CENTRAL MICHIGAN UNIVERSITY

CMU College of Medicine and Medical Education Partners

2025 Research Symposium

CMU College of Medicine and Medical Education Partners 2025 Research Symposium

Welcome

Welcome to the 2025 Research Symposium sponsored by Central Michigan University College of Medicine and Medical Education Partners. This will be our 10th year celebrating the research accomplishments of our students, residents, fellows and faculty.

This event will host over 150 presentations of research both in oral and poster format. The reviewing panel have chosen 10 for oral presentation in the categories of Basic Translational research, Clinical research, Population Health research and Quality Improvement/Medical Education research, as well as 5 oral presentations on Case Study research. These will all be presented today at the 2025 Research Symposium here at the Dow Event Center. The research spans diverse disciplines and includes research from our multiple campuses, as well as from outside research institutions.

Our plenary speaker this year is Dr. George Matar, a former graduate of the Central Michigan University College of Medicine. Dr. Matar comes to us from Family Health in Greenville, Ohio. Some of his special interests include: Public Health, Lifestyle Medicine, HIV Treatment, Adult and Pediatric LGBTQ+Care, and Adult Gender-Afrfirming Hormone Therapy (just to name a few).

Immediately after Dr. Matar's lecture, please stay to recognize our awardees for oral as well as poster presentations. The award ceremony will begin around 4:25 p.m. Financial support for our awardees was generously provided by the Saginaw County Medical Society Foundation and the College of Medicine Research Administration department.

We are proud of the research by our faculty, residents, fellows and students, and we sincerely thank the presenters, judges, and those in attendance for sharing our enthusiasm and celebrating our research accomplishments.

Kathleen Cowling, D.O., M.S., M.B.A.
Professor, Surgical Discipline Chair, Centtral Michigan University Medical Education Partners, Central Michigan University College of Medicine

Jennifer Granger
Executive Administrative Assistant Graduate Medical Education, Central Michigan University College of Medicine

Ghassan Hamadeh, M.D.
Professor Family Medicine, Medicine Discipline Chair,
Chief Medical Informatics Officer, Central Michigan University Medical Education Partners, Central Michigan University College of Medicine

Nawar Hussin, M.D.
Assistant Professor, Director of Clinical Research, Central Michigan University College of Medicine

Edward McKee, Ph.D.
Professor, Biochemistry and Genetics, Central Michigan University College of Medicine

Karin Przyklenk, Ph.D.
Interim AVP for Clinical Research, CMU, Scientific Director, University Pediatricians Clinical Research Institute, Central Michigan University; Carman and Ann Adams Endowed Chair in Pediatric Research, Children's Hospital of Michigan; Director, Professor of Pediatric Science, Central Michigan University College of Medicine

Neli Ragina, Ph.D.
Associate Professor Genetics and Director of Research, Central Michigan University College of Medicine

Sethu Reddy, M.D., M.B.A.
Senior Associate Dean of Research, Central Michigan University College of Medicine

Myra VanSyckle
Coordinator Research Administration, Central Michigan University College of Medicine

Mary Jo Wagner, M.D.
Professor Surgical Sciences, Central Michigan University Medical Education Partners and CAO/Designated Institutional Official, Central Michigan University College of Medicine

2025 Research Symposium

The Dow Event Center, Saginaw MI

Agenda

9:30 a.m.–12 p.m.
Poster presentations and judging.

11 a.m.–12:30 p.m.
Lunch served.

12:30–1:50 p.m.
Oral Presentations Session 1A and 1B will run simultaneously. Each presenter will have ten minutes to share their work and five minutes for questions from judges and viewers.

Oral Presentations Session 1A
Red Room, moderator – Neli Ragina, Ph.D.
12:30-12:35 p.m. Opening remarks, Sethu Reddy, M.D.
12:35-1:50 p.m. Oral presentations 1A-1 through 1A-5

Oral Presentations Session 1B
Garden Room, moderator – Ghassan Hamadeh, M.D.
12:30-12:35 p.m. Opening remarks, Mary Jo Wagner, M.D.
12:35-1:50 p.m. Oral presentations 1B-1 through 1B-5

1:50–2 p.m.
Break and everyone to re-join in Red Room.

2- 2:10 p.m.
The Dean's Welcome, Red Room, George E. Kikano, M.D.

2:10 p.m. – 2:30 p.m.
State of Research, Sethu Reddy, M.D.

2:30 p.m. – 3:45 p.m.
Oral Presentations Session 2: Each presenter will have ten minutes to share their work and five minutes for questions from judges and viewers.

Oral Presentations Session 2
Red Room, moderator – Neli Ragina, Ph.D.
2:30 p.m.- 3:45 p.m. Oral Presentations 2A-6 through 2A-10

3:45–4:15 p.m.
Plenary speaker - George Matar, M.D.

4:15-4:25 p.m.
Break

4:25-5-p.m.
Award announcements - Edward McKee, Ph.D and Mary Jo Wagner, M.D.
Closing summary and remarks - Sethu Reddy, M.D.

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Accreditation:

Central Michigan University College of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

CMU College of Medicine designates this live activity for a maximum of 7.0 *AMA PRA Category 1 Credit* ™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

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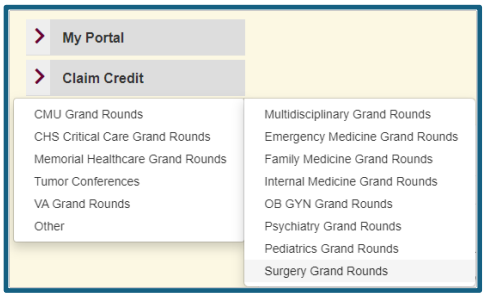

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CMU College of Medicine and Medical Education Partners 2025 Research Symposium

Thank you

Judging panelists

Oral Presentations

Kai Anderson, M.D. Assistant Professor, Central Michigan University, Central Michigan University College of Medicine, Psychiatrist, CMU Health-Saginaw clinic

Andrew Bazakis, M.D. Associate Professor of Emergency Medicine and Foundational Sciences, Central Michigan University College of Medicine

MJ Conway, Ph.D. Professor with Tenure of Foundational Science, Central Michigan University College of Medicine

Kathleen Cowling, D.O. Professor Chair, Emergency Room Program Director, Central Michigan University Health, Central Michigan University Medical Education Partners

Nawar Hussin, M.D. Assistant Professor, Director of Clinical Research, Central Michigan University College of Medicine,

George Matar, M.D. Clinical Assistant Professor, Wright State University, Boonshoft School of Medicine, Greenville, OH

Sundarachalam Pindicura, M.D. General Surgery Resident, Central Michigan University

Xia Wang, M.D., Ph.D. Associate Professor, Clinical Medical Geneticist, Central Michigan University College of Medicine

Poster Presentations

Faculty, staff and community educators from Central Michigan University College of Medicine.

- Preshit Ambade, Ph.D.
- Felix Amissah, Ph.D.
- Beth Bailey, Ph.D.
- Harold J. Bell, Ph.D.
- Wendy Biggs, M.D.
- Joydeep Chaudhuri, M.D.
- MJ Conway, Ph.D.
- Michael D. Elftman, Ph.D.
- Sam Hahn, Ph.D.
- Asef Hoque
- Nawar Hussin, M.D.
- George Kikano, M.D.
- Brianne Lewis, Ph.D.
- Kenneth Lewis, Ph.D.
- John Lowry, Ph.D.
- Brittany Luckett, M.S.
- Richard McCabe, Ph.D.
- Edward E. McKee, Ph.D.
- Jyotsna Pandey, M.D., Ph.D
- Juliette Perzhinsky, M.D.
- Eric Petersen, Ph.D.
- Robert B. Petersen, Ph.D.
- Rosemary Poku, Ph.D.
- Neli Ragina, Ph.D.
- Sethu Reddy, M.D.
- Mariana Rosca, M.D.
- Mildred Willy, M.D.

Faculty, residents and staff from Central Michigan University Medical Education Partners.

- Ihsan Al-Sabbagh, M.D.
- Abishek Bala, M.D.
- Andrew Bazakis, M.D.
- Kenghia Billings, M.D.
- Saad Chaudhry, M.D.
- Kathleen Cowling, D.O.
- Aman Dhaliwal, M.D.
- Olubukola Faturoti, M.D.
- Leslie Francke
- Taylor Gaudard, M.D.
- Zeina Habib, M.D.
- Ghassan Hamadeh, M.D.
- Veronika Kinaschuk, M.D.
- Oleg Kinaschuk, M.D.
- Cecilia Kraus-Horbal D.O.
- Christina Maser, M.D.
- Therese Mead, D.O.
- Bryce Meck, M.D.
- Bernard Noveloso, M.D.
- Nikita Roy, M.D.
- Renee Sundstrom, D.O.
- Steve Vance, M.D.
- Mary Jo Wagner, M.D.
- Xia Wang, M.D.

Faculty from Central Michigan University Herbert H. and Grace A. Dow College of Health Professions.

- Sarah Grinn, Ph.D.
- Lixin Li, M.D., Ph.D.
- Nelda Martinez, Ph.D.
- Emily McIntire, Ph.D.
- Lenna Westerkamp, Ph.D.

Physicians from Children's Hospital of Michigan.

- Ahmad Farooqi, Ph.D.
- Hamza Gorsi, M.D.
- Tarek Husien, M.D.
- Andrew Prout, M.D.
- Ronald Thomas, Ph.D.

Volunteers

Student volunteers from Central Michigan University College of Medicine.

- Kaitlyn Blotter, M-1
- Johnny Chen, M-1
- James Chung, M-3

Staff volunteers from Central Michigan University College of Medicine, and Medical Education Partners

- Bethany Figg
- Jennifer Granger
- Alexis Hadaway
- Colleen Harke
- Julie Johnson
- Donnelle Kiessel
- Alison Rodabaugh
- Patti Sewell
- Katie Simons
- Delaney Trombley
- Myra VanSyckle

The Dow Event Center.

- Kaitlynn O'Keefe
- Crystal Brookins

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- Provides low interest loans to medical students with ties to the Saginaw area, with a maximum of $20,000 over four years.
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  - If the loan recipient returns to Saginaw to practice upon completion of their residency and is a dues paying member of the SCMS/MSMS, 25 percent of the principal balance will be forgiven at the end of each year they are practicing in Saginaw County, with a maximum of $5,000 per year forgiven.
- Assists the SCMS Alliance in awarding scholarships to Saginaw County nursing students.
- Awards scholarships to high school juniors and seniors interested in becoming a physician and practicing in Saginaw County.
- Provides scholarships and awards to medical students and residents for research projects.

The Foundation relies on donations to continue and increase funding programs in order to assist as many students as possible.

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Rev 4/7/25

Research Symposium
April 25, 2025
Live Program

9:30 a.m.–12 p.m. Poster presentations and judging.

11 a.m.–12:30 p.m. Lunch served.

12:30-1:50 p.m.

Oral Presentations Session 1A and 1B will run simultaneously. Each presenter will have ten minutes to share their work and five minutes for questions from judges and viewers.

Oral Presentations Session 1A

Red Room, moderator – Neli Ragina, Ph.D.

12:30-12:35 p.m. Opening remarks, Sethu Reddy, M.D.

12:35-12:50 p.m.
Oral 1A-1 – Yamna Waseem, M.D., Resident and Herchran Singh, D.O., Resident "Impact of Obstructive Sleep Apnea on Maternal Mortality Outcomes during pregnancy: A NIS database analysis"

12:50-1:05 p.m.
Oral 1A-2 – Emma DeVries, M-2 Student "Fetal Health Benefits of Gestational Exercise: A Systematic Review"

1:05-1:20 p.m.
Oral 1A-3 – Michael Chiaramonti, M-2 Student "Effect of a β1-Adrenergic Receptor Allosteric Modulator in a Mouse Model of Ventricular Tachycardia"

1:20-1:35 p.m.
Oral 1A-4 – Zara Chaudhry, M-2 Student "Prenatal Opioid Exposure and Early Child Growth"

1:35-1:50 p.m.
Oral 1A-5 – Ahmed Ftouni, M.D., Resident and Grace Greig, M-3 Student "Comparisons Between Suicide Reporting Methodologies in the State of Michigan"

Oral Presentations Session 1B

Garden Room, moderator – Ghassan Hamadeh, M.D.

12:30-12:35 p.m. Opening remarks, Mary Jo Wagner, M.D.

12:35-12:50 p.m.
Oral 1B-1 – Amaresh Gogikar, M.D., Resident and Charles St.-Germain, M.D., Resident "Beyond the Block: A Rare Case of Lyme-Induced Cardiomyopathy"

12:50-1:05 p.m.
Oral 1B-2 – Ahmad Kafri, M-1 Student "Aberrant Regeneration of the Oculomotor Nerve Following Endovascular Coiling: A Novel Iatrogenic Complication"

1:05-1:20 p.m.
Oral 1B-3 – Batool AlQanber, M.D., Resident "Concurrent Heterozygosity of SPINK1 and CFTR Pathogenic Variants in a Pediatric Patient with Recurrent Acute Pancreatitis"

1:20-1:35 p.m.
Oral 1B-4 – Sayera Muqarram, M.D., Resident "A Case of Severe Symmetrical Intrauterine Growth Restriction in a Premature Infant - Diagnostic Challenges and Multidisciplinary Care"

1:35-1:50 p.m.
Oral 1B-5 – Kush Patel, M-3 Student and Ahmad Shereef Zaky, M.D., Resident "A Case of Prolonged Pica and Amylophagia in an ESRD Patient: Interplay of Dialysis-Related Stressors and Psychiatric Comorbidity"

1:50-2 p.m. Break and everyone to re-join in Red Room

2-2:10 p.m. The Dean's Welcome, Red Room, George Kikano, M.D.

2:10-2:30 p.m. State of Research, Sethu Reddy, M.D.

2:30-3:45 p.m.
Oral Presentations Session 2. Each presenter will have ten minutes to share their work and five minutes for questions from judges and viewers.

Oral Presentations Session 2

Red Room, moderator – Neli Ragina, Ph.D.

2:30–2:45 p.m.
Oral 2A-6 – Bhakthi Liyanage, M-2 Student "A Comparative Study of Large Language Models' Performance on Standardized Medical Examinations"

2:45-3 p.m.
Oral 2A-7 – Udit Thawani, M-2 Student "Factors Associated with Development of Acute Kidney Injury in Hospitalized Patients Following Traumatic Hip Fracture Surgery"

3-3:15 p.m.
Oral 2A-8 – Varun Vadnala, M-4 Student and Sydney Pauls, M-4 Student "Clinical Outcomes of Robotic versus Laparoscopic Cholecystectomy; A Retrospective Pilot Study"

3:15-3:30 p.m.
Oral 2A-9 – Andie Blankenstein, M-2 Student "Impact of Delivery Mode on Infant Intestinal Microbial Diversity and Postoperative Infection after Cardiopulmonary Bypass"

3:30-3:45 p.m.
Oral 2A-10 – Hamdi Lababidi, M-2 Student "Influence of Helicobacter pylori on Bariatric Surgery Outcomes"

3:45–4:15 p.m. Plenary speaker - George Matar, M.D.

4:15-4:25 p.m. Break

4:25-5 p.m. Award announcements - Edward McKee, Ph.D and Mary Jo Wagner, M.D.

Closing summary and remarks - Sethu Reddy, M.D.

Meet our Plenary Speaker

Dr. George W. Matar is a family and preventive medicine physician and an American Academy of HIV specialist currently working at Family Health Services of Darke County as a primary care provider and core faculty at the Wright State University Boonshoft School of Medicine Rural Family Medicine Residency Program. He is a Central Michigan University College of Medicine Class of 2020 alum. Staying true to the mission of the College, Matar serves the rural and medically underserved communities in Drake County. After graduating from the College of Medicine he completed his dual residency in Family Medicine and Preventive Medicine at University Hospitals Cleveland Medical Center. During residency, he also obtained his master's in public health from Case Western University's School of Medicine.

As a medical student, Matar was the recipient of the CMU College of Medicine summer scholar award, the Blue Cross and Blue Shield of Michigan student research award, and The Arnold P. Gold Foundation Student Summer fellowship award for his scholarly work in the areas of cardiovascular and mental health. His work resulted in multiple publications and presentations at both regional and national levels.

During his time at University Hospitals Cleveland Medical Center for his Family and Preventive Medicine Residency Program, he served as chief resident and received the Top Trainee Teacher award through Case Western University's School of Medicine for his dedication towards medical student education and scholarly activities. He also completed his Public Health capstone project on the topic of Sexual and Gender Minority Health through his residency clinic that changed the climate of his clinic, making it more inclusive and welcoming for patients who identify as sexual and gender minorities. Through his capstone, he also created the first resident-run Gender-Affirming Care Clinic at University Hospitals. This project also included regular Safe Zone Training activities that educated clinic staff on topics related to sexual orientation, gender identity and gender expression.

As part of his current clinical practice, Matar provides specialty primary care to the LGBTQ community, gender-affirming care, HIV prevention (PrEP), HIV treatment, latent TB treatment, and chronic hepatitis B and C treatment. As core faculty of the residency program, he is currently the lead faculty for the Clinical Competency Committee and precepts PGY1-PGY3 residents in their continuity clinic.

Through Wright State University's Boonshoft School of Medicine, Matar also precepts third- and fourth-year medical students during their family medicine rotations and sub-internships in his clinic. He is actively involved in scholarly work and sets up health and wellness events with community partners discussing both traditional and non-traditional medicine. He also creates monthly live-stream talks titled "Talk with the Doc" to discuss health-related topics and interview community health partners.

