patients scheduled for hip arthroscopy within the subsequent three months to mitigate the increased risk of infection.

Poster #A65

Arthroscopic Bankart Repair Using a Single Anterior Working Portal Technique: A Systematic Review and Meta-analysis

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Research Category: Clinical and Case-based Research

Objective: To evaluate the efficacy and outcomes of arthroscopic Bankart repair using a single anterior working portal and determine whether they are comparable to the standard two-portal technique.

Methods: A search following PRISMA guidelines was performed in July 2024 in the PubMed, Embase, Scopus, and Cochrane Library databases. Studies evaluating outcomes of patients undergoing arthroscopic Bankart repair using a single anterior portal technique were included. A meta-analysis comparing outcomes was performed using a random-effects model. A P-value < 0.05 was considered statistically significant.

Results: Seven studies in patients undergoing Bankart repair with a single anterior portal were included (311 patients, 84.6% male, mean age 27.8 years, mean follow-up 37.4 months). Five of seven studies compared outcomes of a single anterior portal versus the standard two-portal technique. The duration of surgery was significantly shorter in the single anterior portal group (P < 0.00001). The postoperative Oxford Instability Score (P = 0.84), Rowe score (P = 0.26), American Shoulder and Elbow Surgeons score (P = 0.73), Constant-Murley score (P = 0.92), and Visual Analog Scale Pain score (P = 0.07) were similar between both groups. The postoperative degree of shoulder abduction (P = 0.84) and external rotation (P = 0.64) were similar between both groups. The risk of redislocation (P = 0.98) was similar between both groups. \

Conclusion: Patients undergoing arthroscopic Bankart repair with a single anterior portal had significantly lower operative times and comparable PROs, ROM, and risk of redislocation relative to patients undergoing repair with a standard two-portal technique.

Poster #A66

Clinical Outcomes of Arthroscopic Hip Labral Reconstruction Versus Repair in the Primary Setting: A Systematic Review and Meta-analysis

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Research Category: Clinical and Case-based Research

Objective: To compare clinical outcomes of arthroscopic hip labral reconstruction versus repair in the primary setting.

Methods: A search following Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines was performed in PubMed, Embase, and Scopus to identify studies comparing the clinical outcomes of arthroscopic hip labral reconstruction versus repair in the primary setting with a minimum two-year follow-up. Meta-analyses comparing patient-reported outcomes (PROs), achievement of a minimal clinically important difference (MCID) or patient acceptable symptomatic state (PASS), and revision or conversion to total hip arthroplasty (THA) were performed. A P-value <0.05 was considered statistically significant.

Results: Six studies (level of evidence III) with 429 hips undergoing reconstruction and 1278 undergoing repair were included. Indications for reconstruction in the primary setting included inviable or inadequate size of remaining labrum for repair, labral calcification, >8 mm or <2-3 mm of labral tissue, complex or extensive tear, labral hypotrophy or hypertrophy, tears with severe (or moderate in patients >40 years old) intrasubstance damage, labral ossification, and segmental defects. The modified Harris Hip Score (mHHS) (P =0.18), Visual Analog Scale Pain (P =0.09), International Hip Outcome Tool (iHOT-12) (P =0.55), Hip Outcome Score Sports Scale (P =0.96), and Satisfaction (P =0.26) at the latest follow-up were not significantly different. The odds of achieving a MCID and PASS for the mHHS (P =0.10 and 0.08) and iHOT-12 (P =0.07 and 0.58) were not significantly different. The risk of revision was not significantly different (P =0.76) whereas the risk of conversion to THA was significantly higher in the reconstruction group (P <0.00001).

Conclusions: While PROs, achievement of clinically significant outcomes, and risk of revision appear to be similar for primary labral reconstruction versus repair, the risk of conversion to THA is significantly higher for patients undergoing primary labral reconstruction.

Poster #A67

Rotator Cuff Repair Using a Single-Row Medially Based Triple-Loaded Suture Anchor Technique Augmented With Marrow Vents: A Systematic Review of Biomechanical and Clinical Outcomes

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Research Category: Clinical and Case-based Research

Objective: To evaluate the biomechanical and clinical outcomes of rotator cuff repair (RCR) with a triple-loaded suture anchor, medially based, single-row (SR) technique augmented with marrow vents.

Methods: A search following Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines was performed in the PubMed, Embase, and Cochrane Library databases. Studies evaluating the biomechanical or clinical outcomes of RCR with a triple-loaded suture anchor, medially based, SR technique augmented with marrow vents were included.

Results: Five biomechanical studies were included (40 tendons, age range 49.3 to 71.9 years old). The primary mechanism of failure was at the suture tendon interface. Two studies comparing SR versus double row (DR) repair constructs both reported significantly greater ultimate load to failure in the SR group. One of the two comparative studies also found significantly less anterior and posterior footprint border exposure and gap displacement in the SR group. Six clinical studies were included (330 patients, 61.5% male, age range 44.1 to 65.8 years, follow-up time range 6 to 34 months). Two randomized controlled trials (RCT) compared SR with DR suture-bridge repair. There was significant preoperative to postoperative improvement in the UCLA score (MD: 20.57; 95% CI: 18.01 to 23.12; $P < 0.00001$), Constant-Murley score (MD: 51.98; 95% CI: 35.32 to 68.64; $P < 0.00001$), and VAS pain score (MD: -6.09; 95% CI: -7.05 to -5.12; $P < 0.00001$). The pooled retear rate was 4.8% (range, 0% to 15.0%), with all retears occurring at the tendon footprint (Cho type 1). The two RCTs reported no significant difference in postoperative PROs and retear rates.

Conclusions: A SR medially based triple-loaded suture anchor technique for RCR augmented with marrow vents is associated with excellent biomechanical properties and PROs, along with low retear rates. In all studies, retears in SR repair patients occurred at the tendon footprint.

Poster #A68

Outcomes of Total Joint Arthroplasty in Patients With Ehlers-Danlos Syndrome: A Systematic Review and Meta-analysis

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Research Category: Clinical and Case-based Research

Objective: Patients with Ehlers-Danlos Syndrome (EDS) undergoing total joint arthroplasty (TJA) may have a higher risk of complications due to joint laxity. Our purpose was to evaluate outcomes of TJA in patients with EDS versus without EDS.

Methods: A search following guidelines established by the Preferred Reporting Items for Systematic Reviews and Meta-analyses was performed in PubMed, Embase, and Scopus. Studies were included if they evaluated outcomes of TJA in patients with EDS. A meta-analysis comparing overall complications, revision arthroplasty, non-revision-related complications, instability, and readmission between EDS and control patients undergoing TJA was performed using a random-effects model. A P-value <0.05 was considered statistically significant.

Results: Eight studies were included (four on total knee arthroplasty (TKA), three on total hip arthroplasty (THA), and one on both TKA and THA). In total, 1647 patients (84.6% female) undergoing TJA had EDS, and 8933 patients (85.5% female) served as controls. The risk of complications ($P < 0.00001$), revision arthroplasty ($P = 0.0003$), non-revision-related complications ($P < 0.00001$), and instability ($P < 0.00001$) was significantly higher in EDS patients. The risk of readmission ($P = 0.68$) was similar for EDS and control patients. When TKA and THA were evaluated separately, the risk of complications ($P = 0.0001$ and < 0.00001), revision arthroplasty ($P = 0.003$ and < 0.00001), non-revision-related complications ($P = 0.008$ and < 0.00001), and instability ($P < 0.00001$ for both) remained significantly higher in EDS patients.

Conclusions: Patients with EDS undergoing TJA should be appropriately counseled since they demonstrated significantly higher risks of overall complications, revision arthroplasty, non-revision-related complications, and, most importantly, instability.

Poster #A69

Clinical Outcome of Primary Versus Revision Hip Arthroscopy: A Systematic Review and Meta-analysis

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Research Category: Clinical and Case-based Research

Objective: To perform a systematic review and meta-analysis comparing the outcomes of primary versus revision hip arthroscopy.

Methods: A search following Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines was performed in PubMed, Embase, and Cochrane Library databases. Studies were included if they compared outcomes of primary versus revision hip arthroscopy and had a minimum follow-up of 12 months. Data regarding study characteristics, patient demographics, radiographic parameters, patient-reported outcomes (PROs), and adverse events were recorded. A meta-analysis was conducted using a random-effects model.

Results: Eleven studies were included, with 6,437 patients (56.1% female, mean age: 37.1 years) and 1,251 patients (68.1% female, mean age: 35.2 years) undergoing primary and revision hip arthroscopy, respectively. Preoperative and postoperative radiographic parameters were not clinically different between primary and revision groups. Postoperative Hip Outcome Score Activities of Daily Living Scale, Hip Outcome Score Sports Subscale, modified Harris Hip Score, International Hip Outcome Tool, and Non-Arthritic Hip Score were significantly lower (all $P<0.001$), and the Visual Analog Scale Pain ($P <0.001$) score was significantly higher in revision hip arthroscopy patients. For primary versus revision groups, the range of achievement of the minimal clinically important difference was 66.7%-92% versus 47.4%-90%, respectively; the range of achievement of the patient acceptable symptomatic state was 52.6%-79.4% versus 20%-57.7%, respectively. Risk of complications ($P=0.04$) and conversion to total hip arthroplasty ($P<0.001$) was significantly higher after revision hip arthroscopy.

Conclusion: Patients undergoing revision hip arthroscopy were less likely to achieve clinically significant improvements on postoperative PROs and exhibited higher risks of complications and conversion to THA compared to primary hip arthroscopy patients. These findings suggest that patient outcomes are optimized in the primary setting, and surgeons should appropriately counsel patients regarding expectations following revision hip arthroscopy.

Poster #A70

Arthroscopic-Assisted Core Decompression for Avascular Necrosis of the Femoral Head Demonstrates Favorable Clinical Outcomes: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: This systematic review aims to evaluate clinical outcomes for arthroscopic-assisted core decompression (AACD) for avascular necrosis (AVN) of the femoral head.

Methods: A literature search following guidelines established by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses was performed in PubMed, Embase, and Scopus. Nine studies were included, five of which compared AACD with isolated core decompression (CD) and four of which evaluated outcomes of only AACD.

Results: There were a total of 358 patient (462 hips, 71.8% male) who underwent AACD. In the five comparative studies, the AACD and isolated CD groups had 97.6% (72.2-100.0%) and 98.5% (81.0-100.0%) of hips with pre-collapse AVN, respectively. The mHHS, reported in five comparative studies, was significantly higher in the AACD group in four studies and not significantly different in one study. The VAS pain score, reported in two comparative studies, was significantly lower in the AACD group in one study and not significantly different in another study. The pooled collapse rate was 10.1% (2.9-14.0%) at a mean follow-up of 37.9 months in the AACD group and 23.6% (14.6-28.6%) at a mean follow-up of 34.7 months in the isolated CD group (P = 0.0005). In the four AACD only studies, 76.9% (42.9-100.0%) of hips had pre-collapse AVN with the collapse rate being 24.6% (23.2-45.5%) at a mean follow-up of 39.2 months.

Conclusions: Patients undergoing AACD for treatment of AVN of the femoral head demonstrate excellent patient-reported outcomes and low rate of collapse and complications, with a possibility of superior outcomes compared to isolated CD.

Poster #A71

Hip Arthroscopy for Global Acetabular Overcoverage Demonstrates Favorable Patient-Reported Outcome Scores and Low to Moderate Rates of Revision and Conversion to Total Hip Arthroplasty: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: To evaluate clinical outcomes of hip arthroscopy for patients with global acetabular overcoverage.

Methods: A search following guidelines established by the Preferred Reporting Items for Systematic Reviews and Meta-analyses was performed in the PubMed, Embase, and Scopus databases in July 2024. Studies were included if they had a minimum two-year follow-up and reported on outcomes of hip arthroscopy for patients with global acetabular overcoverage which was defined as a lateral center-edge angle (LCEA) >40° with coxa profunda, acetabular protrusio, and/or a negative Tönnis angle. The primary evaluated outcomes included patient-reported outcomes (PROs) and rates of revision and conversion to total hip arthroplasty (THA).

Results: Eight studies comprising 369 hips (58.5% female; age range, 31.2-42.4 years; follow-up range, 24.0-73.2 months) with global acetabular overcoverage treated with arthroscopy were included. For labral management, 0-30% of patients underwent debridement, 65-100% underwent repair, and 0-100% underwent reconstruction. Femoroplasty and acetabuloplasty were performed in 73.3-100% and 94.7-100% of patients, respectively. Six studies reporting both preoperative and postoperative PROs reported significant improvements in all PROs. Rates of revision and conversion to THA ranged from 1.5-27.3% and 1.8-13.6%, respectively. Of studies comparing outcomes between patients with global overcoverage versus normal coverage, there were no significant differences in any PROs (4/5 studies), revision rates (5/5 studies), and conversion to THA rates (3/5 studies).

Conclusions: Hip arthroscopy for global acetabular overcoverage can allow patients to achieve significant improvements in PROs along with low to moderate rates of revision and conversion to THA that are comparable to patients with normal acetabular coverage.

Poster #A72

Arthroscopic Hip Labral Repair Using Knotless Suture Anchors is Associated with Good to Excellent Patient-Reported Outcomes and Low Rates of Secondary Surgery: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: To evaluate the clinical outcomes of arthroscopic hip labral repair using knotless suture anchors.

Methods: A search was performed according to Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines in PubMed, Embase, and Scopus to find studies reporting on clinical outcomes of arthroscopic hip labral repair using knotless suture anchors.

Results: Ten studies containing 1409 hips (38.7% male; age range, 27.3-42.9 years; follow-up duration, 12.0-77.0 months). In all ten studies, there was significant preoperative to latest follow-up improvement in all but one patient-reported outcome (PRO) measure in a single study. At the latest follow-up, the ranges of PROs were as follows: modified Harris Hip Score (mHHS) (69.1-86.9), Hip Outcome Score Activities of Daily Living (59.9-88.7), Hip Outcome Score Sports Scale (70.0-87.0), International Hip Outcome Tool (71.4-79.0), Nonarthritic Hip Score (74.0-88.0), and Visual Analog Scale Pain (1.0-2.8). The achievement rate of the minimal clinically important difference (MCID) and patient acceptable symptomatic state (PASS) for the mHHS ranged from 50.0-100% and 43.9-99.6%, respectively. The rates of revision surgery and conversion to total hip arthroplasty (THA) ranged from 0-10.0% and 0-8.0%, respectively. Two studies compared knotless versus knotted anchors. Both studies reported no significant difference in patient demographic characteristics, preoperative radiographic measurements, preoperative and latest follow-up PROs, rates of revision, and rates of conversion to THA. Only one of the two studies reported on MCID or PASS, with no significant difference in achievement rates for either. Additionally, only one of the two studies reported complications with only the incidence of synovitis being significantly higher in the knotted group (10.8% versus 2.0%; P =0.01).

Conclusions: Patients undergoing arthroscopic hip labral repair with knotless anchors demonstrated good to excellent PROs and low rates of secondary surgery. The clinical outcomes were comparable to those of knotted anchor repair.

Poster #A73

Equivalent Six-week Knee Motion and Patient-Reported Outcome Scores after Cementless and Cemented Total Knee Arthroplasty with a Kinematic Alignment Optimized Implant

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Research Category: Clinical and Case-based Research

Objective: : Cemented kinematic alignment (KA) total knee arthroplasty (TKA) is popular due to its superior patient-reported outcome scores (PROs). A new cementless version of a KA-optimized implant is available. The femoral component features a 20° trochlear groove and medial spherical articulation. The tibial insert features a medial socket, creating native anterior-posterior stability and a lateral flat articular surface promoting native medial pivot rotation. The present study aimed to determine whether clinical outcomes for patients receiving the cementless KA-optimized implant are equivalent to those receiving the cemented implant after 6 weeks. This comparison is essential because lower PROs could indicate delayed osteointegration of the components, like dysfunction associated with delayed fracture union.

Methods: The study included 95 cementless KA TKAs matched 1:1 with 95 cemented KA TKAs based on surgery date, age, preoperative knee deformity, sex, and surgeon. Patients completed the Oxford Knee Score (OKS) and the Knee Injury and Osteoarthritis Outcome Score for Joint Replacement (KOOS JR) both preoperatively and at 6 weeks, as well as the Forgotten Joint Score (FJS) at 6 weeks. A Wilcoxon two-sided equivalence test was used to test the null hypothesis that results were comparable for the cementless and cemented KA TKAs.

Results: The analysis included 114 females and 76 males, with a mean age of 68 years and a body mass index (BMI) of 31 kg/m^2. Pre-operatively and at 6 weeks, the age, sex distribution, BMI, knee ex-tension and flexion, OKS, and KOOS JR scores for cementless and cemented KA TKAs were equivalent. At 6 weeks, the FJS scores were also equivalent.

Conclusion: The KA-optimized implant closely resembling native knee morphology did not show evidence of delayed osteointegration. After 6 weeks, knee motion and PROs were equivalent to those of the cemented implants. However, longer-term monitoring of this new cement-less implant is necessary.

Poster #A74

Hybrid stenting for treatment of Re-coarctation of the aorta in the infant and young children

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Research Category: Clinical and Case-based Research

Objective: Infants and young children with re-Coarctation of the Aorta (re-CoA) can be managed with stents but have limited arterial access for delivery of large stents that can be further dilated to adult size. Hybrid stenting approaches have been reported, but there are scant data on vascular access details, hybrid techniques and outcomes. We report our experience between 2018 and 2024 with a hybrid stenting approach to treat re-CoA.

Methods: Patient profiles and outcomes were assessed. Hybrid vascular access techniques are described and follow-up (FU) data are presented.

Results: Demographic variables in 9 patients (median; range): age 6 months (0.25-6 yrs.) and weight 6.53 (5.3-23.5 kg). Eight patients had single ventricle anatomy. Patients were divided into 2 groups: Group 1 underwent direct access via the ascending aorta at the time of concomitant cardiac surgery with sternotomy (n=5). Following CoA stenting, access was converted to cannulation site for bypass. Group 2 underwent a mini left thoracotomy and direct access to the descending aorta in the catheterization laboratory (n=4). Stents used: Valeo (mm) 9x17 (5), and 9x26 (1) MaxLD:16mm length (3); sheath size: 7F-10F; fluoroscopy time (mean ± SD): 14.4 ± 7.2 min. All procedures were tolerated well with no complications. Outcomes (mean ± SD): CoA diameter (mm) increased from 4.6 ± 2. to 7.4 ± 1.3 (p=0.0001), and gradient (mmHg) decreased from 22.2 ± 10.7to 1.22 ± 1.72 (p=0.0002). Length of hospital stay (median; range) for group 1 was 7 days (2-45 days) and for Group 2 was 96 days (18-180 days). The 7 patients currently being followed are performing well. FU ranged from 0.25 to 72 mo.

Conclusions: Infants and small children tolerate hybrid transcatheter-based repair of re-CoA well. Stents dilatable to adult size can be implanted safely and effectively using hybrid techniques. Larger series and longer FU are needed.

Poster #A75

Efficacy and Outcomes of Talimogene Laherparepvec (T-VEC) in Solid Tumors: A Systematic Review

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Research Category: Clinical and Case-based Research

Objective: Talimogene Laherparepvec (T-VEC) is an oncolytic virus designed to selectively replicate within tumor cells, causing lysis while enhancing systemic antitumor immunity through the expression of granulocyte-macrophage colony-stimulating factor (GM-CSF). After receiving FDA approval in 2015 for the treatment of unresectable melanoma, T-VEC has generated interest for its potential in treating other malignancies. However, a comprehensive synthesis of T-VEC's response rates, survival outcomes, and adverse events across various solid tumors is still lacking. This systematic review aims to evaluate the efficacy and safety profile of T-VEC in patients with a range of solid tumors to better understand its clinical utility.

Methods: A systematic search of PubMed, Embase, and Scopus was conducted to identify published, peer-reviewed clinical studies, following the guidelines of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). Studies were included if they reported on outcomes of T-VEC therapy in patients with non-melanoma solid tumors. Study variables included patient age, tumor type, dosage, treatment duration, survival rates, response, and adverse effects. Progression-free survival (PFS) and overall survival (OS) were compared across all studies.

Results: From 1,664 identified studies, 10 clinical studies met inclusion criteria. Five studies evaluated T-VEC therapy in breast cancer, three in sarcomas, one in basal cell carcinoma, and one in pancreatic cancer. T-VEC was administered at a dose of 10^4 PFU/ml, with an average treatment duration of 9.5 weeks. The mean PFS was 4.6 months, and the mean OS was 15.5 months. Among 213 patients, the most common adverse effects were pain at the injection site, anemia, neutropenia, thrombocytopenia, fatigue, and diarrhea.

Conclusion: T-VEC demonstrated promising efficacy in sarcomas and pancreatic cancer, with mixed responses in breast cancer. Further investigation is required to assess clinical outcomes of T-VEC therapy in solid tumors, particularly in combination with other immunotherapies.

Poster #A76

Perioperative Management of Chronic Antithrombotic Therapy in Total Joint Arthroplasty: Balancing Bleeding and Thrombotic Risks

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Research Category: Clinical and Case-based Research

Total knee arthroplasty (TKA) and total hip arthroplasty (THA) are increasingly common orthopedic procedures, with growing patient populations requiring chronic antithrombotic therapy. While perioperative anticoagulation and antiplatelet management strategies have evolved, balancing thrombotic and hemorrhagic risks remains a critical challenge in these patients. Tranexamic acid (TXA) has significantly reduced intraoperative bleeding without increasing thrombotic events, and low-dose aspirin has emerged as the preferred thromboprophylactic agent postoperatively. However, current guidelines for managing chronic antithrombotic therapy in total joint arthroplasty (TJA) patients remain inconsistent.

Patients on chronic thromboprophylaxis—due to conditions such as atrial fibrillation, prior venous thromboembolism, acute coronary syndrome, and hypercoagulable states—face elevated risks of both major bleeding and thrombotic complications. The increasing prevalence of these conditions has led to a rise in antiplatelet and anticoagulant use, necessitating a standardized approach to perioperative management. Antiplatelet agents, including aspirin and P2Y12 inhibitors, and anticoagulants, such as warfarin, direct oral anticoagulants (DOACs), and heparins, each present unique perioperative challenges. Emerging evidence suggests that improper management of chronic antithrombotic therapy increases rates of transfusion, wound complications, and thromboembolic events, highlighting the need for individualized risk assessment and treatment protocols. This review synthesizes the latest evidence on perioperative antithrombotic management in TJA patients, detailing current recommendations for treatment interruption, bridging therapy, and postoperative resumption strategies. By optimizing anticoagulation strategies, orthopedic surgeons can minimize perioperative complications while maintaining thrombotic protection in this medically complex patient population. Future research should focus on refining risk stratification models and developing high-level evidence-based guidelines to improve outcomes in TJA patients on chronic antithrombotic therapy.

Poster #A77

No Difference in Outcomes, Complications, or Revision Rate, for Obese vs. Non-obese Patients Following Hip Resurfacing Arthroplasty: A Systematic Review and Meta-Analysis

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Research Category: Clinical and Case-based Research

Objective:
Hip resurfacing arthroplasty (HRA) has advanced to provide long-term outcomes similar to total hip replacements (THR), particularly for young, active patients. Benefits include natural bone preservation, enhanced range of motion, and reduced dislocation risks. However, factors such as bone quality, activity level, and body mass index (BMI) play a crucial role in patient selection. Obesity, in particular, can increase joint stress, complicate surgery, and affect both immediate and long-term results. This review aims to assess whether obesity should be considered a contraindication for HRA or if treatment strategies for obese patients can be similar to those for non-obese individuals.
Methods:
A comprehensive literature search was conducted in PubMed, Embase, and Scopus using keywords related to HRA and obesity. Studies were screened for eligibility, and data on demographics, BMI, complications, revisions, and patient-reported outcomes (PROMs) were extracted. The risk of bias was assessed with the MINORS score. A meta-analysis compared UCLA scores, complication rates, and revision rates between obese and non-obese patients, with statistical significance set at $p<0.05$.
Results:
Of the 39 studies reviewed, 4 met inclusion criteria, involving 1,385 patients (mean age: 50.92 years). These studies (2007–2013) included one prospective and three retrospective designs, all with moderate bias. The complication rate was 9.83% in obese patients compared to 4.7% in non-obese patients. Revision rates were 1.15% for obese patients and 3.70% for non-obese patients. No statistically significant differences were found in UCLA scores, complication rates, or revision rates.
Conclusion:
The similar outcomes between obese and non-obese patients suggest that obesity should not automatically exclude patients from undergoing HRA. While a more individualized approach may be necessary, obesity alone is not a contraindication. Further research with larger, long-term cohorts is needed to confirm these findings.

Poster #A78

Do not pass GO, think of OGO: A wide spectrum of clinical presentations of 14 patients with outflow graft obstruction

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Research Category: Clinical and Case-based Research

Objective:
To illustrate the heterogeneous presentations of outflow graft obstruction (OGO) emphasizing that pump complications should be considered when evaluating patients with left ventricular assist devices (LVADs).

Methods:
We conducted a case series of 14 patients diagnosed with OGO between February 2020 and December 2024. OGO was defined as partial or complete obstruction of blood flow through the outflow graft. Data collected included patient demographics, presenting symptoms, LVAD type, diagnostic imaging, labs, interventions, and clinical outcomes.

Results:
Among the 14 patients, the median age is 52 (IQR: 38-68). 10 were male (71.4%) and 4 female (28.6%). Racial distribution included 8 White, 3 African American, 2 Asian, and 1 Native American. Device types were HVAD (n=6), HeartMate II (n=2), and HeartMate III (n=6). Patients presented 2.5 to 9 years following LVAD placement with an average of 4.95 years of therapy prior to pump failure. Except for 1 patient, all were on anticoagulation. Common heart failure-associated symptoms included dyspnea, chest pain, low flow alarms, and cough, although some patients presented atypically with symptoms such as diarrhea, abdominal pain, lightheadedness, dizziness, or syncope.

Baseline lab findings varied significantly. 6 patients had elevated creatinine, 6 had elevated blood urea nitrogen, and all exhibited high LDH. NT-proBNP levels were elevated in all 6 patients tested. All patients were diagnosed via computed tomography angiography and treated with stenting. 5 patients (35.7%) died, and 1 (7.1%) underwent heart transplantation.

Conclusion:
OGO presents with a wide spectrum of clinical manifestations, from heart failure-like symptoms to ill-defined presentations. The absence of classic findings and the often unpredictable nature of patient presentations creates diagnostic dilemmas. Clinicians should maintain a high index of suspicion and consider OGO in the differential diagnosis, as timely diagnosis and intervention may improve survival and outcomes.

Poster #A79

The Efficacy of Pharmacotherapy on Ascending Thoracic Aortic Aneurysm Growth Rate in a Veteran Population

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Research Category: Clinical and Case-based Research

Objective:
To evaluate the impact of various cardiovascular medications on aneurysm growth rate in a veteran population with a dilated ascending aorta or ascending thoracic aortic aneurysms (aTAAs) under surveillance.

Methods:
We conducted a retrospective cohort study of 731 patients followed for ascending aorta (diameter ≥ 40mm) at a Veterans Affairs Hospital. Patients with aTAA repair, dissection, only one scan, or scans <3 months apart were excluded. Maximum ascending aorta diameter was determined from computed tomography scans, and average growth rate was calculated from diagnosis to most recent scan. We compared patients on angiotensin-converting enzyme inhibitors (ACEi), angiotensin receptor blockers (ARBs), beta-blockers, calcium channel blockers (CCBs), and statins using point-biserial correlation and Welch's two sample t-test.

Results:
Following exclusions, 425 patients were included in the analysis. Average age was 76.0 ± 7.8 years (males n = 425, 100%), 71.1% (n=302) had smoking history, 18.4% (n=78) congestive heart failure, 82.6% (n=351) hypertension, and 76.0% (n=323) hyperlipidemia. Mean imaging follow up between CT scans was 4.57 years. 185 patients received ACEi, 92 received ARBs, 255 received beta-blockers, 131 received CCBs, and 306 received statins. Minimal correlations were noted between medication use and growth rate. Welch's t-test revealed mean growth rates of 0.023 mm/year for ACEi users versus 0.225 mm/year for non-users (p=0.23) and 0.075 mm/year for statin users versus 0.295 mm/year for non-users (p=0.23).

Conclusion:
We found no significant differences in aTAA growth rates between patients taking cardiovascular medications and those who were not. Given the known benefits of ACEi and statins in reducing adverse aortic events, further research should explore their potential role in preventing dissection and other complications as well as additional factors contributing to aneurysm growth.