2025 Index of Abstracts Accepted for the Symposium

Presentation	Category	Submitter Name	Submitter Name Last	Title
B-1	Basic & Translational	Garrett	Borgman	Ameliorative Properties of Trans-beta-2-styryl Boronic Acid (TBSA) on In Vivo Models of Alzheimer's Disease
B-2	Basic & Translational	Tal	Chamdi	From Self-Medication to Basic Science: Analyzing Ivermectin and Fenbendazole Use in Pancreatic Cancer Patients
Oral 1A-3	Basic & Translational	Michael	Chiaramonti	Effect of a β1-Adrenergic Receptor Allosteric Modulator in a Mouse Model of Ventricular Tachycardia
B-3	Basic & Translational	Chinonye	Eze	Sustained Efficacy of Botulinum Toxin in Primary Palmar Hyperhidrosis: A Systematic Review of Duration, Quality of Life, and Satisfaction
B-4	Basic & Translational	Lucas	Garmo	A Systematic Review of the Use of Etanercept in Animal Models of Spinal Cord Injury
B-5	Basic & Translational	megan	O'Mara	Altered NFκB Signaling in Irritable Bowel Disease Affects M Cell Abundance and Immune Cell Interactions
B-6	Basic & Translational	Sid	Osborn	The effects of etanercept and methylprednisolone combinatorial therapy in a rat model of spinal cord injury
B-7	Basic & Translational	Matthew	Ruge	Molecular Characterization of Idiopathic Nephrotic Syndrome
B-8	Basic & Translational	Tim	Seyidov	Effects of UNK Gene Expression on Metabolism and Cancer Stem Cell Phenotype in Breast Cancer
B-9	Basic & Translational	Jacob	Surma	Title: Halting the cycle: KIF23 knockout using siRNA encapsulated PAMAM dendrimers on U-87 human glioblastoma cells in vitro
B-10	Basic & Translational	Nhan	Tran	Influence of Selective Versus Nonselective Joint Preparation in First Metatarsophalangeal Arthrodesis: A Systematic Review and Meta-analysis
B-11	Basic & Translational	Elsa	Varughese	Evaluating Advanced Lipidomics in Predicting Major Adverse Cardiovascular Events: A Multi-Dataset Analysis
C-1	Case Report/Case Series	Robert	Alhaddadin	Graves' Disease: a real pain in the neck
Oral 1B-3	Case Report/Case Series	Batool	AlQanber	Concurrent Heterozygosity of SPINK1 and CFTR Pathogenic Variants in a Pediatric Patient with Recurrent Acute Pancreatitis

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Presentation	Category	Submitter Name	Submitter Name Last	Title
C-2	Case Report/Case Series	Carmen	Avramut	Culture and Self-Immolation as a Method of Suicide
C-3	Case Report/Case Series	Yashi	Ballal	Bilateral Pulmonary Embolism with Bi-atrial Thrombi Entrapped in a Patent Foramen Ovale
C-4	Case Report/Case Series	William	Ballew	Presentation and Evaluation of an Unusual Headache: A Case Report
C-5	Case Report/Case Series	Archita	Chandra	Novel GI Variant Lemierre Syndrome: Case Report
C-6	Case Report/Case Series	Nick	Chiaramonti	Management of a Traumatic Multiligament Knee Injury with Coinciding Patellar Tendon Rupture: A Case Report
C-7	Case Report/Case Series	Cleris	Christian	The Diagnostic Challenge of Persistent Thrombocytopenia: A Case of Immune Thrombocytopenia
	Case Report/Case Series	Cleris	Christian	Cemiplimab and Severe Hepatitis: The Importance of Vigilance in Immune Checkpoint Inhibitor Therapy
C-8	Case Report/Case Series	Haritha	Darapaneni	"An Unusual Presentation of Streptococcal Meningitis Masquerading as Stroke: A Diagnostic Pitfall with Fatal Consequences"
C-9	Case Report/Case Series	Joel	DeJonge	An Overuse Injury Leading to Pronator Teres Syndrome: A Case Report
C-10	Case Report/Case Series	Joel	DeJonge	Edge to edge excellence: TEER in true eccentric commissural mitral valve regurgitation
C-11	Case Report/Case Series	Elizabeth	Fearey	A Rare Case of Broad Ligament Hematoma During Intercourse
C-12	Case Report/Case Series	Chancee	Forestier	Brenner Tumor: A Case Study
	Case Report/Case Series	Brittany	Garza	Case of Bilateral Lower Extremity Pyogenic Gangrenosum
C-13	Case Report/Case Series	Carly	Gatchell	Venous Thromboembolism with Mechanical Thrombectomy in Pregnancy
Oral 1B-1	Case Report/Case Series	Amaresh	Gogikar	Beyond the Block: A Rare Case of Lyme-Induced Cardiomyopathy

Presentation	Category	Submitter Name	Submitter Name Last	Title
C-14	Case Report/Case Series	Amaresh	Gogikar	Dual Rescue: Managing Saddle Pulmonary Embolism and Right Atrial Thrombus with the FlowTriever System
C-15	Case Report/Case Series	Lyluma	Ishfaq	A Vascular Conundrum: Lemierre's Syndrome with Superior Vena Cava Obstruction – A Multidisciplinary Triumph
C-16	Case Report/Case Series	Eunji	Jeong	A Rare Case of Pseudobradycardia with Ventricular Bigeminy and Recurrent Dizziness
C-17	Case Report/Case Series	Eunji	Jeong	A Challenging Case of Multilevel Spinal Discitis, Osteomyelitis, and Epidural Abscesses with Recurrent Infections – Comprehensive Management and Recovery Trajectory: A Case Report
Oral 1B-2	Case Report/Case Series	Ahmad	Kafri	Aberrant Regeneration of the Oculomotor Nerve Following Endovascular Coiling: A Novel Iatrogenic Complication
C-18	Case Report/Case Series	Afrasayab	Khan	Recurrent Pericardial Effusion After Pacemaker Lead Revision: An Interesting Cardiac Challenge
C-19	Case Report/Case Series	Carley	Kibbee	Vasopressor Induced Limb Ischemia Following Treatment for Toxic Shock Syndrome
C-20	Case Report/Case Series	Kevin	Knapp	Thyrotoxicosis Presenting as Acute Psychosis: A Case Report
C-21	Case Report/Case Series	Shivani	Lohit	A Bleeding Mystery: A Case of Uterine Artery Pseudoaneurysm
C-22	Case Report/Case Series	Obianuju	Madu	Depakote-Induced Aggression and Suicidal Ideation in a Pediatric Patient with Autism Spectrum Disorder: A Case Report
C-23	Case Report/Case Series	Obianuju	Madu	Conversion Disorder With Speech Symptoms in the Context of Fluoxetine-Induced Hypomania: A Case Report
C-24	Case Report/Case Series	Garrett	Mason	A case report of a patient with atraumatic prosthetic posterior knee dislocation
C-25	Case Report/Case Series	Matteo	Mazzella	Role of Immune Dysfunction and EBV in ALK+ Inflammatory Myofibroblastic Tumor
C-26	Case Report/Case Series	Mara	McMurray	When "You're almost 40" isn't the source of your pain: A case of an unexpected Popliteal Schwannoma

Presentation	Category	Submitter Name	Submitter Name Last	Title
C-27	Case Report/Case Series	Bradley	Miller	Suspected Lisdexamfetamine (Vyvanse) Induced QTc Prolongation: A Case Report
C-28	Case Report/Case Series	Lisa	Mun	The Diagnostic Dilemma: Pemphigus Vulgaris with Classic Features but Negative Biopsy
Oral 1B-4	Case Report/Case Series	Sayera	Muqarram	A Case of Severe Symmetrical Intrauterine Growth Restriction in a Premature Infant - Diagnostic Challenges and Multidisciplinary Care
C-29	Case Report/Case Series	Diane	Mutete	A Raspy Riddle: Laryngeal Mass in a Patient Presenting with Hoarseness
C-30	Case Report/Case Series	Jaspreet	Nannar	A Case of Post Bariatric Surgery Hypoglycemia 20 Years Later
C-31	Case Report/Case Series	Zachary	Nine	The Dangers of Diphenhydramine (Benadryl) Misuse Among Adolescents
Oral 1B-5	Case Report/Case Series	Kush	Patel	A Case of Prolonged Pica and Amylophagia in an ESRD Patient: Interplay of Dialysis-Related Stressors and Psychiatric Comorbidity
C-32	Case Report/Case Series	Yaseen	Qaroof	A Complex Case of Polyarticular Juvenile Idiopathic Arthritis with Ocular Complications
C-33	Case Report/Case Series	Elit	Quingalahua	Alagille Syndrome, uncommon cause of failure to thrive.
C-34	Case Report/Case Series	Christelle	Rahme	Pembrolizumab-Associated Immune-Mediated Pleuritis with Pleural Effusion: A case report
C-35	Case Report/Case Series	Alan	Ross	When Pneumonia Is Not Just Pneumonia: Recognizing Daptomycin-Induced Eosinophilic Pneumonia
C-36	Case Report/Case Series	Jacob	Surma	Case Report: Crohn's Disease Diagnosed Intraoperatively During a Trauma Exploratory Laparotomy
C-37	Case Report/Case Series	Toni	Tornberg	Use of U-500 regular insulin in pregnancy for suboptimal control using high doses of U-100 regular insulin
	Case Report/Case Series	Stephen	Weatherholtz	Charcot Foot Complications Following Bunion Surgery in a Diabetic Female: A Case Report
C-38	Case Report/Case Series	Benjamin	West	Chest Quivering: A Complication of Multi-Lead Dislodgement in CRT-D Implantation

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Presentation	Category	Submitter Name	Submitter Name Last	Title
C-39	Case Report/Case Series	Carrie	Wild	Acute Fatty Liver in Pregnancy
CI-1	Clinical	Abdulghafoor	Alani	Robotic-Assisted Appendectomy: Is It Safe and Effective in Urgent Settings?
CI-2	Clinical	Margaret	Beyer	Comparing Outcomes of Mechanical and Manual CPR in Out-of-Hospital Cardiac Arrest: A Retrospective Cohort Study
	Clinical	Kasandra	Bienkowski	A Scoping Review of Single Versus Double Incision Fasciotomy for Acute Compartment Syndrome
Oral 2-9	Clinical	Andie	Blankenstein	Impact of Delivery Mode on Infant Intestinal Microbial Diversity and Postoperative Infection after Cardiopulmonary Bypass
CI-3	Clinical	Andie	Blankenstein	Optimizing Malnutrition Screening as a Predictor of Acute Kidney Injury and ICU Outcomes in Critically Ill Children
Oral 1A-4	Clinical	Zara	Chaudhry	Prenatal Opioid Exposure and Early Child Growth
CI-4	Clinical	Catherine	Crow	Examining the Relationship between Substance Use during Pregnancy and Mode of Delivery: Potential Variations by Substance Used
CI-5	Clinical	Jenna	Currier	A Retrospective Cohort Study: The Safety and Feasibility of Biologic Infusions in Dermatology Practice
CI-6	Clinical	Jenna	Currier	A Retrospective Cohort Study: The Efficacy of Omalizumab in Treating Chronic Idiopathic Urticaria and Concomitant Atopic Dermatitis
CI-7	Clinical	Christa	Deban	Mental health effects on pregnancy outcomes in patients with intellectual and developmental disabilities using the National HCUP Database
CI-8	Clinical	Joel	DeJonge	Unrecognized Endocrine Contributions in Women with Recurrent Fractures: The Need for Better Screening
CI-9	Clinical	Mashood	Farooqi	PREVALENCE AND IMPACT OF METABOLICALLY HEALTHY OBESITY ON IN-HOSPITAL OUTCOMES OF GERIATRIC PATIENTS HOSPITALIZED WITH OBSTRUCTIVE SLEEP APNEA: INSIGHTS FROM NATIONAL INPATIENT SAMPLE, 2019
CI-10	Clinical	Rica	Generoso	National Trends of Using Total Neoadjuvant Therapy (TNT) for Locally Advanced Rectal Cancer: An Analysis of the National Cancer Database

Presentation	Category	Submitter Name	Submitter Name Last	Title
CI-11	Clinical	Rica	Generoso	National Trends of Using Immunotherapy for Locally Advanced Rectal Cancer: An Analysis of the National Cancer Database.
CI-12	Clinical	Amaresh	Gogikar	Long-Term Mortality Risk in TAVR Patients with Mitral Stenosis: A Systematic Review and Meta-Analysis
CI-13	Clinical	Neehar	Haryadi	Does Hypothyroidism Confer an Increased Fracture Risk in Postmenopausal Osteoporotic Women Who Have a History of Joint Replacement: A Retrospective Study
CI-14	Clinical	Emily	Heinrich	Comprehensive Systematic Review of Spinal Cord Injuries in Equestrian Athletes: Incidence, Risk Factors, and Outcomes
CI-15	Clinical	Benjamin	Herdman	Looking Beyond the Immune Response: Relationships Between Allergies and Mental Health
CI-16	Clinical	Phoebe	Hu	Pain Features in Acute Demyelinating Optic Neuritis
CI-17	Clinical	Husna	Hussaini	Redefining Remote Healthcare: Evaluating Older Adults' Perspectives Towards a Telehealth Robot
CI-18	Clinical	Sharat	Kamath	The Effectiveness and Safety of Mavacamten for the Treatment of Obstructive Hypertrophic Cardiomyopathy: A Systematic Review
CI-19	Clinical	Afrasayab	Khan	Comparative Outcomes of MitraClip Therapy Versus Surgical and Conservative Management for Mitral Regurgitation: A Meta-Analysis and Systematic Review
CI-20	Clinical	Afrasayab	Khan	Cardiovascular Outcomes of GLP-1 Receptor Agonists in Heart Failure with Reduced Ejection Fraction: A Systematic Review
CI-21	Clinical	Abimbola	Kolawole	Factors Contributing To Achilles Tendon Re-rupture: A Systematic Review
CI-22	Clinical	Konrad	Lautenschlag	A Systematic Review of Recent Developments in Platelet-Rich Plasma Therapy in Hip Osteoarthritis: Variability in Protocols and Clinical Outcomes (2019–2024)
CI-23	Clinical	Jessica	Liu	Utilization of Medical Services Among Infants with a History of Prenatal Substance Exposure
CI-24	Clinical	Miranda	Manzo	Postpartum Depression Following a Substance-Exposed Pregnancy: The Roles of Age, Race/Ethnicity, and Prior Mental Health Experience

Presentation	Category	Submitter Name	Submitter Name Last	Title
CI-25	Clinical	Matteo	Mazzella	Mesenchymal Stem Cells And The Effect of Allogeneic Hematopoietic Stem Cell Transplantation in Shwachman-Diamond Syndrome
CI-26	Clinical	Madison	Miller	Effects of COVID-19 on Breast Cancer Outcome
CI-27	Clinical	Lisa	Mun	Mind Over Picking: A Systematic Review of Nonpharmacological Interventions for Skin Picking Disorder
CI-28	Clinical	Carla	Obeid	Physiological Effects of a Respiratory Muscle Training Device on Ventilation and Airway Pressures
CI-29	Clinical	Riley	O'Keefe	Improving Access to Prenatal Care for Pregnant Individuals with Intellectual and Developmental Disabilities: Barriers and Potential Interventions
CI-30	Clinical	Jawad	Saad	Evaluating the Efficacy of Early Ambulation Within 4 Hours Post-Elective Lumbar Surgery: A Comprehensive Analysis from the Michigan Spine Surgery Improvement Collaborative (MSSIC)
CI-31	Clinical	Alyaa	Saleh	Depression during pregnancy: To pharmacologically treat or not?
Oral 2-10	Clinical	Udit	Thawani	Factors Associated with Development of Acute Kidney Injury in Hospitalized Patients Following Traumatic Hip Fracture Surgery
Oral 2-7	Clinical	Varun	Vadnala	Clinical Outcomes of Robotic versus Laparoscopic Cholecystectomy; A Retrospective Pilot Study
CI-32	Clinical	Makenzie	Wank	The Prognostic Nutritional Index: Assessing its Correlation in Severe Alcohol Withdrawal Syndrome in Mid-Michigan
CI-33	Clinical	Spencer	Williams	Evaluating NALIRIFOX and FOLFIRINOX for Recurrent Pancreatic Ductal Adenocarcinoma: A Systematic Review Highlighting the Evidence Gap
CI-34	Clinical	Payton	Wolbert	Does Admitting Specialty Influence the Outcome of Cholecystitis: Review of Emergency Department Community Hospital Experience
CI-35	Clinical	Ahmad	Yousef	Exploring the Extent of, and Factors associated with Osteoporosis Treatment Gap after Fragility Hip Fracture in a Community Setting
P-1	Population Health	Gabriela	Andrzejewska	Kratom Use Among Reproductive Age Women
P-2	Population Health	Gabriela	Andrzejewska	Exploring the Link Between Psychological Distress and Poly-Substance Use Among Individuals That Use Kratom

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Presentation	Category	Submitter Name	Submitter Name Last	Title
P-3	Population Health	Andie	Blankenstein	Psychological Outcomes of Facial Transplantation: A Systematic Review of Depression and Mental Health-Related Quality of Life
P-4	Population Health	Nathanael	Brookshire	Examining the Impact of Student Involvement on Patient Satisfaction in Free Clinics: An Integrated Scoping Review & Meta-Analysis
P-5	Population Health	Jack	Byrne	High Levels of Overall Patient Satisfaction are Reported after Sacroplasty, Vertebroplasty and Kyphoplasty
P-6	Population Health	Nick	Chiaramonti	The Impact of Diabetes on Outcomes of Tibiotalocalcaneal Arthrodesis: A Systematic Review of Available Comparative Studies
P-7	Population Health	Nick	Chiaramonti	The Impact of Extended Tibial Stem Use on Primary Total Knee Replacement Outcomes: A Systematic Review and Meta-Analysis
P-8	Population Health	Nick	Chiaramonti	Arthroscopic Treatment of Chronic Lateral Ankle Instability Provides Better Functional Outcomes and Decreased Complications Compared to Open Broström Technique: A Systematic Review and Meta-Analysis
P-9	Population Health	Nick	Chiaramonti	Return-to-Play After Arthroscopic Distal Clavicle Excision in Athletes: Current Concepts and Literature Review
	Population Health	Shahzaib	Chughtai	Chemotherapy-Induced Cognitive Impairment: Mechanisms, Emerging Biomarkers, and Therapeutic Interventions
P-10	Population Health	Anna	Coleman	A systematic review on the developmental health implications of excessive screen exposure in children
P-11	Population Health	Anna	Coleman	A systematic review on the eating behaviors of youth exceeding electronic device recommendations
P-12	Population Health	Anna	Coleman	Child autism spectrum disorder following maternal abuse and trauma history
P-13	Population Health	Joe	Cummings	Assessing Long-term Cardiovascular Outcomes with Methylphenidate and Amphetamines Use: A Systematic Review
P-14	Population Health	Zane	Deliu	Living Situation and Healthcare Utilization in Older Adults with Self-Reported Diabetes According to the National Health Interview Survey (2021-2022)
Oral 1A-2	Population Health	Emma	DeVries	Fetal Health Benefits of Gestational Exercise: A Systematic Review

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Presentation	Category	Submitter Name	Submitter Name Last	Title
P-15	Population Health	Emma	DeVries	High episiotomy rates and associated maternal mortality in developing countries
P-16	Population Health	Emma	DeVries	Contrasting Care: a Comparative Analysis of the Indian and USA Healthcare Systems
	Population Health	Emma	DeVries	Exploring Global Health: an Observational Study of the Indian Healthcare System
P-17	Population Health	McKenna	Dooley	Navigating Barriers to Fall Prevention for Older Adults in Rural Mid-Michigan
P-18	Population Health	Alexander	Forrest	Project INCLUDE: Reducing Social Isolation and Loneliness Among Older Adults
Oral 1A-5	Population Health	Ahmed	Ftouni	Comparisons Between Suicide Reporting Methodologies in the State of Michigan
P-19	Population Health	Amaresh	Gogikar	Rising Burden of Atrial Fibrillation in Young Adults Hospitalized with Acute Coronary Syndrome: A Nationwide Analysis
P-20	Population Health	Amaresh	Gogikar	Prediabetes in Elderly NSTEMI Patients Undergoing PCI: Prevalence, Outcomes, and Insights from a Nationwide Study (2016–2020)
P-21	Population Health	Emily	Hock	Comparing the Efficacy of Levonorgestrel Intrauterine Device and Oral Levonorgestrel for Emergency Contraception: A Systematic Review and Meta-Analysis
P-22	Population Health	Rylee	Holek	Assessing the Effectiveness of the Fall Prevention Program Through Balance Assessments and Participant Surveys
P-23	Population Health	Matthew	Jackson	Physician dietary advice has little association with dietary intake of adolescents in cross-sectional and longitudinal study, evidence of moderation by weight perception
P-24	Population Health	Karam	Khasawneh	Racial Disparities in Clinical and Cost Outcomes Among Heart Transplant and Left Ventricular Assist Device Recipients: A Systematic Review
P-25	Population Health	Abimbola	Kolawole	Evaluating Sarcoid-like Reactions in Melanoma Patients Treated with Pembrolizumab: A Systematic Review
P-26	Population Health	Julia	Kwapiszewski	ENDS Use During Pregnancy: A Meta-analysis of Adverse Birth Outcomes
Oral 2-8	Population Health	Hamdi	Lababidi	Influence of Helicobacter pylori on Bariatric Surgery Outcomes

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Presentation	Category	Submitter Name	Submitter Name Last	Title
	Population Health	Ellen	Lauinger	Melanocortin-4 receptor (MC4R): a potential mediator of hypertension in women with polycystic ovary syndrome (PCOS)
P-27	Population Health	Erin	Mattson	Is there an Association Between PFAS Exposure and Cancer Incidence in Michigan Counties?
P-28	Population Health	Sabriyah	Mir	The Relationship Between Tobacco Use During Pregnancy and Postpartum Depression: A Retrospective Analysis
P-29	Population Health	Umme Aiman	Mirza	An Examination of the Effects of Sleep Deprivation on Cardiovascular and Bone Health: A Systematic Review
P-30	Population Health	Adil	Mohammed	GLOBAL POOLED META-ANALYSIS OF COGNITIVE IMPAIRMENT AND SUBGROUP VARIATION IN ELDERLY HEART FAILURE PATIENTS
P-31	Population Health	Devin	Neumann	Maternal Mental Health Conditions as a Predictor of Child Atopic Disease
P-32	Population Health	Jason	Odisho	Maternal Diabetes as a Risk Factor for Retinopathy of Prematurity: A Systematic Review
P-33	Population Health	Megan	O'Mara	Navigating Asthma in Pregnancy: Barriers, Disparities, and Management Strategies
P-34	Population Health	Manas	Peddiboyina	Trends and Factors Associated with Oral Nicotine Pouch (ONP) Usage among Adolescents between 2022 and 2023
P-35	Population Health	Kennedi	Price	Incidence of lower back pain in adolescent weightlifters: a systematic review
P-36	Population Health	Allison	Rakowski	Seasonal Variation in Maternal Vitamin D Levels on Neonatal Outcomes: A Systematic Review
P-37	Population Health	Lydia	Sadlowski	Bridging Generations Through Music and Games: Assessing the Impact of Intergenerational Engagement on Loneliness and Social Connection
P-38	Population Health	Aya	Sameer	A Systematic Review of Maternal Bulimia: Physical Impacts on Maternal Pregnancy Outcomes
	Population Health	Angela	Sasaki Cole	Educational Interventions and Implementation to Decrease Vaccine Hesitancy in Minority Populations
P-39	Population Health	Varun	Vadnala	Current Status of Robotic-Assisted Abdominal Surgery; A Literature Review
P-40	Population Health	Elsa	Varughese	Risk Factor Scoring System for Postpartum Depression: A Proactive Approach to Identification and Prevention

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

2025 Index of Abstracts Accepted for the Symposium

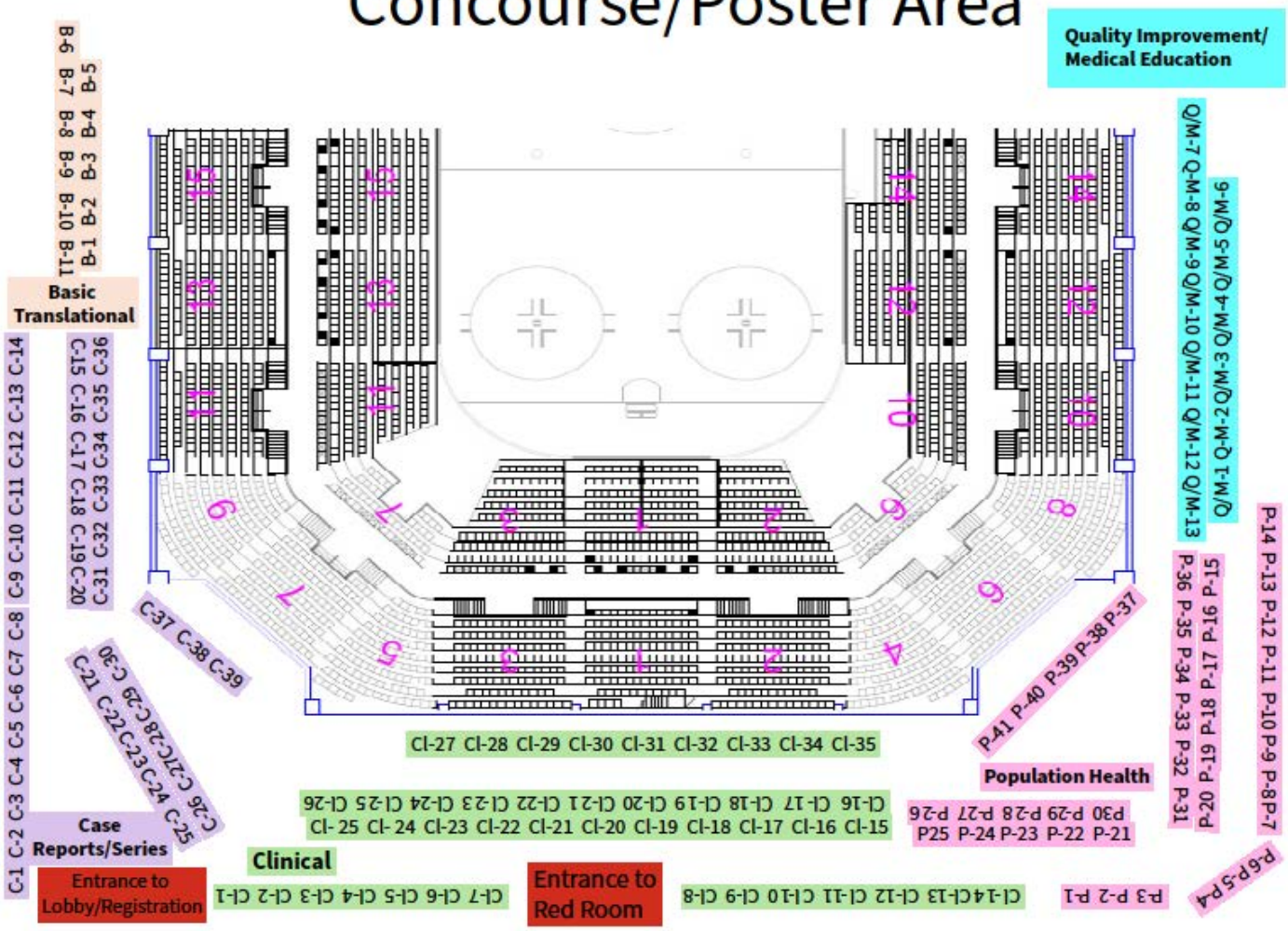
Presentation	Category	Submitter Name	Submitter Name Last	Title
Oral 1A-1	Population Health	Yamna	Waseem	Impact of Obstructive Sleep Apnea on Maternal Mortality Outcomes during pregnancy: A NIS database analysis
P-41	Population Health	Spencer	Williams	Shouldering the Cost: A First Look at Insurance and Arthroplasty Outcomes
	Quality Improvement/Medical Education	Batool	AlQanber	Barriers of adequate treatment of iron deficiency anemia in pediatric patients in underserved community clinics
Q/M-1	Quality Improvement/Medical Education	Gabriela	Andrzejewska	Changes in Participant Mood in Strength and Balance Improving Exercises
	Quality Improvement/Medical Education	Carmen	Avramut	Bridging Theory and Practice: A Simulation Curriculum to Improve Psychiatry Residents' Clinical Preparedness
Q/M-2	Quality Improvement/Medical Education	Rachel	Bishop	Surveying Occupational Medicine Physicians on Worker Health and Extreme Heat
Q/M-3	Quality Improvement/Medical Education	Catherine	Crow	Improving Picky Eating Counseling by Residents in a Continuity Clinic using Interactive Educational Tools
Q/M-4	Quality Improvement/Medical Education	Rachel	Fletcher	Medical Students' Perceptions of Artificial Intelligence Use in Medical Practice: A Systematic Review
Q/M-5	Quality Improvement/Medical Education	Autumm	Heeter	Perceptions of Medical Students of the Cadaver as a First Patient or Teacher
Q/M-6	Quality Improvement/Medical Education	Tejas	Kakunje	Sleep Smarter: Innovative Screening for Obstructive Sleep Apnea with Apple Watches
Oral 2-6	Quality Improvement/Medical Education	Bhakthi	Liyanage	A Comparative Study of Large Language Models' Performance on Standardized Medical Examinations
Q/M-7	Quality Improvement/Medical Education	Bhakthi	Liyanage	Enhancing Crisis Preparedness for Rural Dispersed Older Adults: A Focus Group Analysis of the CMU-CARES Crisis Toolkit
Q/M-8	Quality Improvement/Medical Education	Alexia	Lucas	The Impact of Longitudinal Community Service on Medical Students' Attitudes and Preparedness to Care for Individuals with Disabilities
Q/M-9	Quality Improvement/Medical Education	Chad	Martin	Descriptive Insights from Program Directors and Literature: Patient Caps in Internal Medicine Residency
Q/M-10	Quality Improvement/Medical Education	Bradley	Miller	The Prescription for Audience Engagement in a Psychiatry Podcast: Insights for Medical Educators

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Presentation	Category	Submitter Name	Submitter Name Last	Title
Q/M-11	Quality Improvement/Medical Education	Umme Aiman	Mirza	Constructing Knowledge in the Age of Artificial Intelligence: A Comparative Study Between AI and Medical Student Performance in Problem-Based Learning for Basic Sciences
	Quality Improvement/Medical Education	Varun	Vadnala	The Influence of Cultural and Religious Student Organizations on Matriculated Medical Students
Q/M-12	Quality Improvement/Medical Education	Jaimie	Van De Burg	Comprehensive Sexual Education and Adolescent Health: A Study of Pregnancy and STI Rates in Grand Rapids, MI
	Quality Improvement/Medical Education	Erin	Williams	Role of Cadaveric Dissection in Highlighting Anatomical Abnormalities and Maximizing its Utility in Medical Education
Q/M-13	Quality Improvement/Medical Education	Maria	Younan	Involving End-Users in the Design of a Digital Opioid Safety Intervention for Adolescents and Young Adults with Inflammatory Bowel Diseases: A Qualitative Analysis of Patients and Clinicians

Grey box indicates the abstract was accepted but not for presentation at the Symposium.

Concourse/Poster Area



Abstract Booklet

The following depicts all abstracts that were accepted for the 2025 Research Symposium.

Only selected abstracts were assigned presentation numbers. Those without a number were not chosen for presentation.

Author designations were sourced directly from the abstract submission portal.

Other than formatting, no other changes were made to the listing of the abstracts portrayed here.

Presentation: B-1 Submitter: Garrett Borgman, M-2

Abstract Title: **Ameliorative Properties of Trans-beta-2-styryl Boronic Acid (TBSA) on In Vivo Models of Alzheimer's Disease**

Authors: Borgman, Garrett, M-2 M.D. Candidate, Smith, Olivia, Graduate Student, Poudel, Arjun, Graduate Student, Tavi, Grace, B.S., Garmo, Lucas, M-2 M.D. Candidate, Graduate Student, Dunbar, Gary, Ph.D., Choudhury, Mouraj, Ph.D.

Category: Basic & Translational Mentor: Julien Rossignol, Ph.D.

Abstract:
Background: Alzheimer disease (AD) is the most prevalent type of dementia, accounting for at least two-thirds of cases in patients over the age of sixty-five [1]. The condition leads to progressive degeneration of the patient's behavioral and cognitive functions such as memory, comprehension, language, attention, reasoning, and judgment. AD is a neurodegenerative condition marked with plaque formation, amyloid deposition, neurofibrillary tangles, hyperphosphorylated tau, granulovacuolar degeneration, loss of telencephalic neurons and neuroinflammation. The etiology of AD is debated but one pathological hallmark of AD is the accumulation of β-amyloid, neuroinflammation, and the formation of neurofibrillary tangles.
Boron is a natural compound that is commonly found in plant-based foods such as fruits and leafy greens, but it is not considered an essential nutrient. A study on osteoarthritis has shown that the administration of boronic compounds may be linked to a decrease in systemic inflammation [2]. By observing the behavior and analyzing the biochemical results of 5xFAD mice provided with the boron therapeutics, it can set the stage for new pharmaceutical developments and treatments in patients affected with AD.
Objective: The purpose of this study is to investigate the application of trans-beta-styryl-boronic acid (TBSA) in reducing β-amyloid aggregation and neuroinflammation in 5xFAD mice, an in vivo model of AD.
Methods: The approach to this study involves four cohorts of mice. First divided by age, either 6- or 12-month mice, then by treatment group, half receiving 0.5 mg/kg bodyweight of TBSA in 0.5% methylcellulose or equivalent volume of 0.5% methylcellulose. Before initiating treatment, all mice underwent open field, and novel object recognition (NOR) behavioral studies for baseline data of motor activity, exploration, memory, and object discrimination. Following baseline behaviors, the mice received 60 days of QOD gavaging of treatments listed earlier. Following treatment, mice repeated open field and NOR, in addition to the Morris water maze behavioral test to assess spatial navigational skills and memory. Finally, mice were euthanized and their brains harvested to be analyzed through immunofluorescence for amyloid-beta for disease progression, Iba-1 for microglia activation, and neurofilament light chain to assess for neuroinflammation.
Results and Conclusion: Preliminary behavioral results indicate that there may be modest reduction in memory deficits. However, as the project is ongoing, further analyses of this project, including the neuropathological alterations, should provide a more definitive evaluation of the efficacy of this treatment.
Significance: Alzheimer's Disease is the most common cause of dementia, affecting about 1 in 9 people aged 65 or older [1]. Research into delaying and preventing its progression is imperative to curb the epidemiological burden of AD and to improve the quality of life of those affected.
Bibliography:
[1] Kumar, A., Tsao, J., Sidhu, J., & Lui, F. (2024, February 12). Alzheimer disease: Treatment & management: Point of care. StatPearls. https://www.statpearls.com/point-of-care/17423
[2] Scorei, R., Mitrut, P., Petrisor, I., & Scorei, I. (2011). A double-blind, placebo-controlled pilot study to evaluate the effect of calcium fructoborate on systemic inflammation and dyslipidemia markers for middle-aged people with primary osteoarthritis. Biological trace element research, 144(1-3), 253–263. https://doi.org/10.1007/s12011-011-9083-0

Presentation: B-2 Submitter: Tal Chamdi, M-2

Abstract Title: **From Self-Medication to Basic Science: Analyzing Ivermectin and Fenbendazole Use in Pancreatic Cancer Patients**

Authors: Chamdi, Tal, M-2 M.D. Candidate, Bakke, Jesse, Ph.D.

Category: Basic & Translational Mentor: Jesse Bakke, Ph.D.

Abstract:
Background
A 60-year-old male diagnosed with pancreatic adenocarcinoma initially underwent neoadjuvant chemotherapy (FOLFIRINOX), followed by Whipple surgery and adjuvant chemotherapy (Gemcitabine plus nab-paclitaxel) in 2020. After four years of remission, the patient presented with recurrent metastatic disease, confirmed by elevated CA 19-9 levels, imaging and subclavicular biopsy. PET scans revealed widespread metabolic activity, with a maximum SUV of 8.2 in the para-aortic lymph node.

Due to quality-of-life concerns and residual side effects from prior treatments, the patient declined conventional chemotherapy. Instead, he opted to self-administer fenbendazole and ivermectin at home. After three months, follow-up testing showed a significant drop in CA 19-9 levels to normal and a positive PET response, with slight tumor shrinkage and a strong metabolic response (SUV reduced to background levels). Nine months post-recurrence, the patient remains stable with no significant complaints aside from a loss of appetite.