Poster #A80

Diagnostic Challenges and Management of Early Crohn's Disease in a Pediatric Patient: The Value of Capsule Endoscopy

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Research Category: Clinical and Case-based Research

Crohn's Disease (CD) is a chronic inflammatory bowel disease commonly affecting the terminal ileum. Typical symptoms include right lower quadrant pain, diarrhea, and weight loss. In pediatric and adolescent populations, CD may also present with growth and puberty delays. Often the diagnosis of CD is made using a combination of clinical symptoms, endoscopic findings, and biopsy results that show signs of inflammation. However, diagnostic challenges arise when traditional methods, such as esophagogastroduodenoscopy (EGD), colonoscopy, and magnetic resonance enterography (MRE), fail to provide definitive evidence of disease.

This report discusses a 28-year-old male referred to the Gastroenterology clinic at age 16 for a continuation of right lower quadrant abdominal pain and weight loss following an appendectomy. Despite multiple traditional evaluations, including normal biopsy results of the small bowel, the patient's symptoms persisted. However, capsule endoscopy performed two years later revealed distal small bowel inflammation, leading to a preliminary diagnosis of CD. Treatment with mesalamine and adherence to a specific carbohydrate diet resulted in symptom resolution and normal follow-up imaging.

After six years without progression of disease, the patient discontinued treatment. The patient, less than one year later, consequently developed a small bowel obstruction due to complications of his Crohn's disease and MRE showed disease progression despite normal biopsies in the distal ileum.. This case highlights the limitations of traditional diagnostic methods in detecting early CD, emphasizing the importance of early diagnosis with capsule endoscopy and consistent treatment and follow up to prevent complications.

Poster #A81

Hearing Loss Among the Uninsured Population

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Research Category: Clinical and Case-based Research

Objectives: To determine the impact of socioeconomic factors on hearing thresholds and health.

Study Design: A prospective cohort study comparing uninsured patients from free clinics (Clinica Tepati, SEVA, Shifa Clinic, Sacramento (FCS)) to insured patients at a tertiary academic medical center (UC Davis Health Medical Center (UCDMC)).

Methods: Participants completed a questionnaire on otologic symptoms following pure tone audiometry (PTA) (Amplivox 270, Amplivox, Birmingham, United Kingdom). The audiologist data collected included air-conduction thresholds for 1, 2, 4, and 8KHz, using over-the-ear headphones. Patients with any relevant otologic history or younger than 18 years old were excluded. Chi-squared and ANOVA tests were used for analysis.

Results: The study included 34 participants (FCS: 21, UCDMC: 13). 14% and 54% of participants from FCS and UCDMC, respectively, were above 65+. The average PTA for 1, 2, and 4 kHz was 24.9dB +/- 13.2 for FCS and 24.5dB +/-13.4 for UCDMC. When stratified by age, the PTA results showed no significant difference between the two groups. FCS participants reported higher exposure to loud noise (38% vs. 8%, p= 0.0017), while the UCDMC patients had a higher rate of over-the-ear earphone usage (30.7% vs. 4.8%, p=0.033, respectively). We intend to present data from over 50 patients in each group.

Conclusion: The study underscores that, despite comparable PTAs between the two cohorts, significant differences in noise exposure and listening habits exist. These findings suggest that socioeconomic factors influence hearing health differently across populations. Consequently, there is a pressing need for further research to explore the implications of these factors on the uninsured population and to promote awareness of safe listening practices and noise exposure among patients.

Poster #A82

Efficacy of Tocilizumab in Treating MOGAD in a Pediatric Patient

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Research Category: Clinical and Case-based Research

Objective:
To describe the clinical course of a 7-year-old male with Myelin Oligodendrocyte Glycoprotein Antibody-Associated Disease (MOGAD), emphasizing the efficacy of tocilizumab, an interleukin-6 receptor inhibitor, in treating refractory cases.

Methods:
The patient presented with altered mental status, seizures, and febrile illness. Initial treatment included intravenous methylprednisolone for suspected autoimmune encephalitis. Diagnosis was confirmed by positive MOG antibody titers (>1:1000). Due to insufficient response to first-line therapies, tocilizumab (8 mg/kg) was administered on days 10 and 13 post-admission. Clinical progress was monitored through neurological assessments, imaging, and laboratory findings.

Results:
The patient exhibited marked clinical improvement within 24 hours of the first tocilizumab dose. MRI findings consistent with encephalitis showed no optic nerve involvement or masses. Cerebrospinal fluid analysis revealed pleocytosis with a shift from neutrophilic to lymphocytic dominance over time. Supportive care included antihypertensive therapy (amlodipine), sleep management (diphenhydramine), and nutritional support via nasogastric feeding. Rehabilitation efforts restored independent ambulation and oral intake. The patient was discharged on day 16 with follow-up care in place.

Conclusion:
This case highlights the potential of tocilizumab as a second-line treatment in refractory MOGAD by targeting IL-6-mediated inflammation. The rapid symptom resolution observed aligns with emerging evidence supporting its efficacy in autoimmune encephalitis unresponsive to conventional therapies. Further research is needed to validate its long-term safety and effectiveness in pediatric populations.

Poster #A83

Management of Bone Loss After Multiple Metacarpal and Distal Row Carpal Resection Due to Osteomyelitis

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Research Category: Clinical and Case-based Research

Atraumatic wrist pain can be due to a variety of causes including gout, pseudogout, cellulitis, arthritis flare, or infection of the joint. One important differential to rule out immediately is septic arthritis as it is considered an orthopedic emergency. Due to the rarity of septic arthritis in the wrist, there is limited data to guide diagnosis and treatment. Furthermore, delayed diagnosis of septic arthritis can progress to osteomyelitis and result in severe damage. The primary objective of this study is to present a case of atraumatic septic arthritis with a delayed diagnosis that developed into osteomyelitis in the left wrist and hand of an immunocompetent hand surgeon. In addition, we discuss the surgical treatment including reconstruction of the hand and wrist through a multidisciplinary approach.

Poster #A84

Improving Self-Reported Pain Tracking: A Path Toward Personalized Pain Management in Orthopaedic Trauma

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Research Category: Clinical and Case-based Research

Study Objective:
Orthopaedic trauma patients are at high risk for poor postoperative pain relief and chronic opioid use. Personalized pain management requires accurate tracking of pain intensity, yet self-reporting is difficult and often underreported in Electronic Medical Records. This study aims to identify the best method for collecting self-reported pain scores, hypothesizing that a specifically designed pain-recording device (PRD) will outperform traditional methods.

Methods:
This ongoing randomized controlled trial includes 150 postoperative orthopaedic trauma patients. Patients record pain intensity (0-10), date, and time at intervals of at least five minutes. They are randomly assigned to one of three methods: clipboard/paper/pen (CBPP), smartphone survey (QSP), or a pain-recording device (PRD) with 11 buttons strapped to their hospital bed. The number of pain recordings over 12 hours is compared between groups.

Results:
Among 56 enrolled patients, 51 completed the study (PRD: 18, CBPP: 13, QSP: 20). The PRD group recorded the highest number of pain scores (5.41±2.57; Median: 5.09; Range: 2.70-10.78), followed by CBPP (4.58±4.07; Median: 3.12; Range: 1.51-13.06) and QSP (3.13±2.85; Median: 2.40; Range: 0.48-12.63). However, ANOVA analysis found no statistically significant difference ($p = 0.0841$).

Conclusion:
The PRD facilitated more frequent pain self-reporting, suggesting potential benefits in personalized pain management. Further statistical updates will be provided at the 2025 Annual OTA Meeting.

Poster #A85

Hepatitis B and C Co-infection Following Recent Vaccination: A Case Report

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Research Category: Clinical and Case-based Research

Hepatitis B (HBV) and Hepatitis C (HCV) are viruses of significant global health concern as they can cause serious liver injury such as cirrhosis and hepatocellular carcinoma, while also contributing to extrahepatic symptoms such as pulmonary embolism and portal vein thrombosis. Both viruses are transmitted through similar mechanisms including but not limited to: intravenous (IV) drug use, sexual transmission, perinatal transmission, and transfusion of contaminated blood products. These viruses are endemic in various third world countries, notably Pakistan, where a significant portion of the population is infected by one or both viruses each year. There is currently no manufactured vaccine to prevent the spread of HCV; however, a subunit vaccine exists to prevent the spread of HBV by creating antibodies against the HBsAg antigen. This has been shown to be fully effective in nearly all individuals who receive all doses. Here, we present a case in which a 75 year old woman received a HBV vaccine prior to traveling to Pakistan; however, upon returning to the United States, she presented with symptoms that were suggestive of a HBV and HCV co-infection. We find that the age of the patient, the timing of vaccine administration prior to travel, and a compromised immune system can contribute to the development of HBV, despite vaccination status. Therefore, these are all risk factors that clinicians should be aware of when administering the HBV vaccine and counseling patients about its effects, especially to those traveling to regions endemic for HBV and HCV.

Poster #A86

A Case of Transverse Myelitis With an Intrathecal Pump: A Case Report

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Research Category: Clinical and Case-based Research

Study Objective:
Intrathecal pumps (ITP) are an effective tool for patients with intractable pain. We report a rare case of transverse myelitis (TM) as a late complication of ITP placement.
Methods:
This case report was received from Dr. Foad Elahi who cared for this patient in the hospital after developing complications from the ITP.
Results:
A 60-year-old female patient reported bilateral progressive lower extremity weakness and loss of sensation 1.5 years post-implant of an ITP. She became unable to ambulate and developed urinary incontinence. Magnetic resonance imaging (MRI) found hyperintense signaling from T6 to mid-T9 level. Lumbar puncture showed an elevated white blood cell count with lymphocyte predominance. The patient was given high-dose corticosteroids and plasmapheresis without improvement in symptoms. Following this, the ITP was removed without complications and was sent for culture. The patient was monitored after the procedure and set up for transfer to a tertiary medical center for further work-up and treatment.
Conclusion:
This case calls for early and prompt diagnosis and management of post-implant complications of an ITP.

Poster #A87

Effects Of Postoperative Music Therapy On Patient Outcomes: A Systematic Review And Meta-Analysis

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Research Category: Clinical and Case-based Research

Background: This review systematically evaluates the effect of music on postoperative patient outcomes following various surgeries. Music therapy has been explored as a nonpharmacologic intervention to enhance recovery by influencing both subjective experiences and physiologic responses. Postoperative pain and anxiety are common concerns that can contribute to delayed recovery and increased opioid use. Beyond subjective improvements, music therapy may modulate autonomic nervous system activity, as evidenced by reductions in heart rate. By assessing both subjective (pain and anxiety) and physiologic (heart rate and opioid use) measures, this review aims to provide a comprehensive analysis of music's impact on postoperative recovery.

Methods: We conducted a systematic review of 3 databases according to PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) guidelines using the terms "music," "noise," "postoperative," "surgery," "outcome," and "recovery." Collected data included study characteristics, patient outcomes (pain, anxiety, physiologic markers, etc.), measurement methods, type of surgery, and statistical data.

Results: Our search yielded 3736 studies, of which 35 met inclusion criteria. The included studies largely consisted of therapeutic evidence levels I. 19 of 27 studies reporting pain showed a significant reduction, 4 of 7 showed a reduction in anxiety scores, 6 of 10 showed a reduction in heart rate, and 2 of 5 showed a reduction in opioid use. Random-effects model analysis showed a mean reduction of 0.775 ($p<0.0001$) for Visual Analogue Scale pain scores, 1.896 ($p<0.0001$) for Numerical Rating Scale pain scores, 2.508 ($p=0.0436$) for State-Trait Anxiety Inventory scores, 4.565 ($p<0.0001$) for heart rate, and 0.961 ($p=0.0409$) for opioid use.

Conclusion: Music therapy significantly improves postoperative outcomes, including reductions in pain, anxiety, heart rate, and opioid use. These findings highlight its potential role in perioperative care, warranting further research to optimize implementation across surgical populations.

Poster #A88

Radiofrequency Ablation of the First Carpometacarpal Joint: A Technical Report

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Research Category: Clinical and Case-based Research

Objective: Chronic pain of the first carpometacarpal (CMC) joint can significantly impair thumb function and quality of life, particularly in patients refractory to conventional treatments. This study reports a novel approach to radiofrequency ablation (RFA) targeting the articular branches supplying the CMC joint to achieve effective pain relief.

Methods: Case details were provided by Dr. Foad Elahi, who managed the patient following the development of chronic CMC joint pain refractory to conventional treatments.

Results: A patient with chronic CMC joint pain underwent RFA under ultrasound and fluoroscopic guidance. A 22-gauge RF needle was used for precise localization and controlled thermal energy delivery to ablate the target nerves while avoiding adjacent neurovascular structures. Following ablation, a combination of Depo-Medrol (80 mg) and 0.25% Marcaine was injected for additional pain relief. The procedure was well-tolerated, with no intraoperative complications or blood loss. The patient experienced immediate pain relief postoperatively, with improved thumb mobility and grip strength. No adverse effects were reported at follow-up.

Conclusion: This case highlights RFA as a safe and minimally invasive alternative for managing refractory CMC joint pain. Ultrasound and fluoroscopic guidance enable precise needle placement and effective ablation, offering significant pain relief for patients who have exhausted conservative treatment options. Further studies are warranted to validate the long-term efficacy of this approach.

Poster #A89

Enhancing Knowledge Retention in Medical Education Through Escape Box Games

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Research Category: Clinical and Case-based Research

Objective:
Gamification is a novel strategy to enhance student learning and engagement that is growing in popularity. One such game is an escape box, where players solve a series of challenges and riddles within a limited time to unlock a box. This study aims to expand on the use of games in medical school curricula by implementing an escape box-themed game as an effective strategy to teach pre-clinical science to first-year medical students.

Methods:
The study (IRB protocol number = 2403-02-144) involved first-year medical students divided into the escape box and lecture only groups. The study was conducted over three phases: a pre-game survey, the escape box game, and a post-game survey. Overall, the surveys included four questions that assessed confidence in renal medical concepts, three questions that assessed student engagement with the escape box game, and five questions that assessed personality traits.

Results:
Sixty-five students completed both pre- and post-game surveys. The escape box group found the escape box-themed game to be more stimulating than traditional lecture. For most students it enhanced engagement beyond previous game-based methods. The overall increase in confidence was higher, but statistically insignificant, for three out of four questions between the two groups. This increase was statistically significant for one question regarding dialysis access ($p = 0.00434$). No correlation was found between personality traits and increase in confidence after escape box game learning.

Conclusions:
The escape box-themed game substantially enhanced engagement compared to traditional lecture methods and other game-based strategies and showed strong potential in increasing confidence in various medical concepts. The study suggests that gamification could effectively complement traditional lecture-based learning in medical education by supporting student retention of material. Future research is necessary to explore more objective measures of knowledge retention and apply the use of escape box games across various medical education phases.

Poster #A90

Safety and Efficacy of IDH1 Inhibitor Ivosidenib in Patients with Intrahepatic Cholangiocarcinoma

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Research Category: Clinical and Case-based Research

Objective: Intrahepatic cholangiocarcinoma (ICC) is the second most common liver malignancy after hepatocellular carcinoma and is an aggressive and difficult-to-treat cancer. One promising targeted therapy is ivosidenib, an isocitrate dehydrogenase-1 (IDH1) mutation-targeted inhibitor. This systematic review aims to assess the current literature on the survival outcomes, treatment efficacy, and adverse events of ivosidenib use in ICC patients.

Methods: We conducted a comprehensive search following the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines in CENTRAL, Scopus, and PubMed databases to examine ivosidenib's impact on patient survival in advanced-stage ICC patients, extracting variables such as progression-free survival (PFS), overall survival (OS), treatment response, disease control rate (DCR), and frequency of adverse events.

Results: Three studies, including one randomized control trial and two cohort studies, were analyzed with a total of 271 patients with a mean length of follow-up of 8.1 months and a mean age of 60.25 months. Ivosidenib was found to improve advanced ICC patient outcomes in median PFS (Range: 2.7-4.4 months), median OS (Range: 10.3-15 months), objective response rate (ORR) (Range: 2.41-18.18%), and DCR (Range: 53.23-63.64%), compared to outcomes in untreated advanced ICC (PFS=1.4 months, OS=7.5 months, ORR=0%, and DCR=27.87%), although 12-month PFS was found to be similar between ivosidenib-treated and placebo cohorts in one study (43% vs. 36% respectively in the randomized control trial). Using individual-level data, patient survival was calculated with a hazard ratio of 0.31 (95% CI 0.22-0.44, $p<1x\ 10\text{-}10$) utilizing Cox regression and the Wald test to determine statistical significance.

Conclusions: These findings suggest that ivosidenib could be considered for advanced-stage ICC patients because of its clear impacts on patient progression-free survival and well-tolerated side effects profile.

Poster #A91

Changes in Time to Diagnosis of HPV+ Oropharyngeal Squamous Cell Carcinoma

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Abstract:

Purpose:
Timely diagnosis is critical for effective management of HPV+ oropharyngeal squamous cell carcinoma (OPSCC). This study investigates whether increased public and provider awareness over recent years has led to a reduction in the time to diagnosis and an earlier stage at presentation.

Methods:
A retrospective cohort study was performed on 312 patients with HPV+ OPSCC treated at a tertiary Head and Neck Oncology clinic between 2013 and 2022. Time to diagnosis—defined as the interval from initial symptom presentation (e.g., neck mass, throat pain, dysphagia) to tissue confirmation—and clinical stage (using AJCC 7 criteria) were analyzed using one-way ANOVA and Chi-square tests.

Results:
Time to diagnosis significantly decreased over the study period ($p<0.001$), with a higher proportion of patients presenting with early-stage disease (stage I/II, $p=0.002$) in later years. Additionally, differences in presenting symptoms ($p=0.021$) and patient proximity to the tertiary center ($p=0.039$) were associated with diagnostic delays, while rates of misdiagnosis, alternative treatments, and prior work-up modalities remained unchanged.

Conclusions:
The findings indicate that improved awareness of HPV+ OPSCC among both the public and primary care providers may be contributing to faster diagnosis and stage migration toward earlier disease. Nonetheless, persistent misdiagnosis rates underscore the need for ongoing education and optimized diagnostic protocols to further reduce delays.

Level of Evidence:
Level III, retrospective cohort study

POSTER PRESENTATIONS

ABSTRACTS

(Basic and Translational Sciences)

SESSION B

COLLEGE OF DENTAL MEDICINE

Poster #B1

Category	Basic and Translational Sciences
Affiliation	College of Dental Medicine
Submitter	Baker Al-Rawi
Authors	Baker Al-Rawi; Simerit Kaur; Lauren Farias; Reina Karaki; Dalia Lopez-Pelayo; Shadi Javadi; Shymaa E. Bilasy
Title	Oral manifestation of congenital tooth agenesis and its management strategies
Abstract	Study Objectives: Congenitally missing teeth can pose challenges for children, parents and dentists. About 20% of the population is affected, with a higher prevalence in females. Patients can experience difficulties in speech, mastication, and aesthetic concerns that can negatively impact their mental well-being. These patients face long-term financial burdens, treatments, and maintenance strategies starting from early childhood to ensure favorable outcomes[SB1] . As current replacement methods all seem to come with challenges and limitations, a more promising novel treatment modality involving regenerative approaches is currently investigated. Here, we aimed to investigate the current and future management modalities and shed light on the much-anticipated topics of stem-cell and antibody-mediated tooth replacement. Methods: We performed a literature search using different search engines to identify English written articles investigating the etiology, tooth loss impact, as well as the current and future treatment practices. Results: Multiple studies have suggested removable dentures (with overall satisfaction rates of 50-81%), fixed partial dentures (with a satisfaction rate of 84 %), and dental implants (with survival rates hovering around 88%). Various developmental pathways are involved in regulating tooth formation. Therefore, future management modalities could involve utilizing antibodies and/or stem cells. For example, USAG-1 monoclonal antibody therapy demonstrated promising results in rodents and ferrets to regenerate missing teeth. As erupting teeth dictate the development of oro-maxillofacial structures such as alveolar bone, the use of stem cells for generating deficient facial structures is another prominent topic. For instance, stem cells from exfoliated deciduous teeth can attract host cells and trigger lamellar bone formation. Conclusion: In summary, a multidisciplinary approach involving novel therapeutic methods in stem-cell and antibody-based approaches could potentially improve the comfort and satisfaction rates of patients with congenitally missing teeth.

COLLEGE OF GRADUATE STUDIES

Poster #B2

Title: PGRMC2 Knockout Disrupts Ciliary Extracellular Vesicle Biogenesis and Cardiac Functions

Authors: Riley A. Danna[1], Ashraf M. Mohieldin[1,2]

Affiliations: College of Medicine[1], College of Graduate Studies[2]

Category: Basic and Translational Research

Objective: Progesterone receptor membrane component 2 (Pgrmc2) plays a critical role in ciliogenesis and ciliary extracellular vesicles (ciEVs) biogenesis, a process essential for cardiac function. This study investigates the effects of cardiac-specific Pgrmc2 knockout on heart structure and function. **Methods**: A cardiac-specific Pgrmc2 knockout mouse model was generated using the Cre-LoxP system to investigate its role in cardiac homeostasis. Functional assessments included treadmill exhaustion tests, tail-cuff blood pressure tests, pressure-volume loop analysis using the working heart system, and Masson's Trichrome staining for fibrosis assessment. To confirm that the observed cardiac dysfunction was due to the loss of ciEVs, extracellular vesicle injection was evaluated as a potential rescue intervention. Pgrmc2 knockout mice received weekly IV injections of 200 mL containing 1.6 million extracellular vesicles from 2 to 17 weeks of age. **Results:** Survival analysis showed that control mice treated with saline maintained 100% survival over the 17-week study period, while Pgrmc2 knockout mice exhibited a 50% reduction in survival by week 13. Extracellular vesicle injections improved survival to 75%, confirming the role of ciEVs in cardiac homeostasis. Knockout mice also demonstrated significant cardiac hypertrophy, increased fibrosis, and a decline in systolic and diastolic functions. Treadmill exhaustion tests revealed a statistically significant reduction in exercise capacity, and measurements showed increased left ventricular thickness compared to controls. Tail cuff blood pressure analysis indicated a greater decline in systolic blood pressure in male knockout mice compared to females, suggesting potential cardioprotective effects of circulating progesterone. Extracellular vesicle injections partially restored exercise capacity, improved blood pressure, and reduced fibrosis, further supporting the essential role of ciEVs and Pgrmc2 in cardiac functions. **Conclusion:** Loss of Pgrmc2 disrupts ciEVs release, leading to structural and functional cardiac deterioration. Extracellular vesicle injections partially rescue these deficits, highlighting the essential role of ciEVs and Pgrmc2 in maintaining cardiac homeostasis.

Poster #B3

Title: Exploring the Medicinal Chemistry and Therapeutic Potential of Nabiximols in Neurological Disorders

Authors: Mehar Brar, Fernanda Galo-Reyes, Abdelbasset Farahat

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

Nabiximols is a cannabis-based pharmaceutical formulation that combines tetrahydrocannabinol (THC) and cannabidiol (CBD) to treat spasticity and pain, particularly in neurological conditions such as multiple sclerosis. The medicinal chemistry of Nabiximols involves a unique combination of cannabinoids that work through complementary mechanisms to provide pain relief and improve motor function. Clinical trials and preclinical studies have shown that Nabiximols effectively reduces spasticity and alleviates chronic pain, with a favorable side effect profile compared to conventional treatments. Its pharmacokinetic properties support efficient absorption, enabling optimal therapeutic levels. Nabiximols offer a promising treatment for neurological disorders, demonstrating both efficacy and safety. Further research is needed to explore its long-term effects, optimize formulations, and expand its therapeutic uses.

Poster #B4

Title: HEMOGLOBIN, A DRUG TARGET

Authors: Kenneth Okwuegbe, Shahadat Hossain, Abdelbasset Farahat

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

Hemoglobin, as the primary oxygen carrying protein in red blood cells, affords a crucial role in oxygen delivery, and its allosteric properties in various disease states especially hemoglobinopathies such as sickle cell anemia. Targeted drug designs could be used to manipulate its oxygen stability, affinity, or interaction with other molecules. Pharmacotherapeutic agents can be designed to address this impaired oxygen transport by red blood cells, affording treatment for anemia and other associated disorders. An analysis of hemoglobin's structure and function, its interaction with various drugs, therapeutic mechanisms of action were conducted. Key approaches include the use of allosteric modulators, fetal hemoglobin reactivators, small molecule inhibitors, gene therapy, and protein replacement. Clinical trials and experimental data were reviewed to evaluate the efficacy and challenges of these methods. Drugs such as voxelotor enhances oxygen affinity thereby reducing complications, while hydroxyurea reactivates fetal hemoglobin (Hbf) decreasing red blood cell sickling and improving therapeutic outcome and patient's quality of life.

Poster #B5

Title: Exploring the Complexity and Personalized Treatment of Genetic Illnesses: Albinism and Haemophilias.

Authors: Alina Nikitskiy, Abdelbasset Farahat

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

DNA is the blueprint of life, providing instructions that drive all cell functions. When mutations occur, they disrupt the normal sequence, leading to an array of genetic illnesses. Albinism and hemophilia are especially recognized, as they have shown distinct complexity in both their compositions and development of effective treatments. This review aims to analyze the genetic illnesses- albinism and hemophilia, along with their required and developing targeted treatment strategies. In this paper, we conduct a scientific literature review obtained from relevant databases, extrapolating key findings to highlight the complexities, molecular compositions, and the developing trajectory of effective treatments in albinism and haemophilia. Albinism, an autosomal recessive disorder, is caused by mutations in melanin-related genes of melanocytes, resulting in a reduction of melanin production. Despite the lack of a direct cure, management focuses on preventing UV damage and exploring gene therapy to correct TYR mutations. Moreover, haemophilias are bleeding disorders caused by clotting factor deficiencies, demonstrating efficacy using several current treatments, including gene therapy, antifibrinolytic drugs, as well as factor replacement therapy. Although both illnesses present genetically varied origins, they both require their own personalized treatment. Advances in gene therapy and precision medicine are constantly evolving, offering promising treatments for future use.

Poster #B6

Title: Ciliary Extracellular Vesicles in Alzheimer's Disease: Proposed Pathophysiological Mechanisms

Authors: Anagha Math, Gratiana Chen, Ashraf M. Mohieldin

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

Objectives: Alzheimer's Disease (AD) is a progressive neurodegenerative disorder characterized by cognitive decline and memory loss. Despite its global health impact, the molecular mechanisms underlying AD are not completely understood, and early diagnostic biomarkers are limited. Recent studies have focused on the role of primary cilia and extracellular vesicles (EVs) in AD pathophysiology, including amyloid-beta plaques, tau tangles, neuroinflammation, and neuronal loss. Similarly, ciliary EVs (ciEVs), a recently identified subtype of EVs derived from cilia, have been associated with AD biomarkers, though their exact involvement in AD remains unclear. This study examines the relationships between AD and key ciEV biomarkers, including NADPH-cytochrome p450 reductase (POR), Topoisomerase II Alpha (TOP2a), and CD151 Antigen (CD151). **Results:** Our review results suggest that ciEVs may contribute to AD progression by trafficking amyloid precursor protein (APP), potentially triggering neuroinflammatory signaling. (1) In astrocytes and neurons, ciEVs may transport POR, which may activate the Shh and Wnt signaling pathways, leading to the activation of the advanced glycation end product-specific receptor (AGER) pathway. These cascades may ultimately drive inflammation, promote amyloid plaque formation, and disrupt the blood-brain barrier in AD. (2) TOP2A, a key protein in ciEVs, may regulate Shh, Wnt, and Reelin gene signaling pathways, potentially altering the role of Peptidyl-Prolyl Isomerase 1 (PIN1), which is known to contribute to AD pathology hallmarks, such as tau tangles and amyloid plaques. (3) CD151 may promote the release of ciEVs containing Cathepsin B (CTSB), a lysosomal protease, which could impair the blood-brain barrier, enhance APP accumulation, and worsen cognitive dysfunction in AD. **Conclusion:** The critical involvement of POR, TOP2A, and CD151 in AD further strengthens the growing evidence linking primary cilia and ciEVs to AD pathophysiology. In summary, this study highlights key mechanistic pathways that could serve as potential targets for early AD detection and therapeutic intervention.

Poster #B7

Title: Comparative Proteomic Analyses for Cilia Fragments in Sickle Cell Disease

Authors: Chrislyn Lawrence[1], Madison Spencer[2] , Carter Bernal[1,2], Bisma Khan[2], Emily Waddle[2], Ashraf Mohieldin[2]

Affiliations: College of Pharmacy[1], College of Graduate Studies[2]

Category: Basic and Translational Research

Objective: Sickle cell disease (SCD) is an inherited hemoglobinopathy characterized by sickle-shaped red blood cells (RBCs). Primary cilia are mechanosensory organelles and are projected in the lumen of blood vessels to detect blood flow. We previously reported that interaction between microvasculature endothelial cells and sickled RBCs resulted in altered blood flow that can elevate reactive oxygen species, leading to increased deciliation in SCD patients. However, the impact of deciliation mediated by sickled RBCs in the context of ciliary protein profiles remains unclear. **Methods:** Here, we investigated cell-cilia stability under different physiological shear-stress magnitudes and examined cilia protein profiles in SCD, utilizing mouse models and human participants. **Results:** Our results demonstrate that subjecting endothelial cilia to sickled RBCs at 5.0 dyn/cm2 led to significant deciliation events. The proteomic and bioinformatic analyses showed different ciliary protein profiles, distinct signaling pathways, and unique post-translational modifications processes in SCD mouse models. Consistent with the SCD mouse model results, our translational studies validated the enrichment of specific proteins, including Transferrin Receptor-1 (TfR1), Glyceraldehyde-3-Phosphate-Dehydrogenase (GAPDH), and ADP Ribosylation Factor Like GTPase-13B (ARL13B) in SCD patients. **Conclusion:** These findings underscore the clinical relevance of cilia in SCD and suggest ciliary proteins as potential biomarkers for assessing vascular damage.

Poster #B8

Title: The Emerging Therapeutic Potential of Methuosis in Cancer

Authors: Alina Nikitskiy[1], Eslam Mohamed[1]*

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

Introduction: Among the increasing number of identified apoptotic cell death pathways, methuosis has been established as a developing alternative non-apoptotic mechanism with potential therapeutic applications. In contrast to apoptosis, a highly regulated programmed cell death mechanism, characterized by DNA fragmentation and caspase activation, non-apoptotic cell death pathways have a distinct morphology and have been identified in pathological conditions, such as cancer. **Objective:** In this project, we aim to review current evidence addressing the mechanisms leading to methuosis, pathways by which methuosis can be induced by natural compounds, and its potential application towards current cancer therapies, particularly in overcoming resistance mechanisms. **Methods:** A comprehensive scientific literature review of methuosis was conducted using PubMed and other relevant databases, to illustrate methuosis, evaluate its composition, explain molecular pathways involved in this non-apoptotic cell death. In addition, we are highlighting natural and pharmacological inducers of methuosis that can have a therapeutic potential in cancer settings. **Results:** The literature describes methuosis as a non-apoptotic cell death mechanism, characterized by the build-up of large, fluid-filled vacuoles that interrupt macropinocytosis and cellular homeostasis, compromising the cell's viability. Unlike apoptotic pathways, which have been widely utilized in cancer treatments, methuosis functions independently of fragmentation and caspase activation. Its unique reliance on macropinocytosis was first observed in glioblastoma cells following Ras signaling activation. Since the original discovery, many studies have been conducted to confirm and highlight natural compounds that promote methuosis, revealing its potential to overcome cancer resistance to multiple drugs. The mechanism impairs intracellular trafficking, composed of nutrient uptake and the recycling of receptors, which play a significant role in maintaining the cellular functions. The disruption results in death of multiple cancer cell lines, as well as a promising therapy for conventional drug-resistant tumors. **Conclusion:** As demonstrated in the narrative reviews, methuosis reveals to be a promising avenue in targeting resistant cancers and enhancing existing treatment approaches. Despite the developing research, continued studies are vital to confirm and expand methuosis applications in clinical settings.

Poster #B9

Title: The Barriers for Adoptive Cell Therapies in Solid Tumors

Authors: Hansoo Kim*, Noah Kim*, Eslam Mohamed

Affiliations: College of Graduate Studies

Category: Basic and Translational Research

Background: The advent of adoptive cell therapy has paved a new road for cancer treatment. Despite the advances it has made in liquid cancers, there are continued challenges in solid tumor malignancies for tumor-infiltrating lymphocyte (TIL) and CAR-T specific therapies. **Objective:** In this study, we identified three unique challenges for adoptive cell therapy in solid tumors. These three major challenges are tumor heterogenicity, cell trafficking, and immunosuppressive tumor microenvironments. **Methods:** We reviewed different literature of ongoing research which showed the continued efforts to mitigate the unique challenges in solid tumor therapy. **Results:** Tumor heterogeneity continues to be a challenge for CAR-T due to the lack of a clear targetable antigen. Although TILs have multiple TCR clones allowing for an improved response against tumor heterogeneity, not all solid tumors are rich in TILs and TIL selection methods limit its application to various solid tumors. Cell trafficking proves to be difficult specifically in CAR-T cells because abnormal angiogenesis in tumors causes inefficient extravasation of the cell product. Conversely, TILs are isolated from the tumor itself, therefore possess chemokine receptors necessary to home to the tumor. However, their short life in vivo presents a challenge for TILs to travel to the tumor and produce an effective response. For both TIL and CAR-T, the tumor microenvironment presents the biggest challenge. The hypoxic environment and combinations of immune suppressive cells, such as regulatory T cells and tumor associated macrophages, hinders cell survival, proliferation and effective T-cell mediated cancer destruction**. Conclusion**: The combination of these three factors indicates the difficulty of delivery and efficacy of these T cell-based approaches. Further investigation will be conducted to show how different clinical trials are trying to address these three core issues.

COLLEGE OF PHARMACY

Poster #B10

Title: Comparative Proteomic Analyses for Cilia Fragments in Sickle Cell Disease

Authors: Chrislyn Lawrence 1 ; Madison Spencer 2 ; Carter Bernal 2 ; Bisma Khan 2 ; Emily Waddle 2; Ashraf Mohieldin 2

Affiliation: CNUCOP (1), CNUCGS (2)

Category: Basic and Translational Sciences

Objective:
Sickle cell disease (SCD) is an inherited hemoglobinopathy characterized by sickle-shaped red blood cells (RBCs). Primary cilia are mechanosensory organelles projected in the lumen of blood vessels to detect blood flow. We previously reported that interaction between microvasculature endothelial cells and sickled RBCs resulted in altered blood flow that can elevate reactive oxygen species, leading to increased deciliation in SCD patients. However, the impact of deciliation mediated by sickled RBCs in the context of ciliary protein profiles remains unclear.

Methods:
Here, we investigated cell-cilia stability under different physiological shear-stress magnitudes and examined cilia protein profiles in SCD, utilizing mouse models and human participants.

Results:
Our results demonstrate that subjecting endothelial cilia to sickled RBCs at 5.0 dyn/cm2 led to significant deciliation events. The proteomic and bioinformatic analyses showed different ciliary protein profiles, distinct signaling pathways, and unique post-translational modification processes in SCD mouse models. Consistent with the SCD mouse model results, our translational studies validated the enrichment of specific proteins, including Transferrin Receptor-1 (TfR1), Glyceraldehyde-3-Phosphate-Dehydrogenase (GAPDH), and ADP Ribosylation Factor Like GTPase-13B (ARL13B) in SCD patients.

Conclusion:
These findings underscore the clinical relevance of cilia in SCD and suggest ciliary proteins as potential biomarkers for assessing vascular damage.

Poster #B11

Title: Microfluidic Device for the Selective Capture and Characterization of Circulating Endothelial Cells as Biomarkers for Pulmonary Arterial Hypertension (PAH)

Authors: Md Ibrahim1, Md Shahadat Hossain1, Sakib M. Moinuddin1, Tri Nguyen1, Tanoy Sarkar1, and Fakhrul Ahsan 1,2*

Affiliation: 1 CNUCOP, 2 Veterans Affairs Northern California Health Care System,

Category: Basic and Translational Sciences

Objective

Pulmonary arterial hypertension (PAH) is a life-threatening vascular disorder with diagnostic challenges due to nonspecific symptoms and the limitations of current invasive and non-invasive techniques. Circulating endothelial cells (CECs) are promising biomarkers for PAH; however, reliable methods for their isolation and analysis remain elusive. This study aimed to develop a microfluidic lab-on-a-chip system for the selective capture, phenotypic characterization, and genetic profiling of CECs to enable non-invasive PAH diagnosis and monitoring.

Methods

A polydimethylsiloxane (PDMS)-based microfluidic device was engineered to isolate CECs from patient blood. The chip's surface was functionalized with a five-layer polymeric nanofilm through sequential coating with poly-diallyldimethylammonium chloride (PDAC, cationic) and biotinylated alginate (anionic). Streptavidin-Dylight® 650 and biotinylated antibodies targeting CD31 or CD146 (endothelial markers) were conjugated to the nanofilm. To confirm pulmonary vascular origin, CD31/CD146-positive cells were counterstained with Helix pomatia lectin (HPL) and Griffonia simplicifolia lectin (GSL), which selectively bind to pulmonary endothelial cells. The device leveraged biomarkers associated with pulmonary vascular remodeling to enable real-time, selective CEC capture. Integrated phenotypic (morphological and protein expression) and genetic analyses were conducted on captured cells. Preliminary validation using blood samples from PAH patients assessed detection efficiency and specificity.

Results

The microfluidic system successfully isolated CECs from PAH patient samples with high specificity and sensitivity. Phenotypic and genetic profiling provided insights into CEC heterogeneity and their role in PAH progression. Preliminary validation confirmed the device's ability to selectively capture and characterize CECs, highlighting its potential for early PAH detection and longitudinal monitoring.

Conclusion

This PDMS-based microfluidic lab-on-a-chip system offers a novel, non-invasive approach for CEC analysis in PAH. By addressing the limitations of conventional diagnostic methods, this technology provides a transformative tool for early diagnosis, prognostic assessment, and real-time therapeutic monitoring. Its scalability and precision hold promise for improving PAH clinical management, particularly in guiding personalized treatment strategies and detecting early-stage disease.

Poster #B12

Title: Deciphering Mechanisms of and Developing Therapies for Drug-Induced Pulmonary Arterial Hypertension (D-PAH)

Authors: Md Ibrahim1,4, Sakib M. Moinuddin1,4, Md Shahadat Hossain1, Tanoy Sarkar1, Tri Nguyen1, Ahmed ElShamy2, and Fakhrul Ahsan 1,3*

Affiliation: 1 CNUCOP, 2, CNUCGS, 3 Veterans Affairs Northern California Health Care System,

Category: Basic and Translational Sciences

Objective: Drug- and toxin-induced pulmonary arterial hypertension (D-PAH) is a severe but understudied subtype of PAH, triggered by exposure to certain drugs and toxins, including appetite suppressants, selective serotonin reuptake inhibitors (SSRIs), tyrosine kinase inhibitors (TKIs), opioids, and drugs of abuse. While idiopathic PAH (IPAH) has been widely studied, the molecular mechanisms underlying D-PAH remain poorly understood. Furthermore, patient-specific factors such as genetics, age, and sex may influence susceptibility and disease progression, yet these remain largely unexplored. This study aims to investigate the pathogenesis of D-PAH and potential therapeutic interventions using a microfluidic PAH-on-a-chip (PAH-chip) system in parallel with in vivo animal models.

Methods: The PAH-chip is a polydimethylsiloxane (PDMS)-based microfluidic model engineered to replicate the pulmonary arterial microenvironment. Primary pulmonary arterial endothelial cells (PACs) cultured on the chip were exposed to known PAH-inducing agents to assess key pathological features, including endothelial-to-mesenchymal transition, mitochondrial dysfunction, autophagy, and vascular remodeling. Complementary rat models of D-PAH were established using PAH-inducing agents and environmental stressors to validate in vivo disease progression. Proteomic and metabolomic profiling were conducted to elucidate the molecular pathways altered by D-PAH triggers.

Results: Exposure to non-cytotoxic PAH-inducing agents on the PAH-chip led to distinct cytoproliferative effects, endothelial-to-mesenchymal transition (EndMT), mitochondrial dysfunction, ER stress, and extracellular matrix remodeling, hallmark features of D-PAH pathogenesis. Notably, dasatinib, benfluorex, and bupropion induced progressive endothelial dysfunction, with increased vimentin expression, VE-cadherin loss, and elevated collagen I and laminin production. Proteomic analysis revealed drug-specific alterations in key signaling pathways associated with vascular remodeling and oxidative stress.

Conclusion

This study provides novel insights into D-PAH pathogenesis and introduces a robust platform for screening drug-induced PAH risk. The PAH-chip and animal models offer a translational approach for identifying patient-specific risk factors and optimizing therapeutic strategies for this neglected PAH subtype.

Poster #B13

Title: Inhibitory effect of compound X on prostate cancer cells

Authors: Darin Cheung, Mohammad Ali Hassan, Tri Huynh, Tibebe Woldemariam, Hongbin Wang

Affiliations: CNUCOM, CNUCOM, CNUCOM, CNUCOP, CNUCOP

Category: Basic and Translational Sciences

Objective: The aim of this study is to compare the efficacy of 5-fluorouracil (5FU) and Compound X in reducing the viability of prostate cancer cell lines PC3, PC3-ML, and LNCaP. Given the previously tested limited sensitivity of prostate cancer to 5FU, we wanted to identify a more potent therapeutic compound that can improve treatment strategies

Methods: Three prostate cancer cell lines (PC3, PC3-ML, and LNCaP) were cultured and treated with a titration of 5FU and Compound X. Cell viability was assessed using a Cell Counting Kit 8 colorimetric assay to quantify cell death 48 hours after treatment. Western blot analysis was performed to evaluate protein expression, and chemiluminescence imaging was used for visualization. Half-maximal inhibitory concentration (IC50) values were determined for both drugs.

Results: In testing, Compound X exhibited significantly greater potency compared to 5FU in all cell lines. The half maximal inhibitory concentration (IC50) for Compound X was significantly lower than those of 5FU, indicative of higher cytotoxicity at reduced concentration. Colorimetric data revealed that Compound X led to a greater reduction in cell viability. Western blot analysis showed differential protein expression in response to Compound X, suggesting potential alterations in apoptotic or proliferative pathways.

Conclusions: Compound X demonstrates superior cytotoxicity compared to 5FU, making it a potentially more effective therapeutic candidate. Future studies are warranted to investigate its mechanism of action and potential clinical applications in other cancer cell lines

Poster #B14

Title: Quality-by-Design Development of Dissolving Microneedles for Enhanced Transdermal Delivery of Semaglutide

Authors: Hung Kieu; Hiep X. Nguyen

Affiliations: CNUCOP

Category: Basic and Translational Sciences

Objectives:
The global obesity epidemic represents a critical public health issue projected to affect nearly half the population by 2030, imposing healthcare costs exceeding $1.71 trillion in the USA. Semaglutide, a potent glucagon-like peptide-1 receptor agonist, has emerged as a transformative therapeutic agent for diabetes and obesity management. However, current subcutaneous administration presents significant limitations, including needle phobia, cold chain requirements, infection risks, and environmental concerns. This research aims to fabricate, characterize, and optimize semaglutide-loaded dissolving microneedles to enhance transdermal drug delivery into and across the skin.

Methods:
We identified the critical material attributes (CMAs) and critical process parameters (CPPs) that impact key characteristics of microneedles using a systematic quality-by-design approach. We prepared microneedles using the micromolding technique and evaluated various properties of the formulations. The CMAs were the purity and moisture content of semaglutide, molecular weight, viscosity, and concentration of polyvinylpyrrolidone K10. The CPPs were solution mixing temperature, speed, and time, drying temperature and time, and vacuum level. Mean microneedle length, tip diameter, mechanical strength, drug content, content uniformity, dissolution time, drug-loading capacity, drug release kinetics, moisture content, and impurities as critical quality attributes (CQAs) were selected in the design for the evaluation and optimization of the formulations.

Results:
We presented the alteration in the CQAs among various formulations to select the optimal parameters. The fabricated microneedles demonstrated optimal mechanical strength and rapid dissolution upon skin insertion. The permeation study indicated that microneedles delivered markedly more drug into the receptor fluid and skin tissue than the control group ($n = 4$, $p < 0.05$). This enhancement in transdermal drug delivery was demonstrated by cumulative drug permeation after 24 h, steady-state flux, permeability coefficient, and predicted steady-state plasma concentration. Drug quantity in skin layers, total delivery, delivery efficiency, and topical selectivity were also reported.

Conclusions:
Conclusively, semaglutide-loaded dissolving microneedles significantly increased transdermal drug delivery.

Poster #B15

Title: Complimenting Antioxidant Potential of Carotenoids in Goji berries (Lycium barbarum) fruit with Topical Sunscreens

Authors: Tibebe Z. Woldemariam; Peter M. Tenerelli; Jose Puglisi; and Katherine Le

Affiliations: CNUCOP, CNUCOP, CNUCOM, CNUCOP

Category: Basic and Translational Sciences

Study objective(s)
In 2021, Hawaii banned sunscreens containing the chemical active ingredients oxybenzone and octinoxate because studies have shown these chemicals to have harmful impacts on Hawaii's marine environment and ecosystems, including coral reefs.
The aim of this work is, to develop natural sunscreen utilizing the antioxidant potential of carotenoids in Goji berries with currently available topical sunscreens. A library of fractions and compounds from commonly used dietary supplements were generated and tested for possible sunscreen activity. Goji berries are a rich source of antioxidant carotenoids, including zeaxanthin, neoxanthin, cryptoxanthin, and β-carotene which can deliver UV protection by neutralizing free radicals.

Methods
Powdered Goji berries (10g) was extracted twice with isopropyl myristate and Tween 80 (30 mL each time) for 24 hours at room temperature. Mass spectra were recorded on Agilent 1200 Series LC/MSD VL system. DPPH radical scavenging assay was carried out as per reported method with slight modifications. Spectroscopic and chemical data for the active carotenoids will be presented.

Results
The DPPH (2,2-diphenyl-1-picrylhydrazyl) radical scavenging assay was found to be a quick and easy way to assess the carotenoids' antioxidant activity. It is based on the idea that antioxidants act as hydrogen donors to reduce the DPPH radical. The biocompatible extraction solvents, isopropyl myristate and TWEEN 80, were found to be very effective and non-toxic to extract in the liquid form directly in pharmaceutical formulations that is acceptable for human use, topically or orally without requiring the removal of the extraction solvent, reducing complexity and cost of processing.

Conclusions
The optimized solvents selectively extracted the carotenoids from minerals, vitamin C, amino acids, and polysaccharides. The extracts showed an absorption that spans the UVA and UVB ranges (220nm-400nm) in a manner that meets updated FDA recommendations without requiring the addition of titanium dioxide. This work sets significant foundation for our future in vitro screening methods to measure natural compounds' SPF to obtain a comparison to an existing commercial sunscreen product by reducing the number of in vivo experiments and risks related to UV exposure of human subjects.

Poster #B16

Title: Prevention of Ferroptosis Protects Human Cardiac Microvascular Endothelial Cells against Doxorubicin-induced Cell Death

Authors: Katalina Vue; Zhuqiu Jin

Affiliation: CNUCOP

Category: Basic and Translational Sciences

Objective: Doxorubicin (DOX) is one of the most efficient chemotherapy medications for treatment of several cancers such as breast cancer, lymphoma, etc. Cardiotoxicity is the most severe adverse effect induced by doxorubicin. DOX-induced cardiac toxicities include cardiomyopathy, congestive heart failure, and overall increased mortality in patients. Cell death is divided into regulated cell death and irregular cell death. Ferroptosis is a form of regulated cell death characterized with iron-dependent lipid peroxides. Ferroptosis is involved in DOX-induced death of cardiomyocytes such as H9C2 or neonatal rat cardiomyocytes. The role of ferroptosis in DOX-induced human cardiac endothelial cell death remains unknow.

Method: In the presented study, human cardiac microvascular endothelial cells (HCMECs) were cultured in endothelial cell medium supplemented with 5% fetal bovine serum and endothelial cell growth supplement in 5% CO2 incubator. HCMECs from passage 3 to 6 were sub-cultured at a density 1x104 cells/well in 96 wells coated with collagen I. Cell viability and cell cytotoxicity were determined through morphology changes, MTT assay and LDH release into medium. The concentration-response and time-response of doxorubicin on viability of HCMECs were investigated.

Results: DOX at 1 μM for 24 hours was selected for testing of drug protection. Pretreatment of HCMECs with ferrostatin-1 (Fer-1), a ferroptosis inhibitor, for 24 hours protected cells against DOX-induced cell death and LDH release in culture medium. Pretreatment of HCMECs with RSL-3, a ferroptosis inducer, caused morphology change from elongated polygons to round shape and cell death. Pretreatment of HCMECs with Fer-1 protected cell death induced by RSL-3 as well. Treatment of HCMECs with Fer-1 after exposure to DOX had no therapeutic effects.

Conclusion: Our results indicated that prevention of ferroptosis with ferrostatin-1 protects HCMECs from toxicity induced by DOX or RSL-3. The signal pathways in DOX- induced cardiomyopathy need to be further studied.

COLLEGE OF MEDICINE

Poster #B17

Investigating RELT Expression in Various Cancer Cell Lines and Tumor-Exposed Immune Cells

Authors: Luke Cho MS2; Petros Raygoza; John Cusick PhD; Eslam Mohamed PhD

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Affiliations: California Northstate University College of Medicine; California Northstate University College of Graduate Studies; California Northstate University College of Medicine; California Northstate University College of Medicine, California Northstate University College of Graduate Studies

Research Category: Basic and Translational Sciences

Objective: Receptor Expressed in Lymphoid Tissues (RELT) is a member of the Tumor Necrosis Factor superfamily whose role in carcinogenesis is not fully understood. The purpose of this study is to characterize the expression of RELT and its two paralogs RELL1 and RELL2 among different cancer cell-lines, and to study the relationship between the tumor microenvironment and the expression of RELT in T cells and macrophages.

Methods: Seven cancer cell lines: MCF7, Jurkat, Raji, Thp-1, H-358, HEK-293, and MDA-MB-231 were used. To examine the relative expression of RELT, RELL1, and RELL2 transcripts in those cell lines, Real Time PCR (RT-PCR) was performed. Flow Cytometry was used to examine the surface expression of RELT. To investigate RELT expression in immune subsets exposed to tumor factors, Jurkat (T-cell leukemia cell line) and Thp-1 (monocyte cell line) were exposed to various concentrations of Tumor Conditioning Media (TCM). Western blot was performed to evaluate RELT expression. All experiments were performed in triplicate and all data was analyzed using the statistical program, GraphPad Prism 9.5.

Results: For RELL1, RNA expression was greatest in the 293 and 231 cell-lines. For RELL2, RNA expression was greatest in the Thp1, RAJI, and Jurkat cell-lines. The relative expression of RELT was greatest in Thp1 and RAJI. The surface expression of RELT was highest in Thp1 cells. After analyzing RELT expression in Jurkat cells and Thp1-derived macrophages exposed to TCM, we found no significant increase in expression in Jurkat cells while there was an increase in RELT expression in macrophages.

Conclusion: RELL2 and RELT may play a role in hematopoietic cell lines while RELL1 may play a role in epithelial lines. The upregulation of RELT in macrophages vs T-cells could indicate which cell type RELT plays a larger role in influencing when exposed to a tumor microenvironment.

Poster #B18

Identification of TP53 expression profile in Breast cancer patients by Immunocytochemistry in Saint Vincents and the Grenadines from 2007 to 2017.

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Research Category: Basic and Translational Science

Objectives:

- To identify and classify malignant breast cancer diagnosed in Saint Vincents and the Grenadines from 2007 to 2017 using the 2019 WHO classification as a guideline.
- To update the literature on the pattern of primary breast cancers.

Method/Materials:

- A retrospective evaluation of seventy-six histological sections by p53 expression profile using immunohistochemistry.
- Manufacturer-recommended protocols (e.g., mouse monoclonal anti-p53 antibody, Clone: DO-7, PI 5846 Rev. D-p53, manufactured by Bio SB, Santa Barbara, USA) stain all samples that meet the inclusion criteria.
- Based on histological patterns using the guideline, the cases were reviewed(stratified/graded).
- The data obtained were analyzed using SPSS (Statistical Package for Social Sciences) version 29 Software. Tests for statistically significant relationships (Chi-square and Fisher's exact) are set at $p \leq 0.05$.

Results:

Six identifiable distinct histopathological patterns exist among the 76 sections, with a relatively higher frequency of rare ones (Table 1). The distribution based on histopathological types, patterns, mitotic score, grading, and socio-demography are depicted in Table 1-3 and Figure 1 -12.

Table 1: Histopathological types and p53 expression status. Total n=76, negative (n=51), positive (n=25).

The invasive carcinoma of NST(Ductal carcinoma) and age(41-60) have the highest frequency and variability of positive(mean:4.17, SD:6.77) and negative P53 profile(mean :8.5, SD:12), with CI:23.82% and 48.52%).There is a moderate variability in p53 expression across different age ranges(mean =6.50 -13.75, SD=3.57 -7.16).P53 expression profile shows a large disparity between gender (SD =12 to 17).Higher positive p53 expression with age groups (20–40 and >60) and females (37.3% vs. 11.1% in males).

No statistically significant association exists between histological type and negative p53 expression (Pearson's Chi-Square p = 0.242), with a potential trend based on linear-by-linear association (p= 0.064, Fisher's Exact Test(p)=1]. Most subtypes have a mitotic score of one (CI: 25.17%- 48.61%).

Conclusion:

There is no statistically significant association between histological type and p53 expression. However, the borderline p-values (0.061 and 0.064) suggest a weak trend that may become significant with a larger sample size. Exploring other prognostic biomarkers that will be valuable in managing BC is imperative.

Poster #B19

Drainless Autologous Breast Reconstruction: A Systematic Review and Meta-analysis

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Research Category: Basic and Translational Sciences

Background: Drain placement in breast reconstruction has been a topic of contention as their placement decreases dead space while also posing an increased infection risk. The goal of this systematic review is to identify the circumstances in which drain-free autologous breast reconstruction (ABR) is advisable.

Methods: PubMed, ScienceDirect, and Web of Science were indexed for studies with no drain placement at either the flap donor site, recipient site, or both in the setting of ABR. Data analysis was performed with SPSS Version 29.0.2.0.

Results: Twelve studies met inclusion criteria and comprised 1,220 patients, with 781 patients undergoing either complete or partial drain-free breast reconstruction. The mean age and BMI of patients with drain-free reconstruction were 50.0 years and 26.5 kg/m2, respectively. The effect of no drain placement was assessed at the donor site in seven studies, the recipient site in one, one study did not specify, and two evaluated the effect at both. The most common techniques to reduce drain number were progressive tension and quilting sutures. In DIEP flaps the use of quilting sutures to allow for a drain-free abdominal site demonstrated a significant reduction in hospital length of stay(LOS) (g= -1.2 [-1.5, -1.0]). The overall effect, regardless of flap type or technique, demonstrated a significantly decreased LOS (g= -1.0 [-1.6, -0.4]). When transitioning the recipient site to being drain-free in addition to the donor, there were no significant differences in LOS (g= -0.3 [-6.6, 6.0]). The complication rate for drain-free reconstruction ranged from 0 to 32.3%. Evaluating the effect of no drain at the recipient site, there was one case of flap congestion across 3 studies. The recipient site demonstrated a significantly increased rate of seroma when drains were removed from both the recipient and donor site vs. the donor site alone (p=.01, Table 1).

Conclusion: The incorporation of a drainless donor site promoted a significant reduction in LOS, though removing drains from the recipient site may increase rate of seroma.

~~Poster #B20~~ (Podium Group 2 presentation)

Targeting Mitochondrial LONP1 to Induce Immunogenic Cell Death in Melanoma

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Research Category: Basic and Translational Sciences

Study Purpose: Mitochondria are essential organelles for cell survival and energy expenditure. Because of these pivotal roles, mitochondria have protective mechanisms against stress, including Endoplasmic Reticulum (ER) stress. LONP1 is an ATP-dependent protease that promotes carcinogenesis by regulating mitochondrial homeostasis and metabolism. However, its role under ER stress in cancer remains unclear. This study investigates the role of ER stress-driven LONP1 in carcinogenesis and tests if blocking LONP1 activity pharmacologically can induce immunogenic cell death (ICD) in melanoma cells.
Methods: TIMER 2.0 is a public database that was used to analyze correlations between LONP1, patient survival, and immune infiltration across cancer types. Western blot and RT-PCR detected LONP1 expression levels in B16 melanoma cells treated with the ER stressors, Thapsigargin and Tunicamycin. CDDO-ME, a synthetic terpenoid, was utilized to inhibit LONP1 activity. Flow cytometry analyzed surface markers like MHC I and Calreticulin (CALR), mitochondrial permeability, cell cycle, and micropinocytosis flux. A bioluminescence assay was performed to investigate extracellular ATP levels.
Results: TIMER 2.0 shows a negative correlation between LONP1 and CD8+ T-cell infiltration across different cancers. In metastatic cutaneous melanoma, LONP1 positively correlated with poor survival. In ER-stressed B16 melanoma, blocking LONP1 activity caused an arrest in sub-G1 phase of the cell cycle and promoted surface CALR exposure together with extracellular ATP release, hallmarks of ICD. Also, we found that LONP1 inhibition reversed the downregulation of surface MHC I induced by ER stress. Next, we wanted to explore the mechanism by which B16 cells undergo ICD. We found that blocking LONP1 activity in B16 cells undergoing ER stress triggered a halt of autophagic flux as shown by p62 accumulation and heightened LC3-II levels. This interruption was confirmed by a significant decrease in the exocytosis of dextran-FITC cargo.
Conclusion: These findings demonstrate LONP1 is pivotal for survival and immune evasion of B16 cells under ER stress and emphasize that inhibiting LONP1 imposes a vulnerability for tumor cells facing stress conditions. This highlights the clinical and therapeutic potential of targeting LONP1 as a novel approach for cancer treatment, particularly in tumors characterized by high levels of cellular stress.