This case study prompted us to conduct basic science investigations. Pancreatic cancer, characterized by its high resistance to treatment and low survival rates, remains one of the deadliest malignancies. Considering the case study above, repurposing antiparasitic drugs, such as ivermectin and fenbendazole, may provide a novel and frankly surprising therapeutic strategy due to the possibility that these drugs may disrupt cancer cell metabolism, inhibit cell proliferation, or limit immune escape mechanisms.
Objective
This study aimed to evaluate the effects of ivermectin, fenbendazole, and their combination on the viability and proliferative capacity of pancreatic cancer cell lines in vitro.
Methods
Pancreatic cancer cell lines (PANC-1) were treated with varying concentrations of ivermectin, fenbendazole, and their combination. The CellTiter-Glo assay was employed to assess cell viability by quantifying ATP levels, providing a measure of metabolic activity. Additionally, colony-forming assays were conducted to evaluate cancer cells' long-term survival and proliferative ability after drug exposure. Further cell lines are in testing; our plan is to also include control cell lines to test for cytotoxicity in healthy cells.
Results
Preliminary results showed that ivermectin demonstrated a dose-dependent reduction in cell viability, While Fenbendazole showed a dose-independent response. The combination treatment exhibited enhanced cytotoxic effects compared to either drug alone. Colony-forming assays further revealed a significant decrease in the ability of treated cells to form colonies, indicating an impact on cancer cell survival and proliferation.
Conclusions
Ivermectin and fenbendazole show promising anticancer activity against pancreatic cancer cell lines, with the combination therapy displaying synergistic effects. These findings suggest their potential as repurposed therapeutic agents for pancreatic cancer. Further research is warranted to determine their mechanisms of action and evaluate their efficacy in preclinical and clinical settings, potentially expanding therapeutic options for this highly aggressive cancer.
Significance
This study provides preliminary evidence supporting the use of ivermectin and fenbendazole in pancreatic cancer treatment.

Presentation: Oral 1A-3 Submitter: Michael Chiaramonti, M-2

Abstract Title: **Effect of a β1-Adrenergic Receptor Allosteric Modulator in a Mouse Model of Ventricular Tachycardia**

Authors: Chiaramonti, Michael, M-2 M.D. Candidate, Jyothidasan, Arun, Ph.D.

Category: Basic & Translational Mentor: Howard Rockman, M.D.

Abstract:

Introduction:

Cardiovascular diseases present a large burden in the United States, affecting an estimated 48% of Americans. Thus, the development of effective treatments is a critical priority. Compound 11 (C11) has been identified as an allosteric modulator with unique pharmacological properties that is currently under investigation as a potential therapeutic agent. The project presented here aims to evaluate the impact that C11 has on the frequency of premature ventricular contractions (PVCs) and ventricular tachycardia (VT) duration in a mouse model.

Methods:

On day 0, Casq2-/- mice were implanted with wireless ECG telemetry units and allowed to recover for 3 days. After the recovery period, the mice were subject to pre-exercise conditioning to acclimate them to the rodent treadmill. This involved placing the mice on the rodent treadmill for 30 consecutive minutes on 3 consecutive days. On the first day, mice were allowed to explore the treadmill chamber. On the second and third day, the treadmill speed was set to 2 cm/s, 5cm/s, and 10cm/s at 25 degrees of incline for 10 minutes at each speed.

The mice underwent a graded exercise protocol on day 8 and 12. On day 8, the mice underwent graded treadmill exercise runs following injection with vehicle (control). Three days later, the mice underwent graded treadmill exercise runs with C11 (experimental). Each run followed a treatment protocol where the mice received an intraperitoneal injection of either vehicle or C11 at a dose of 10mg/kg at time 0, followed by graded treadmill exercise starting at 45 minutes post-injection. The graded exercise protocol consisted of five stages: 5 minutes at 0cm/s, 5 minutes at 2cm/s, 5 minutes at 5cm/s, 5 minutes at 10cm/s, and 5 minutes at 10cm/s with a 25-degree incline, followed by a 5-minute recovery period at 0cm/s. Negative reinforcement with a shock grid set at 0.4mV was used to encourage running. Telemetry was recorded using the implanted telemetry units and reviewed using Ponemah v6.6 software. The treadmill was disinfected with 70% EtOH after each session. Mice ECG data was then evaluated.

Results:

A total of 8 mice underwent exercise protocol, with each serving as its own internal control by receiving vehicle pretreatment followed by C11 pretreatment after a washout period. There was an average VT duration of 194.077 seconds during vehicle pretreatment compared to average VT duration of 66.1 seconds with C-11 pretreatment. The data shows that C11 significantly reduced total VT duration ($p=0.0078$). Additionally, PVC counts appeared lower in C11-treated mice, but the difference did not reach statistical significance ($p=0.1953$).

Conclusions:

These findings suggest that compound C11 effectively mitigates exercise-induced arrhythmias, particularly VT in the Casq2-/- model of CPVT, supporting its potential as a therapeutic agent for managing arrhythmogenic conditions associated with CPVT. Further work will elucidate whether C11 is synergistic with other known therapeutic modalities for CPVT.

Presentation: B-3 Submitter: Chinonye Eze, M-2

Abstract Title: **Sustained Efficacy of Botulinum Toxin in Primary Palmar Hyperhidrosis: A Systematic Review of Duration, Quality of Life, and Satisfaction**

Authors: Eze, Chinonye, M-2 M.D. Candidate, B.A., Munoz-Lara, Susana, B.S., Jafferany, Mohammad, M.D.

Category: Basic & Translational Mentor: Mohammad Jafferany, M.D.

Abstract:
Background:
Primary palmar hyperhidrosis (PPH) is a debilitating condition characterized by excessive sweating of the palms, significantly impairing patients' quality of life (QoL). Hyperhidrosis often leads to a significant impact on relationships, mental health, and self-esteem leading to avoidance of social interaction (Parashar et al, 2023). Patients with primary hyperhidrosis also reported greater disabilities in work/school, social functioning, and emotional health with up to 48% of patients reporting poor or very poor quality of life (QoL) (Parashar et al, 2023). Botulinum toxin (BoNT) injections are a widely used treatment, but data on their sustained efficacy, impact on QoL, and patient satisfaction remain limited.
Objective:
This systematic review aims to synthesize existing evidence on the duration of efficacy of BoNT, its impact on QoL, and patient-reported satisfaction and improvement to provide a comprehensive understanding of its role in PPH management.
Methods:
A comprehensive search of PubMed, Cochrane Library, and Scopus using keywords like “Botulinum Toxins,” “OnabotulinumtoxinA,” “palmar hyperhidros,” “sweaty palms,” “hand,” and “sweating” identified 19 studies meeting inclusion criteria (RCTs, observational studies, clinical trials). Exclusions included pediatric-only studies, non-palmar hyperhidrosis, non-needle BoNT delivery, case reports, expert opinions, and studies lacking relevant outcomes or were published in a language other than English. Outcomes were categorized into (1) duration of efficacy and (2) QoL and patient satisfaction. Subgroup analyses compared toxin types, dosages, and disease severity.
Results:
Results indicate that the duration of BoNT efficacy ranged from 3 to 12 months, with BoNT-A demonstrating a mean efficacy of 4.9 to 9.5 months, while BoNT-B showed a shorter duration of 3.8 to 4.6 months. Higher doses and repeated injections were associated with prolonged symptom control. Disease severity also influenced efficacy, with moderate hyperhidrosis cases experiencing longer symptom relief compared to severe cases. QoL improvements were substantial, with Dermatology Life Quality Index (DLQI) scores showing significant reductions post-treatment. Patient satisfaction rates ranged from 65% to 100%, with a majority reporting excellent or good improvement at one-month post-treatment, though this effect diminished over time.
Conclusion:
While BoNT is an effective treatment that significantly improves symptoms and patient QoL, further large-scale, randomized trials are recommended to refine treatment protocols, assess long-term outcomes, and optimize dosing strategies to ensure sustained relief and enhanced patient well-being.
Significance:
This study highlights the significant impact of PPH on daily life and underscores the need for long-term, effective treatment options. Given the variability in BoNT efficacy duration and patient satisfaction, this review highlights the need to optimize BoNT treatment protocols, by adjusting doses and retreatment intervals, to ensure lasting symptom relief. Despite its temporary effects, high patient satisfaction demonstrates that BoNT is playing a significant role in PPH management and improving QoL. However, its diminishing efficacy over time suggests the need for further research into alternative or adjunctive therapies. By synthesizing current evidence, this study offers valuable guidance for clinicians and future research to improve long-term treatment strategies.

Presentation: B-4 Submitter: Lucas Garmo, M-4

Abstract Title: **A Systematic Review of the Use of Etanercept in Animal Models of Spinal Cord Injury**

Authors: Garmo, Lucas, M-2 M.D. Candidate, Graduate Student, Osborn, Sid, M-2 M.D. Candidate, Hock, Emily, M-2 M.D. Candidate, Rossignol, Julien, Ph.D., Dunbar, Gary, Ph.D.

Category: Basic & Translational Mentor: Gary Dunbar, Ph.D.

Abstract:

Introduction: Traumatic spinal cord injury (SCI) is a severely debilitating condition that often results in permanent motor and sensory deficits. Etanercept, an anti-inflammatory biologic, inhibits tumor necrosis factors (TNF) that have been described to be upregulated in the acute phases following SCI, and believed to contribute to several downstream effects throughout the secondary injury cascade. The current review seeks to synthesize and describe the current literature relating to the potential of etanercept in managing SCI.

Methods: The authors performed a systematic review of the literature in accordance with the Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) 2020 guidelines. Included were studies accessible as of August 18, 2024, that reported on the use of etanercept following SCI. The studies must have investigated SCI in an in vivo mammalian model (e.g., mouse, rat, rabbit) and originally published in English. Pre-print articles, case reports, conference abstracts, and other reviews were excluded. Searched databases included PubMed, Scopus, and Web of Science; search queries included all MeSH entry terms relating to “Etanercept” and “Spinal Cord Injury”.

Results: Initially, 116 records were identified, with 36 duplicates being removed. Upon screening of the remaining 80 records, 64 were removed for not meeting the inclusion criteria. Thus, the full texts of 16 articles were retrieved. Review of these articles revealed that etanercept has been investigated in the treatment of SCI in various animal models, as both monotherapy as well as in combination with other treatment(s). Thus far in our review, the results from fourteen out of sixteen articles have suggested etanercept to exhibit some degree of benefit post-SCI in preclinical studies.

Conclusion : Despite the current understanding of its pathophysiology, no clinically approved treatments for the devastating and often permanent functional deficits resulting from SCI have been identified. As neuroinflammation is described to be among the earliest mediators of SCI pathophysiology, anti-inflammatories have been widely investigated for early SCI management. Preliminary results of our review suggest that etanercept may modulate early facets of the neuroinflammatory cascade following SCI, which may in turn facilitate functional recovery or protect against worsened outcomes. Further research into the potential of etanercept in SCI is warranted.

Presentation: B-5 Submitter: Megan O'Mara, M-2

Abstract Title: **Altered NFκB Signaling in Irritable Bowel Disease Affects M Cell Abundance and Immune Cell Interactions**

Authors: O'Mara, Megan, M-2 M.D. Candidate, Torres, Teresa, Graduate Student, Pedchenko, Tetyana, Ph.D., Zachos, Nicholas, Ph.D.

Category: Basic & Translational Mentor: Nicholas Zachos, Ph.D.

Abstract:

Background/Objective: Microfold (M) cells are specialized intestinal epithelial cells within Peyer's patches (PP) that act as gatekeepers to regulate delivery of gut antigens to immune cells and establish immune tolerance. Previous transcriptomic studies have suggested that increased abundance of M-like cells is associated with increased inflammation, particularly in patients with Inflammatory Bowel Disease. Since the pathogenesis of IBD is associated with increased invasion of gut microbes, we hypothesize that functionally mature M cells (expressing glycoprotein-2 (GP-2)) are present in the epithelium of the inflamed intestine.

Methods: Immunostaining for immune cell markers and mature M cells was performed on formalin-fixed paraffin-embedded (FFPE) biopsies from the ileum and colon of IBD patients and healthy donors. Image analysis was used to quantitate the numbers of M cells (GP-2+) and immune cells (CD45).

Results: We observed a statistically significant increase in the population of CD45-expressing immune cells ($p = .02$) in biopsies from IBD patients compared to healthy donors. GP-2 staining (marker of the mature M cell) revealed no significant increase in IBD specimens.

Summary / Conclusions: These data suggest that the abundance of functionally mature M cells (i.e., GP-2+) normally found in healthy subjects is not increased in ulcerative colitis. Based on prior transcriptomic studies, an alternative M cell may be differentiated under inflammatory conditions. Future studies to identify and characterize this alternative type of M cell will be conducted using markers described in previous transcriptomic studies.

Presentation: B-6 Submitter: Sid Osborn, M-2

Abstract Title: **The effects of etanercept and methylprednisolone combinatorial therapy in a rat model of spinal cord injury**

Authors: Osborn, Sid, M-2 M.D. Candidate, Garmo, Lucas, M-2 M.D. Candidate, Graduate Student, Hock, Emily, M-2 M.D. Candidate, Hughes, Johnathan, Other, Darragh, Elise, B.S., Dunbar, Gary, Ph.D., Rossignol, Julien, Ph.D.

Category: Basic & Translational Mentor: Julien Rossignol, Ph.D.

Abstract:
Background:
Spinal cord injury (SCI) is a significant cause of global morbidity and mortality, often resulting in permanent and severe motor deficits below the injury site. Despite our understanding of spinal cord physiology, treatments remain limited. Methylprednisolone (MP), a corticosteroid, has been extensively explored in acute SCI. Although studies of MP in SCI have demonstrated mixed efficacy, recent animal studies investigating the drug in SCI suggest that MP can suppress neuroinflammation and promote functional recovery. Another anti-inflammatory, etanercept, has recently gained special attention in SCI discourse. Although primarily used to treat rheumatologic conditions as a tumor necrosis factor (TNF) inhibitor, these cytokines are also known to play a significant role in SCI pathophysiology. Recent investigations of etanercept have shown promise in reducing histopathological damage to the spinal cord following SCI.

Objective:
This study is the first to assess the post-SCI effects of combined etanercept and MP therapy and compare their systemic and intrathecal administrations, providing insight into their potential to limit neuroinflammatory-related deficits of SCI.

Methods:
Wistar rats (n = 48) were randomly allocated to SCI with either systemic saline (n = 6), systemic MP (n = 6), systemic MP + etanercept (n = 6), intrathecal saline (n = 6), intrathecal MP (n = 6), or intrathecal MP + etanercept (n = 6) injections. Injections were given 30 minutes after SCI.. The Basso, Beattie, Bresnahan locomotor rating scale (BBB) was utilized to assess functional outcomes pre-injury, 3-days post-injury, and weekly thereafter for 6 weeks. The rats were placed in an open-field environment consisting of a round plastic wading pool and video-recorded for at least 4 minutes. Blinded independent raters scored videos using the standardized BBB scale (0 = complete paralysis, 21 = normal movement). Higher average BBB scores indicate greater functional recovery.

Results:
On interim analysis of the ongoing study, repeated-measures ANOVA of BBB scores over time revealed a significant interaction between injection type and treatment allocation, $F(5.615, 39.306) = 2.885$, $p = 0.022$, partial $\eta 2 = 0.292$). Compared to intrathecal saline, intrathecal MP seemed to significantly reduce average BBB scores, $p = 0.019$, whereas intrathecal ETN demonstrated noninferiority, $p = 0.908$. Moreover, rats receiving intrathecal ETN demonstrated significantly greater BBB scores than rats receiving intrathecal MP, $p = 0.025$.

Conclusion/Significance:
This study is the first to evaluate the effectiveness of systemic and intrathecal etanercept, MP, and their combination within a rat model of SCI. Preliminary analyses of the ongoing study seem to suggest that intrathecal administration of MP may hinder the functional recovery of rats following SCI. Further analyses, including measures of treatment effects on neuropathological alterations following SCI, will provide a more definitive assessment of the efficacy of these treatments both as separate and as combined therapies.
Support for this study was provided by the College of Medicine Summer Scholarship Program, the Neuroscience Program, the John G. Kulhavi Professorship in Neuroscience, and the E. Malcolm Field and Gary Leo Dunbar Chair in Neuroscience at Central Michigan University.

Presentation: B-7 Submitter: Matthew Ruge, M-2

Abstract Title: **Molecular Characterization of Idiopathic Nephrotic Syndrome**

Authors: Ruge, Matthew, M-2 M.D. Candidate, Dougherty, Julie, Ph.D.

Category: Basic & Translational Mentor: Gabriel Cara-Fuentes, M.D., Ph.D.

Abstract:

Background: Idiopathic nephrotic syndrome (INS) is considered a non-inflammatory podocyte-specific disease caused by autoantibodies that exclusively injure the podocyte in the kidney glomerulus. However, clinical outcomes and response to immunosuppressive therapies are quite variable suggesting a heterogeneous underlying biology. Understanding the underlying pathobiology involved in the disease process could help identify biomarkers that improve clinicians' ability to predict prognosis and to tailor therapies according to certain molecular signatures.

There is recent evidence supporting the presence of endothelial injury as noted by an increase of glycocalyx products in circulation in INS. Urinary Ang-2, MCP-1, and TNFR, which are indicative of glomerular inflammation and shown to predict outcomes in kidney diseases, but its involvement in childhood INS is unknown.

The aim of this pilot study is to determine the involvement of selected biomarkers of endothelial injury and inflammation in childhood INS and assess their response to steroids.

Methods: Serum samples from 70 children with INS and age-matched healthy controls were analyzed using commercial ELISA kits to measure Angiopoietin-2 and TNFR1/2 as markers of endothelial activation and inflammation. Urinary MCP-1, adjusted for creatinine, was assessed as an inflammatory marker. In a puromycin-induced rat model of nephrotic syndrome, a single tail vein injection of puromycin (75 mg/kg) was administered, and serum and urine samples were collected at baseline, day 3, day 7, and day 11 (proteinuria peak) from diseased rats, puromycin-treated rats receiving a single dose of methylprednisolone, and control rats receiving normal saline.

Results: INS patients receiving immunosuppressive therapy had lower serum Ang-2 levels compared to those off treatment. During relapse, 68% of idiopathic nephrotic syndrome (INS) patients exhibited elevated serum Angiopoietin-2 (Ang-2), which remained high in 39% of patients considered in remission. Urinary MCP-1 was elevated in 54% of patients during relapse and persisted in 10% of those in remission. TNFR1 and TNFR2 levels were elevated in 78% and 82% of patients during relapse compared to controls, and remained high in 45% and 42% of patients in remission. These findings suggest persistent endothelial injury and inflammation even in the absence of overt proteinuria.

Conclusion: Endothelial injury and inflammation are underrecognized in idiopathic nephrotic syndrome (INS). In this study, half of the patients in relapse exhibited elevated urinary MCP-1 levels, suggesting glomerular TNF activation. Notably, the absence of proteinuria during remission did not indicate complete resolution of the disease process, as subclinical endothelial injury and inflammation persisted in approximately 40% of patients. These findings highlight the importance of molecular characterization in INS to advance the development of precision medicine approaches

Key words: Idiopathic nephrotic syndrome, endothelial injury, inflammation, proteinuria, immunosuppressive therapy, glomerular TNF activation

Presentation: B-8 Submitter: Tim Seyidov, M-2

Abstract Title: **Effects of UNK Gene Expression on Metabolism and Cancer Stem Cell Phenotype in Breast Cancer**

Authors: Seyidov, Tim M, M-2 M.D. Candidate, Kohtz, D. Stave, Ph.D.

Category: Basic & Translational Mentor: D. Stave Kohtz, Ph.D.

Abstract:

Background: Triple-negative breast cancer (TNBC) accounts for 10–20% of all invasive breast cancers and is characterized by aggressive clinical behavior and the lack of targeted therapies. Cancer stem cells (CSCs) within TNBC, identified by CD44+/CD24-/low markers, contribute to relapse and resistance due to their ability to self-renew and propagate tumors. Previous studies suggest that CSCs preferentially utilize oxidative phosphorylation (OXPHOS) over glycolysis, making metabolic regulation a potential therapeutic target. The UNK gene, known for its role in nutrient sensing and mTOR pathway inhibition, may influence CSC metabolism and tumor stemness, thereby improving treatment outcomes.

Objective: This study investigates the impact of UNK gene expression on CSC markers and metabolic activity in TNBC using genetically engineered MDA-MB-231 cell lines.

Methods: Two modified TNBC cell strains (4G and 4W) capable of inducible UNK expression were analyzed. At 48 hours after induction, Western blot analysis indicates that the 4G cell line expresses an approximately 2.5-fold increase in UNK expression, while the 4W cell line shows approximately 5-fold increase. Correspondingly, the 4G cell line shows decreased OXPHOS activity, while the 4W cell lines shows increased OXPHOS activity. UNK expression was induced with anhydrotetracycline (ATC), and cell growth was monitored over five days. Western blot assays were performed to assess expression levels of CSC markers CD44, CD24, and ALDH1A3 at 0-, 48-, and 96-hours post-induction. Statistical analysis was conducted using ANOVA to identify significant changes.

Results: Growth curve analysis showed no significant differences in proliferation rates between parent and UNK-induced strains, suggesting UNK expression does not affect cell growth. Western blot analysis revealed distinct marker expression patterns. The 4G strain showed a significant increase in CD24 expression ($p < 0.05$), potentially indicating reduced CSC-like properties. Conversely, the 4W strain exhibited increased ALDH1A3 levels ($p < 0.05$), suggesting enhanced stemness when UNK is overexpressed.

Conclusion: Moderate UNK expression appears to reduce CSC-like characteristics in TNBC cells, possibly through mTOR pathway modulation. The proposed mechanism indicates that after induction, the 4G strain moderately enhances UNK activity and thus can form a complex with Headcase, which reduces OXPHOS by inhibiting mTOR downstream. However, excessive UNK expression may increase stemness, highlighting the importance of dosage in therapeutic applications. This is potentially demonstrated in the 4W strain, where the overabundance of UNK protein can outcompete the UNK-Headcase complex for binding mTOR, which would in turn enhance its function and increase OXPHOS, thus increasing stemness. These findings underscore UNK's potential as a metabolic and phenotypic regulator in TNBC. Future research will focus on elucidating the precise mechanisms of UNK-mTOR interactions and evaluating combinatory treatments targeting CSC metabolism.

Significance: Breast cancer remains the most prevalent malignancy among women, with triple-negative breast cancer (TNBC) showing the poorest prognosis due to the lack of targeted therapy options. Cancer stem cells (CSCs) play a significant role in cancer relapses and resistance to conventional therapies. This study contributes to understanding of the impact of UNK expression on CSC phenotypes in TNBC.

Presentation: B-9 Submitter: Jacob Surma, M-2

Abstract Title: **Title: Halting the cycle: KIF23 knockout using siRNA encapsulated PAMAM dendrimers on U-87 human glioblastoma cells in vitro**

Authors: Surma, Jacob, M-2 M.D. Candidate, Allahyarzadeh Khiabani, Nadia, Graduate Student, Rossignol, Julien, Ph.D., Demarinis, Sierra, M-2 M.D. Candidate, Heithoff, Hannah, M-1 M.D. Candidate, Dunbar, Gary, Ph.D., Petersen, Robert, Ph.D., Elmhirst, Avery, Other

Category: Basic & Translational Mentor: Julien Rossignol, Ph.D.

Abstract:
Background:
Glioblastoma (GB) remains one of the most aggressive and treatment-resistant brain cancers, with limited survival benefits from current therapies such as temozolomide (TMZ). Targeting cell cycle regulators, particularly the kinesin family protein KIF23, presents a promising avenue for therapeutic intervention. Overexpression of KIF23 in glioblastoma promotes mitotic activity, making it an ideal target for siRNA-based silencing. Advances in siRNA delivery, including polyamidoamine (PAMAM) dendrimers, offer a novel approach to address challenges in specificity and efficiency of treatment delivery.
Objective:
This study investigates the efficacy of KIF23 siRNA encapsulated in PAMAM dendrimers on U-87 human glioblastoma cells, both independently and in combination with TMZ, to assess the potential for enhanced therapeutic outcomes.
Methods:
We conducted a dose-response analysis using TECAN cytotoxicity assays to determine cell viability after siRNA-lipofectamine treatment targeting KIF23. For subsequent studies, siRNA was encapsulated in G4 PAMAM dendrimers to enhance intracellular delivery. Treatments included KIF23 siRNA, TMZ, and their combination. Efficacy was assessed using MTT viability assays, RT-PCR for gene expression, and colony formation. Statistical significance was determined via one-way ANOVA.
Results:
Preliminary findings demonstrated a dose-dependent decrease in cell viability following siRNA-lipofectamine treatment, reinforcing the role of KIF23 in glioblastoma cell survival. Encapsulation within PAMAM dendrimers is expected to further enhance delivery efficiency while minimizing off-target cytotoxicity. Among tested concentrations, 60 pmol of KIF23 siRNA complexed with dendrimers achieved the most significant KIF23 mRNA knockdown. Following transfection at this concentration, the KIF23+dendrimer group exhibited a ~70% reduction in KIF23 mRNA levels, as confirmed by RT-PCR analysis. Subsequent viability studies on astrocytes (control cells) revealed no significant reduction in cell viability after KIF23+dendrimer transfection, indicating a preferential effect on malignant glioblastoma cells. Ongoing combination therapy studies with TMZ aim to assess potential synergistic effects on proliferation inhibition and overall therapeutic efficacy.
Conclusions:
KIF23 siRNA encapsulated in PAMAM dendrimers represents a promising therapeutic strategy for glioblastoma. Preliminary data validate the target specificity and efficacy of siRNA in silencing KIF23 expression. Ongoing studies with dendrimers and combination therapies aim to further elucidate their potential to improve patient outcomes.
Significance:
This research advances our understanding of targeted siRNA delivery in glioblastoma treatment, leveraging dendrimer technology to enhance therapeutic specificity. The results may inform the development of novel combinatorial therapies, ultimately improving survival rates and quality of life for GBM patients.
Support:
Support for this study was provided by the Summer Scholarship Program, the Neuroscience Program, the Office of Research and Graduate Studies, the College of Medicine, the John G. Kulhavi Professorship in Neuroscience, and the E. Malcolm Field and Gary Leo Dunbar Chair in Neuroscience at Central Michigan University.

Presentation: B-10 Submitter: Nhan Tran, D.P.M., Resident

Abstract Title: **Influence of Selective Versus Nonselective Joint Preparation in First Metatarsophalangeal Arthrodesis: A Systematic Review and Meta-analysis**

Authors: Tran, Nhan, Resident D.P.M, Pierson, Kyleigh, Resident D.P.M, Bullock, Mark, D.P.M., Desai, Shivam, M-3 M.D. Candidate, Renirie, Rebecca, B.S., Ching, Chen-I, Ph.D., Samani, Marisa, M-3 M.D. Candidate

Category: Basic & Translational Mentor: Mark Bullock, D.P.M.

Abstract:

First metatarsophalangeal (MPJ) arthrodesis is a common and effective procedure for hallux rigidus and select patients with hallux valgus. Nonselective joint preparation with conical reamers is the most common method for joint preparation in the literature. This meta-analysis compares patients who underwent 1st MPJ arthrodesis with reamer versus patients who underwent selective joint preparation with rongeurs and/or burrs. A systematic review was performed according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. PubMed, CINAHL, Cochrane, and Scopus databases were used to identify recent studies based on inclusion and exclusion criteria, and only patients with locking plate fixation were included. Twenty-three studies with reamers and 5 studies with aggressive selective joint preparation met the criteria. Many of the included studies in both treatment groups had low-quality data with inadequate radiographic follow-up. A random effects model was utilized to compare union rates between the treatment groups. The estimated union rate was significantly higher (p=0.03) for selective joint preparation, 99% (95% CI 98-100), compared with reamers, 93% (95% CI 91-96). Current data suggests aggressive selective debridement with rongeurs and/or burrs has superior union rates when 1st MPJ arthrodesis is performed with locking plate fixation.

Presentation: B-11 Submitter: Elsa Varughese, M-2

Abstract Title: **Evaluating Advanced Lipidomics in Predicting Major Adverse Cardiovascular Events: A Multi-Dataset Analysis**

Authors: Varughese, Elsa, M-2 M.D. Candidate, Epstein, Elizabeth, M.D.

Category: Basic & Translational Mentor: Evan Muse, M.D.

Abstract:

Background: Cardiovascular disease (CVD) remains the leading cause of death worldwide, accounting for over 17.9 million fatalities annually, or 32% of all deaths, according to the World Health Organization. ApoB-containing lipoproteins have a causal relationship with atherosclerotic cardiovascular disease (ASCVD). Small lipoprotein particles are susceptible to oxidative mechanisms, resulting in atherosclerotic activity and higher CVD risk. The Framingham Study established the importance of both low-density and high-density lipoprotein cholesterol (LDL-C and HDL-C) in ASCVD risk prediction, yet the potential utility of lipoprotein particle size (LDL-P, HDL-P) and LDL-P/HDL-P ratios remain underexplored.

Objective: This study aims to evaluate the predictive power of LDL-P/HDL-P ratios for major adverse cardiovascular events (MACE) using data from the Multi-Ethnic Study of Atherosclerosis (MESA) and the UK Biobank (UKBB). Our goal is to develop a novel risk calculator incorporating particle ratios, Lipoprotein(a), risk-enhancing factors, plaque burden, and polygenic risk scores to revolutionize precision cardiology.

Methods: Two datasets were utilized during this study. MESA is a longitudinal study of over 6,000 U.S. participants aged 45–84, while the UKBB dataset includes health and lifestyle information from over 500,000 participants aged 40–69 in the United Kingdom. Variables within each dataset were extracted and aggregated along with qualifiers such as description, type and unit of measurement (whether it's continuous, categorical, etc.), and data coding assignment within the dataset. Data harmonization across these cohorts led to identification of relevant variables and classification of outcomes into four categories, including coronary artery disease, atherosclerosis, and stroke, using ICD-10 codes.

Results: Our initial analysis examined baseline lipid biomarkers and their associations with ethnicity, sex, and BMI. The mean LDL Particle Concentration is higher in females (1216.3 nmol/L, $p < 0.05$) compared to males (1195.9 nmol/L, $p < 0.05$). Applying a Generalized Liner Model (GLM), advanced lipid biomarkers plus socio-demographic factors yielded AUC of 0.712 for CAD, whereas HDL-C to HDL-P alone produced AUC of 0.64 for CAD. The relative hazard ratio for CAD is 1.6 at HDL-C to HDL-P of 69.

Conclusion: These findings underscore the promise of LDL-P and HDL-P in enhancing risk stratification for CVD. HDL-C is the most predictive individual lipid biomarker for MACE, while the HDL-C/HDL-P ratio emerged as the most predictive lipid ratio. Models integrating advanced lipid values and socio-demographic factors yielded the highest area under the curve (AUC) for predictive accuracy. In addition, the relative hazard ratio using HDL-C to HDP-P with age, gender, and BMI as covariates revealed that both low and excessively high HDL-C/HDL-P ratios may be associated with increased cardiovascular risk.

Much of the limitations relate to data with MESA and UKBB. For example, the initial patient intake involved self-reported questionnaires which are subject to recall bias. The UKBB lacks population diversity, which may challenge generalizability. Lastly, we wonder about access and cost in smaller communities to obtain advanced lipid panels for patients.

Significance: By integrating these metrics into a comprehensive risk calculator, we aim to enable early detection and aggressive treatment, paving the way for a paradigm shift in personalized cardiovascular medicine.

Presentation: C-1 Submitter: Robert Alhaddadin, M.D., Resident

Abstract Title: **Graves' Disease: a real pain in the neck**

Authors: Alhaddadin, Robert, M.D. Tornberg, Toni, M-3 M.D. Candidate, Nannar, Jaspreet, M.D., Haque, Henna, B.S., Variar, Vivek, M.D.

Category: Case Report/Case Series Mentor: Vivek Variar, M.D.

Abstract:

Introduction: Graves' disease is an autoimmune disorder that leads to hyperthyroidism due to production of thyroid-stimulating immunoglobulins. Common symptoms include weight loss, palpitations, heat intolerance, and ophthalmopathy. However, presence of painful thyroiditis and recurring neck rash is not typically associated with Graves' disease, making such presentations rare in literature. This case highlights an unusual manifestation of Graves' disease, emphasizing the complexity of autoimmune thyroid disorders and the diagnostic challenges they may pose.

Case Presentation: A 41-year-old female presented with new-onset dysphagia, bilateral hand tremors, palpitations, severe neck pain, and superficial tenderness. Physical examination revealed a thyroid goiter on palpation. Laboratory findings demonstrated a significantly elevated free T4 (2.8 ng/dL) and free T3 (8.8 pg/mL), with suppressed thyroid-stimulating hormone (< 0.01 mIU/L). Thyroid autoantibodies, including thyroid-stimulating immunoglobulin (6.96 IU/L), thyroglobulin antibody, and thyroid peroxidase antibodies, were elevated, leading to a diagnosis of Graves' disease. Imaging studies included a thyroid ultrasound, which revealed an enlarged, heterogeneous thyroid with increased vascularity. A CT scan of the neck confirmed thyroiditis. However, a radioactive iodine uptake test could not be performed due to IV contrast administration. During hospitalization, patient developed an erythematous macular rash over the thyroid region. This rash resolved overnight but reappeared the following day. She was initiated on methimazole, prednisone, and propranolol. Despite four weeks of treatment, her free T4 and free T3 levels remained elevated, and she continued to experience persistent neck pain, ocular discomfort, and dysphagia. Interestingly, patient had recurrent remissions and flare-ups of her thyroid neck rash. Due to refractory symptoms, she ultimately underwent total thyroidectomy. Surgical pathology revealed benign nodular follicular hyperplasia with numerous patchy lymphoid infiltrates. Postoperatively, she was transitioned to levothyroxine and was monitored with regular thyroid function tests. The rash began to subside after that.

Discussion: This case represents a rare and complex presentation of Graves' disease with painful thyroiditis and recurrent neck rash, both of which are not commonly associated with the disease, as it is typically painless. The presence of persistent neck pain, dysphagia, and erythematous rash in this patient posed a diagnostic challenge and raised concerns for alternative thyroid pathologies, including subacute thyroiditis. Failure of standard medical therapy to control symptoms and hormone levels further complicated management. While antithyroid drugs and steroids are commonly used to manage Graves' disease and associated thyroiditis, this patient demonstrated a refractory course, ultimately requiring surgical intervention. Pathological findings of nodular follicular hyperplasia with lymphoid infiltrates suggest an exaggerated autoimmune response contributing to persistent inflammation and symptoms.

Conclusion: This case underscores the diagnostic complexity of autoimmune thyroid disorders, particularly when atypical features such as pain and rash are present. The persistence of inflammation despite medical therapy necessitated thyroidectomy, which led to symptom resolution and more insight into the pathology. Recognizing rare presentations of Graves' disease can aid physicians in timely diagnosis and management, ultimately improving patient outcomes. This case also highlights the importance of considering surgical intervention when medical management proves insufficient in autoimmune thyroid disease.

Presentation: Oral 1B-3 Submitter: Batool AlQanber, M.D., Resident

Abstract Title: **Concurrent Heterozygosity of SPINK1 and CFTR Pathogenic Variants in a Pediatric Patient with Recurrent Acute Pancreatitis**

Authors: AlQanber, Batool, Resident M.D., Meck, Bryce, M.D.

Category: Case Report/Case Series Mentor: Xia Wang, M.D.