Poster #B21

Contributions of Traumatic Brain Injury and Repetitive Head Impacts to Chronic Deficits in Recognition Memory in Military Veterans

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Research Category: Basic and Translational Sciences

Objective: The objective is to assess how traumatic brain injury (TBI) and repetitive head impacts (RHI) may relate to behavioral measures of recognition memory in Veterans. TBI and RHI are prevalent among military Veterans and increase the risk of chronic traumatic encephalopathy (CTE). Behavioral correlates of recognition memory (identifying previously encountered information) may reflect medial temporal lobe pathology in CTE. There are two components of recognition: recollection (detailed remembering) and familiarity (general sense of remembering). We hypothesized that while both would be impaired in veterans with head injury compared with controls, recollection would show greater impairments due to its sensitivity to hippocampal damage.

Methods: In pilot data, 13 older Veterans with exposure to both TBI and RHI, aged 52-89 years, were compared with 7 age-matched healthy Veterans without head injury. Participants underwent a word recognition memory task, providing confidence judgments to quantitatively measure recollection and familiarity. The Ohio State University TBI Identification Method was used to classify head trauma exposure. Questionnaires measuring aspects of mood, including the Neurobehavioral Symptom Inventory (NSI), Post-Traumatic Stress Disorder checklist (PCL), and Pittsburgh Sleep Quality Index (PSQI), were administered.

Results: A two-sample t-test revealed a trend towards lower recollection in Veterans with RHI and TBI (mean 0.32 ± 0.22) compared to controls (mean 0.50 ± 0.16) ($p=0.07$). However, there were no differences in familiarity (means 0.81 ± 0.43 and 0.66 ± 0.61, respectively). Participants with RHI and TBI had significantly higher measures of NSI ($p=0.049$) and PCL ($p=0.014$), and a trend towards higher PSQI measures ($p=0.058$).

Conclusions: These pilot data suggest that head injury exposure may be associated with impaired recollection and relatively-intact familiarity. Comparisons of mood found that head trauma may contribute to neurobehavioral dysregulation, post-traumatic stress, and sleep disturbances in older Veterans, consistent with prior literature.

Poster #B22

YTHDF2 Downregulation Drives Astrocytic KCTD20 Overexpression in Lupus-Induced Chronic Pain

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Research Category: Basic and Translational Sciences

Study Objective: Chronic pain affects up to 90% of patients with systemic lupus erythematosus (SLE), largely due to the limited efficacy and adverse side effects of available analgesics. The m6A RNA modification system is a key epigenetic mechanism that regulates protein expression by influencing mRNA degradation, translation, and alternative splicing. This study aims to investigate whether and how the m6A RNA system contributes to the development of chronic pain in SLE.
Methods: Female MRL/lpr mice were used as an SLE model, with MRL mice as controls. Behavioral assessments, Western blotting, immunohistochemistry, and RNA immunoprecipitation followed by next-generation sequencing (RIP-Seq) were employed to analyze molecular changes in the spinal dorsal horn.
Results: MRL/lpr mice exhibited hypersensitivity to heat and mechanical stimuli at 16 weeks. In the spinal dorsal horn of lupus mice, protein expression of the m6A methyltransferases METTL3 and METTL14, the demethylase FTO, and the m6A reader protein YTHDF2 were significantly reduced, while YTHDF1 expression remained unchanged. Despite these changes, global m6A RNA levels were similar between lupus and control mice. RIP-Seq analysis identified 2,882 transcripts bound to YTHDF2 in both groups, with 143 transcripts detected in control mice but absent in lupus mice. Among these, five genes—Arhgef2, Cse1l, Irak1bp1, KCTD20, and Stx16—were selected for further investigation based on functional annotations and predicted m6A modification sites. Western blotting revealed a striking increase in KCTD20 expression in lupus mice, with levels more than fivefold higher than in controls. Immunohistochemical analysis demonstrated that KCTD20 was exclusively expressed in astrocytes, with no detectable expression in neurons or microglia in the spinal dorsal horn.
Conclusions: These findings suggest that YTHDF2 downregulation contributes to lupus-induced chronic pain by enhancing KCTD20 expression in astrocytes, highlighting a potential molecular target for therapeutic intervention.

Poster #B23

Genetic Associations with Substance Use and Behavioral Disinhibition in a Twin Cohort

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Research Category: Basic and Translational Sciences

Objective: We investigate genetic associations with addiction phenotypes in a large twin cohort, utilizing genome-wide association analysis (GWAS) to identify predictive loci.

Methods: We analyzed data from the Minnesota Center for Twin and Family Research, comprising 7,188 offspring and parents, including monozygotic and dizygotic twins. Genotyping was performed using Illumina's Human660W-Quad Array (561,490 SNP markers). Data preprocessing included filtering SNPs with call rates <99%, minor allele frequency <1%, and deviation from Hardy-Weinberg equilibrium at p < 1e-7 using PLINK. GWAS were conducted using GEMMA unix package based on linear mixed model (LMM), which accounts for population stratification via a kinship matrix. Covariates included age, sex, birth year, and generation. Multiple linear regressions using R were performed to estimate SNP contributions while controlling for covariates.

Results: No SNPs reached genome-wide significance (p < 5x10^-8), but multiple loci met predictive significance (p < 5x10^-6) for nicotine use, alcohol consumption, alcohol dependence, illicit drug use, and behavioral disinhibition. Bonferroni-significant results included:
Behavioral disinhibition (11 SNPs): rs9309065_G, rs4470367_A (DYSF, linked to height, intelligence/ADHD/autism pleiotropy), rs1995888_G, rs7648557_A, rs1503603_G, rs2055613_A, rs282472_G, rs4871455_A, rs10979023_A, rs10857606_A, rs7940871_A (PRDM11, linked to thyroid-stimulating hormone levels)
Alcohol consumption (11 SNPs): rs10096148_G, rs2589232_A, rs8048568_A, rs6041762_A, rs321558_G, rs6432310_C, rs13103626_G, rs16901165_A, rs12517872_A, rs6898675_A, rs6461470_A
Nicotine (9 SNPs): rs856084_C, rs1279186_A, rs2313565_A, rs2059121_A, rs6458065_G, rs6923361_G, rs11139710_A, rs4149276_G, rs324325_A
Alcohol dependence (1 SNP): rs7940871_A (PRDM11, linked to thyroid-stimulating hormone levels)
Illicit drugs (8 SNPs): rs10488013_A, rs3944154_G, rs1867306_C, rs3790014_G, rs918402_C (LINC00290/NDUFB5P1, linked to schizophrenia, bipolar disorder, nicotine dependence, and depressive symptoms), rs11968408_A, rs1782627_G (PLG/MAP3K4-AS1, linked to lipid measurements and smoking initiation), rs540524_G (SPC25, linked to fasting glucose and drinks per week)

Conclusion: Our findings provide preliminary evidence of genetic influences on substance use and behavioral disinhibition. Further validation and replication are in progress to determine the external validity of these findings.

Poster #B24

Elucidating the mechanism of RELT-Induced Cell Death in Breast Cancer Cells

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Research Category: Basic and Translational Sciences

Objective: Receptor Expressed in Lymphoid Tissues (RELT) is a Tumor Necrosis Factor Receptor family member that is upregulated in breast cancer. Previous studies have shown that RELT activates the p38 MAPK pathway when phosphorylated by the OXSR1 kinase, and may activate cell death through an apoptotic pathway. We sought to study the mechanism of RELT-induced death, determine whether it can sensitize breast cancer cells to chemotherapeutic agents, and elucidate the cellular localization of RELT.

Methods: MDA-MB-231 (231) breast cancer cells and HEK 293 (293) cells were cultured and transfected with plasmids containing the RELT gene. RELT localization was determined by immunofluorescence. Apoptosis was measured by flow cytometry using either Annexin V and propidium iodide (AV/PI) or Caspase-3 and SyTox. Flow cytometry results were quantified via FlowJo software. X-Gal staining was used to confirm transfection efficiency.

Results: Flow cytometry showed higher rates of apoptosis in RELT-treated cells versus the control in both cell lines. Plasmids that disrupted RELT-OXSR1 binding did not reduce the amount of apoptosis induced by RELT. Apoptosis was increased when RELT was used in conjunction with the chemotherapy treatment Doxorubicin. Immunofluorescence of both endogenous and transfected RELT showed both nuclear and cytosolic staining, with higher amounts of nuclear staining observed for endogenous RELT.

Conclusion: We report novel findings that RELT induces cell death in breast cancer cells by an apoptotic pathway that is associated with both phosphatidylserine externalization and Caspase 3/7 cleavage. Furthermore, RELT induces death by a pathway that is independent of the OXSR1 kinase. Chemotherapy flow cytometry results indicate that it is unlikely that RELT sensitizes breast cancer cells to Paclitaxel or Doxorubicin. We report that RELT also translocates to the nucleus in breast cancer cells. Future experiments are needed to differentiate the function of RELT in the nucleus versus cytosol.

Poster #B25

Comparison of Protein Quantity and Composition Across Animal and Plant-Based Protein Isolates

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Research Category: Basic and Translational Sciences

Objective: Proteins, composed of amino acids, play a crucial role in muscle synthesis, metabolism, and immune function. Protein isolates, derived from animal and plant sources, vary in their amino acid compositions and are commonly used to supplement dietary protein intake. However, there has not been any comparative studies assessing the composition of the protein isolates from these different sources. This study aims to compare the amino acid profiles of different protein isolates, focusing on their relative composition.

Methods: We selected protein isolates from animal-derived (whey, casein, beef, egg white) and plant-based (soy, pea, rice, pumpkin seed, hemp seed) sources for comparison. Data of the average quantities of amino acids from at least four brands per protein type were extracted. The amino acid compositions were compared relative to each other and against whey protein.

Results: Egg-white, soy, and pea protein did not have any relative amino acid deficiencies while soy and pea protein had the highest levels of histidine. Dairy-based protein supplements were relatively deficient in arginine. Beef, rice, and hemp seed-based protein supplements were deficient for multiple amino acids. The leucine content was the highest in whey and pea protein sources.

Conclusion: Different sources of proteins offered different advantages and disadvantages. Overall, pea was the highest and most consistent source of amino acids and pea, soy, egg white, and pumpkin seed proteins were the only protein sources that were not relatively deficient in any amino acids when compared against other protein sources. Deficiencies in whey, casein, and beef sources of protein could be corrected by mixing with appropriate plant-based sources of protein.

Poster #B26

Reduction of Fibrotic Pathway Activation in Heart Failure through PLLGA Nanoparticle Intervention

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Research Category: Basic and Translational Sciences

Cardiomyopathy and heart failure are leading causes of morbidity and mortality worldwide, with cardiac fibrosis playing a critical role in the progression. Cardiac fibrosis exacerbates heart failure by stiffening the heart tissue and inhibiting its ability to pump blood effectively. Current treatment options for cardiac fibrosis are limited and often come with significant drawbacks. This study aims to evaluate the efficacy of PLLGA nanoparticles developed within the lab in mitigating fibrosis within the heart. Using mouse models, heart failure was induced through the administration of phenylepinephrine and angiotensin 2 for a period of 42 days. After the 42-day period, heart tissue samples from the mouse models that were both untreated and treated with PLLGA nanoparticles were snap frozen and used for western blotting.

The expression of proteins involved in the fibrotic pathway was analyzed via western blotting. Specifically, proteins were separated by gel electrophoresis and transferred onto nitrocellulose membranes. Detecting was done using antibodies against multiple proteins within the fibrosis pathway, such as SMAD, Phosphorylated SMAD, TGF-b, and Fibronectin. Imaging was performed using chemiluminescence detection methods, allowing for the quantification and comparison of protein expression levels between the treated and untreated mouse samples.

Results of western blotting demonstrate that treatment with the PLLGA nanoparticle reduced certain fibrotic protein expression in heart tissue. The western blot analysis revealed a decrease in the expression of key fibrotic markers, such as phosphorylated SMAD and Fibronectin, compared to untreated controls. Due to the data analysis, it was concluded that the PLLGA nanoparticles were able to reduce steps within the fibrotic pathway, leading to a reduction in the overall fibrotic response. These findings suggest that the nanoparticle has a protective effect against cardiac fibrosis and may represent a promising therapeutic strategy for heart failure.

Poster #B27

Genomic structural equation study reveals links between anorexia nervosa and delay discounting but not other facets of impulsivity

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Research Category: Basic and Translational Sciences

Objective: Anorexia nervosa (AN) is a heritable condition, characterized by a fear of weight gain and a distorted body image, for which treatments are only limited. AN is characterized by excessive control over feeding behaviors, which has been hypothesized to indicate that low impulsivity may place certain individuals at risk for AN; however, this has not been fully genetically evaluated.
Methods: We used genomic structural equation modeling and genome-wide association studies (GWAS) based on individuals of European ancestry to examine the latent genetic architecture between AN and several measures of impulsivity. Because AN is positively genetically associated with substance use disorders (SUDs), which are also strongly associated with impulsivity, we conditioned our analyses using GWAS data from four SUDs (alcohol, tobacco, cannabis, and opioid use disorders).
Results: AN was not significantly genetically correlated with impulsivity latent factors as indices of BIS or UPPSP subscales (Common Impulsivity, rg =-0.06; Urgency-Specific Impulsivity, rg =0.10), but was negatively genetically correlated with delay discounting (rg =-0.19), even after controlling for SUDs (rg =-0.20).
Conclusion: This work suggests that delay discounting could serve as an endophenotype for AN.

Poster #B28

Investigating how RELT impacts migration and gene expression in breast cancer cells

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Research Category: Basic and Translational Sciences

Objectives: Receptor Expressed in Lymphoid Tissues (RELT) is a Tumor Necrosis Factor Receptor (TNFR) superfamily member implicated in immune disorders and cancer. Previous studies have shown that RELT is upregulated in breast cancer (BC) and induces cell death. The aim of this study was to investigate how RELT impacts the migratory ability of MDA-MB-231 (231) triple-negative BC cells by overexpressing RELT or RELT mutants that are missing part of the intracellular domain. Additionally, the expression of cell-cycle related genes was examined in the context of RELT knockdown.

Methods: 231 cells were first transfected with RELT siRNA, and the expression of cell cycle related genes, including p53, c-Jun, cyclin D and others were examined by qPCR. To investigate the role of RELT in cell migration, 231 cells were transfected with plasmids containing either an empty vector, RELT, or two different RELT mutants that are missing part of the carboxy-terminus, and an invasion assay was performed.

Results: Using two different siRNA clones, RELT knockdown showed variable expression changes in cell-cycle related genes that have been implicated in cancer progression, including decreased expression of cyclin D, heat shock factor 1 (HSF1) and Matrix metalloproteinase 1 (MMP1). Overexpression of full-length RELT or RELT mutant DNA inhibited the migration of BC cells in an invasion assay.

Conclusions: The qPCR results suggest that RELT may play a role in gene expression of cell-cycle related genes, but more work is needed to understand the differential results between the two types of siRNA utilized. Our results also suggest that RELT may inhibit BC migration, as overexpression of RELT inhibited cell migration in an invasion assay. Two RELT mutants missing significant sections of their intracellular domains also inhibited cell migration, suggesting that regions proximal to the cytosolic carboxy terminus are not required to inhibit BC invasion.

POSTER PRESENTATIONS

ABSTRACTS

(Educational and Quality Improvement Research)

SESSION B

COLLEGE OF DENTAL MEDICINE

Poster #B29

Category	Educational and Quality Improvement Research
Affiliation	College of Dental Medicine
Submitter	Aban Yaqub
Authors	Yaqub, Aban ; Varimezova, Tanya;
Title	Predoctoral Student Perception of Effectiveness of Objective Structured Clinical Examination in Dental Implant Education
Abstract	Title: Predoctoral Student Perception of Effectiveness of Objective Structured Clinical Examination in Dental Implant Education Objective: Objective structured clinical examinations (OSCE) assess critical thinking of dental students in their progression of higher-level learning. Applying foundational knowledge to clinical scenarios suggests a deeper understanding of the material. The goal of this qualitative study is to identify student perception of the OSCE as an effective tool in assessing preparedness for clinical application of foundational dental knowledge, specifically implants. Responses would drive improvement of future examination designs. Methods: An anonymous questionnaire was administered electronically via SurveyMonkey to a class of 37 students who had recently taken the Implant OSCE as part of the curriculum at CNU CDM. Preliminary analysis was centered around the following three themes: OSCE preparation, OSCE organization/test-taking experience, and OSCE translating to clinical preparedness. Results: There was 29.7% participation of the survey in its entirety. 90.9% of the respondents believed the course topics were reflected in the exam. More varied responses were given in terms of the test-taking experience, with 63.6% seeing the OSCE as comparable in stress level to other examinations. Interestingly, 27.2% of respondents agreed that OSCE-style exams are a better predictor of clinical preparedness than multiple-choice examinations, with approximately 45.5% respondents recommending OSCEs over multiple-choice examinations. Conclusion(s): OSCEs hold a favorable place in dental education amongst students and may require some adaptation for students to feel the exam is useful to their learning. Students reported a positive experience with respect to the organization of the OSCE and overall exam-taking experience. This survey will be administered to future classes taking the exam in hopes that more robust participation will facilitate deeper evaluation of the exam and fine-tune the OSCE instrument to help bridge implant didactic knowledge to clinical application. Other courses may adapt this survey for curriculum enhancement.

Poster #B30

Category	Educational and Quality Improvement Research
Affiliation	College of Dental Medicine
Submitter	Nisha Manila
Authors	Nisha Manila; Sahel Farhangi; Pinelopi Xenoudi; Joel Whiteman; Marie Miranda; Gwen Essex
Title	Integrating Artificial Intelligence in Dental Education-A Framework for Curriculum Development
Abstract	Objective Our objective is to integrate Artificial Intelligence into D3-D4 dental curriculum at California Northstate University College of Dental Medicine. We are proposing an educational framework called "Artificial Intelligence in Dentistry" with core AI competencies required to effectively use AI-driven tools in dental practice. Methodology 1. Literature review: We analyzed the existing literature on the use of AI in dental education, and additional educational framework in medical disciplines. In this review we also tried to identify the current gaps in dental education that could be addressed by AI integration. 2. Expert consultation: We consulted with expert dental educators, AI specialists and Industry experts to gather insights into relevant AI skills for dental students. 3. Framework development: With the above information we designed a 15-week curriculum that included core courses, hands-on training, and thesis presentation. We also ensured that the proposed curriculum aligns with dental school accreditation standards. 4. Proposal Validation: We presented this framework to a panel of dental educators and AI experts for feedback. This proposal was unanimously approved. Results We identified major AI skills/knowledge required for dental students and designed a15-week curriculum including lectures and hands-on training sessions followed by final thesis submission and presentation. We predict the integration of this new curriculum will equip dental school graduates with an in-depth knowledge of AI that may lead to adoption of this technology confidently in clinical settings. Conclusion Integration of AI into dental curriculum offers significant potential to enhance dental education. This preliminary research highlights the need for a structured framework that prepares future dental professionals with necessary AI skills. Further research will be required to validate the proposed framework.

Poster #B31

Category	Educational and Quality Improvement Research
Affiliation	College of Dental Medicine
Submitter	Cat-Quynh Nguyen
Authors	Cat-Quynh Nguyen; Shadi Javadi; Shymaa Bilasy
Title	Developing a Hybrid Module to Enhance Dental Student Learning in California Northstate University
Abstract	Objective(s): In this study, we explored the impact of a variety of pedagogical strategies to enhance dental students' engagement in the following didactic courses: pharmacology, biomedical and clinical sciences, dental anatomy, foundations of medical sciences, growth and development, and introduction to orthodontics. We expected that additional teaching strategies such as clinical cases, facilitator-guided sessions, student-led activities (namely Kahoot questions and mini presentations), and videos (such as Osmosis) would yield a more interactive learning experience and improve students' satisfaction. Moreover, adding hands-on experiences and models could result in a better understanding of the didactic lectures. Many studies have emphasized the importance of active learning strategies in the health professional education. Methods: The protocol for this study was reviewed and approved by the California Northstate University Institutional Review Board. The survey was provided to student cohorts in their first and second year of dental school. It included prewritten statements specific to each course in which students could choose to agree, disagree, or neutral options with regards to resources and class activities. We examined the impact of different pedagogical strategies on students' satisfaction via questionnaires to identify the optimal student learning experience and engagement method. Results: This study showcased the positive impact of additional educational modalities on students' satisfaction levels regarding their educational experience. Conclusions: Overall, the teaching methods utilized have the potential to transform didactic courses into more interactive and interesting learning experiences for students. In addition, they will assist with students' transformation into more independent and active learners. Moreover, reinforcing didactic knowledge with hands-on experiences could prepare students better as future clinicians.

COLLEGE OF PHARMACY

Poster #B32

Title: Assessing ChatGPT's Response accuracy in Pharmacy Education: Insights into Cognitive Complexity

Authors: Tuan Tran, Ph.D., Victor Phan, PharmD, Uyen Le, Ph.D.

Affiliation: CNUCOP

Category: Educational and Quality Improvement Research

Objective : To evaluate the accuracy of ChatGPT's responses in pharmacy education using standardized exam questions.

Methods: One hundred twenty exam questions based on the NAPLEX study guide covering biostatistics, calculation, and therapeutics (40 questions per subject) were administered. The questions were evenly distributed in four main levels of Bloom's Taxonomy including Recall, Understand, Apply, and Analyze. The responses from ChatGPT-3.5 were classified into three categories: correct (similar to the provided answers), incorrect (different from the provided answers), or partially correct (partially matched with the provided answers).

Results: The result showed that ChatGPT's responses were 65% (n = 78) correct, 29.17% (n = 35) incorrect, and 5.83% (n = 7) partially correct. Particularly, biostatistics has 70% (n = 28) accuracy, calculation 65% (n = 26), and therapeutics the lowest at 60% (n = 24). Accuracy varied across Bloom's Taxonomy, from 76.67% (n = 23) in Recall and 73.33% (n = 22) in Understand to 60% (n = 18) in Apply and 50% (n = 15) in Analyze. This indicates a trend where accuracy dipped with increasing question complexity. Similarly, within the correct responses, the accuracy declined from basic questions in Recall (29.49%, n = 23) to higher-order cognitive tasks in Analyze (19.23%, n = 15). The data suggests that while ChatGPT is reliable for simpler questions, its accuracy decreases with more complex analytical cases.

Conclusions: The study reveals ChatGPT as a potential tool in pharmacy education, demonstrating a 65% accuracy rate across a variety of exam questions. However, its accuracy declines as the complexity of questions increases with the level in Bloom's Taxonomy. Our future study will expand the framework into the entire pharmacy program curriculum.

Poster #B33

Title: Impact of transitioning to a block mode of teaching on student outcomes and instructors in courses which use Team-Based Learning pedagogy

Authors: Shahanara Ahsan; Welly Mente; Sonya Frausto; Ruth Vinall

Affiliations: CNUCOP

Category: Educational and Quality Improvement Research

Objectives: The primary objective of this study was to determine how transition to a block mode of teaching (BMT) has impacted student performance and satisfaction in courses taught using Team-Based Learning (TBL) pedagogy. A secondary goal was to identify perceived benefits and challenges to course instructors.

Methods: Data from 4 TBL courses was extracted from Canvas to allow for comparison of student performance before vs after the implementation of BMT. Course grade data included individual readiness assessment test (iRAT), team readiness assessment test (tRAT), team-based assurance test (tBAT), and final course grade data. T-tests were used to compare performance data. Course instructors were asked to complete an anonymous open-ended survey and thematic analyses of survey data were performed.

Results: Statistically significant increases in average scores for were observed following implementation of BMT: iRAT scores increased for 3 of the 4 courses, tRAT scores increased for 1 of the 4 courses, tBAT scores increased for 2 of the 4 courses, and overall course grades increased for 3 of the 4 courses. Statistically significant decreases in iRATs, tRATs, tBATs, or overall course grades were not observed for any of the 4 courses. Six out of 7 TBL course instructors completed the survey (86%). Benefits of BMT that were identified included: condensed teaching timeframe and increased student focus. Challenges included: long class times, lack of student knowledge retention, instructors and students can feel overwhelmed.

Conclusions: The data from this study indicate that implementation of BMT had a positive impact on student performance in TBL courses. They survey data can be used to help further improve instructor and student experiences.

COLLEGE OF MEDICINE

Poster #B34

Efficacy of In-house Vs. Third Party Resources on Medical Student NBME Style Exam

Authors: Hunter Hudgins MPS; Emma Hutchison ; Sarah Swerdlow ; Hannah Wolfson ; Lyndsey Hightower ; John Cusick, PhD ; Valerie Gerriets PhD

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Research Category: Educational and Quality Improvement Research

Abstract
Background: Lecture attendance in medical schools has declined over the past decade due to the increasing use of third-party study resources. While these external materials were initially intended to supplement lectures, many students now rely on them exclusively. This study examines whether students who primarily use third-party resources perform differently on National Board of Medical Examiners (NBME) system block exams compared to those who rely on traditional in-house lecture materials.
Methods: A survey was conducted among first- and second-year medical students at California Northstate University College of Medicine (classes of 2026, 2027 and 2028). Respondents reported their primary study method—either in-house lectures or third-party resources—for NBME system block exams across seven subject blocks. Grades were numerically coded (Honors (100-90% correct) = 3, High Pass (89-80%) = 2, Pass (79-70) = 1, Fail (69 and below) = 0) and averaged across blocks. Students who used both sources equally were grouped with lecture users. A Mann-Whitney U test was performed to compare average scores between groups.
Results: The in-house lecture group (n=28) had a significantly higher average grade (2.40) compared to the third-party group (n=81, average = 2.20) ($p<0.001$).
Conclusion: Students who primarily rely on in-house lectures may achieve higher NBME exam scores than those who depend on third-party resources. However, several confounders may influence these results, including the possibility that professors select NBME-style exam questions based on lecture content, the larger sample size of third-party users, and unknown differences in individual study time. Further research is needed to account for these factors and better understand their impact on student performance.

Poster #B35

WIMS Burnout Survey: The Impact of COVID-19 on Women Physicians

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Research Category: Educational and Quality Improvement Research

Objective: The COVID-19 pandemic has profoundly impacted the healthcare system, exacerbating pre-existing challenges for women physicians2-4. The pandemic resulted in higher expectations for productivity for physicians due to an overwhelming increase in patient burden and insufficient staffing. This has led to increased rates of burnout among physicians1. In this survey study, we examine how the COVID-19 pandemic has uniquely affected women physicians in their experience of burnout.

Methods: An anonymous RedCap survey was first sent to attendees of the Women in Medicine Summit 2023 (WIMS). Afterwards, the survey was secondarily sent to WIMS social media followers. The survey elicited respondents' perspectives and experiences regarding COVID-19 and professional burnout. Information regarding demographics, perceived career progress, and clinical workload was collected.

Results: Out of 148 respondents, 139 identified as women with an average age between 35-44. Of these 139 respondents, 101 were physicians (50% academic, 27% hospitalists, 12% private practice, 2% non-clinical, and 9% other). 76% of women physicians perceived an increased clinical load since the start of the pandemic. 70% of women physicians expressed a desire to leave clinical medicine, yet 26% reported making a career change since the start of the pandemic. More than half (64%) reported that they often or always feel more emotionally drained or exhausted as a result of healthcare responsibilities. Women physicians who experienced an increased workload had a stronger desire to leave clinical medicine ($p=0.0416$).

Conclusion: Burnout for women in medicine has been exacerbated since the pandemic due to greater workload, productivity demands, and personal responsibilities. Our study found that more women are considering leaving clinical medicine since the pandemic. However, many have yet to take action by changing careers away from clinical medicine. This is a crucial time for employers to create programs to promote women physician retention.