Abstract:

Introduction:

Recurrent acute pancreatitis (RAP) in children is increasingly recognized as having a genetic basis, especially when structural, metabolic, and infectious causes are excluded. Genes such as CFTR, SPINK1, PRSS1, CTRC, CPA1, CTSB, and CLDN2 are implicated, encoding proteins involved in pancreatic enzyme regulation. CFTR mutations are primarily associated with cystic fibrosis (CF), where biallelic mutations cause pancreatic insufficiency and pulmonary disease (1). Heterozygous CFTR mutations are considered a risk factor for RAP (2). Similarly, biallelic SPINK1 mutations are linked to hereditary pancreatitis, and heterozygous mutations may increase susceptibility to pancreatic disease (3). This case describes a pediatric patient with RAP and concurrent CFTR and SPINK1 mutations, illustrating the diagnostic complexity in determining the underlying etiology.

Case Presentation:

An 11-year-old female presented with multiple episodes of acute pancreatitis starting at age 6, characterized by abdominal pain, nausea, and vomiting, with asymptomatic intervals. She had nine hospital admissions and ER visits by age 11. Workup, including complete blood count, metabolic panel, lipid profile, fecal elastase, and celiac panel, was unremarkable. Imaging studies, including CT, ultrasound, and MRCP, were normal, ruling out anatomical pancreatic abnormalities. Sweat chloride testing for cystic fibrosis showed an intermediate level, not meeting diagnostic criteria. The patient had no pulmonary symptoms, such as chronic cough or recurrent infections, and no signs of malabsorption or pancreatic insufficiency. Genetic testing revealed monoallelic mutations in SPINK1 (p.N34S) and CFTR (p.F508del), along with a CFTR function modifier variant (5T/11TG).

Discussion:

This case highlights the genetic complexity of RAP in pediatric patients. While biallelic CFTR mutations are associated with cystic fibrosis, the absence of sinopulmonary infections or pancreatic insufficiency suggests this patient does not have classic CF. Instead, the combination of CFTR and SPINK1 mutations likely contributes to her recurrent pancreatitis. In adults, combined heterozygosity of SPINK1 p.N34S and CFTR p.F508del is recognized as a risk factor for chronic pancreatitis, with SPINK1 mutations facilitating pancreatic disease (4). The presence of co-mutation in adults is typically associated with earlier symptom onset (3), though this association is less understood in pediatric cases due to limited data.

The 5T variant of the CFTR gene is a gene expression modifier (5), not a pathogenic variant. It reduces RNA transcription and protein production from that gene copy. While it does not independently cause CF symptoms, the 5T variant may contribute to CF-related symptoms when present alongside a pathogenic CFTR mutation. This variant has also been seen in males with infertility due to bilateral agenesis of the vas deferens, without classic CF (6).

This case underscores the importance of genetic testing in pediatric RAP patients and the variable expressivity of CFTR and SPINK1-related disorders. It also highlights the need for a comprehensive approach to diagnosing genetic contributors to recurrent pancreatitis, particularly when classic CF is not present.

Presentation: C-2 Submitter: Carmen Avramut, M.D., Resident

Abstract Title: **Culture and Self-Immolation as a Method of Suicide**

Authors: Avramut, Carmen, Resident M.D., Patel, Trusha, Resident M.D., Garces, Lorrie, M.D.

Category: Case Report/Case Series Mentor: Lorrie Garces, M.D.

Abstract:

Introduction:

Suicide is a phenomenon that occurs across the world. Self-immolation is defined as the intentional act of setting oneself on fire. It has come to replace the term “suicide by burning” and is accompanied by high mortality rates as well as serious long-term complications and consequences. It is a dramatic method, often linked to a severe intent to die. Self-immolation is a common occurrence across many developing countries in the Middle East and Asia, however, continues to be a rarity in more Western and highly developed countries like the United States.

Case Report:

A 60-year-old Caucasian female with a past psychiatric history of schizoaffective disorder, trialed on numerous antipsychotics including Clozapine, was admitted to Covenant HealthCare for Acute Encephalopathy. Medical workup with associated imaging was completed, and the CMU Psychiatry CL team was subsequently consulted for further input given her extensive mental health background. Upon psychiatric evaluation, she presented with noteworthy psychotic symptoms including significant paranoia in the context of negative CT and MRI scans of the head. Per collateral with caregiver, the patient was experiencing worsening hallucinations and paranoia leading up to this admission due to Clozapine non-adherence. Additionally, due to a prolonged hospitalization and a post-acute rehab stay, the patient was unable to receive her past few Fluphenazine long-acting injections which she routinely received biweekly. Her paranoia included delusional thinking that her apartment would be taken away, that others were out to harm her, and that a gasoline can in her closet was a threat to her safety.

Chart review revealed serious persistent mental illness, including numerous suicidal attempts with her first one taking place at the age of 17. She had been hospitalized at Caro State Hospital in Michigan for 5+ years due to treatment resistance in her 40s, although her symptoms began in childhood - likely related to both genetics and social factors. In her early adulthood, the patient’s father completed suicide via firearm following his release from prison. He was incarcerated for sexual molestation of the patient during her adolescent years, and his passing brought on a constellation of feelings including intense guilt. This contributed to the patient attempting suicide via self-immolation in the backyard of their home, after which she suffered burns covering 70% BSA. Unfortunately, she had many other suicide attempts and self-harming behaviors in subsequent years - including swallowing various items, intentional overdoses, self-cutting, and stabbing herself in the abdomen. Raising the question, what risk factors may have contributed to this patient's self-immolation as her first attempt?

Discussion:

Although suicide is a common cause of death in high-income countries, more commonly completed in men than women, self-immolation itself is less frequent overall. For this patient, identifiable risk factors included: female gender, history of poor impulse control in the context of multiple psychiatric disorders, negative affective states, poverty/low SES, and familial conflict. In exploring these through a global perspective, self–immolation often represents an individual’s attempt to speak out against and escape oppression of psychosocial conditions and/or psychological distress.

Presentation: C-3 Submitter: Yashi Ballal, M-2

Abstract Title: **Bilateral Pulmonary Embolism with Bi-atrial Thrombi Entrapped in a Patent Foramen Ovale**

Authors: Ballal Yashi, M-2 M.D. Candidate, Mourad, Denise, Resident M.D., Mohamed, Fahd, M-2 M.D. Candidate, Mrad, Elie, M-2 M.D. Candidate, Petreska, Natasa, Resident M.D., Singh, Sachin, Resident M.D.

Category: Case Report/Case Series Mentor: Paritharsh Ghantasala, M.D.

Abstract:

Introduction: Bi-atrial thrombi with bilateral pulmonary embolism (PE) through a patent foramen ovale (PFO) is a rare, life-threatening condition requiring urgent diagnosis and management due to the high risk of systemic embolization and death. Patients often have comorbidities that complicate treatment due to high bleeding risk. We present a case of bi-atrial thrombi straddling a PFO with bilateral PE following recent neurosurgery.

Case Report: A 53-year-old Caucasian female presented with left lower extremity (LLE) swelling. She had a medical history of dyslipidemia, and recent intracranial abscess of the right frontal lobe with mass effect status post craniotomy with evacuation. Venous Doppler confirmed extensive DVT, and chest CTA revealed acute bilateral PE with moderate clot burden and no right heart strain. She was started on IV heparin, and interventional radiology (IR) performed LLE mechanical thrombectomy for symptomatic DVT. As she remained stable without oxygen requirements, PE thrombectomy was not needed. A post-procedure echocardiogram showed mobile echodensity in both atria, suggesting a clot in transit with possible PFO. Upon transfer to a tertiary center due to local limitations, a repeat 2D echocardiogram revealed a 4 cm thrombus originating from the left interatrial septum and freely crossing the mitral valve, along with a right atrial thrombus and PFO. Pulmonary artery systolic pressure was moderately elevated to 51.4 mmHg. The patient underwent cardiopulmonary bypass surgery, where the thrombus was found densely attached to the atrial septum. She underwent right atriotomy, mass excision, partial atrial septum resection, PFO closure, and bilateral pulmonary artery embolectomy. The next day, her course got complicated by a left-sided weakness, and a head CT showed worsening vasogenic edema, midline shift, and subfalcine herniation. Urgent craniotomy and craniectomy were performed, leading to rapid neurological improvement. Due to recent brain surgery and postoperative anemia, anticoagulation was withheld, an IVC filter was placed, and she was discharged stable after five days. Seven days post-discharge, she developed recurrent LLE weakness and swelling. CTA showed unresolved pulmonary artery thrombi, a partially occlusive IVC thrombus, and extensive bilateral proximal LE DVT. She was treated with heparin, transitioned to apixaban, and discharged on lifelong anticoagulation. A follow-up echocardiogram two months later showed complete thrombus resolution.

Discussion: Literature lacks clear guidelines for managing bi-atrial thrombi with PFO. Treatment options include anticoagulation, thrombolysis, or surgery. This case involves a patient without hypercoagulability who developed bilateral PE with bi-atrial thrombi. Her recent craniotomy, the presence of a PFO, and all the components of Virchow's triad presented significant complexity and posed a substantial challenge in implementing timely management. Surgical thrombectomy, pulmonary embolectomy, PFO closure, and IVC filter placement were performed, yet the patient had recurrent PE and DVT, because anticoagulation was risky, given her high bleeding risk. Individualized care is crucial, balancing risks based on comorbidities, clot type, and hemodynamic status. Further research is needed to optimize management strategies.

Presentation: C-4 Submitter: William Ballew, M-3

Abstract Title: **Presentation and Evaluation of an Unusual Headache: A Case Report**

Authors: Ballew, William, M-3 M.D. Candidate, Singh, Joginder, M.D.

Category: Case Report/Case Series Mentor: Joginder Singh, M.D.

Abstract:

Introduction: Headaches are a common reason for visits in primary care offices. While usually benign in nature, it is crucial to be aware of possible red flag symptoms that may point to a more serious underlying pathology. This report discusses the case of a patient presenting with headaches associated with sharp left-sided head pain that were exacerbated by postural changes or actions that increase intracranial pressure. Patient was ultimately found to have a pituitary adenoma on head CT and follow up MRI.

Case Report: A 65-year-old male with past medical history significant for hypertension, hyperlipidemia, central retinal artery occlusion, and prior renal cyst resection presented to our primary care office for concerns of persistent headaches that had been ongoing for several weeks. Pain was described as a constant pressure-like sensation over the left side of his face. Additionally, the patient noted a sharp pain in the area when sneezing, coughing, or bending forward. His pain was acceptably controlled with acetaminophen. The patient denied photophobia, visual changes, nausea, or history of migraines. The neurologic exam was non-focal and the rest of the physical exam was unremarkable. Given the concerning findings of headache and facial pain exacerbated by position changes and actions that increase intracranial pressure a CT of the head was ordered. This unfortunately revealed the presence of a lobulated cystic lesion in the sella turcica. Follow up brain MRI revealed an expansile cystic peripherally enhancing mass in the sella turcica and pituitary gland on the right with infundibular stalk to the left. The lesion was in contact with the inferior optic chiasm without compression. There was also lateral displacement of the right cavernous sinus without gross invasion. The primary consideration was cystic pituitary macroadenoma. On follow up in our office, the patient was referred to neurosurgery and further investigation included an endocrine lab panel. This was revealing for borderline hyperprolactinemia (22.2 ng/mL), low testosterone (84.8 ng/dL) with normal gonadotropins, and low T4 (0.5 ng/dL) without compensatory rise in TSH. These findings were suggestive of possible hypopituitarism caused by compression of the pituitary infundibular stalk. At this time, neurosurgical evaluation is still pending and further management is still being decided, though the current preferred treatment for pituitary adenomas is transsphenoidal surgical intervention. However, aside from the headaches, which now have an identifiable and likely benign cause, the patient has remained largely asymptomatic with no observable neurologic deficits or endocrinological aberrancies.

Conclusion: This case highlights the importance of being able to recognize red flag headache symptoms in the primary care setting. In this presentation these signs included left sided facial pain aggravated by position changes and maneuvers that increase intracranial pressure (coughing, sneezing). While the large majority of headaches have benign or unidentifiable causes, providers should have a low threshold for ordering imaging studies for headaches that present with the danger signs previously discussed. In this case, timely imaging was crucial for identifying a secondary cause for a headache with a rather unusual presentation.

Presentation: C-5 Submitter: Archita Chandra, M-4

Abstract Title: **Novel GI Variant Lemierre Syndrome: Case Report**

Authors: Chandra, Archita, M-4 M.D. Candidate, El-Hajj, Jad, Resident M.D., Ghantasala, Paritharsh, M.D.

Category: Case Report/Case Series Mentor: Paritharsh Ghantasala, M.D.

Abstract:

Introduction: Lemierre syndrome is a rare complication of oropharyngeal Fusobacterium bacteremia involving internal jugular vein thrombophlebitis and septic pulmonary embolism. One hypothesized pathophysiology for Lemierre syndrome is the hematogenous dissemination of inherently thrombogenic Fusobacterium from oropharyngeal sources such as peritonsillar abscesses or dental caries. This dissemination may facilitate distant septic embolization seen in Lemierre syndrome. A rare gastrointestinal (GI) variant, characterized by pylephlebitis, is often associated with portal vein thrombosis, septic thrombophlebitis, liver abscesses, and hepatic congestion. Occasionally, this GI variant Lemierre syndrome has also been associated with splenic and mesenteric vein thrombosis. Complications of Lemierre syndrome are equally thrombogenic and include septic pulmonary embolism, pleural effusion, and an increased risk for new thromboembolic lesions and septic peripheral lesions during hospital treatments.

Case Presentation: A 71 year old female with a history of hypertension, GERD, uterine prolapse, and carpal tunnel syndrome presented with hypertension, tachycardia, and shortness of breath. She previously developed a symptomatic COVID-19 infection one week after returning from Alaska, accompanied by poor appetite and sinus infection. Following this, she was admitted to an outside hospital for pulmonary embolism, hepatic vein thrombosis, loculated pleural effusion, and hepatic abscess. Cultures drawn at the outside hospital revealed Fusobacterium. She was treated with Ceftriaxone, Metronidazole, Eliquis, and a pigtail catheter was placed for effusion drainage. Soon after discharge from the outside facility, her tachycardia and dyspnea recurred, prompting admission to the current facility. Upon presentation, the patient's vitals showed sinus tachycardia (118 bpm), low-grade fever (99.3°F), and oxygen saturation of 95% on room air. Physical exam revealed poor dentition, oral ulcers, and mild abdominal tenderness. Labs showed leukocytosis (WBC 14.2), thrombocytosis (platelets 754,000), and elevated PT/INR (19.3 and 1.6). CTA chest confirmed a right middle-lobe segmental pulmonary embolism and a small-to-moderate right pleural effusion with suspected loculation.The patient's hospital course included continued Rocephin and Flagyl as recommended by infectious disease specialists, and the start of Eliquis (5mg BID). Thoracentesis revealed empyema, likely related to Fusobacterium, though cultures were negative. A chest tube was placed, and TPAse/Dornase injections were administered to facilitate pleural effusion drainage. The liver abscess was drained, with aspirated fluid cultures yielding negative results. After stabilization and removal of the chest tube, the patient was discharged with instructions to complete a 20-day course of Ceftriaxone.

Discussion: This case illustrates a novel presentation of GI variant Lemierre syndrome with hepatic vein thrombosis, a previously unreported feature. This patient's findings of hepatic vein involvement, pulmonary embolism, and pleural effusion align with literature detailing Lemierre syndrome's thrombogenic complications and associated risk for thrombotic events. The patient's antibiotic regimen of Ceftriaxone and Metronidazole for Lemierre syndrome aligns with guidelines recommending 3-6 weeks of treatment, with Metronidazole as the preferred agent. Anticoagulation treatment of thrombi in Lemierre Syndrome is controversial due to mixed evidence, but is suggested to be safe in reducing thromboembolic complications without increasing bleeding risk. In this case, anticoagulation was appropriate due to the symptomatic pulmonary embolism, hepatic vein thrombosis, and literature supporting its safety.

Presentation: C-6 Submitter: Nick Chiaramonti, M-3

Abstract Title: **Management of a Traumatic Multiligament Knee Injury with Coinciding Patellar Tendon Rupture: A Case Report**

Authors: Chiaramonti, Nick, M-3 M.D. Candidate, Krebs, Nathan, D.O.

Category: Case Report/Case Series Mentor: Nathan Krebs, D.O.

Abstract:

Introduction:

Injuries to the ligamentous knee structures in isolation are commonly seen in the United States, affecting approximately 400,000 individuals each year. Less common, though still routinely seen in orthopedic and sports medicine clinics, are multi-ligamentous knee injuries—those that simultaneously affect two or more of the knee ligaments. Furthermore, rupture of the patellar tendon (PT) or quadriceps tendon is seen in a mere 0.19% of knee injuries. Since 1980, there have only been 21 cases reporting combined anterior cruciate ligament (ACL)/medial collateral ligament (MCL) injury in addition to a PT rupture. Here, we present a case of this extremely rare injury pattern: a multi-ligamentous knee injury with concomitant rupture of the PT. We also report the clinical findings and operative management using the most current techniques.

Case Presentation:

A 28-year-old male presented to the emergency department shortly after a severe dirt bike accident. The patient was traveling at 25 mph on a dirt bike when he lost control of the bike and crashed, sustaining a severe right knee injury. In addition to assessing cognitive function and activating trauma protocol, the emergency department consulted orthopedic surgery to evaluate the right knee. On initial physical exam, there was obvious deformity of the knee, as the patient held the extremity in a hyper flexed position. Magnetic resonance imaging (MRI) of this knee was obtained 5 days after the initial injury after being further evaluated in clinic. Results of the MRI showed: (1) complete tear/rupture of the patellar tendon at its midsubstance, between the patellar and tibial attachments, (2) high-grade, near complete tears of the ACL and PCL, and (3) complete tear of the superficial MCL at the level of the joint line, along with complete tear of the meniscofemoral component of the deep MCL. With these findings, an operative plan was developed in two stages: first, an immediate repair of the PT and MCL; second, a subsequent arthroscopic reconstruction the ACL and PCL. The post-operative management for this patient was focused on returning the patient to full range of motion while still allowing graft healing. By the 1-year follow up appointment, the patient was cleared to return to all normal activities and self-reported satisfaction with the treatment was very high.

Discussion:

Conjecture still exists today over the best management of multi-ligament knee injuries, even without the confounding rupture of the patellar tendon. Several studies report positive outcomes for both the single stage (acute) approach and the two-stage approach. However, some systematic reviews claim that a staged treatment approach yields the best clinical results for patients with ACL/MCL/PT injury. On the contrary, Lau et. al found that the single-stage approach resulted in fewer complications, less reoperations, and lower total costs compared to the two-stage treatment. Regardless of the operative approach, timely diagnosis of these injuries with the assistance of MRI is essential for developing an operative plan. In this complex case, a two-staged operative repair that utilized internal brace augmentation was successful and provided positive clinical outcomes for the patient.

Presentation: C-7 Submitter: Cleris Christian, M.D., Resident

Abstract Title: **The Diagnostic Challenge of Persistent Thrombocytopenia: A Case of Immune Thrombocytopenia**

Authors: Christian, Cleris, Resident M.D., Darapaneni, Haritha, Resident M.D., Nannar, Jaspreet, Resident M.D.

Category: Case Report/Case Series Mentor: Samer Abboud, M.D.

Abstract:
Background:
Thrombocytopenia is a common finding in hospitalized patients, particularly those with sepsis, liver disease, or critical illness. While sepsis-associated thrombocytopenia is often attributed to disseminated intravascular coagulation (DIC) or platelet consumption, immune thrombocytopenia (ITP) should be considered when thrombocytopenia persists despite infection resolution. ITP is an acquired autoimmune disorder characterized by platelet destruction and impaired thrombopoiesis due to autoantibodies targeting platelet glycoproteins, particularly glycoprotein IIb/IIIa. Diagnosis remains one of exclusion, requiring a thorough workup to differentiate ITP from other causes of thrombocytopenia, including DIC, microangiopathic hemolytic anemia (MAHA), and drug-induced thrombocytopenia (DITP). The absence of a highly specific diagnostic test and its overlap with other etiologies, including drug-induced and hereditary thrombocytopenia, further complicates identification.
Case Presentation:
A 53-year-old male with a history of bicuspid aortic valve, congenital aortic stenosis, type 2 diabetes mellitus, alcohol use disorder, and liver cirrhosis of unknown etiology underwent elective aortic valve replacement. His postoperative course was complicated by methicillin-sensitive Staphylococcus aureus (MSSA) bacteremia and infective endocarditis, requiring cefazolin therapy. Additionally, he developed renal dysfunction, requiring renal replacement therapy, and underwent multiple paracenteses for ascitic fluid accumulation.
During subsequent admission, he developed narrow complex tachycardia, requiring intervention. His platelet count declined progressively from 209 to 87 over 13 days, with an acute drop over five days despite continued antibiotic therapy. He developed spontaneous bacterial peritonitis (SBP), prompting a switch from cefazolin to ceftriaxone. Thrombocytopenia was initially attributed to sepsis, but persistent decline raised concern for an alternative etiology. Hematologic evaluation revealed negative heparin-induced thrombocytopenia (HIT) testing, normal coagulation studies, and absence of schistocytes on peripheral blood smear, ruling out DIC and MAHA. Despite platelet transfusions, counts failed to improve, favoring an immune-mediated mechanism. Corticosteroid therapy with intravenous methylprednisolone (Solumedrol) resulted in a steady platelet count recovery, supporting a diagnosis of ITP.
Diagnosis and Management:
The patient's persistent thrombocytopenia, absence of overt coagulopathy, and failure to respond to platelet transfusions suggested ITP as the primary cause. A comprehensive evaluation ruled out secondary causes, including infection, malignancy, and drug-induced thrombocytopenia. Given the severity of thrombocytopenia, the patient was started on high-dose corticosteroids, leading to significant improvement in platelet counts. First-line therapy for ITP includes corticosteroids and intravenous immunoglobulin (IVIG) in cases of severe bleeding. Thrombopoietin receptor agonists (eltrombopag, romiplostim) and rituximab serve as second-line options in refractory cases.
Outcome and Follow-up:
Following corticosteroid therapy, the patient's platelet count gradually increased, confirming the immune-mediated nature of thrombocytopenia. Close monitoring was continued, and the patient remained stable without further bleeding complications.
Conclusion:
This case highlights the diagnostic challenge of persistent thrombocytopenia in critically ill patients. Sepsis-associated thrombocytopenia typically improves with infection resolution, but failure of platelet counts to recover should prompt evaluation for alternative causes. ITP should be suspected in patients with isolated thrombocytopenia, no evidence of DIC or MAHA, and a lack of response to platelet transfusions. Early recognition and appropriate immunosuppressive therapy are crucial in preventing life-threatening hemorrhagic complications. This case underscores the importance of distinguishing ITP from other thrombocytopenic disorders to ensure timely and effective treatment.

Presentation: Submitter: Cleris Christian, M.D., Resident

Abstract Title: **Cemiplimab and Severe Hepatitis: The Importance of Vigilance in Immune Checkpoint Inhibitor Therapy**

Authors: Farooqi, Mashood, Resident M.D., Al-Khateeb, Wasef, Resident M.D., Christian, Cleris, Resident M.D., West, Benjamin, M-3 M.D. Candidate, Gogikar, Amaresh, Resident M.D., El-Hajj, Jad, Resident M.D., Rahme, Christelle, Resident M.D.

Category: Case Report/Case Series Mentor: Jahangir Khan, M.D.

Abstract:

Background

Cemiplimab is a PD-1 immune checkpoint inhibitor approved for the treatment of locally advanced or metastatic squamous cell carcinoma (SCC) of the skin. While it enhances anti-tumor immunity, it can also precipitate immune-mediated adverse events, including hepatotoxicity. Although immune-mediated hepatitis is uncommon, it is a serious complication that necessitates vigilant liver function monitoring during therapy.

Case Presentation

An 80-year-old woman with metastatic squamous cell carcinoma of the forehead was being treated with cemiplimab. She presented with new-onset profound weakness, poor appetite, drowsiness, and confusion. On examination, she was significantly drowsy but had no focal abdominal pain or hepatomegaly. Laboratory tests revealed marked liver injury, with aspartate aminotransferase (AST) at 1,074 U/L, alanine aminotransferase (ALT) at 1,067 U/L, alkaline phosphatase at 685 U/L, and total bilirubin at 1.2 mg/dL.

Diagnosis and Management

An extensive work-up for alternative causes of hepatic dysfunction was unremarkable. Viral hepatitis serologies were negative, and acetaminophen toxicity and alcohol use were ruled out. Magnetic resonance cholangiopancreatography (MRCP) showed mild common bile duct dilation but no evidence of choledocholithiasis or tumor. Given the absence of other etiologies, cemiplimab-induced immune-mediated hepatitis was diagnosed. Immunotherapy was immediately discontinued, and the patient was started on intravenous fluids and high-dose corticosteroids to suppress immune-mediated liver inflammation.

Outcome and Follow-up

The patient's liver enzyme levels improved over the course of hospitalization with steroid therapy. Given the severity of hepatic injury, her oncology team elected to permanently discontinue cemiplimab treatment. At follow-up, her liver function tests continued to trend toward normal, and no further immunotherapy was planned.

Conclusion

This case highlights the importance of early recognition and prompt management of immune checkpoint inhibitor–related hepatotoxicity. Adherence to established guidelines (such as ASCO recommendations) is crucial. Severe immune-mediated hepatitis (Grade 3–4) warrants holding or permanently discontinuing the immune checkpoint inhibitor and initiating high-dose corticosteroids. Close liver function monitoring during immune checkpoint inhibitor therapy is essential. In patients who develop significant hepatotoxicity, immunotherapy should be halted to prevent life-threatening liver damage. Clinicians must remain vigilant for such immune-related adverse effects, as severe cases often preclude re-challenge with the agent, impacting future cancer treatment strategies.

Presentation: C-8 Submitter: Haritha Darapaneni, M.D., Resident

Abstract Title: **"An Unusual Presentation of Streptococcal Meningitis Masquerading as Stroke: A Diagnostic Pitfall with Fatal Consequences"**

Authors: Darapaneni, Haritha, Resident M.D., Jarad, John, Resident M.D., Christian, Cleris, Resident M.D., Khambali, Srinivas, M.D.

Category: Case Report/Case Series Mentor: Srinivas Khambali, M.D.

Abstract:
Background
Bacterial meningitis is a life-threatening condition requiring prompt recognition and treatment. While classic symptoms include fever, headache, neck stiffness, and altered mental status, atypical presentations like hemiplegia can mimic stroke, leading to delayed diagnosis. This case highlights a patient with Streptococcus pneumoniae meningitis who initially presented with neurological deficits suggestive of stroke, resulting in a delayed diagnosis and severe complications. The report underscores the importance of considering infectious etiologies in stroke mimics and the necessity of early cerebrospinal fluid (CSF) analysis in atypical neurological presentations.
Case Presentation
A 62-year-old woman with diabetes mellitus, transient ischemic attack, rheumatoid arthritis, atrial fibrillation, and prior endovascular aneurysm repair was brought to the emergency department with sudden-onset altered mental status. Her family found her unresponsive, last known normal 24 hours prior. On arrival, she was afebrile but tachycardic (118 bpm) and tachypneic. Neurological examination revealed left-sided hemiplegia, aphasia, and rightward gaze deviation, with an initial NIHSS score of 26.
A Code Stroke and level III trauma were activated. The patient was placed in a cervical collar. A non-contrast CT of the head showed a chronic right subdural hematoma, while CT angiography revealed < 50% stenosis in both internal carotid arteries. CT perfusion imaging showed no significant mismatch suggestive of acute stroke. Trauma evaluation was negative, but collar removal was delayed. Labs showed leukocytosis (WBC: 31,000/µL), ESR of 73 mm/hr, and CRP of 294 mg/L. She also had burning urination and abdominal pain, and urine cultures later grew Escherichia coli. She was started on Linezolid and Zosyn for urinary tract infection and sepsis due to antibiotic allergies, including vancomycin and cephalosporins. Despite initial management, her neurological status worsened. A repeat CT showed diffuse cerebral edema, prompting dexamethasone. MRI showed a large acute/subacute right fronto-parieto-temporal infarct. Given the atypical course, a lumbar puncture was performed, revealing WBC of 4,221/µL (86% granulocytes), 390 mg/dL protein, and 49 mg/dL glucose. CSF PCR and blood cultures confirmed Streptococcus pneumoniae meningitis. Antibiotic therapy was adjusted. Neurosurgery, after reviewing the MRI, suspected empyema rather than infarct and recommended MRI with contrast. However, the patient's family declined further interventions, and she was transitioned to hospice care.
Discussion
Bacterial meningitis cases might present without the classic triad of fever, nuchal rigidity, and encephalopathy. Stroke and sepsis are common differentials in acute encephalopathy with leukocytosis, often leading to empiric antibiotic choices with poor CNS penetration. Community hospitals may also experience delays due to provider discomfort with lumbar puncture, contributing to disease progression and worsened outcomes.
Differentiating stroke from meningitis is critical, as treatment strategies differ significantly. Stroke management focuses on thrombolysis or thrombectomy, whereas bacterial meningitis requires urgent antibiotics and corticosteroids. Early CSF analysis should be pursued in patients with unexplained neurological deterioration, even if they lack classic signs of meningitis. Adjunctive dexamethasone in Streptococcus pneumoniae meningitis has been shown to reduce neurological complications, hearing loss, and mortality. This case underscores the need for heightened clinical suspicion of infectious etiologies in stroke-like presentations, especially when inflammatory markers are elevated.

Presentation: C-9 Submitter: Joel DeJonge, M-3

Abstract Title: **An Overuse Injury Leading to Pronator Teres Syndrome: A Case Report**

Authors: DeJonge, Joel, M-3 M.D. Candidate, Singh, Sachin, Resident M.D., Mourad, Denise, Resident M.D., Al-Sabbagh, Ihsan, M.D.

Category: Case Report/Case Series Mentor: Ihsan Al-Sabbagh, M.D.

Abstract:
Introduction:
Pronator teres syndrome (PTS) is a rare cause of compressive median nerve neuropathy in the proximal forearm which often results from overuse. We present the case of a 25-year-old male who developed PTS due to work-related repetitive stress. Our case highlights the importance of distinguishing PTS from other median nerve entrapment syndromes and emphasizes the utility of clinical and diagnostic evaluation in managing nerve compression.
Case Presentation:
A 25-year-old male with no significant past medical history presented to the clinic with chief complaints of right forearm pain, tingling, and weakness in his right hand. His symptoms began two months prior, after a period of intense, repetitive forearm use at work, where he frequently engaged in tasks involving elbow flexion and forearm pronation.
Needle EMG revealed a decreased right median nerve conduction velocity in the right forearm and abnormal spontaneous activity in the form of fibrillations and positive sharp waves and reduced motor unit recruitment in the right pronator teres muscle were also noted. These electrodiagnostic findings were consistent with right upper extremity pronator teres syndrome.
MRI of the right forearm demonstrated enlargement of the median nerve with diffuse, bright signal in T2-weighted pulse sequence starting from the level of the elbow and extending into the distal one third of the forearm. Mild edema was also noted to the pronator teres, flexor carpi radialis, and abductor pollicis longus muscles in the proximal two thirds of the forearm, likely secondary to median nerve entrapment.
The patient was managed conservatively with NSAIDs, rest, and physical therapy. At a two-month follow-up, he reported a greater than 90% improvement in symptoms, with full recovery of range of motion and strength in his forearm. NSAIDs were discontinued, and follow-up was maintained to monitor for any recurrence.
Discussion:
Pronator teres syndrome [PTS], or pronator syndrome [PS], is a rare cause of compressive median nerve neuropathy in the proximal forearm. It is frequently caused by repetitive movements such as elbow flexion, forearm supination, and pronation, along with activities involving frequent gripping or pushing. These motions place the forearm muscles in constant contact with the median nerve, leading to its compression. Due to variability in the anatomy of the forearm structures, PTS has multiple possible causes. Still, the pronator teres muscle has been identified as the most common culprit.
PTS is often misdiagnosed as CTS; the distinguishing feature is tenderness in the proximal forearm, as opposed to the volar wrist. Sensory deficits in PTS may extend to the thenar eminence, which remains spared in CTS due to the palmar cutaneous branch of the median nerve originating proximal to the carpal tunnel.
Management of PTS is generally conservative, with NSAIDs, rest, and physical therapy often resulting in symptom resolution in as many as 80% of cases. However, surgical intervention to release compressing structures may be necessary when conservative management fails.
This case highlights the importance of considering PTS in patients with repetitive stress/overuse, as early diagnosis and appropriate management can prevent prolonged discomfort and functional impairment.

Presentation: C-10 Submitter: Joel DeJonge, M-3

Abstract Title: **Edge to edge excellence: TEER in true eccentric commissural mitral valve regurgitation**

Authors: DeJonge, Joel, M-3 M.D. Candidate, Singh, Sachin, Resident M.D., Mourad, Denise, Resident M.D., Darapaneni, Haritha, Resident M.D., Kassas, Ryan, Other, Khan, Afrasayab, Resident M.D., Fattal, Peter, M.D., Kassas, Safwan, M.D.

Category: Case Report/Case Series Mentor: Safwan Kassas, M.D.

Abstract:

Background:

All randomized transcatheter edge-to-edge repair [TEER] therapy trials for mitral regurgitation [MR] have focused on central A2/P2 MR and excluded eccentric true commissural MR, which poses a significant risk due to the heavy presence of cords in that location and the potential for device entrapment. Currently, the MitraClip and the Pascal device are approved in the U.S. for this procedure.

Case:

An 87-year-old male with a past medical history of heart failure with preserved ejection fraction, aortic stenosis status post transcatheter aortic valve replacement, coronary artery disease, severe mitral regurgitation, hypertension, and severe chronic obstructive pulmonary disease presented with symptoms of congestive heart failure despite maximally tolerated guideline-directed medical therapy. Physical examination revealed a parasternal heave, thrill, and 3/6 holosystolic murmur on auscultation. A transesophageal echocardiogram identified severe eccentric MR originating from the far medial posterior P3 scallop adjacent to the medial commissure.

Decision-making: The heart valve team evaluated the patient and deemed him high risk for surgical management. Consequently, the decision was made to proceed with MitraClip despite the procedural complexities posed by true commissural regurgitant jets, which complicates visualization and increases the difficulty of leaflet grasping and clip positioning. Specific technical steps were required: A higher transseptal puncture elevation [4.5 to 5 cm], the use of a shorter NTW clip instead of the longer XTW, crossing the mitral valve in the closed position, avoiding deep insertion of the device into the left ventricle, and finally, avoidance of a wide grasping arm angle. The MitraClip NTW was successfully deployed, significantly reducing MR from severe to trace.

Conclusion:

The successful application of TEER therapy for true commissural MR highlights the importance of operator expertise. Although head-to-head randomized trials comparing the two devices for such complex anatomies may be improbable, it is imperative that operators become proficient in both devices and make their choice based on their clinical experience.

Presentation: C-11 Submitter: Elizabeth Fearey, D.O., Resident

Abstract Title: **A Rare Case of Broad Ligament Hematoma During Intercourse**

Authors: Fearey, Elizabeth, Resident D.O., Ireland, Nichole, M-4 M.D. Candidate

Category: Case Report/Case Series Mentor: Kathleen Cowling, D.O.

Abstract:

Submitter: Elizabeth Fearey

Abstract Title: A Rare Case of Broad Ligament Hematoma During Intercourse

Authors: Dr. Kathleen Cowling D.O., Dr. Elizabeth Fearey D.O. PGY-3, Nichole Ireland MS3

Abstract Category: Case Report

Broad ligament hematomas are rare occurrences outside of pregnancy and usually occur surrounding birth trauma. No cases of spontaneous broad ligament hematoma during intercourse have been reported. As such, we aim to describe a rare case of non-obstetric spontaneous broad ligament hematoma/hemorrhage in the setting of intercourse. The patient was 43-year-old G5P4014 with a past medical history significant for super mesenteric artery syndrome who presented to the emergency department for acute onset right lower quadrant abdominal pain that began during intercourse. She was found to have a rapidly expanding broad ligament hematoma secondary to a ruptured pelvic vein requiring emergent laparotomy, hysterectomy, and blood transfusion. Although rare, non-obstetric spontaneous broad ligament hematomas require rapid diagnosis and immediate surgical intervention to ensure the safety of the patient and should be considered in cases of sudden onset pelvic pain during intercourse.