Poster #B36

Determining the Effectiveness of Music in the Teaching, Learning, and Wellness of Medical Students

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Research Category: Educational and Quality Improvement Research

Study objectives: Music and medicine are two disciplines that often do not intersect. However, music's integration into the medical curriculum has demonstrated potential as an effective teaching and studying method. Aside from academic applications, music can contribute to students' wellness. Study Objective: This study aims to determine medical students' perspectives on the benefits of music integration into the curriculum and engaging in extracurricular musical activities.

Methods: Surveys were used to assess students' perspectives with questions using a Likert scale out of 7. To assess music as a teaching and learning tool, a song parody with lyrics related to an immunology lecture's topic was introduced to the students, and a survey was completed by students after attending the lecture. To assess music's role in students' wellness, the members of Music Meets Medicine (MMM), a medical student-led organization, were surveyed. MMM hosts events, such as performing at senior centers and karaoke nights, that allow students to connect with the community and each other through music.

Results: The song parody's survey results showed most students believed parodies could be a useful mnemonic device (average Likert score of 5.28, n=25) and were receptive to using the parody as a study tool (average Likert score of 3.96, n=25). Participants showed great interest in seeing song parodies as a part of future lectures (average Likert score of 6, n=25). For the MMM surveys, most members experienced stress relief (average Likert score of 5.53, n=19) and found meaning and fulfillment while performing for the community (average Likert score of 5.71, n=14). The survey results indicated great interest in having more music-related activities made available to students.

Conclusion: Music is part of many students' lives, and its ability to serve as a learning tool and stress reliever can be a valuable resource for students during their medical education.

Poster #B37

Evaluating student satisfaction of Hotspot audience response system technology in lectures

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Research Category: Educational and Quality Improvement Research

Objective Hotspot questions using PointSolutions technology is an interactive tool that permits students to use their personal electronic devices to select a specific point on an image to answer questions during live lectures. This enables faculty to supplement standard multiple-choice type questions with questions that require students to comprehend complex images related to pertinent lecture material. Individual student performance on Hotspot questions is tabulated in a friendly competition to perk student interest, as no extra points are awarded to the winning students. This form of active learning can foster a deeper student understanding of complex concepts, especially pathways and structures associated with the basic sciences. We hypothesized that Hotspot technology would benefit medical students and would be well-received in their education.

Methods First-year medical students at California Northstate University College of Medicine attended lectures incorporating Hotspot PointSolutions. A seven-point Likert scale survey assessed student perceptions and was administered electronically via SurveyMonkey immediately after a pharmacology lecture. Responses were recorded anonymously in this IRB-approved study.

Results Students reported that Hotspot technology made it easier to pay attention during lectures (average Likert score of 5.91 out of 7, n=44). They also felt that the interactive format challenged them and reinforced their knowledge better than standard multiple-choice questions (average Likert score of 5.71 out of 7, n=40). Additionally, 35% of students felt better prepared for summative exams after using Hotspot questions (average Likert score of 5.08 out of 7, n=23).

Conclusion Students preferred Hotspot questions over traditional multiple-choice questions, believing they better prepared them for exams. This study supports the use of active learning in medical education to engage students, deepen comprehension, and potentially improve lecture attendance. We hope that our investigation will inspire other educators to consider the use of unique, active-learning style teaching approaches to reach today's future physicians.

Poster #B38

Effectiveness of Video Learning Materials on Medical Students' Preparedness in the Hip, Ankle, and Foot Physical Exam

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Research Category: Educational and Quality Improvement Research

Objective:
Objective Structured Clinical Examinations (OSCE) is a common tool used in medical schools to teach physical examinations and to assess the clinical competence of students. This study aims to determine the most effective teaching method for the hip, ankle, and foot (HAF) physical examination. It is hypothesized that video learning materials with clinical correlations will significantly increase students' ability to learn and perform this exam.

Methods:
First-year medical students at California Northstate University College of Medicine were recruited to participate in this study. Students who consented were equally randomized into the intervention and control group. Two weeks before the HAF Medical skills workshop, the intervention group received an educational video demonstrating the HAF physical examination, special tests, relevant anatomy, and clinical correlates. A Likert scale survey gauged student perceptions of the intervention video and knowledge of the examination via anonymous Microsoft Forms responses. Comparisons were analyzed using standard student t-test on GraphPad Prism v10.4.1.

Results:
Sixty medical students consented to participate in the study. Twenty-five students completed the post-workshop survey with one being excluded due to incorrectly answering an attention check question. Data collection displayed that the intervention group had increased confidence in the relevant anatomy explanations ($P=0.0054$), relevant special tests ($P=0.0014$), and pathology of relevant special tests ($P=0.0167$). No statistical significance was seen in the confidence in performing the physical exam, anatomical basis of the exam, interpretations of special tests, and use of physical exam findings ($P> 0.05$).

Conclusion:
Findings from this study suggest that intervention videos with detailed demonstrations of the physical exams can increase confidence in medical students as they begin learning exams. There was statistical significance in the improvement of understanding for anatomy, performing special tests and interpretation of the associated pathology of the HAF exam.

Poster #B39

Analyzing Match Trends in Residency Applicants for Pathology

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Research Category: Educational and Quality Improvement Research

Objectives:
This study aims to investigate how residency requirements have changed within the Pathology match and evaluate factors that permit a successful match for a Pathology residency applicant.

Methods:
A retrospective analysis was performed on NRMP residency match data for Pathology spanning 2013-2022. Average Step 1 and 2 scores from 2021–2022 were excluded. Several variables potentially influencing residency match outcomes were determined - number of programs, positions offered, unfilled programs, applicants, successful matches, average step 1 and step 2 score of matched applicants or the percentage passing on first attempt, average number of research citations, research experiences, volunteer experiences among matched applicants, percentage of women matched, percent of underrepresented minorities, and LGBTQIA+ applicants matched. Information was graphed using line charts, and correlation coefficients were calculated to assess trends over time. A p-value was determined for each graph.

Results:
From 2013-2022, pathology residency applicants have seen an increase in citations from 6.3 to 8.4 (predictor p-value<0.001, $R^2=0.7829$), research experiences from 2.3 to 2.6 (predictor p-value<0.01, $R^2=0.7529$), and volunteering experiences from 4.0 to 4.8 (predictor p-value<0.001, $R^2=0.7894$). However, academic requirements for a successful match have declined, as Step 1 scores have decreased from 229.8 to 227.1 (predictor p-value<0.001, $R^2=0.8643$) and Step 2 scores have decreased from 236.8 to 234.4 from 2013-2020 (predictor p-value<0.001, $R^2=0.7035$).

Conclusions:
There appears to be an emphasis on soft skill requirements such as volunteering and research with the most significant increase being research experiences. Conversely, there appears to be less of an emphasis on objective medical knowledge with the most dramatic decline on average Step 2 scores.

Poster #B40

Exploring Animation as Novel Teaching Modality for Immunology

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Research Category: Educational and Quality Improvement Research

Objective
Cells at Work and Invasion of the Body Snatchers were used as teaching aids to evaluate the efficacy of alternative teaching tools alongside traditional didactic methods in immunology. By creating visual and story-driven analogies, we aim to determine if media increases the retention and accessibility of abstract knowledge.

Methods:
In the "Cells at Work" study, students from California Northstate University College of Medicine (CNUCOM) were divided into two groups. Group A completed an immunology quiz before and after watching selected episodes, while Group B completed the same quiz after watching. Subjects also completed a subjective survey.

In the "Invasion of the Body Snatchers" study, CNUCOM students from the Classes of 2027 ('27) and 2028 ('28) watched the film and received a lecture with immunology concepts analogized to movie characters. They received two subjective Likert scale surveys following the lecture and the midterm.

Results:
In the "Cells at Work" research study, Group A (n=37) scored on average 65% at baseline, with significant improvement after watching the anime, averaging 77%, (p-value=0.00015). Group B (n=30) scored an average of 75%, higher than Group A pre-video scores (p-value=0.0014). In post-exam surveys, 96% agreed the animation was helpful for introducing immunology while 81% found it helpful for review.

The "Invasion of the Body Snatchers" study had 57 pre-exam submissions ('27=27, '28=30) and 46 post-exam submissions ('27=19, '28=29). 79% expressed increased engagement and 75% reported that the analogy was effective for introducing immunology. 72% supported the faculty adopting this modality with a collective 40% increase in students' confidence.

Conclusions:
The significant improvement in quiz scores, positive reception, and increase in student confidence with educational media supplements showcases an improvement in understanding of immunology and information retention. These results suggest that implementing media aids enhances comprehension and confidence in medical education.

Poster #B41

Exploring Popular Media as Novel Teaching Modalities for Immunology

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Affiliations: California Northstate University College of Medicine

Research Category: Educational and Quality Improvement Research

Objective
Cells at Work and Invasion of the Body Snatchers were used as teaching aids to evaluate the efficacy of alternative teaching tools alongside traditional didactic methods in immunology. By creating visual and story-driven analogies, we aim to determine if media increases the retention and accessibility of abstract knowledge.

Methods:
In the "Cells at Work" study, students from California Northstate University College of Medicine (CNUCOM) were divided into two groups. Group A completed an immunology quiz before and after watching selected episodes, while Group B completed the same quiz after watching. Subjects also completed a subjective survey.

In the "Invasion of the Body Snatchers" study, CNUCOM students from the graduating classes of 2027 ('27) and 2028 ('28) watched the film and received a lecture with immunology concepts analogized to movie characters. They received two subjective seven-point Likert scale surveys following the lecture and the midterm.

Results:
In the "Cells at Work" research study, Group A (n=37) scored on average 65% at baseline, with significant improvement after watching the anime, averaging 77%, (p-value=0.00015). Group B (n=30) scored an average of 75%, which was significantly higher than Group A pre-video scores (p-value=0.0014). In post-exam surveys, 96% agreed the animation was helpful for introducing immunology while 81% found it helpful for review.

The "Invasion of the Body Snatchers" study had 57 pre-exam submissions ('27=27, '28=30) and 46 post-exam submissions ('27=19, '28=29). 79% expressed increased engagement and 75% reported that the analogy was effective for introducing immunology. 72% supported faculty adopting this modality with a collective 40% increase in students' confidence.

Conclusions:
The significant improvement in quiz scores, positive reception, and increase in student confidence with educational media supplements showcases an improvement in understanding of immunology and information retention. These results suggest that implementing media aids enhances comprehension and confidence in medical education.

Poster #B42

Predicting The General Surgery Residency Interview: A Texas STAR Data Study

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Research Category: Educational and Quality Improvement Research

Study Objective:
This study aimed to identify factors influencing the number of interviews received by applicants in General Surgery residency programs using a Weighted Least Squares (WLS) regression model. The analysis utilized predictors derived from Texas STAR data spanning 2018–2024.

Methods:
The study analyzed data from 2,015 applicants and included eight predictors: number of applications, Step 2 Clinical Knowledge (Step 2) scores, research years, research items, publications, volunteer experiences, leadership positions, and clerkship honors. A WLS regression model was employed to address heteroscedasticity and enhance predictive accuracy. Model performance was compared to an Ordinary Least Squares (OLS) regression model.

Results:
The WLS model demonstrated superior fit (Adjusted $R^2 = 0.348$; F-statistic = 135.2, $p < 0.001$) compared to the OLS model (Adjusted $R^2 = 0.272$). Significant predictors of interview outcomes included Step 2 scores ($\beta = 0.279$, $p < 0.001$), number of applications ($\beta = 0.092$, $p < 0.001$), and clerkship honors ($\beta = 0.443$, $p < 0.001$). Leadership positions had a modest positive effect ($\beta = 0.129$, $p < 0.05$). Non-significant predictors included research years, research items, publications, and volunteer experiences.

Conclusions:
Step 2 scores, clerkship honors, and the number of applications were the strongest predictors of interview outcomes in General Surgery residency applications. Leadership positions also contributed positively but to a lesser extent. The WLS regression model provided a better fit than the OLS model, highlighting its utility in analyzing heteroscedastic data. These findings emphasize the importance of academic performance and strategic application planning for maximizing interview opportunities.

Poster #B43

Alignments and Differences Between Standardized Patients' and Preceptors' Observations of Medical Students in OSCEs: Impacts on Feedback

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Research Category: Educational and Quality Improvement Research

Introduction: The Objective Structured Clinical Examination (OSCE) is an essential learning tool that provides medical students with an interactive approach to clinical skills education. Although OSCE sessions generally follow a standard protocol, there are variations in how they are conducted and how feedback is provided to medical students by preceptors and standardized patients (SP). This study aims to explore alignments or differences between the traits SPs and preceptors focus on when evaluating medical students in OSCE and whether this impacts the way feedback is provided.
Methods: Purposive sampling was used to recruit California Northstate University College of Medicine preceptors and SPs to participate in individual semi-structured interviews. The interviews will be recorded and transcribed. The transcript will serve as the basis for analysis and thematizing participant responses using Grounded Theory. Descriptive statistics, including frequencies and central tendency estimates, will be used to summarize demographic data.
Results: Nine SPs (five paid professional and five student volunteers) and five preceptors participated. Preliminary analysis revealed group alignment regarding the importance of empathy, curiosity, and responsiveness. Preceptors emphasized structure and professionalism, while SPs focused on sensitivity and curiosity. Both groups withheld feedback on behaviors they viewed as innate or likely to improve. Preceptors focused on diagnostic algorithm feedback while SPs centered on their emotions and student sincerity.
Conclusion: Preceptors and SPs value empathetic engagement, illustrated through contextual listening, professionalism, and emotional responsiveness. Both groups are likely to omit subtle behaviors that may improve naturally over time in OSCE training. These unrecorded behaviors may still affect the interaction. Further demographic, thematic, and frequency data is expected to elucidate more comprehensive findings.

Poster #B44

Analyzing Match Trends in Residency Applicants for Orthopedic Surgery

Authors: Sophie Sankar; Samuel Salib; Layla Ali; Hannah Wolfson; Angela Mihalic; Michael S. Wong, MD, MBA, FACS

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Affiliations: CNUCOM

Research Category: Educational and Quality Improvement Research

Background: This study investigates how various metrics required to match into Orthopedic Surgery have changed, particularly after Step 1 has changed to pass/fail.

Methods: A review of NRMP residency match data (2013-2024) and applicant data from the Texas STAR database (2023–2024) was performed. Metrics including Step scores, research, leadership and volunteer experiences, were evaluated. ANOVA and T-tests were used to determine statistically significant predictors of match success; trends were plotted with correlation coefficients and p-values.

Results: During 2013-2021, NRMP data shows an increase in volunteering (6.5 to 8.75, predictor p-value<0.01, $R^2=0.662$), research experiences (3 to 5.25, predictor p-value<0.001, $R^2=0.8216$), and Step 2 scores (248.7 to 253.5, predictor p-value<0.0001, $R^2=0.9413$; 2013-2020) among matched applicants.

According to Texas STAR(2023-2024), the number of received interviews decreased (12.78±6.60 to 11.35±5.71, $p<0.05$) along with applications (63.72±44.51 to 47.92±28.54, $p<0.01$), average volunteer (7.87±3.26 to 4.25±2.44, $p<0.01$) and leadership experiences (4.98±2.91 to 3.69±2.20, $p<0.01$), coinciding with ERAS application limiting experiences declared. Clerkship honors rose among those matching in Orthopedic surgery from 3.95±2.59 to 4.73±2.16 ($p<0.01$). Step 2 scores were similar 257.42±9.95 to 258.18±9.63 although an increase compared to 2020(253.5). The strongest significant positive predictor for an interview was clerkship honors (estimate=0.66, $p<0.001$) followed by step 2 scores (estimate=0.238439, $p<0.001$).

Conclusion: Overall, the number of clerkship honors, Step 2 scores, research experiences, and volunteering have increased between 2013-2021. Not unexpected, the loss of Step 1 scores has led to increased importance of Step 2 scores as the only remaining standardized national objective metric, contributing to the rigor of matching into Orthopedic Surgery. While volunteer and leadership experiences have decreased between 2023-2024, no conclusions can be made regarding their importance due to changes to ERAS. Curricular factors such as Step 2 scores and clerkship honors have remained equally if not more important in distinguishing orthopedic resident applicants.

Poster #B45

Healthcare as a Privilege or a Right – A Study on Medical Students' Perspectives

Authors: Tianyu (Cindy) Luo, BS1; Emily H. Tran, BS1; Valerie Gerriets, PhD1; Peter Katz, PhD2; John Cusick, PhD1

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2California Northstate University College of Health Sciences

Research Category: Educational and Quality Improvement Research

Objectives
The topic of healthcare as a privilege or a right is becoming increasingly relevant as various social determinants influence the care patients receive. This study is designed to examine whether class presentations about biases and barriers to healthcare change medical students' perceptions of patient access to healthcare.

Methods
A Likert scale survey was administered electronically via SurveyMonkey before CNUCOM first-year students received a whole-class presentation (Timepoint 1=T1) to assess their baseline perceptions of healthcare. After the lecture, the students broke into small group discussions centered around selected case studies. Students were assessed again after the seminars (Timepoint 2=T2) using the same survey questions along with additional open-ended responses.

Results
52 and 40 students participated in the study at the 2 timepoints, respectively. Two-tailed unpaired t-test analysis revealed that 4 out of 15 survey questions showed statistically significant differences in changes in student attitudes between T1 and T2. Students who believed that a patient's ability to pay should influence the quality of care showed the largest increase in Likert-scale averages, rising by 0.81 points ($p = 0.005$). Additionally, 29.73% more students agreed that unemployed patients or those working sparingly deserve the same scheduling preferences as full-time workers ($p = 0.007$). Notably, 100% of the participants at T2 agreed that everyone deserves equal access to healthcare, regardless of past history of alcohol use disorder or engagement in risky behavior.

Conclusion
The integration of ethical discussions on biases and barriers in healthcare into medical education significantly influences students' perceptions of healthcare as a privilege versus a right. Our research demonstrates the benefits of incorporating such learning opportunities into the curriculum, enabling students to thoughtfully engage and explore the complexities of this public health issue.

POSTER PRESENTATIONS

ABSTRACTS

(Health Informatics and Literature Reviews)

SESSION B

COLLEGE OF PSYCHOLOGY

Poster #B46

Accessibility and feasibility of Parent-Child Interaction Therapy in marginalized families

Allison Livesey; Sarah Bornstein; Micheal Gentry
Affiliation(s): CNUPSY
Category: Health Informatics and Literature Reviews

Objective: Parent-child interaction therapy (PCIT) is an evidence-based treatment for children, ages two to seven, and their parent(s) to aid in the parent-child relationship and children's externalizing behavior. PCIT focuses on establishing affective warmth within the dyad and provides skills to parents to assist in de-escalating behaviors. PCIT has demonstrated success in addressing aggression, defiance, and anxiety (Ahou Vaziri et al., 2024). However, its impact and accessibility in systematically disadvantaged communities need to be examined further (Jent et al., 2023; Yeh et al., 2022). Methods: This literature review synthesizes research on the accessibility, cultural relevance, and efficacy of PCIT in marginalized communities through an extensive review of existing scholarly articles that were published in the last seven years and included predominately diverse populations. Results: The findings suggest that PCIT shows promising results in reducing externalizing behavioral problems; however, challenges remain as cultural adaptations are sparse, and resource accessibility such as transportation, childcare, and engagement barriers must be addressed to ensure broader success in such populations. Conclusion: By identifying gaps and recommending strategies for enhancing accessibility and reducing barriers, this review contributes to the discourse on equitable mental health care and family dyad interventions.

COLLEGE OF DENTAL MEDICINE

Poster #B47

Category	Health Informatics and Literature Reviews
Affiliation	College of Dental Medicine
Submitter	Kaleelah Muhammad
Authors	Kaleelah Muhammad; Jennifer Torres Diaz; Karisa Yamamoto
Title	Integration of a Cultural Competency Curriculum in Predoctoral Dental Education
Abstract	Objectives A standardized cultural competency curriculum in U.S. predoctoral dental programs does not exist, despite the Commission on Dental Accreditation (CODA) requirement for graduates to effectively manage diverse patient populations. This narrative review explores strategies for implementing a cultural competency curriculum, emphasizing best practices, challenges, and assessment methods from existing programs. Methods The studies included in this review examined curricula, interventions, and tools designed to build a cultural competency curriculum. Articles that discussed academic and assessment strategies for cultural competency were included, while those that discussed unrelated topics or non-measurable outcomes were excluded. The selected articles included literature reviews, a systematic review, cross-sectional studies, case studies, and a pre-post outcome study. Key terms used in the database search included “dental education,” “cultural competence,” “health disparities,” and “tools for assessment.” Results Best practices identified included integrating cultural competency into behavioral sciences, ethical practice, and clinical rotations, using interactive methods such as case studies, small group discussions, and faculty training programs. Challenges included an over-reliance on case-based teaching, limited student engagement with web-based modules, and the introduction of cultural competency too late in the curriculum to have a significant impact. Success was measured through practical assessments, reflective journaling, and participation in community service activities that enhanced cultural awareness, empathy, and communication skills. Conclusions Cultural competency remains essential in dental education for preparing students to manage diverse populations. Faculty and student buy-in, as well as open-mindedness, are critical for the effective implementation of cultural competence. Findings demonstrate that cultural competency is challenging to both measure and attain. Rather, institutions should focus on teaching and upholding a balance of cultural competency and cultural humility, with an emphasis on lifelong learning.

Poster #B48

Category	Health Informatics and Literature Reviews
Affiliation	College of Dental Medicine
Submitter	Nisha Manila
Authors	Manila N; Ignacio Olmeda
Title	Efficacy of Automatic Segmentation Techniques for Anatomic Landmarks in Dental Imaging: A Systematic Review and Meta-analysis
Abstract	Objective: The goal of this systematic literature review is to assess the efficacy, accuracy, and reliability of automatic segmentation techniques for identifying anatomic landmarks in dental imaging, compared to traditional manual segmentation techniques. Methods: We used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analysis) guidelines to select articles. A systematic search was performed in PubMed, Scopus, Web of Science, Cochrane Library, and IEEE Xplore databases for relevant papers published from January 2000 to the present. This review focused on studies conducted in clinical, academic, or research settings involving dental imaging analysis. It includes studies that evaluate automatic segmentation in both diagnostic and treatment planning contexts. This study is registered in Prospero with protocol number CRD42024619407. Results: This is an ongoing project, and we are presenting the preliminary outcomes. We collected 51 articles through this systematic review. Our intended outcomes are listed below. Primary Outcome: Accuracy of automatic segmentation techniques, measured using metrics like Dice similarity coefficient, sensitivity, specificity, or similar standards. Measures of Effect: Effectiveness of segmentation algorithms in correctly identifying key anatomical landmarks, compared to manual methods. Additional Outcome(s) • Secondary Outcomes: o Computational efficiency (e.g., time taken for segmentation). o Reproducibility and reliability (e.g., inter-rater and intra-rater reliability). o Clinical relevance and applicability (e.g., integration in treatment planning or diagnostic workflow). • Measures of Effect: o Time savings and error reduction in clinical applications. o Consistency of results across different observers or sessions Conclusion: This report contributes to the literature of deep learning and its application in segmentation involving 2D and 3D dental images. The authors systematically reviewed literature on various segmentation approaches used for the detection of dental anatomical landmarks. Some of the models have notably higher accuracy and consistency compared to traditional manual techniques. However, there are several unresolved challenges.

Poster #B49

Category	Health Informatics and Literature Reviews
Affiliation	College of Dental Medicine
Submitter	Shannon Isabel Caymo
Authors	Shannon Isabel Caymo; Aron Glodowski; Shadi Javadi; Shymaa E Bilasy
Title	Gender-Specific Differences, Cellular Senesecence, and Periodontitis
Abstract	Objectives: Immunosenescence, an age-related decline in immune function, has emerged as a critical factor influencing the pathogenesis and progression of several pathological disorders. Inflammaging keys a chronic low-grade sterile inflammatory state that arises with aging. Together, they lead to a dysfunctional immune response. Males experience immunosenescence earlier with rapid decline in immune function compared to premenopausal females, who benefit from estrogen protection. Periodontitis, a chronic inflammatory condition affecting the supporting tooth structures, could lead to tissue damage and tooth loss. Interestingly, the prevalence of periodontitis increases with age. In this review, we aimed to summarize the interplay between periodontal diseases, immunosenescence and inflammaging, emphasizing the gender-based differences. Methods: We conducted a literature search using PubMed to identify English-written articles using the following keywords: gender differences, cellular senescence and periodontal inflammation. Results: Innate and adaptive immune responses are crucial for maintaining periodontal health. Immunosenescence and inflammaging lead to an imbalanced inflammatory response within the periodontium. This imbalance exacerbates tissue damage and dysregulates the host defenses against common periodontal pathogens. The decline of the male immune system's function is attributed to lower estrogen levels. This immune frailty results in an earlier initiation of immunosenescence compared to females. Conclusion: Aging, dysbiotic microbiota, and multiple environmental as well as physiological factors can increase oxidative DNA damage and accelerate the accumulation of senescent cells. In this study, we summarized the role of impaired immune clearance of senescent cells in inflammaging with gender-differences, which could potentially influence the progression of periodontitis. Proper understanding of age and gender-related immune dysregulation may help in developing strategies to improve geriatric patients' oral health.

Poster #B50

Category	Health Informatics and Literature Reviews
Affiliation	College of Dental Medicine
Submitter	Santiago Mendoza
Authors	Santiago Mendoza; Madeline Yeager; Shymaa E. Bilasy; Jennifer Goss
Title	The Role of Statins in Inflammation and Bone Regeneration in the Oral Cavity
Abstract	Objective: Periodontitis is an inflammatory condition with a multifactorial etiology that affects up to 50% of the population. Chronic inflammation caused by the host immune response to oral bacteria leads to the destruction of the alveolar bone that supports dentition. If left untreated periodontitis can ultimately lead to tooth loss. Accumulating evidence documents an anti-inflammatory property to statins. Statins are FDA-approved medications to manage dyslipidemia and the prevention of atherosclerotic cardiovascular disease. These drugs inhibit the action of the Hydroxymethylglutaryl-coA enzyme which prevents the formation of mevalonate, an essential building block of cholesterol. Additional evidence indicates statins may have a role in bone formation via stimulation of bone morphogenic proteins. The aim of this literature review is to explore the role of statins as a potential adjunctive periodontal and surgical therapy and their use in future clinical settings. Methods: This narrative review included in-vivo and in-vitro studies investigating the anti-inflammatory and bone regenerative role of statins as an adjunct for periodontal treatments. A comprehensive search using PubMed as the primary search engine was conducted. Articles included were published between 2010 and 2025 and written in English. Results: Subgingival placement of topical statins in conjunction with scaling and root planing reduced periodontal parameters such as pocket depth, gingival index and overall increased alveolar bone levels in patients with chronic periodontitis. Prior reports indicate that statins increase the expression of BMP-2 which binds to TGF-beta to stimulate bone formation via endochondral and intramembranous ossification. Conclusions: According to these studies, statins have been shown to have anti-inflammatory and bone-regenerative properties that may improve overall periodontal parameters in patients with periodontitis and combat the resorption of alveolar bone in patients with chronic periodontitis.

COLLEGE OF GRADUATE STUDIES

Poster #B51

Title: Primary Cilia as Timekeepers of Neuronal Aging in Neurodegenerative Diseases

Authors: Soham Venkat Kondle[1] , Michayla Mabourakh[1] , Orr Amar[1] , Riley Danna[1] , Ashraf Mohieldin[1,2]

Affiliations: College of Medicine[1], College of Graduate Studies[2]

Category: Health Informatics and Literature Review

Objective: Aging is a key factor in neurodegenerative diseases such as Alzheimer's disease (AD) and Parkinson's disease (PD). In contrast, Huntington's disease (HD) exhibits an earlier onset, with symptoms potentially emerging in childhood, despite sharing common neurodegenerative mechanisms. This study proposes that primary cilia dysfunction accelerates neuronal aging and neurodegeneration through oxidative stress, mitochondrial dysfunction, and epigenetic changes. **Methods:** A comprehensive literature review (2024–2025) was conducted using PubMed and Google Scholar to examine primary cilia dysfunctions in neurodegenerative diseases, including AD, PD, and HD. **Results:** Primary cilia function as key regulators of aging by controlling essential signaling pathways, like Sonic Hedgehog (Shh) and Wnt, which are crucial for neuronal homeostasis and survival. In AD, amyloid-beta disrupts circadian rhythm, leading to dysfunctional cilia by increasing its length. This further results in neuroinflammation, reduced astrocyte proliferation, and induce cognitive decline. In PD, primary cilia house dopamine receptors and regulate oxidative stress. In addition, Leucine-rich repeat kinase 2 (LRRK2) protein mutation prevents primary ciliary formation, impairing Shh signaling and decreasing neuroprotective factors, rendering dopaminergic neurons more susceptible to oxidative stress. In HD, the mutant polyQ-Htt protein accumulation in cilia causes ciliary elongation and disruption of intraflagellar transport. In return, this disrupts mitochondrial function, increases oxidative stress, and inhibits DNA repair, leading to accelerated neuronal aging. **Conclusions:** Primary cilia act as cellular timekeepers, regulating neuronal aging, and disease progression. Their dysfunction accelerates aging-related processes, including oxidative stress, mitochondrial dysfunction, and impaired DNA repair, contributing to neurodegeneration. In AD and PD, cilia shortening disrupts neuroprotective signaling, while in HD, elongation impairs transport and signaling efficiency. Understanding ciliary dysfunction provides new insight into neurodegenerative mechanisms and suggests that restoring cilia function could be a potential therapeutic strategy to slow neurodegenerative progression.

Poster #B52

Title: Neurotoxin Protein Trafficking: The Role of Primary Cilia in Tunneling Nanotubes and Exosome Communication

Authors: Orr Amar[1], Riley Danna[1], Michayla Mabourakh[1], Soham Kondle[1], Ashraf Mohieldin[1,2]

Affiliations: College of Medicine[1], College of Graduate Studies[2]

Category: Health Informatics and Literature Review

Objective: This study explores the interplay between tunneling nanotubes (TNTs), exosomes, and primary cilia (PC) in propagating neurodegenerative diseases, including Alzheimer's (AD), Parkinson's (PD), and Huntington's (HD). We examine how these intercellular communication systems drive the spread of pathogenic proteins and the role of PC in regulating or responding to these processes. **Methods:** A literature review (2010–2024) using PubMed and Google Scholar analyzed TNTs, exosomes, and PC in AD, PD, and HD. Peer-reviewed studies on protein aggregation, signaling disruption, and disease propagation were included, with data categorized by epidemiology, molecular mechanisms, and PC involvement. **Results:** We identified a common pathway in these diseases: diseased protein creation, accumulation, and propagation via TNTs and/or exosomes, with PC as a key player. TNTs transfer toxic proteins, influenced by PC signaling pathways such as Hedgehog and Wnt. Similarly, exosomes from ciliated neurons carry ciliary proteins and pathogenic cargo, driving disease spread. PCs regulate exosome biogenesis and release, linking ciliary function to neurodegenerative progression. In AD, amyloid-β spreads via TNTs and exosomes, with ciliary dysfunction worsening this process. In PD, **α**-synuclein aggregates are transported through TNTs, while ciliary defects impair exosome-mediated clearance. HD presents a unique interplay, as mutant huntingtin disrupts ciliary function, leading to increased TNT formation and release of pathogenic exosomes. These findings underscore the critical role of PC, both in facilitating neuroprotective intercellular communication and pathogenic protein propagation in AD, PD, and HD. **Conclusion:** PC regulate TNTs and exosomes, key players in spreading pathogenic proteins in AD, PD, and HD. Ciliary dysfunction exacerbates disease progression by enhancing TNT-mediated protein transfer and altering exosome release. Targeting the cilia-TNT-exosome complex offers a novel therapeutic strategy to disrupt protein propagation and slow neurodegeneration. Restoring ciliary function or modulating TNT and exosome dynamics could mitigate disease spread, highlighting this pathway’s potential for treatment.

Poster #B53

Title: Innovative Nanomedicine: The Usage of Nanoparticles in Clinical Trails

Authors: Bisma Khan[1], Emily Waddle[1] , Chrislyn Lawrence[2] , Ashraf Mohieldin[1]

Affiliations: College of Graduate Studies[1], College of Pharmacy[2]

Category: Health Informatics and Literature Review

Objective: Nanoparticles (NPs) have garnered significant attention in nanomedicine as innovative drug-delivery systems with diagnostic and therapeutic potential. This study aimed to evaluate the clinical progress, applications, and limitations of NPs in nanomedicine. **Methods:** The methodology involved searching PubMed and ClinicalTrials.gov to collect relevant data, which was then categorized by type, FDA approval status, and other criteria. **Results:** Analysis of the resulting data highlighted the advancements and limitations of NPs, with clinical trials showing organic paclitaxel and albumin as the most utilized types. NPs, can be synthetically created and derived from diverse sources such as metals, and exhibit various disease applications. While they can target specific organs or tissues, NPs are associated with evidence of toxicity and generally have lower bioavailability unless specially coated. **Conclusion:** Despite their promising applications, NPs face challenges such as engineering complexity, potential toxicity, and their relatively recent introduction in clinical use. Further research is essential to advance their therapeutic and diagnostic applications in nanomedicine.

Poster #B54

Title: Innovative Nanomedicine: Analysis of the Clinical Trials of Extracellular Vesicles

Authors: Emily Waddle[1], Bisma Khan[1] , Chrislyn Lawrence[2] , Ashraf Mohieldin[1]

Affiliations: College of Graduate Studies[1], College of Pharmacy[2]

Category: Health Informatics and Literature Review

Objective: Extracellular vesicles (EVs) are naturally occurring lipid-based particles released by cells, playing a crucial role in trafficking complex biomolecules between cells. These nanoscale structures function as efficient carriers, making them highly valuable for targeted drug delivery, disease monitoring, and regenerative medicine. However, the uses of EVs in therapeutic and diagnostic applications are not well known. **Methods:** Thus, this systemic review aims to examine past and current clinical trials utilizing EVs. The advancements and limitations of EVs in nanomedicine are evaluated for diagnostic and therapeutic applications in 96 clinical trials from 2003 to 2024. The trials are put into categories by the disease treated or diagnosed, clinical trial status, and specific type of EVs utilized. **Results:** Our findings reveal that EVs are increasingly utilized in diagnostic and therapeutic clinical trials. In diagnostics, EVs have been used to monitor a total of 52 diseases, with a significant focus in cancer (n=19) and neurological disorders (n=11). Therapeutically, EVs have been applied in the treatment of 44 diseases, with a significant emphasis on dermatological (n=8) and infectious diseases (n=8). Notably, our results indicate that bloodderived EVs (n=37) are the predominant type used for diagnostic applications, while mesenchymal stem cellderived (MSC) EVs (n=23) are the most utilized for therapeutic purposes. **Conclusion:** In summary, our review highlights the increasing use of EVs in clinical trials for diagnostic and therapeutic applications. EVs show strong potential in diagnosing cancer and neurological disorders and treating dermatological and infectious diseases. Overall, this study underscores EVs clinical relevance and aims to inspire further advancements in EV-based nanomedicine.

Poster #B55

Title: Exploring the Complexities of Long COVID

Authors: Jackson Donald, Shymaa Bilasy, Catherine Yang and Ahmed El-Shamy

Affiliations: College of Graduate Studies, College of Dental Medicine

Category: Health Informatics and Literature Review

Since the emergence of the SARS-CoV-2 virus in 2019, nearly 700 million COVID-19 cases and 7 million deaths have been reported globally. Despite most individuals recovering within four weeks, the Center for Disease Control (CDC) estimates that 7.5% to 41% develop post-acute infection syndrome (PAIS), known as 'Long COVID'. This review provides current statistics on Long COVID's prevalence, explores hypotheses concerning epidemiological factors, such as age, gender, comorbidities, initial COVID-19 severity, and vaccine interactions, and delves into potential mechanisms, including immune responses, viral persistence, and gut dysbiosis. Moreover, we conclude that women, advanced age, comorbidities, non-vaccination, and low socioeconomic status all appear to be risk factors. The reasons for these differences are still not fully understood and likely involve a complex relationship between social, genetic, hormonal, and other factors. Furthermore, individuals with Long COVID-19 seem more likely to endure economic hardship due to persistent symptoms. In summary, our findings further illustrate the multifaceted nature of Long COVID and underscore the importance of understanding the epidemiological factors and potential mechanisms needed to develop effective therapeutic strategies and interventions.

Poster #B56

Title: The Promising Therapeutic Effectiveness of Psychobiotics for Eating Disorders (EDs) –A Systematic Review & Meta-Analysis of Pharmacological Treatments for EDs

Authors: Jasjot Kaur Sandhu; Ria Kumar; Dr. Ahmed ElShamy

Affiliations: College of Graduate Studies

Category: Health Informatics and Literature Review

Over 21 million individuals in the United States---with an age as young as five--- have an eating disorder (ED). Three common EDs include anorexia nervosa (AN), bulimia nervosa (BN), and binge-eating disorder (BED). The co-occurrence of EDs with neurodegenerative diseases remains high with 39 % in patients with Parkinson's disease, 34% in patients experiencing dementia, 58% with bipolar disorder, and up to 40% with anxiety and depression. The neurological basis of EDs has been a target of many therapeutic strategies. Antidepressants, anticonvulsants, antipsychotics, stimulants, and anti-obesity treatments have all been used. Given the adverse events of these treatments, exploring new tolerable ED therapeutic strategies is of great interest. Thus, we here shed the light on the use of psychobiotics as alternative therapeutic intervention for EDs. Patients with EDs showed structural changes and functional impairment of an integrated neural network, such as the orbitofrontal and prefrontal cortices and the temporal pole. Recent studies highlight the unique microbiota of individuals with EDs as a possible origin for these neurological manifestations via the gut-brain axis. Indeed, gut dysbiosis can impact neural functions through neuroinflammation that alters brain structures. This immunological mechanism connecting the gut microbiota and neurological structures has added a new pathway to treat EDs by targeting gut dysbiosis through combinations of diverse bacteria strains known as psychobiotics. Interestingly, psychobiotics have shown a 43 - 70% decrease in EDs. Furthermore, psychobiotics show anti-inflammatory effects with 85% - 90% reduction in pro-inflammatory biomarkers, such as IFN-γ and TNF-α. Psychobiotics also provide a safer and less addictive alternative to CNS pharmacological treatments compared to traditional neurological treatments. In conclusion, psychobiotic treatment of EDs has shown promising effectiveness and safety in patients with EDs. However, further large-scale studies must be conducted to better evaluate the long-term effects on the neurological structures of these patients.

Poster #B57

Title: Holistic Tongue Health Prediction System (HTH-PS): An AI Model for Comprehensive

Tongue Image Analysis

Authors: Mehar Brar, Anagha Math, Ahmed El-Shamy

Affiliations: College of Graduate Studies

Category: Health Informatics and Literature Review

This study presents the development of a Holistic Tongue Health Prediction System (HTH-PS), an AI-driven model designed to integrate multiple aspects of tongue analysis into a single comprehensive assessment tool. The research was conducted to address the limitations of existing AI models, which analyze individual features in isolation rather than providing a holistic diagnosis. By leveraging deep learning techniques such as Convolutional Neural Networks (CNNs), Transformer-based models, and Self-Supervised Learning (SSL), this system improves disease prediction, syndrome differentiation, and overall health assessment based on tongue images. Findings indicate that this approach enhances diagnostic accuracy, improves interpretability, and enables a more standardized dataset for AI-driven tongue analysis

Poster #B58

Title: Review of Medications Targeting Selective Inhibition of COX-2 Isoenzyme Pathway

Authors: Gratiana Chen, Hansoo Kim, Noah Kim, Stella Yao, Abdelbasset Farahat

Affiliations: College of Graduate Studies

Category: Health Informatics and Literature Review

The production of a multitude of prostaglandins (PGs) regulating various pathological and physiological responses are largely due to enzymes involved in the cyclooxygenase (COX) pathways. The enzyme phospholipase A2 (PLA2) releases arachidonic acid from the cell's phospholipid membrane, which is the precursor for the two isozymes of cyclooxygenase (COX-1 and COX-2). While structurally similar, the constitutive COX-1 pathway maintains the body's overall homeostatic state, primarily regulating renal blood flow, controlling platelet aggregation, and maintaining gastric mucosal health. The inducible COX-2 pathway initiates and amplifies a plethora of pro-inflammatory responses, indicating potential benefits of selective inhibition of this isozyme. This literature review outlines the long-term consequences of one of the first promising anti-COX2 inhibitors released in the market, underscoring the fine line between positive anti-inflammatory effects while limiting negative systemic risks including strokes or heart attacks.

Poster #B59

Title: The systemic literature review findings demonstrated the effectiveness of Nirmatrelvir with Ritonavir against hospitalization and mortality during the 2019 pandemic

Authors: Aliyah Adnan, Kevin Yen, Abdelbasset Farahat

Affiliations: College of Graduate Studies

Category: Health Informatics and Literature Review

Ritonavir, is a protease inhibitor used for the treatment of HIV/AIDS. Sold under the brand name Norvir. Initially designed to inhibit HIV-1 protease, studies have found that Ritonavir also inhibits cytochrome P450-3A4 and CYP2D6. In combination with Nirmatrelvir (Paxlovid), Ritonavir indirectly inhibits the viral replications of SARS-Cov-2. A systemic literature review was conducted using sources from NCBI and PubMed to provide a comprehensive summary of evidence on the efficacy of Ritonavir with Nirmatrelvir against hospitalization and mortality organized by categories such as age, vaccination status, underlying health conditions, and acute vs longer-term follow-up. In multiple studies, Ritonavir boosts the bioavailability of Nirmatrelvir when used concomitantly through CYP2D6 inhibition in Covid. However, it may be associated with side effects such as metabolic disturbances, hepatotoxicity, cardiovascular effects, and gastrointestinal side effects. The systemic literature review findings demonstrated the effectiveness of Nirmatrelvir with Ritonavir against hospitalization and mortality during the 2019 pandemic.

COLLEGE OF PHARMACY

Poster #B60

Title: Targeting immunosuppressive factors by oncolytic viral delivery systems

Authors: Tri Huynh; Mohammad Ali Hassan; Darin Cheung; Brandon Bol; Hongbin Wang

Affiliations: CNUCOM, CNUCOM, CNUCOM, CNUCOM, CNUCOP

Category: Health Informatics and Literature Reviews

Objective(s): This study aims to analyze the history, current advancements, and future directions of oncolytic viral (OV) delivery systems, particularly CRISPR-modified viruses, in the targeted delivery of anti-tumor reagents. These viruses are designed to reduce pathogenicity while maintaining cytotoxicity and tissue specificity, offering dual anti-tumor effects by delivering immune enhancers and initiating antiviral immunity in the tumor microenvironment (TME).

Methods: A systematic literature search was conducted using the PubMed database to examine studies related to OVs and their use in delivering reagents that target immunosuppressive factors within the TME. This analysis focused on animal models and clinical trials assessing the safety, efficacy, and immune responses associated with OV therapy.

Results: Oncolytic viruses engineered with immunomodulatory agents, including anti-PD-1, anti-PD-L1, anti-TGFβ, and anti-CXCL10, have shown promising results in sensitizing tumors, reducing tumor size, and improving immune cell infiltration. These modifications help reshape the TME, increasing the potential for tumor eradication. OVs exhibit a selective replicative advantage in cancer cells, which are typically deficient in antiviral pathways. The use of OVs ensures targeted tumor destruction while sparing healthy tissue. Additionally, the release of damage-associated molecular patterns (DAMPs) promotes immune memory, potentially preventing metastasis.

Conclusions: Co-expression and co-delivery of anti-immunosuppressive reagents with oncolytic viruses represent a novel and effective strategy for cancer treatment. This approach has demonstrated significant potential for treating both local and metastatic tumors. Future directions should focus on optimizing pharmacologic cargo, overcoming immune barriers in cancerous tissues, and expanding the use of OVs in treating other immune-mediated diseases.

Poster #B61

Title: Shedding light on the role of complement C4 activation in cancer

Authors: Mohammad Ali Hassan, Tri Huynh, Darin Cheung, Xiaodong Feng, Hongbin Wang

Affiliations: CNUCOM, CNUCOM, CNUCOM, CNUCOP, CNUCOP

Category: Health Informatics and Literature Reviews

Objective: This review examines the evolving role of complement C4 in cancer, focusing on its activation within the tumor microenvironment (TME). While traditionally considered part of the immune defense against tumors, recent evidence suggests that complement activation may contribute to immunosuppression and tumor progression. The potential of C4d as a biomarker and a therapeutic target is also explored.

Methods: A literature review was conducted, analyzing studies on complement C4 activation in cancer, its role in tumor progression, and the presence of C4d in cancer tissues and lymph nodes. Research on C4d as a diagnostic biomarker and its implications for immunotherapy was included. Additionally, assay methods for detecting C4 and its activation products were assessed, highlighting potential limitations.

Results: Recent studies indicate that complement C4 activation plays a dual role in cancer, with its activation fragment C4d frequently detected in tumor tissues and lymph nodes. Rather than solely contributing to anti-tumor immunity, complement activation appears to support an immunosuppressive TME, aiding tumor survival and metastasis. Emerging evidence suggests that C4d could serve as a biomarker for diagnosing various cancers, though inconsistencies in assay methodologies raise concerns about data interpretation.

Conclusions: Complement C4 activation is increasingly recognized as one of key players in cancer progression, with C4d emerging as a potential biomarker. Further research is needed to standardize detection methods and explore the therapeutic implications of targeting complement C4 within the TME. Understanding these mechanisms may open new avenues for complement-based cancer immunotherapy.

Poster #B62

Title: A Comprehensive Review of Emerging Immunotherapy Approaches

Authors: Tri Huynh; Mohammad Ali Hassan; Darin Cheung; Hongbin Wang

Affiliations: CNUCOM, CNUCOM, CNUCOM, CNUCOP

Category: Health Informatics and Literature Reviews

Objective: This study aims to evaluate recent literature on cancer vaccines, focusing on emerging strategies and advancements in vaccine development. With increasing interest in immunotherapy, novel vaccine delivery mechanisms may enhance efficacy and broaden therapeutic applications.

Methods: A comprehensive literature review analyzing published studies and clinical trial data on cancer vaccines was conducted. Research articles detailing vaccine formulations, immune response mechanisms, and clinical outcomes were included. Particular attention was given to novel approaches, such as nanoparticle-based vaccine delivery.

Results: Recent findings highlight the incorporation of nanoparticles as a promising strategy for cancer vaccine delivery. Nanoparticles enhance antigen presentation, improve immune activation, and enable targeted delivery to tumor-associated antigen-presenting cells. Clinical trials have demonstrated improved vaccine stability and efficacy through nanoparticle-based formulations, suggesting potential advantages over conventional vaccine platforms.

Conclusions: The application of nanoparticle technology in cancer vaccines represents a significant advancement in immunotherapy. These innovations may enhance vaccine efficacy, prolong immune responses, and provide new therapeutic opportunities. Further clinical studies are needed to optimize nanoparticle-based vaccine formulations and assess long-term safety and effectiveness

Poster #B63

Title: Medication Therapy Management (MTM) in the Identification and Prevention of Drug Interactions Between Prescription and Over-the-Counter Medications

Authors: Ogechi Okorie; Shahanara Ahsan

Affiliation: CNUCOP

Category: Health Informatics and Literature Reviews

Objective:
In this study, we evaluated the role of Medication Therapy Management (MTM) in identifying and preventing drug interactions between prescription and nonprescription medications, thereby enhancing patient safety and optimizing therapeutic outcomes

Methods:
We conducted a comprehensive review of published studies to evaluate drug-drug interactions between prescription and nonprescription medications. Our study selection included clinical evaluations, observational studies, retrospective chart reviews, and systematic reviews that examined patient outcomes, pharmacist-led interventions, and the role of MTM services. Collecting and analyzing data from relevant literature, we assessed the effectiveness of MTM in mitigating risks associated with the concurrent use of prescription and nonprescription medications. Using keywords such as 'prescription drugs,' 'nonprescription drugs,' 'older adults,' and 'medication therapy management,' we identified relevant studies from PubMed and Google Scholar. Inclusion criteria focused on individuals aged 18 and older with chronic conditions, while studies involving individuals under 18, pregnant individuals, patients with acute conditions, and inpatient settings were excluded

Results:
Our study findings indicate that MTM services play a key role in identifying and mitigating drug interactions between prescription and nonprescription medications. Pharmacist-led interventions, such as patient education, adherence support, and medication adjustments, were associated with improved clinical outcomes. Analyzing the data, we observed that MTM programs reduce the risk of adverse drug events by identifying high-risk medication combinations and recommending safer alternatives. The review also showed that older adults, who are more likely to self-medicate with OTC drugs, benefit the most from pharmacist intervention in preventing harmful drug interactions.

Conclusions:
This study underscores the importance of MTM services in reducing drug-drug interactions between prescription and non-prescription medications, particularly in older adults. By addressing the risks associated with over-the-counter medication use, MTM programs help optimize therapeutic outcomes and enhance patient safety. These findings emphasize the need for the continued implementation of MTM services in healthcare settings to improve medication management and overall patient well-being.

Poster #B64

Title: Herbal bioactive compounds as promising inhibitors of p37 in monkeypox virus: a computational approach

Authors: Linh Thuy Hoang1; Tuan Duc Nguyen2; Hieu Trung Nguyen3; Huong Thi Thu Phung4; Dao Thanh Tran1

Affiliations: 1. College of Pharmacy, California Northstate University, U.S.A. 2. Faculty of Pharmacy, University of Medicine and Pharmacy at Ho Chi Minh City, Vietnam. 3. Microbiology and Immunology Department, Pasteur Institute in Ho Chi Minh City, Vietnam. 4. NTT Hi-Tech Institute, Nguyen Tat Thanh University, Vietnam

Category: Health Informatics and literature reviews

Objective: Monkeypox virus (MPXV) has been declared a Public Health Emergency of International Concern. The p37 protein is essential for MPXV replication and virion formation, making it a prime drug target. While tecovirimat, an FDA-approved antiviral, inhibits p37, its structural and functional details remain unclear. This study aims to predict the 3D structure of MPXV p37 and identify potential natural bioactive inhibitors using computational approaches.

Methods: The MPXV p37 sequence from Congo Basin (GenBank KJ642613.1) and West African (GenBank UWO39625.1) clades was retrieved from GenBank. Its structure was predicted using AlphaFold, I-TASSER, and Swiss-MODEL, with validation by Ramachandran plots. Molecular docking simulations using Autodock Vina evaluated the binding affinity of tecovirimat and ten bioactive compounds from olives, citrus, green tea, and curry leaves. Ligand-protein interactions were analyzed to identify potential inhibitors.

Results: AlphaFold provided the best p37 structure, with 88.1% of residues in the preferred region. Docking analysis revealed 19 binding poses of tecovirimat with MPXV p37 across five potential binding sites. Natural compounds exhibited binding affinities ranging from −4.4 to −7.4 kcal/mol. Among them, curry leaf-derived compounds (isomahanine, pyrayafoline C, mahanimbinine, and murrayacinine) exhibited the strongest binding, similar to tecovirimat, via hydrophobic interactions. Additionally, olive-derived verbascoside and oleuropein also showed strong affinity, primarily via hydrogen bonding.

Conclusion: This study provides structural insights into MPXV p37 and identifies promising herbal bioactive inhibitors. The strong binding interactions observed suggest that curry leaves and olive compounds may serve as alternative antiviral agents against monkeypox. Further in vitro and in vivo validation is required to confirm their therapeutic potential.

COLLEGE OF MEDICINE

Poster #B65

Efficacy of Gold Nanoparticles in the Treatment of Parkinson's Disease: An In Vivo Study

Authors: Elizabeth Kouch; Hannah Chang; Jenibelle Hsu; Eliette Seo; Megan Dudaney; Eldo Frezza

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Research Category: Health Informatics and Literature Reviews

Background: Gold nanoparticles have garnered attention in nanotechnology for their potential in drug delivery, particularly due to their ability to cross the blood-brain barrier. This ability has shown promise in advancing treatments for neurological diseases, such as Parkinson's disease, which is characterized by the degeneration of neurons. We reviewed current literature to assess whether gold nanoparticles have demonstrated neuroprotective effects in Parkinson's disease.

Objectives: This study aimed to systematically review and analyze existing research on the use of gold nanoparticles in mouse and other in vivo models, investigating their potential therapeutic effects for Parkinson's disease treatment in humans.

Methods: A comprehensive search for peer-reviewed preclinical and clinical studies was conducted through PubMed, Embase, and Scopus. Keywords used in the search included "nanoparticle," "Parkinson," "delivery," and "therapy." We uploaded the 3,398 studies identified to Covidence, and after an initial screening of titles and abstracts, 1,573 studies were excluded. Following full-text review, 199 articles were removed, leaving 11 studies for data extraction and analysis.

Results: Ten out of the 11 articles were deemed relevant for data analysis. Findings showed that gold nanoparticles improved neuronal survival, enhanced motor activity, and reduced oxidative stress in mouse models, leading to overall improvement in Parkinson's disease symptoms.

Conclusion: Gold nanoparticles show promising therapeutic potential for Parkinson's disease treatment. However, further research is needed to evaluate the safety and long-term effects of nanoparticles in the body before transitioning to human clinical trials.

Poster #B66

Exploring the Complexities of Long COVID

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Research Category: Health Informatics and Literature Reviews

Since the emergence of the SARS-CoV-2 virus in 2019, nearly 700 million COVID-19 cases and 7 million deaths have been reported globally. Despite most individuals recovering within four weeks, the Center for Disease Control (CDC) estimates that 7.5% to 41% develop post-acute infection syndrome (PAIS), known as 'Long COVID'. This review provides current statistics on Long COVID's prevalence, explores hypotheses concerning epidemiological factors, such as age, gender, comorbidities, initial COVID-19 severity, and vaccine interactions, and delves into potential mechanisms, including immune responses, viral persistence, and gut dysbiosis. We conclude that women, advanced age, comorbidities, non-vaccination, and low socioeconomic status all appear to be risk factors. The reasons for these differences are still not fully understood and likely involve a complex relationship between social, genetic, hormonal, and other factors. Furthermore, individuals with Long COVID-19 seem more likely to endure economic hardship due to persistent symptoms. In summary, our findings further illustrate the multifaceted nature of Long COVID and underscore the importance of understanding the epidemiological factors and potential mechanisms needed to develop effective therapeutic strategies and interventions.

Poster #B67

Differential Utilization and Spending for WBRT vs. SRS in Older Adults with Brain Metastases

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Research Category: Health Informatics and Literature Reviews

Background: While whole-brain radiation therapy (WBRT) remains a mainstay in treating brain metastases, stereotactic radiosurgery (SRS) achieves similar survival while reducing cognitive impairment. However, SRS is costly and requires nuanced considerations when treating older adults, including tolerance of treatment, neurotoxicity, and prognosis.
Methods: Radiotherapy episodes from 2015-2019 for Medicare beneficiaries with brain metastases aged ≥65 years were analyzed. Radiation modality (conventional and SRS), year of treatment, age, site of care (freestanding vs. outpatient [OP]), and death within 90 days were covariables. Use of SRS versus WBRT was analyzed with multivariable logistic regression. Medicare spending was analyzed with multivariable linear regression.
Results: 33,258 episodes were included from 2015-2019 (65% SRS). SRS was used in 41% of patients who died within 90 days and 66% of patients ≥85 years. SRS use was associated with OP setting (OR 2.33[95%CI:2.2-2.5]) and older age (≥85 years vs. 65-74 years, OR 1.43[95%CI:1.3-1.6]), while it was less likely in patients who died within 90 days (OR 0.23[95%CI:0.22-0.24]; p<0.01 for all). SRS use increased over time (OR 1.1[95%CI:1.1-1.1], p<0.01). SRS significantly increased spending (β=$6512[95%CI:6421-6602]) vs. WBRT; this increase was similar for patients who died within 90 days (mean differential $6837, p<0.001) and those who survived (mean differential $6840, p<0.001).
Conclusion: OP sites were more likely to use SRS in older patients with brain metastases, although use was dampened in patients with poorer prognosis across both sites-of-care. SRS use was highest among patients ≥85 years, suggesting age as a factor guiding SRS use. SRS use was associated with higher spending; therefore, value-based practice must be aligned with financial considerations. Further investigation is needed to determine how to improve balance between intracranial control, patient burden with treatment, and spending.

Poster #B68

The Impact of Exercise-Based Prehabilitation on Postoperative Outcomes in Major Abdominal Surgery

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Research Category: Health Informatics and Literature Reviews

Objectives/Introduction: This literature review examines the impact of exercise-based prehabilitation programs on postoperative outcomes in patients undergoing major abdominal surgery. These procedures carry a high risk of complications, with 30–50% of patients experiencing significant postoperative issues, including severe complications (Clavien-Dindo Grades 3–4). Physical prehabilitation aims to enhance physiological resilience, reduce complications, and improve functional capacity. This study evaluates four prehabilitation modalities: Inspiratory Muscle Training (IMT), aerobic exercise combined with resistance training, multimodal training (aerobic, resistance, and respiratory exercises), and High-Intensity Interval Training (HIIT). The primary outcomes assessed include postoperative complications and length of hospital stay (LOS).

Methods: This review analyzed randomized controlled trials, systematic reviews, and meta-analyses published over the past 10–15 years on physical exercise prehabilitation programs for major abdominal surgery.

Results: IMT demonstrated significant benefits, including increased maximum inspiratory pressure (MIP) and a reduction in postoperative pulmonary complications (PPCs), such as pneumonia and atelectasis. Studies also reported a shorter LOS in patients undergoing IMT, particularly when the training was supervised and performed for extended durations. Aerobic and resistance training programs produced mixed results, with some studies indicating reduced complications and shorter LOS, while others found no significant differences. Multimodal prehabilitation, combining aerobic, resistance, and respiratory training, showed a trend toward reducing PPCs but had inconsistent effects on LOS. HIIT effectively improved cardiorespiratory fitness; however, its impact on complications and LOS varied, with some studies reporting clinically meaningful but statistically insignificant improvements.

Conclusions: Physical prehabilitation, particularly IMT and multimodal approaches, shows promise in improving postoperative outcomes by reducing complications and shortening hospital stays. However, variability in study designs and outcomes underscores the need for standardized protocols and larger, high-quality trials to establish definitive recommendations. Incorporating physical prehabilitation into preoperative care may enhance recovery and mitigate the burden of postoperative complications in major abdominal surgery.

Poster #B69

Advances in Preoperative Mediastinal Lymph Node Staging for Non-Small Cell Lung Cancer (NSCLC)

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Research Category: Health Informatics and Literature Reviews

Objectives/Introduction: Accurate mediastinal nodal staging is critical for determining the extent of disease, prognosis, and management in lung cancer patients. Traditionally, the gold standard for mediastinal lymph node (LN) evaluation is invasive surgical approaches such as mediastinoscopy. However, minimally invasive techniques like endobronchial ultrasound-guided transbronchial needle aspiration (EBUS-TBNA) and endoscopic ultrasound-guided fine needle aspiration (EUS-FNA) have emerged as effective approaches, offering improved diagnostic accuracy and reduced procedural risks. EBUS depicts a greater range of LN stations, including regions that are beyond the scope of mediastinoscopy. This review evaluates studies on mediastinal staging approaches in non-small cell lung cancer (NSCLC), focusing on the efficacy of minimally invasive techniques compared to traditional surgical methods.

Methods: Key trials assessing the diagnostic performance of EBUS, EUS, and combined EBUS/EUS were analyzed with study endpoints including sensitivity, specificity, and negative predictive value (NPV) for detecting mediastinal LN metastases, as well as procedural complications, cost-effectiveness, and patient outcomes.

Results: Analysis depicted that use of EBUS in various techniques has a higher sensitivity and greater efficacy in detecting nodal metastases compared to mediastinoscopy alone. EBUS-TBNA, either by itself or combined with EUS, offers high sensitivity (up to 93%) and negative predictive value (up to 97%), outperforming mediastinoscopy in key trials. EBUS-TBNA was also found to identify nodal metastases in patients with normal mediastinal LN. Minimally invasive techniques, particularly endosonography, demonstrate increased diagnostic accuracy in mediastinal LN staging for NSCLC. The combined approaches reduce unnecessary thoracotomies and shorten time-to-treatment without procedural complications. Particularly the combination of EBUS/EUS, demonstrate greater diagnostic accuracy compared to TBNA, EUS, EBUS alone for mediastinal staging in NSCLC.

Conclusions: These advancements depict how these minimally invasive techniques enhance staging accuracy, reduce unnecessary surgical interventions, and improve patient outcomes. Future studies can aim to better understand how robotics and navigational bronchoscopy play a role in mediastinal staging.

Poster #B70

Elucidating the use of atomoxetine for the treatment of cocaine dependence

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Research Category: Health Informatics and Literature Reviews

Background: Cocaine use disorder (CUD) is a major public health concern with no FDA-approved treatment. Atomoxetine—a selective norepinephrine reuptake inhibitor used for ADHD—has been explored as a repurposed therapy for CUD. This systematic review synthesizes clinical evidence regarding atomoxetine's potential efficacy and safety for treating CUD.
Methods: Following PRISMA guidelines, we systematically searched PubMed, Scopus, Web of Science, and the Cochrane Library for randomized controlled trials (RCTs) assessing atomoxetine in cocaine-dependent patients. Extracted variables included study details (author, publication year, study year), patient demographics (sample size, gender ratio, mean age), follow-up duration, dosing regimen, patient-reported outcomes, and complications.
Results: Nine double-blind, placebo-controlled RCTs were identified, involving 224 participants (209 males, 15 females) with mean ages between 38.8 and 44.6 years. Treatment durations ranged from 0 to 12 weeks, and atomoxetine dosages varied from 40 to 100 mg. Several studies consistently reported improvements in cognitive performance—specifically in decision impulsivity and attentional bias—among cocaine users receiving atomoxetine. However, findings on response inhibition were mixed. Notably, atomoxetine did not reduce cocaine cravings nor adversely affect cocaine metabolism or cardiovascular health, suggesting a favorable safety profile.
Conclusion: Atomoxetine shows promise in enhancing certain cognitive functions in individuals with cocaine dependence, particularly by improving decision impulsivity and attentional bias. Its effects on response inhibition remain inconclusive, and it does not appear to decrease cocaine cravings. Importantly, its neutral impact on cocaine metabolism and cardiovascular health supports its safety. Given the heterogeneity of findings and limited study sizes, further research with larger samples and standardized cognitive outcome measures is needed to clarify atomoxetine's therapeutic role and to assess its long-term efficacy and safety in treating CUD.

Poster #B71

Elucidating the Contribution of the Furin Cleavage Site to COVID-19 Fusion

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Research Category: Health Informatics and Literature Reviews

Study objectives: The causative agent of COVID-19 is the novel coronavirus SARS-CoV-2. The spike glycoprotein projecting from the viral membrane is essential for receptor binding and cell fusion. The spike of the SARS-CoV-2 is unique among other coronaviruses in containing two cleavage sites, one for TMPRSS2 and another one for the protease Furin. The spike protein binds to the ACE2 receptor expressed on human cells following cleavage and activation by the membrane protease TMPRSS2. The role of each protease in the viral fusion is not known. The study goal is to elucidate the contribution of the Furin cleavage site to the viral membrane fusion.
Methods: We used a mutagenesis kit to introduce single base mutation at the cleavage site of the spike glycoprotein. The first Furin cleavage site (CM-1) and the TMPRSS2 site (CM-2) were individually mutated or in combination (DCL). The DNA samples of the spike protein with the mutated cleavage sites were sequenced and confirmed for the absence of other mutations. The wild-type spike protein or the mutant DNAs were transfected into 293 cells and used to challenge HeLa cells that expressed the receptor proteins. The extent of the fusion function of each mutant was compared to the wild-type spike using a reporter gene activation assay.
Results: We demonstrate for the first time that knocking out the Furin cleavage site (CM-1) resulted in a significant decrease in the spike's fusion function. In contrast, knocking out the second TMPRSS2 cleavage site (CM-2) or both cleavage sites (DCL) abolished viral fusion.
Conclusions: We conclude that, in addition to the TMPRSS2 site, the spike cleavage at the Furin site is critical for the viral fusion function. The results provide critical insights into the future design of a therapeutic intervention that aims at blocking viral fusion.

Poster #B72

Extensively Hydrolyzed versus Intact Milk Protein Formula and Risk of Necrotizing Enterocolitis: A Meta-Analysis

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Research Category: Health Informatics and Literature Reviews

Objectives: Nutrition plays a critical role in neonatal outcomes, and formula composition significantly influences gastrointestinal health and development. This meta-analysis evaluated the impact of extensively hydrolyzed formulas (HFs) compared to standard intact protein formulas (SPFs) on the incidence of necrotizing enterocolitis (NEC) and feeding intolerance (FI) in preterm infants.

Methods: A comprehensive literature search was conducted across Ovid, Cochrane and PubMed: the search terms included combinations of "Necrotizing Enterocolitis," "Hydrolyzed," "Amino Acid," "Intact," "Standard," and "Formula" with preterm-related keywords. Eligible studies included randomized controlled trials comparing HFs and SPFs in preterm infants (<37 weeks gestation). Primary outcomes were the incidence of NEC and FI. Risk ratios (RR) for dichotomous outcomes and mean differences (MD) for continuous outcomes were calculated using a random-effects model with 95% confidence intervals (CIs). Sensitivity and stratified analyses were performed to assess study quality and heterogeneity. Publication bias was also evaluated.

Results: Three eligible studies, comprising 1,180 preterm infants, met the inclusion criteria. Infants receiving SPFs had a significantly higher risk of FI (RR = 1.78; 95% CI = 1.32-2.40; $p < .01$) and NEC (RR = 2.31; 95% CI = 1.58-3.38; $p < .01$) compared to those receiving HFs. Conversely, infants receiving HFs had a significantly lower risk of FI (RR = 0.56, 95% CI = 0.39–0.81; $p < .01$) and NEC (RR = 0.43, 95% CI = 0.27–0.69; $p < .001$) compared to those receiving SPFs. Sensitivity analyses confirmed the robustness of these findings.

Conclusions: Standard intact protein formulas significantly increase the risk of NEC and feeding intolerance in preterm infants compared to extensively hydrolyzed formulas. These findings support the incorporation of HFs into neonatal feeding guidelines. Further research is needed to evaluate long-term clinical benefits and refine feeding strategies for preterm populations.

Poster #B73

MRI-Derived Spatial Features and Statistical Modeling for Predicting Clinically Significant Prostate Lesions: Insights from the PROSTATEx Dataset

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Research Category: Health Informatics and Literature Reviews

Objective Accurately identifying clinically significant prostate lesions is critical for improving diagnostic accuracy and guiding clinical decision-making. This study evaluates the predictive value of MRI-derived spatial coordinates and zonal information in distinguishing between significant and non-significant prostate lesions using statistical modeling.

Methods The dataset PROSTATEx, sourced from The Cancer Imaging Archive (TCIA), includes 344 patients with 538 prostate lesions. Lesion coordinates (x, y, z) and anatomical zones (Peripheral Zone [PZ], Transition Zone [TZ], Anterior Stroma [AS], Seminal Vesicle [SV]) were used as predictors. Logistic regression was applied to assess the influence of spatial and anatomical factors, with bootstrapped 95% confidence intervals (CIs) estimated for model coefficients. Kruskal-Wallis tests were used to compare lesion coordinates across zones and assess spatial distribution differences. All statistical analyses were performed in R (version 4.4.2), with statistical significance set at $p < 0.05$.

Results Logistic regression identified lesion position on the y-axis as a significant predictor of clinical significance ($p < 0.05$, 95% CI: -0.688, -0.055). Lesion zone was also a significant predictor, with lesions in the PZ ($p < 0.01$, 95% CI: -2.156, -0.396) and TZ ($p < 0.0001$, 95% CI: -3.160, -1.351) being less likely to be clinically significant. However, lesions in the SV zone were not significantly associated with clinical significance. Kruskal-Wallis testing revealed a significant association between y-coordinates and lesion zone ($p < 0.0001$), supporting the role of lesion location in predicting clinical significance. Bootstrapped confidence intervals confirmed the robustness of these findings, reinforcing the stability of model estimates.

Conclusions MRI-derived spatial coordinates and zonal information significantly contribute to predicting clinically significant prostate lesions. Lesions positioned higher on the y-axis and those in the PZ or TZ were less likely to be clinically significant. These findings highlight the potential for integrating spatial and anatomical features into prostate cancer risk stratification to improve diagnostic precision and clinical decision-making.

Poster #B74

"Should Endocrine or Reproductive Complications Take Precedence When Devising A Treatment Plan For PCOS Patients?"

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Polycystic ovary syndrome (PCOS) is one of the most common endocrine and metabolic disorders in women. The main features of PCOS are hyperandrogenism, ovulatory irregularity, and polycystic ovaries [1]. PCOS has been determined to be a complex genetic trait that has both a genetic and environmental factor [4]. However, as it is difficult to locate a specific gene or set of genes and the multiple symptoms associated with the syndrome, it is difficult to pinpoint any exact etiology. Due to the different abnormalities stemming from PCOS, difference in degree of severity of the syndrome, and difference in patient's goals for treatment, there is no singular treatment approach for PCOS. Our Literature Review focuses on exploring what complications of PCOS, endocrine vs reproductive, should take precedence when a clinician devises a treatment plan for PCOS. Overall, treatments will vary depending on desired outcomes for patients, whether it is ovulation induction in the case of infertility or management of visible symptoms due to hyperandrogenism. It is vital to design a treatment plan for a PCOS patient by prioritizing the individual patient's needs and disease state.

Poster #B75

Neurotoxin Protein Trafficking: The Role of Primary Cilia in Tunneling Nanotubes and Exosome Communication

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Objective This study explores the interplay between tunneling nanotubes (TNTs), exosomes, and primary cilia (PC) in propagating neurodegenerative diseases, including Alzheimer's (AD), Parkinson's (PD), and Huntington's (HD). We examine how these intercellular communication systems drive the spread of pathogenic proteins and the role of PC in regulating or responding to these processes.

Methods A literature review (2010–2024) using PubMed and Google Scholar analyzed TNTs, exosomes, and PC in AD, PD, and HD. Peer-reviewed studies on protein aggregation, signaling disruption, and disease propagation were included, with data categorized by epidemiology, molecular mechanisms, and PC involvement.

Results We identified a common pathway in these diseases: diseased protein creation, accumulation, and propagation via TNTs and/or exosomes, with PC as a key player. TNTs transfer toxic proteins, influenced by PC signaling pathways such as Hedgehog and Wnt. Similarly, exosomes from ciliated neurons carry ciliary proteins and pathogenic cargo, driving disease spread. PCs regulate exosome biogenesis and release, linking ciliary function to neurodegenerative progression.

In AD, amyloid-β spreads via TNTs and exosomes, with ciliary dysfunction worsening this process. In PD, **α**-synuclein aggregates are transported through TNTs, while ciliary defects impair exosome-mediated clearance. HD presents a unique interplay, as mutant huntingtin disrupts ciliary function, leading to increased TNT formation and release of pathogenic exosomes. These findings underscore the critical role of PC, both in facilitating neuroprotective intercellular communication and pathogenic protein propagation in AD, PD, and HD.

Conclusion PC regulate TNTs and exosomes, key players in spreading pathogenic proteins in AD, PD, and HD. Ciliary dysfunction exacerbates disease progression by enhancing TNT-mediated protein transfer and altering exosome release. Targeting the cilia-TNT-exosome complex offers a novel therapeutic strategy to disrupt protein propagation and slow neurodegeneration. Restoring ciliary function or modulating TNT and exosome dynamics could mitigate disease spread, highlighting this pathway’s potential for treatment.

Poster #B76

Mechanisms of Gastrointestinal Infiltration by Influenza Virus — a Review

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Research Category: Health Informatics and Literature Reviews

Introduction: While influenza is primarily known as a respiratory illness, gastrointestinal (GI) symptoms such as nausea, vomiting, diarrhea, and abdominal pain are relatively common presentations of viral infection. The pathophysiology behind these effects have been the topic of many research studies, but is largely inconclusive. In this review, we present possible mechanisms of GI infiltration and subsequent symptomatology by the influenza virus.

Methods: Peer-reviewed literature was comprehensively searched through three databases, PubMed, Google Scholar, and ScienceDirect. The following search terms were used to collect relevant articles on influenza and the GI system: "Influenza and GI symptoms," "Diarrhea in patients with influenza," "Vomiting in patients with influenza," "Influenza and GI complications," "Influenza and GI pathophysiology," "Influenza Sialic acid receptors," "α2-6 and α2-3 linkage distribution in GI system," "Influenza types," "Colonic infiltration from Influenza", "Influenza effect on colonic mucosa", and "Influenza effect on intestinal microbiome." Selection of articles depended upon relevance to the topic with a clear objective of the study, acceptable methodology with proper analysis and conclusion of results, and publication in a peer-reviewed journal.

Summary/Conclusion: The pathogenesis of influenza infiltration in causing GI symptomatology remains unclear with research supporting both direct and indirect mechanisms. Direct mechanisms suggest the pathway on GI mucosal inflammation is via binding of α2-6 and α2-3 sialic acid receptors, while indirect mechanisms emphasize immune system dysregulation via leukocytic migration, apoptosis, cytokine storm, and/or microbiome instability as the root cause. Understanding the mechanisms behind influenza infection in the GI tract can further aid in the development of targeted interventions to decrease the likelihood of GI complications, while also emphasizing the importance of increasing clinical suspicion of influenza in patients presenting with predominantly extra-respiratory manifestations.

Poster #B77

Investigating the Lack of Representation of Melanoma Diagnosis in People of Color

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Melanoma is one of the deadliest forms of skin cancer and the prognosis of the patient is dependent on time of diagnosis. It was found that melanoma diagnosis for people of color (POC) is typically in advanced stages with lower survival rates. This review investigates the underrepresentation of melanoma in POC and its impact on time to diagnosis.

We conducted a systematic review of 3 databases according to PRISMA guidelines. Collected data from 7 studies included study characteristics, correct diagnosis, measurement methods, and source-identifying melanoma.

The proportion of ethnicities and skin tones represented in each online source was disproportionately lower for images representing POC. The LaRosa study reported that only 16.66% of melanoma depicted in YouTube videos were of POC. Of this percentage, only African American, Asian, and Native-American ethnicities were shown while no videos reported on Hispanic patients. Sadur's 2024 study displayed that 13.2% of the images found from online searches of skin cancer were of patients with Pantone C-E or darker tones.

The diagnostic scores of melanoma diagnosis on darker skin tones displayed that artificial intelligence (AI) has a better probability of correctly identifying melanoma in patients with Fitzpatrick IV-VI skin tones. In the Lyman study, general practitioners scored 38% and 69% when diagnosing 2 melanoma pictures on black skin. Schneider's study reported that AI produced 77.78% and 83.33% scores for malignant neoplastic skin conditions and 69.57 and 82.61 for benign neoplastic skin conditions. The time to melanoma diagnosis for POC can be attributed to limited representation in media sites and online searches. AI may be used to increase the likelihood of correctly identifying forms of skin cancer on all skin types. Further research is needed to establish a clearer relationship between the representation of POC and its impact on melanoma diagnoses.

Poster #B78

Prognostic value of calcium score in the setting of stable chest pain

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Objective
Assess coronary calcium scoring (CCS) as a predictor of clinically significant outcomes or major adverse cardiovascular events (MACE) in patients that present with stable chest pain.

Research Category: Health Informatics and Literature Reviews

Methods
Search Strategy
A systematic review was performed in four databases on July 19, 2024: Medline, Google scholar, Cochrane Central Register of Controlled Trials, and EBSCO Academic Search Complete. The query was performed utilizing the Boolean search phrase "((Coronary calcium scor* or coronary calcification or coronary calcium) and (CT or computed tomography) and (mortalit* or fatalit* or death or stroke or coronary artery bypass graft or percutaneous coronary intervention or arrhythmia or heart failure or myocardial infarction or cerebrovascular disease or cardiovascular disease or cardiovascular event))." There were no restrictions set to the search. Studies were included if they reported follow-up studies on coronary calcium score in patients experiencing stable chest pain. Exclusion criteria included case reports, review articles, conference abstracts, studies performed in animals, articles not in English, expert opinions, letters to editors, and studies in which outcomes pertaining to the relationship between MACE and CCS were not specified.

Data Extraction
Study variables extracted from each article included author, title, publication year, study design, inclusion and exclusion criteria, patient demographic variables and clinical characteristics, CT scanner details, CCS average and stratifications, and MACE. All extracted data were compiled for analysis using Covidence.

Quality Assessment and Risk of Bias
The methodological quality of studies was assessed using the Quality In Prognosis Studies (QUIPS).

Results
In progress, the study is currently in the consensus stage for data extraction.

Conclusion
The goal of this study is to determine the prognostic value of CCS in patients with stable chest pain by assessing the relationship between MACE and CCS.

Poster #B79

Enhancing Patient Flow: Impact of Clinic Resource Redesign on Wait Times for Glaucoma and Retina Services in an Academic Practice

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Research Category: Health Informatics and Literature Reviews

Objective: Long wait times correlate with decreased patient satisfaction and can erode health care quality. In ophthalmology, imaging wait times significantly contribute to appointment delays. However, the literature lacks clarity on how clinic design and increasing resources can improve patient flow. This study evaluated the impact of imaging workflow redesign and resource expansion on glaucoma and retina wait times in a large academic clinic after transitioning to a new eye institute.
Methods: EHR metadata on total appointment time and components were retrospectively collected in an academic ophthalmology practice for three months before and after transitioning to a new eye institute. Redesign included placing a frequently used imaging modality (OCT) in a glaucoma exam lane and increasing imaging equipment and personnel. We also examined the relationship between patient demographics and visit time.
Results: Combined imaging wait times for glaucoma and retina decreased significantly from a mean of 24 pre-move to 14.6 mins post-move ($p<0.001$), with individual services also showing significant reductions (glaucoma $p<0.001$; retina $p<0.001$). Total visit time increased for glaucoma (100.4 to 105.5 mins, $p=0.014$) and decreased for retina (109.4 to 104.2 mins, $p<0.001$). Visits with OCT in the exam lane were shorter than those using centralized services (100.7 to 68 mins, $p<0.001$). Older age correlated with shorter waiting for imaging and at imaging times but longer at visual field testing ($p<0.001$). Higher BMI correlated with longer total visit times. Race and language were not associated with visit time changes.
Conclusion: Clinic redesign positively impacted wait times. Embedding a key imaging device directly in a glaucoma exam lane was associated with shorter waiting time. Increasing imaging resources decreased the visit time for retina, and imaging wait time for both services.

Poster #B80

Application of neuroinflammatory mechanisms towards biomarker development for Chronic Traumatic Encephalopathy: A Literature Review

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Objective: Chronic traumatic encephalopathy (CTE) is a neurodegenerative disorder diagnosed only during pathological evaluation at autopsy. The disease is primarily associated with repetitive head impacts (RHI) resulting from contact sports, military blasts, or intimate partner violence. This review aims to evaluate the potential of novel neuroinflammatory biomarkers for CTE diagnosis during life, with a focus on inflammatory mediators and their role in disease pathogenesis.
Methods: A literature search was conducted on Pubmed using keywords including “Chronic Traumatic Encephalopathy”, “Repetitive Head Impacts”, and “Neuroinflammation”. Post-mortem assessments of pathologically-confirmed CTE tissue and in-vivo studies of RHI-exposed subjects were included.
Results: Our review highlights the central role of chronic neuroinflammation in CTE development, with inflammation preceding pathology. Inflammatory pathways, including highly-specific transcriptional alterations in activated microglia and astrocytes, and subsequent chemokine release, contribute to degeneration. Specific markers, such as CCL11 and CCL21, were identified as promising candidates, based on post-mortem comparisons with tissue from Alzheimer’s disease patients and age-matched controls. While general injury markers like Glial Fibrillary Acidic Protein (GFAP) and Neurofilament light chain (NfL) are useful for monitoring disease progression, they lack specificity for CTE, as they are present in other forms of neural injury.

Conclusions: Inflammatory mediators, particularly CCL11 and CCL21, show promise as specific biomarkers for CTE and may serve as therapeutic targets. Further research is necessary to validate these markers in both post-mortem and living individuals. Given the potential overlap of some markers in different neurodegenerative diseases, a multi-marker panel incorporating both specific and sensitive markers, along with imaging and clinical evaluation, may be the most feasible diagnostic approach for CTE.

Poster #B81

Title: Prevalence and In-Hospital Mortality of Fall-Related Injury Hospitalizations in California During the COVID-19 Pandemic: A Retrospective Analysis (2016–2022)

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Research Category: Health Informatics and Literature Reviews

Objective: This study aims to investigate trends in fall-related hospitalizations and in-hospital mortality rates in California from 2016 to 2022 to assess the pandemic's impact on fall incidents and outcomes.

Methods: We conducted a retrospective analysis of patient discharge data from the California Department of Health Care Access and Information, screening approximately 25 million inpatient events for fall-related injuries identified by ICD-10-CM codes (W00-W18) across all ages. Age-and sex-standardized hospitalization rates per 100,000 population were calculated for a comprehensive overview. We examined the influence of COVID-19 on fall-related admissions by applying multivariate logistic regression (MLR) models, adjusting for age, gender, race and ethnicity, geographic regions, and payer source. The results were reported as Adjusted Odds Ratios (AOR) to capture the relative impact of these variables.

Results: The study identified 1,092,323 (4.38%) fall-related hospitalizations, with an in-hospital mortality rate of 3.24%. Pre-COVID (2016–2019), the rates showed an increase, from 338.1 per 100,000 in 2016 to 347.4 in 2018, followed by a dip in 2019. Post-COVID, a drop to 307 occurred in 2020. Rates began to rise again in 2021 (314.6) and 2022 (318.8). Pre-COVID, fall-related hospitalization rates were higher in females, increasing from 399.2 in 2016 to 405.5 in 2018, with a decline to 403.6 in 2019. Post-COVID, female rates dropped significantly in 2020 (352.6) but rebounded to 364.7 by 2022. For males, pre-COVID rates gradually increased from 274.7 to 287.1 by 2018, with a similar post-COVID drop in 2020 (259.5) and recovery to 271.1 by 2022. Age and sex adjusted mortality rates rose from 10.05 in 2016 to 10.71 in 2017 and fluctuated through 2019.

Conclusion: There has been a decrease in fall-related hospitalization rate starting from 2020, which corresponds with the start of the COVID-19 Pandemic, with females having a higher prevalence compared to men, while having a lower in-hospital mortality.

Poster #B82

The Effects of Advanced Age on the Outcomes of Total Hip Arthroplasty: An Updated Systematic Review and Meta-Analysis

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Research Category: Health Informatics and Literature Reviews

Study Objective:
Total hip arthroplasty (THA) is a common procedure among elderly patients, yet the impact of advanced age on postoperative outcomes remains unclear. This systematic review and meta-analysis aim to compare postoperative complications, mortality, length of stay, and other outcomes between octogenarians and younger cohorts to guide preoperative decision-making and postoperative care.

Methods:
A systematic literature search was conducted in PubMed, Embase, and Scopus for studies published from 2018 onward. Inclusion criteria required primary research reporting postoperative outcomes in octogenarians or nonagenarians undergoing THA. Data extraction focused on key variables, including mortality, complications, length of stay, readmission, and revision rates. The risk of bias was assessed using the MINORS criteria. Meta-analysis was conducted using a random effects model to compare outcomes between patients ≥80 years and those <80 years, with statistical significance set at $p < 0.05$.

Results:
A total of 28 studies were included. Meta-analysis revealed that octogenarians had a significantly higher risk of postoperative complications (OR = 0.49) and mortality (OR = 0.18) compared to younger patients. They also experienced a longer length of stay ($p < 0.05$). The risk of postoperative fractures was significantly higher in patients ≥80 years, with no heterogeneity in this outcome across studies ($I^2 = 0$). However, no significant difference was observed in surgical infection rates, although infection incidence was generally higher in octogenarians.

Conclusion:
Advanced age is associated with increased postoperative complications, mortality, fractures, and length of stay following THA. These findings underscore the need for enhanced preoperative assessment and tailored postoperative management for older patients. Optimizing perioperative care strategies may help mitigate risks and improve outcomes in this vulnerable population.

Poster #B83

Comparing outcomes of microwave ablation vs. parathyroidectomy in patients with hyperparathyroidism

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Research Category: Health Informatics and Literature Reviews

Objective: Compare outcomes of microwave ablation vs. parathyroidectomy in patients with hyperparathyroidism.

Methods: A systematic review was performed in four databases on October 25, 2024: Medline, Google scholar, Cochrane Central Register of Controlled Trials, EBSCO Academic Search Complete, Embase, and Web of Science. The query was performed utilizing the Boolean search phrase “(microwave ablation OR microwave) AND ("surgical resection" OR parathyroidectomy OR operation OR "surgical procedure" OR "surgical excision" OR surgery) AND (hyperparathyroidism OR "parathyroid disease" OR "parathyroid adenoma").” There were no restrictions set to the search. Studies were included if they reported studies comparing outcomes of microwave ablation and parathyroidectomy in patients with primary, secondary, and tertiary hyperparathyroidism. Exclusion criteria included case reports, review articles, conference abstracts, studies performed in animals, articles not in English, expert opinions, and letters to editors.

Data Extraction: Study variables extracted from each article included author, title, publication year, study design, inclusion and exclusion criteria, patient demographic variables and clinical characteristics, follow-up time, cure rate, calcium levels, phosphorous levels, parathyroid hormone levels, alkaline phosphatase level, type of surgical procedure, method of ablation, complications, hospitalization duration, need for re-intervention, and imaging findings. All extracted data were compiled for analysis using Covidence.

Quality Assessment and Risk of Bias: The methodological quality of studies was assessed using the methodological index for non-randomized studies (MINORS).

Results : In progress, the study is currently in the data extraction phase.

Conclusion: This systematic review aims to provide a comprehensive comparison of microwave ablation and parathyroidectomy in the management of hyperparathyroidism. By evaluating outcomes such as cure rates, complication rates, and hospitalization duration, our findings will help inform clinical decision-making and guide future research on the effectiveness and safety of these treatment modalities.

Poster #B84

Investigating the efficacy and safety of Ponatinib in Acute Lymphoblastic Leukemia: A Systematic Review

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Research Category: Health Informatics and Literature Reviews

Background & Objective:
Ponatinib has been well studied in treating Chronic Myeloid Leukemia. However, there are no reviews to date analyzing the efficacy of ponatinib in treating Ph+ Acute Lymphoblastic Leukemia (ALL). Ponatinib is a 3rd generation, broad-spectrum tyrosine kinase inhibitor (TKI) designed to suppress mutations conferring resistance to earlier generations of TKIs including the threonine to isoleucine mutation at position 315 (T315I) in the BCR-ABL fusion protein. We aim to review clinical studies evaluating the efficacy of ponatinib in Ph+ ALL populations.

Methods:
PubMed, Embase, and the Cochrane Library were screened for published, peer-reviewed clinical studies. Study variables included patient age, BCR-ABL^T315I mutation status, previous TKI therapy, comorbidities, dosage, median duration of therapy, median follow-up, the use of combination therapy, response and overall survival, and adverse events. To evaluate efficacy, we compared hematologic, cytogenetic, and molecular response rates as well as overall survival and progression-free survival.

Results:
From 1088 identified studies, 14 clinical studies were included. Two studies illustrated ponatinib as a promising treatment for Ph+ ALL alone, 4 studies indicated that ponatinib is more effective when coupled with chemotherapy, and 5 studies illustrated superior overall survival (OS) rates of ponatinib compared to 1st and 2nd generation TKIs. In particular, the average 3-year OS rates of ponatinib compared to imatinib was 98% vs 58% respectively; the average 3-year OS of ponatinib vs dasatinib was 87.5% vs 46.5% respectively. Out of 583 individuals, there were 56 reports of adverse dermatologic events, 80 adverse events affecting the gastrointestinal tract, and 141 affecting the circulatory system. Out of 56 Ph+ ALL patients carrying the T315I mutation, 52 experienced anti-leukemic responses.

Conclusion:
Ponatinib exhibits promising response rates for Ph+ ALL patients, especially when combined with chemotherapy and allo-SCT, as well as superior overall survival rates compared to earlier generation TKIs.

Poster #B85

Primary Cilia as Timekeepers of Neuronal Aging in Neurodegenerative Diseases

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Research Category: Health Informatics and Literature Reviews

Objective: Aging is a key factor in neurodegenerative diseases such as Alzheimer's disease (AD) and Parkinson's disease (PD). In contrast, Huntington's disease (HD) exhibits an earlier onset, with symptoms potentially emerging in childhood, despite sharing common neurodegenerative mechanisms. This study proposes that primary cilia dysfunction accelerates neuronal aging and neurodegeneration through oxidative stress, mitochondrial dysfunction, and epigenetic changes.

Methods: A comprehensive literature review (2024–2025) was conducted using PubMed and Google Scholar to examine primary cilia dysfunctions in neurodegenerative diseases, including AD, PD, and HD.

Results: Primary cilia function as key regulators of aging by controlling essential signaling pathways, like Sonic Hedgehog (Shh) and Wnt, which are crucial for neuronal homeostasis and survival. In AD, amyloid-beta disrupts circadian rhythm, leading to dysfunctional cilia by increasing its length. This further results in neuroinflammation, reduced astrocyte proliferation, and induce cognitive decline. In PD, primary cilia house dopamine receptors and regulate oxidative stress. In addition, Leucine-rich repeat kinase 2 (LRRK2) protein mutation prevents primary ciliary formation, impairing Shh signaling and decreasing neuroprotective factors, rendering dopaminergic neurons more susceptible to oxidative stress. In HD, the mutant polyQ-Htt protein accumulation in cilia causes ciliary elongation and disruption of intraflagellar transport. In return, this disrupts mitochondrial function, increases oxidative stress, and inhibits DNA repair, leading to accelerated neuronal aging.

Conclusions: Primary cilia act as cellular timekeepers, regulating neuronal aging, and disease progression. Their dysfunction accelerates aging-related processes, including oxidative stress, mitochondrial dysfunction, and impaired DNA repair, contributing to neurodegeneration. In AD and PD, cilia shortening disrupts neuroprotective signaling, while in HD, elongation impairs transport and signaling efficiency. Understanding ciliary dysfunction provides new insight into neurodegenerative mechanisms and suggests that restoring cilia function could be a potential therapeutic strategy to slow neurodegenerative progression.

Poster #B86

Alzheimer's Disease and Cerebral Amyloid Angiopathy - A Review of Impaired Glymphatic Clearance

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Research Category: Health Informatics and Literature Reviews

OBJECTIVE
To understand the role of the glymphatic system in the pathogenesis of Alzheimer's Disease (AD) and Cerebral Amyloid Angiopathy (CAA) to encourage further investigative research focused on restoring glymphatic function to decelerate disease progression. Alzheimer's Disease (AD), the most common form of dementia, is characterized pathologically by the abnormal accumulation of amyloid β (Aβ) and phosphorylated tau (p-Tau). The recent discovery of the glymphatic system offers a potential explanation for Aβ accumulation in AD. Impaired glymphatic flow is also postulated to be responsible for the pathogenesis of CAA to AD.

METHODS
We performed an electronic literature search in PubMed, Google Scholar, and Scopus regarding the glymphatic system, AD, and CAA. We then synthesized common themes, trends, and results into a literature review.

RESULTS
The recent discovery of the glymphatic system suggests that impaired clearance through aquaporin-4 (AQP4) channels on glial membranes, rather than excessive protein production, may contribute to Aβ accumulation leading to AD. The clearance of Aβ by the glymphatic system is most active during rest but can be impaired by sleep deprivation and cerebral vascular abnormalities such as cerebral amyloid angiopathy (CAA) and subarachnoid hemorrhage (SAH).

CONCLUSION
The growing evidence of glymphatic system dysfunction as a contributing factor to AD pathology calls attention to the importance of understanding how impaired CSF fluid dynamics impact disease progression. The glymphatic system's relationship with sleep deprivation, CAA, and SAH, provide insight into the mechanisms underlying accelerated cognitive decline. Collectively, this emphasizes the need for continued exploration of effective diagnostic and therapeutic strategies for AD.

Poster #B87

Title: The Utility of Optical Coherence Tomography in Demarcating Pre-Surgical Margins for Skin Cancer Removal: A Systematic Review and Meta-Analysis

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Research Category: Health Informatics and Literature Reviews

Study Objective: This systematic review and meta-analysis evaluated the effectiveness of optical coherence tomography (OCT) in delineating pre-surgical margins for skin cancer excision and its impact on surgical decision-making. OCT is a non-invasive imaging technique that can be used to visualize superficial layers of the skin up to 2 millimeters beneath the surface. Determining accurate surgical margins in skin cancer surgery is crucial to remove all malignant cells, prevent recurrence, improve patient outcomes, and minimize the need for additional treatments.
Methods: A comprehensive review of 15 studies assessing OCT's role in identifying tumor margins for basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) was conducted. The analysis focused on diagnostic accuracy, sensitivity, specificity, and clinical outcomes related to surgical precision and tissue preservation.
Results: OCT demonstrated high diagnostic accuracy in distinguishing tumor boundaries, with sensitivity and specificity consistently reported above 80%. This tool improved surgical precision, reducing unnecessary excisions and optimizing tissue preservation. OCT's ability to provide real-time, non-invasive imaging allowed for more targeted resections, potentially decreasing the number of Mohs surgical stages and re-excision rates. While results varied due to differences in imaging protocols, studies indicated that combining OCT with other imaging modalities such as reflectance confocal microscopy (RCM) enhanced its diagnostic reliability.
Conclusions: OCT is a valuable adjunct for presurgical margin assessment in skin cancer excision, offering high accuracy and potential improvements in surgical efficiency. Its integration into clinical workflows may reduce unnecessary tissue removal and enhance patient outcomes. Future research should focus on standardizing imaging protocols, integrating OCT with other imaging modalities to optimize agreement with histopathology, and exploring the potential of implementing this technology into clinical practice.

Poster #B88

SUPRACHOROIDAL SPACE CHANGES WITH SUPRACHOROIDAL INJECTIONS OF TRIAMCINOLONE ACETONIDE

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Research Category: Health Informatics and Literature Reviews

Purpose Uveitic macular edema is a complication of acute or chronic uveitis and leads to vision loss when untreated. The first-line treatment for uveitic ocular edema is with corticosteroids (e.g., triamcinolone acetonide). Suprachoroidal space (SCS), a key site for uveoscleral outflow situated between the choroid and sclera, is an interesting route for corticosteroid delivery. Here, we evaluate how the SCS, choroidal thickness (CT), and choroidal vascularity index (CVI) change with suprachoroidal injections of triamcinolone acetonide (Xipere).

Methods: We analyzed enhanced depth imaging optical coherence tomography (EDI-OCT) images of 41 eyes from 34 human subjects (range 14 - 88 years of age). Sub-foveal SCS and CT measurements were performed using the Heidelberg Explorer software, while choroidal vascularity was calculated via binarization with Niblack's auto-local threshold to measure total choroidal area (TCA) and luminal area (LA), and to calculate stromal area (SA) and CVI. CVI was computed by dividing LA by TCA. Regression analyses were utilized to determine the relationship between BCVA and CST change with degree of SCS changes, while Student's t-tests were used to detect differences in SCS, CT, and CVI before and after Xipere injections.

Results: Sub-foveal SCS increases at 1-2 months post-Xipere injections ($p < 0.001$) and returns to normal at 6-9 months after injection. Stromal CT decreased slightly 1-2 months after Xipere injections ($p < 0.001$) but returned to normal or increased 6-9 months after the corticosteroid injection ($p < 0.001$). Improvement of best corrected visual acuity (BCVA) seemed to correlate with SCS elevation at 1 month post-Xipere injection ($R2 = 0.1529$, $p = 0.08$). Neither BCVA nor central subfield thickness (CST) changes at 3 months post-Xipere did not seem to correlate with SCS changes.

Conclusion Patients with a visible SCS (~66%) had had an increase in SCS at one to two months after the first Xipere injection, but it returned to normal by six to nine months after the injection. The eyes with a more pronounced SCS expansion may likely be more susceptible to increases in SCS following suprachoroidal triamcinolone acetonide injections. Interestingly, SCS increased after the second Xipere injection in two patients for whom OCT data were available. By increasing the volume within the SCS, triamcinolone acetonide may reduce the inflammation and swelling in the macula, thereby improving BCVA. Our findings provide insights into the ocular distribution and anatomical effects of suprachoroidal Xipere injections in patients with uveitic macular edema.

Poster #B89

Gluten as an Inflammatory Molecule and Its Relationship With Parkinson's Disease

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Research Category: Health Informatics and Literature Reviews

Objective: Gluten is an inflammatory molecule that has been linked to the onset and progression of Parkinson's Disease. One theory states that gluten causes local inflammation in the gut of patients with pre-existing gluten sensitivity. The inflammation leads to the misfolding of alpha synuclein protein which then is transported to the substantia niagra via the vagus nerve. This project hopes to discuss gluten as an inflammatory molecule and its relation to Parkinson's Disease.

Methods: In this literature review, we use several studies focusing on the effects gluten has systemically on the body, and concerning inflammation in the brain. We specifically looked at how these compounds affect the gut and whether or not they have a significant impact on the structure and function of the gut. We included relevant studies that showed how gluten could cause a cascade effect leading to chronic inflammation and eventually Parkinson's Disease.

Results: Gluten was found to play an inflammatory role in patients with celiac disease and gluten sensitivity. Specifically, it causes inflammation around the gastrointestinal epithelial cells leading to flattening of gut villi. Additionally, gluten was seen to be connected to Parkinson's Disease in terms of possible neurotoxicity stemming from systemic inflammation brought upon by gluten ingestion in patients.

Conclusion: Although there is no clinical proof that a gluten-free diet is beneficial to Parkinson's Disease patients, some patients have reported a reduction of symptoms when following a gluten-free diet. This may be due to some patients having very mild gluten sensitivity that causes very general medical symptoms that may be ignored by patients. Over time, as inflammation remains in the body, misfolding of alpha-synuclein protein may occur and lead to the development of plaques and apoptosis of neurons in the substantia nigra. More research is needed to see whether gluten causes a direct response in the initiation of Parkinson's Disease.

POSTER PRESENTATIONS

ABSTRACTS

(Public Health, Community, and Policy Research)

SESSION B

COLLEGE OF PSYCHOLOGY

Poster #B90

Relationship between health insurance coverage and risky health behavior and the moderating role of race.

Irene Kuang; Jason Lillis
Affiliation(s): CNUPSY
Category: Public Health, Community, and Policy Research

Objective: The purpose of this research was to determine if there is a relationship between the presence of health insurance coverage and presence of risky health behavior; and to further examine the potential moderating role of race on this relationship. Method: Data used for analysis comes from the fourth wave of the National Longitudinal Study of Adolescent Health and consists of 5,114 adults aged 24-34 years (AddHealth; 2008). Add Health is a school-based longitudinal study of a nationally represented sample of adolescents in grades 7-12 who have been followed for more than 20 years. A chi-square test of independence was performed in order to determine association between health insurance coverage and risky health behaviors as dichotomized variables; moderation analysis was then performed to determine effects of race. Results: Results of chi-square test of independence revealed that health insurance was significantly associated with risky health behaviors ($X^2=9.836$, $df=1$, $p<.001$). After running separate chi-squares for each category of race, race was found to be a moderator of the relationship between health insurance coverage and risky health behavior. Conclusion: Having health insurance appears to be significantly associated with engaging in risky health behaviors and this relationship appears to be moderated by race. However, it is difficult to interpret the direction of this relationship due to lack of linearity in the results. Therefore, further research is needed in order to fully understand the interrelationships at play to determine if having health insurance acts as a protective factor and how race might be of influence.

Poster #B91

The predictive ability of common suicide risk factors

Ken Schultze; Jason Lillis
Affiliation(s): CNUPSY
Category: Public Health, Community, and Policy Research

Objective: Suicide is a public health crisis that has not meaningfully decreased despite considerable research and resources aimed at formulating prevention strategies. Many risk factors have been associated with suicide risk, but research often contradicts these findings and finds little consistency in the predictive abilities of these factors. This study aimed to examine common risk factors identified in the literature for salience in predicting suicide. Method: Secondary analysis was conducted with the AddHealth Wave 4 data set. AddHealth is a longitudinal study of adolescents collecting a vast array of data over the course of 5 years. Data was collected from single survey questions such as “has a doctor, nurse, or other healthcare provider ever told you that you have or had depression?” Results: Logistic regression revealed that depression symptoms and perceived stress significantly predicted having a suicide attempt. The model examined in this study accounted for approximately 25% of the variance of suicide risk attempts. Mixed results examining common suicide risk factors in this sample were found to be insignificant in predicting a history of suicide attempts. Conclusion: This analysis corroborated the complex nature of suicide risk factors as examined in the literature. Further research needs to identify more predictive suicide risk factors to improve suicide risk assessment.

Poster #B92

Dialectical materialism revisited: Control sewn into capital and crime

Erin Reim; Jason Lillis
Affiliation(s): CNUPSY
Category: Public Health, Community, and Policy Research

Objective: The primary aim of the study was to explore the association between locus of control and non-violent criminal activity. The literature regarding factors that influence criminal justice involvement indicates that socioeconomic status (SES) is a key correlate of likelihood of having a criminal charge, while the literature on material disadvantage spotlights locus of control (LOC) as a key correlate of SES. Nevertheless, the relationships between SES, LOC, and likelihood of *non-violent* criminal charges remain unknown. Methods: Using data collected from 5,114 participants from the 2008 Wave IV of the National Longitudinal Study of Adolescent Health (AddHealth), this study assessed whether (a) low SES was associated with a higher likelihood of a non-violent criminal charge than high SES, (b) external LOC was associated with a higher likelihood of a non-violent criminal charge than internal LOC, and (c) LOC served as a confound for the relationship between SES and likelihood of non-violent criminal charge. Results: Using chi-square tests of independence and regression analyses, the two primary hypotheses were supported, such that 90.2% and 66.2% of participants who had a non-violent criminal charge also identified as low SES and as having an external LOC, respectively. However, these associations were independent – LOC was not a confounding factor in the relationship between SES and likelihood of a non-violent criminal charge. Conclusion: Given these associations, research on how preventative and anti- recidivism programs can target both financial insecurity and perceived control must be explored.

COLLEGE OF DENTAL MEDICINE

Poster #B93

Category	Public Health, Community, and Policy Research
Affiliation	College of Dental Medicine
Submitter	Mark Palmer
Authors	Antony Ibrahim; Mark Palmer; Dr. Paul Glassman, Valerie Phillips
Title	Completing the Kindergarten Oral Health Assessment (KOHA) Using and AI-Supported Remote Assessment Process
Abstract	Objectives: The primary aim of this study was to compare the results of the California-mandated Kindergarten Oral Health Assessment (KOHA) performed by in-person dental hygienists with those conducted by a remote dentist utilizing a teledentistry support system and decision-support tools. Methods: Approval by CNU IRB committee was received for this study. After training and calibration, KOHA screenings were completed at five schools in two California counties. Consent was given for 109 children. At each school, screenings were completed by two in-person dental hygienists and an in-person non-dental screener, who used a cell phone to capture pictures of the child's teeth. These pictures were uploaded to a specially designed AI software platform designed to detect suspicious issues. A remote dentist reviewed the pictures, the AI report and any notes taken by the non-dental screener and then completed a KOHA as well. The deidentified results were analyzed and compared for agreement and disagreement among the screeners. Results: The results demonstrated that the methodology used in this study produced equivalent or, in some cases, superior outcomes when the KOHA was performed by the remote dentist compared to the in-person dental hygienists. Conclusion: These findings suggest that AI-supported remote assessments have the potential to enhance schools' ability to complete KOHA screenings, ensuring early detection and treatment of dental disease among young children. However, challenges such as the absence of an established payment mechanism and the need for expanded training and calibration support must be addressed for widespread adoption. If these barriers can be overcome, this approach could improve early identification of dental disease, facilitate timely treatment, mitigate the negative impact of untreated oral health conditions on school attendance, and ultimately promote greater oral health equity among children.

COLLEGE OF PHARMACY

Poster #B94

Title: Impact of the CNUCOP Capital Leadership Forum in modernizing Pharmacy Practice

Authors: Peter Tenerelli1; Tibebe Z. Woldemariam2; Jonathan Vue3; Joanna Jullien4.

Affiliations: CNUCOP

Category: Public Health, Community, and Policy Research

Study Objectives:
To determine the effectiveness of the Capital Leadership Forum, as a continuing professional development (CPD) platform to modernize the practice of pharmacy.

Methods:
A retrospective analysis was conducted for six (6) Capital Leadership Forums that focused on modernizing pharmacy practice. 621 participants attended the on-line forums with 233 participants engaging in the pre and post activity surveys and forum evaluations to assess:

1. Enhancement of clinician knowledge and competence: via the delta of correct responses pre and post Forum activity assessments.
2. Improvement of clinician performance: via clinical willingness to implement changes due to the training.
3. Clinician training was perceived to be meaningful, practical, evidence based, and free from bias.

Results
95% of participants perceived the training to be meaningful, practical and evidence based. 96% of respondents agreed the learning objectives were achieved.
(96%) of respondents indicated that the program content was useful for their practice or other professional development. (97%) of respondents indicated that the speakers were knowledgeable about the topic. 96% of respondents indicated the educational material was useful and valuable. (92%) of respondents indicated they would make changes to their practice because of this training. 62% percent indicated they could make changes to their practice easily or somewhat easily. 25% felt they needed more information/research before making changes. 16% reported their primary obstacle to implementing changes is financial restraints, while 29% identified lack of time. Of the 233 responses, there was a 14% increase in correct post compared to pre-activity assessments.

Conclusions
Based on respondent perceptions and knowledge gap pre and post Forum assessments, the CLF is a valuable tool to accelerate the modernization of pharmacy practice. Research also identified obstacles to practice modernization which may be addressed in future presentations.

COLLEGE OF MEDICINE

Poster #B95

Health Insurance Coverage as the Key Driver of Hearing Health: Rethinking the Role of Socioeconomic Resources

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Research Category: Public Health, Community, and Policy Research

Background: Hearing health disparities remain a significant challenge in otolaryngology, disproportionately affecting socioeconomically disadvantaged populations. While financial resources like family savings are assumed to mitigate disparities, their role in hearing outcomes relative to healthcare access remains underexplored. This study utilized National Health and Nutrition Examination Survey (NHANES) data from 2020–2023 to evaluate the interplay between family savings, health insurance, and hearing health.

Methods: NHANES data were analyzed, focusing on the "general condition of hearing" (rated as 1-6) and "difficulty following conversations with noise" as dependent variables. Predictors included health insurance coverage (private or any coverage) and family savings exceeding $20,000. Analytical methods included linear regression, Pearson correlation, Chi-square tests, Quade nonparametric ANCOVA, and ordinal logistic regression.

Results: Private health insurance coverage significantly predicted difficulty following conversations with noise ($p = 0.036$), though the effect size was negligible. The results showed a weak yet statistically significant association between health insurance coverage and general hearing condition,$p<0.001$. In contrast, family savings had no significant independent effect on the general hearing condition after adjusting for insurance coverage (Quade ANCOVA, $p = 0.102$). Furthermore, ordinal logistic regression revealed that time without insurance significantly influenced hearing outcomes ($\chi^2(4) = 10.901$, $p = 0.028$), but the effect size remained negligible (Nagelkerke $R^2 = 0.001$). The "Other" insurance category was 3.3 times more likely to report better hearing condition ($p = 0.017$).

Conclusion: This study challenges assumptions that financial resources directly impact hearing health, demonstrating that healthcare access, rather than wealth, is the key determinant of outcomes. These findings highlight the critical need for policies prioritizing expanded insurance coverage over socioeconomic status improvements alone. By reframing hearing health disparities as an issue of access, otolaryngology can better address barriers to care for vulnerable populations.

Poster #B96

Socioeconomic and Demographic Determinants of Retinopathy Severity: Insights from NHANES Data Analysis

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Research Category: Public Health, Community, and Policy Research

Objective This review systematically assesses the association between retinopathy severity and demographic, socioeconomic, and environmental factors. Retinopathy, a leading cause of preventable blindness in the U.S., results from retinal blood vessel damage, impairing vision processing. Identifying how factors such as race/ethnicity, citizenship, age, education, marital status, and income influence severity can inform targeted public health interventions.

Methods We analyzed data from the National Health and Nutrition Examination Survey (NHANES), the only national survey that integrates in-house interviews, clinical examinations, and laboratory tests to provide a cross-sectional assessment of the health of adults and children in the United States. Specifically, we utilized data from the 2005–2008 cycles—the most recent period with available retinopathy assessments.

The study included participants aged ≥40 years who completed NHANES interviews and retinal imaging. Retinopathy data (N = 4,808) were analyzed for associations with demographic and socioeconomic factors using crosstabulations and chi-square tests. Phi and Cramer's V quantified effect sizes.

Results Significant associations were found between retinopathy severity and multiple factors. Race/ethnicity ($p<0.001$) and citizenship status ($p<0.001$) had small to weak effects. U.S. residency length ($p=0.047$) showed a moderate association, as did education level and household income ($p<0.001$). Overall age was strongly linked ($p<0.001$) with moderate effect sizes, and participants under 24 months exhibited a very strong association ($p<0.001$, Phi=1.210). Marital status, while statistically significant ($p=0.033$), had a limited impact.

Conclusion Retinopathy severity is significantly associated with demographic and socioeconomic factors, including race/ethnicity, citizenship, U.S. residency, age, education, and income. Individuals from underrepresented and lower socioeconomic groups face an elevated risk of severe retinopathy, reflecting disparities in healthcare access and quality. Further research is needed to explore underlying mechanisms and assess interventions to improve visual health equity.

Poster #B97

Impact of E-Cigarette Use and Traditional Smoking on Head and Neck Cancer Incidence: A Population-Level Analysis.

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Research Category: Public Health, Community, and Policy Research

Objectives
To assess the impact of electronic cigarette (e-cigarette) use and traditional smoking on head and neck cancer (HNC) incidence using data from the All of Us Research Program.

Study Design
This retrospective cross-sectional study analyzed de-identified All of Us Researcher Workbench data. HNC cases were identified through relevant ICD codes in participants' electronic health records.

Methods
Participants aged 18 years or older who completed lifestyle survey questions on e-cigarette and smoking behaviors were included. They were divided into age groups: 18–30, 31–45, 46–60, and 60+ years. ICD codes determined HNC incidence and Chi-square tests were used to make pairwise comparisons and assess statistical significance.

Results
Among 338,127 participants (68.1% female), 6.2% reported exclusive e-cigarette use, with 62% aged 18–30 years. 32.3% reported exclusive smoking, with 50% aged 60 years or older. 61.6% reported neither smoking nor vaping, while 12.3% reported dual use of e-cigarettes and cigarettes.
HNC incidence was highest among participants aged 60+ who reported dual use (1.06%, $p < 0.001$), followed by exclusive smokers in the same age group (0.83%, $p < 0.001$) compared to non-users. There was no significant difference in HNC incidence between non-users and exclusive e-cigarette users.

Conclusions
This study suggests that dual use of e-cigarettes and traditional cigarettes, particularly in older adults, is associated with the highest risk of HNC. Exclusive smoking also significantly increased risk, while exclusive e-cigarette use was not linked to a significant increase in HNC incidence. However, the majority of e-cigarette users were younger adults, highlighting the need for long-term research to evaluate the relationship between e-cigarette use and HNC risk over time.

Poster #B98

Associations Between Hearing Health, Insurance Coverage, and Hearing Assessment Utilization: Statistical Insights from a Population-Based Study

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Research Category: Public Health, Community, and Policy Research

Objective: Healthcare payment strategies have been a major topic of discussion in the United States in recent years. However, the specific impact of insurance coverage on a patient's hearing health has yet to be explored. This study uses correlation and regression analyses to analyze the impact of insurance coverage on healing health, focusing on the general condition of hearing, insurance type, and hearing test utilization.

Methods: Data for hearing health and demographics were sourced for 2020-2023 from the National Health and Nutrition Examination Survey (NHANES) and analyzed using Pearson correlations, linear regression, and Quade nonparametric ANCOVA. Key variables included hearing health, difficulty following conversations with noise, and timing of hearing tests. Covariates included health insurance coverage.

Results: A weakly positive but statistically significant correlation was found between general hearing conditions and health insurance coverage ($r = 0.029$, $p = 0.002$). Linear regression analysis revealed that private insurance was a statistically significant predictor of difficulty following conversations in noise ($p = 0.036$), though the effect size was negligible ($R^2 = 0.001$; $B = 0.003$). Quade ANCOVA indicated that the timing of hearing tests varied by hearing condition, even after adjusting for covariates such as insurance coverage and family savings ($F = 105.591$, $p < 0.001$).

Conclusions: Prior research links insurance coverage to improved healthcare access. Our findings, however, reveal that insurance minimizes overall self-reported hearing health, the ability to follow conversations in noisy environments, and frequency of hearing tests. These analyses suggest that insurance alone is inadequate to address hearing health needs. Our results underscore the critical need to address additional barriers including awareness, accessibility, and systemic inequalities with respect to auditory health.

ADDENDUM

The following posters were inadvertently listed twice in the abstract program booklet.

- Poster #B7/#B10 - Comparative Proteomic Analyses for Cilia Fragments in Sickle Cell Disease (Lawrence et al.)
- Poster #B51/#B85 - Primary Cilia as Timekeepers of Neuronal Aging in Neurodegenerative Diseases (Kondle et al.)
- Poster #B52/#B75 - Neurotoxin Protein Trafficking: The Role of Primary Cilia in Tunneling Nanotubes and Exosome Communication (Amar et al.)
- Poster #B55/#B66 - Exploring the Complexities of Long COVID (Donald et al.)
- Poster #A8/#B23 - Genetic Associations with Substance Use and Behavioral Disinhibition in a Twin Cohort (Zhou et al.)