Presentation: C-12 Submitter: Chancee Forestier, M.D., Resident

Abstract Title: **Brenner Tumor: A Case Study**

Authors: Forestier, Chancée, Resident M.D., O'Keefe, Riley, M-3 M.D. Candidate, Kinaschuk, Veronika, M.D.

Category: Case Report/Case Series Mentor: Veronika Kinaschuk, M.D.

Abstract:

Background: Brenner tumors (BT) are an extremely rare type of ovarian mass that fall under the epithelial tumor classification. BT are a type of transitional cell tumor, resembling the epithelium physiologically found in the bladder and ureters. Benign BT tend to be less than 2 cm in size and often found incidentally, whereas borderline or malignant Brenner tumors tend to be larger, with sizes around 12 cm and may be symptomatic. When present, symptoms include abdominal pain, postmenopausal bleeding due to estrogen production, or mass effects on surrounding structures.

Case Presentation: A 39 year-old woman presented with three months of lower abdominal pain, pulling, and urge incontinence. A large, 11.7 x 10.7 x 15.6 cm pelvic mass was identified on computed tomography scan. The mass was resected via laparotomy and found to be benign. Macroscopically, the specimen contained multiple smooth, walled, unilocular cystic components along the periphery up to 2.3 cm in diameter filled with serosanguinous fluid. Microscopically, there was expansion of ovarian tissue by fibrous tissue and benign-appearing urothelial nests. Cytology of pelvic washings confirmed no cells diagnostic for malignancy.

Conclusions: Due to the rarity of these ovarian neoplasms and the large size of the current BT with benign pathology, this case becomes an interesting learning point. While the majority of large, symptomatic BT return with borderline or malignant pathology, the presence of these features may not be a reliable predictor of malignancy. Further, the presence of early menopause in this case is in contrast to the association of postmenopausal bleeding secondary to estrogen production by some BT. This case challenges conventional expectations of the already rare Brenner tumor, thus offering a unique opportunity for deeper investigation and understanding. In practice, this case can help counseling patients with large solid ovarian masses with negative tumor markers.

Presentation: Submitter: Brittany Garza, D.O., Resident

Abstract Title: **Case of Bilateral Lower Extremity Pyogenic Gangrenosum**

Authors: Liu, Jessica, M-4 M.D. Candidate, Garza, Brittany, D.O.

Category: Case Report/Case Series Mentor: Mary Lynn Arvanitis, D.O.

Abstract:

Introduction:

Ulcerative colitis (UC) is a gastrointestinal condition characterized by recurring episodes of mucosal inflammation of the colon. Patients can experience diarrhea, colicky abdominal pain, tenesmus and more. Patients also experience extraintestinal manifestations, one of which is pyogenic gangrenosum (PG). PG is a neutrophilic dermatosis causing an inflammatory papule that can ulcerate and form violaceous borders. Both UC and PG can be manifestations of autoimmunity and can be challenging to treat.

Case Presentation:

A 51 yo male with a past medical history of UC status post colectomy presented to the emergency department for wounds on the anterior surface of his bilateral lower extremities. The patient stated that over the past two weeks he noticed the development of small pustules on his legs which he attempted to drain himself and then applied Vashe, a bleach skin solution. The lesions became larger and more painful which prompted his evaluation in the ED. He denied any new chemical exposures, zoonotic exposures, trauma, recent viral illnesses or vaccinations. Initial vital signs were within normal limits. Laboratory studies were remarkable for an elevated WBC count, sed rate, and procalcitonin. Wound and blood cultures were obtained. The patient was given morphine for pain and was given a dose of vancomycin for treatment of presumed cellulitis. The patient was admitted to the Clinical Decision Unit for further care. While in the CDU, infectious disease, plastic surgery, and general surgery were consulted. Surgery did not think debridement was necessary. The ID team modified his antibiotics to linezolid and cefepime and ordered a CT of the bilateral lower extremities. The CT demonstrated mild edema in the subcutaneous soft tissues without abscess or osteomyelitis. Wound cultures were positive for MRSA. Blood cultures were negative. A skin biopsy showed necroinflammatory debris and inflamed epidermis. Due to the rapid progression of the ulcer formation and the patient's history of UC, both plastic surgery and infectious disease concluded that these lesions were PG. The patient was discharged on 40mg methylprednisolone BID and doxycycline. He was referred to dermatology who increased his methylprednisolone to 80mg BID with a taper.

Discussion:

PG is an uncommon neutrophilic dermatitis. Generally, young to middle aged women are effected which is unlike the older male patient in this case. More than 50% of patients with PG have an underlying systemic condition, in this case UC. When managing any patient, it is important to tie all of the patient's symptoms and clinical findings together into one cohesive diagnosis which was well illustrated with the diagnosis of PG. PG subtypes include ulcerative (what this patient had), bullous (atypical), pustular, and vegetative. PG can effect a variety of body sites including peristomal, genital, extracutaneous, and postoperative surgical sites. This patient was a carpenter with frequent trauma to his anterior lower extremities which may have been contributory. PAD has also been thought to contribute to the development of PG by reducing healing potential and may contribute to the development of PG but more research is necessary in this field.

Presentation: C-13 Submitter: Carly Gatchell, D.O., Resident

Abstract Title: **Venous Thromboembolism with Mechanical Thrombectomy in Pregnancy**

Authors: Gatchell, Carly, Resident D.O., Larochelle, Alexandra, Resident D.O., Kinaschuk, Veronika, M.D.

Category: Case Report/Case Series Mentor: Veronika Kinaschuk, M.D.

Abstract:

Background: Pregnancy is a well-established hypercoagulable state, increasing the risk of venous thromboembolism (VTE), particularly in the third trimester. Deep venous thrombosis (DVT) poses significant maternal and fetal risks, necessitating prompt diagnosis and management. While anticoagulation is the mainstay of therapy, mechanical thrombectomy may be considered in cases of extensive clot burden, phlegmasia, or contraindications to systemic anticoagulation.

Case Presentation: A 21-year-old G1P0 at 35 weeks gestation presented to the emergency department with acute left lower extremity swelling and discomfort. Physical exam revealed significant unilateral lower extremity edema, pallor, coolness to touch, and diminished pedal pulses. Doppler ultrasound confirmed extensive DVT involving the common femoral, femoral, and deep profundus veins. Given the extensive clot burden, a multidisciplinary team—including maternal-fetal medicine and interventional radiology—proceeded with mechanical thrombectomy. The procedure was performed successfully, and the patient was initiated on postoperative anticoagulation with heparin infusion and transferred to Intensive care unit. On hospital day two, she was transitioned to therapeutic enoxaparin (1mg/kg).

Hypercoagulability workup revealed elevated protein C, low protein S, normal Factor V Leiden, and negative anticardiolipin antibodies. Due to persistent tachycardia, Transthoracic echocardiogram and electrocardiogram were performed, both unremarkable. A plan was made to reassess the clot burden prior to delivery to determine the need for inferior vena cava (IVC) filter placement. Follow-up ultrasound prior to delivery showed complete clot resolution. The patient underwent labor induction at 38 weeks per maternal-fetal medicine guidance and delivered without complication.

Discussion: Pregnancy is a well-established hypercoagulable state due to physiological adaptations that increase thrombotic risk. Virchow's triad: venous stasis from uterine compression, endothelial injury from vascular remodeling, and hypercoagulability due to elevated clotting factors and decreased fibrinolysis. DVT incidence in pregnancy is estimated at 0.5 to 2.0 per 1000 pregnancies, with the left lower extremity more commonly affected due to compression of the left common iliac vein by the gravid uterus against the lumbar spine and right iliac artery. This case highlights a severe DVT presentation with signs of limb ischemia, prompting the use of mechanical thrombectomy. While anticoagulation remains the cornerstone of treatment, interventional therapies can be critical in cases of extensive clot burden, limb compromise, or contraindications to systemic anticoagulation. Though mechanical thrombectomy is rarely employed during pregnancy, emerging reports support its safety when performed in a controlled setting, with favorable maternal outcomes and minimal fetal risk. Management requires a multidisciplinary approach, balancing maternal stabilization and fetal considerations. Post-procedure care requires close maternal-fetal monitoring, with anticoagulation adjusted to minimize both thrombotic recurrence and bleeding risk, especially near delivery. This case underscores the importance of early recognition of severe pregnancy-associated DVT and the expanding role of advanced interventions when anticoagulation alone may not suffice.

Conclusion: The management of extensive pregnancy-associated DVT requires a multidisciplinary approach balancing maternal and fetal risks. Mechanical thrombectomy can be a safe and effective option in select cases, preventing complications while allowing for continuation of pregnancy. Further research is needed to refine management guidelines and clarify the optimal role of interventional therapies in pregnancy-associated thrombosis.

Presentation: Oral 1B-1 Submitter: Amaresh Gogikar, M.D., Resident

Abstract Title: **Beyond the Block: A Rare Case of Lyme-Induced Cardiomyopathy**

Authors: Gogikar, Amaresh, Resident M.D., Petreska, Natasa, Resident M.D., St-Germain, Charles L, Resident M.D., Christian, Cleris, Resident M.D., Ghantasala, Paritharsh, M.D.

Category: Case Report/Case Series Mentor: Mayar Jundi, M.D.

Abstract:

Introduction:

Lyme disease, caused by Borrelia burgdorferi, is transmitted by Ixodes ticks and is the most common vector-borne illness in the U.S., with 476,000 diagnoses annually (Centers for Disease Control and Prevention [CDC], 2024; Lo, 2021). It progresses through three stages: early localized, disseminated, and late disseminated. Early symptoms include flu-like signs and erythema migrans in 70–80% of cases (Bay Area Lyme Foundation, 2024). In 4–10% of untreated cases, Lyme carditis arises during the disseminated stage, frequently presenting as an atrioventricular (AV) block (Kugeler et al., 2024; Fish et al., 2008). While temporary pacing may be needed in severe cases, cardiac symptoms often resolve with antibiotics (Fish et al., 2008; Ciesielski et al., 1989). However, Lyme-induced cardiomyopathy remains a rare complication, observed in only 0.5% of cases, and poses significant diagnostic challenges due to its potential mechanisms of direct myocardial invasion or immune-mediated inflammation (Ciesielski et al., 1989; Fish et al., 2008). This case report highlights Lyme-induced cardiomyopathy, emphasizing the importance of early recognition and management in endemic regions (Kugeler et al., 2024; Ciesielski et al., 1989).

Case Presentation:

A 29-year-old male with no prior medical history presented to the ED after syncope while working on a farm. He denied chest pain, dyspnea, or recent illness and had no substance use or family history of cardiac disease. EKG revealed a complete AV block. Despite IV fluids, dopamine, and transcutaneous pacing, his condition persisted. Echocardiography showed a severely reduced ejection fraction (EF) of < 20% and Lyme serologies confirmed positive IgG and IgM antibodies. The autoimmune workup was unremarkable. He was treated with IV ceftriaxone and heart failure medications, including Farxiga, Toprol XL, Entresto, and Aldactone. His EF improved to 35–40% before discharge. At a four-week follow-up, he remained asymptomatic, with stable cardiac function.

Discussion/Conclusions:

Lyme carditis typically presents as an AV block due to B. burgdorferi spread during the disseminated phase (Fish et al., 2008). While AV block usually resolves with antibiotics, untreated Lyme can rarely lead to cardiomyopathy, as seen in this case. The SILC score (Suspicion Index for Lyme Carditis), which evaluates risk factors such as age, outdoor exposure, and erythema migrans, suggested a low likelihood of Lyme disease (Besant et al., 2018). Despite this, positive Lyme serology confirmed the diagnosis, highlighting the need for testing even in atypical cases.

Lyme-induced cardiomyopathy is rare but serious. One case described a 47-year-old female with biventricular heart failure and EF of 10% who recovered with prolonged antibiotic therapy (Koene et al., 2012). The mechanism may involve direct myocardial invasion or autoimmune inflammation, as demonstrated in studies showing Borrelia species in endomyocardial samples of patients with dilated cardiomyopathy, especially in endemic regions (Kubánek et al., 2012). In Michigan, where Lyme disease prevalence is rising, this case emphasizes the need for heightened clinical suspicion and timely intervention (Michigan.gov, 2024). Early antibiotic therapy can improve outcomes, as seen in this patient's significant recovery.

Presentation: C-14 Submitter: Amaresh Gogikar, M.D., Resident

Abstract Title: **Dual Rescue: Managing Saddle Pulmonary Embolism and Right Atrial Thrombus with the FlowTriever System**

Authors: Gogikar, Amaresh, Resident M.D., St-Germain, Charles L, Resident M.D.

Category: Case Report/Case Series Mentor: Paritharsh Ghantashala, M.D.

Abstract:
Introduction:
The coexistence of a saddle pulmonary embolism (PE) with a right atrial (RA) thrombus in transit is a rare but life-threatening condition, associated with mortality rates as high as 42% when left untreated. The European Working Group on Echocardiography classifies RA thrombi into three types, with Type A (thrombi-in-transit) carrying the highest embolic risk. Standard treatments, including anticoagulation, thrombolysis, or surgical embolectomy, are often limited in efficacy or feasibility in unstable patients. The FlowTriever system, initially FDA-approved for PE treatment, was cleared in 2021 for intracardiac thrombus removal. However, large-scale studies comparing its efficacy to other modalities, such as AngioVac or open thrombectomy, remain lacking.
Case Presentation:
We report a 74-year-old female with hypertension, diet-controlled type 2 diabetes mellitus with peripheral neuropathy (on gabapentin), chronic kidney disease (CKD), and obesity who presented with abrupt-onset chest pain, progressive dyspnea over a week, and a pre-syncopal episode. On arrival, she was hypertensive (162/112 mmHg) but otherwise vitally stable on 2L nasal cannula. Laboratory workup revealed hypokalemia (2.9 mEq/L, corrected), elevated BNP (982 pg/mL), baseline CKD (creatinine 2.1 mg/dL), and mildly elevated troponin (0.05 ng/mL) without dynamic changes. Electrocardiography showed normal sinus rhythm with QTc 479 ms but no acute ischemic changes, and chest radiography was unremarkable. Bilateral lower extremity duplex ultrasound showed no evidence of deep vein thrombosis (DVT).
To avoid contrast-induced nephropathy, a ventilation-perfusion (V/Q) scan was performed instead of CT pulmonary angiography (CTPA), revealing a large perfusion defect concerning PE. A heparin infusion was initiated, and subsequent CTPA confirmed a massive saddle PE with bilateral pulmonary artery involvement and right heart strain. Transthoracic echocardiography (TTE) demonstrated a large, mobile RA thrombus, severe right atrial and ventricular dilation, elevated pulmonary artery pressures (80 mmHg), and moderate tricuspid regurgitation.
Given the clot burden and urgency, interventional radiology (IR) performed an emergent mechanical thrombectomy using the FlowTriever system. Intraoperative imaging showed no residual RA thrombus and pulmonary artery pressures improved significantly (pre-procedure: 66/25/41 mmHg; post-procedure: 54/22/34 mmHg). The patient was transferred to the ICU for close monitoring, where a post-procedure TTE unexpectedly revealed persistent RA thrombus. A subsequent transesophageal echocardiogram (TEE) confirmed its presence. Cardiology then performed right atrial thrombectomy using the FlowTriever system, successfully removing the thrombus with significant hemodynamic improvement. The patient was stabilized, transitioned to the medical floor, and discharged home on therapeutic anticoagulation with apixaban.
Discussion/Conclusions:
This case demonstrates the successful sequential use of the FlowTriever system for pulmonary and intracardiac thrombectomy, emphasizing its expanding role in high-risk thromboembolic disease. A recent two-center study on FlowTriever for RA thrombi reported an 83% success rate, with significant reductions in pulmonary artery pressures. Compared to AngioVac, FlowTriever eliminates the need for extracorporeal circulation and reduces procedural complexity. Additionally, systemic thrombolysis carries a 13–20% risk of major bleeding, making mechanical thrombectomy a preferable alternative in select cases. This case contributes to the growing literature supporting FlowTriever's role in right heart thrombus management, highlighting the need for further studies to establish standardized protocols.

Presentation: C-15 Submitter: Lyluma Ishfaq, M-1

Abstract Title: **A Vascular Conundrum: Lemierre's Syndrome with Superior Vena Cava Obstruction – A Multidisciplinary Triumph**

Authors: Ishfaq, lyluma, Resident M.D., Khan, Afrasayab, Resident M.D., Gariaqoza, Yousif, M-3 M.D. Candidate, Mesaros, Katherine, M-3 M.D. Candidate, Abbasi, Ramzi, Resident M.D., Kasemodel, Robert, Resident M.D., Kambali, Shrinivas, M.D.

Category: Case Report/Case Series Mentor: Shrinivas Kambali, M.D.

Abstract:
Introduction:
Lemierre's syndrome is a rare condition, first described by Andre Lemierre in 1936, characterized by thrombophlebitis of the internal jugular vein and bacteremia predominantly due to Fusobacterium necrophorum—a gram-negative anaerobe normally residing in the oropharynx—following a recent oropharyngeal infection. The organism's propensity to aggregate platelets and induce intravascular coagulation plays a pivotal role in the pathogenesis of septic thrombophlebitis and subsequent dissemination of septic emboli. Despite its rarity in the antibiotic era, a resurgence of Lemierre's syndrome has been noted, likely due to more conservative antibiotic use for pharyngitis.
Case Description
A 33-year-old African American male presented with a three-week history of insidious, progressively worsening midsternal chest pain, accompanied by a productive cough, nausea, vomiting, dyspnea, night sweats, fatigue, loss of appetite, and facial swelling. He also reported severe dental and jaw pain after a dental abscess treated unsuccessfully with amoxicillin and had lost 9 lbs unintentionally. Examination revealed poor dentition with halitosis, multiple caries, jaw tenderness, and left-sided neck swelling. Laboratory evaluation revealed markedly elevated inflammatory markers (CRP 103.3 mg/L, ESR 54 mm/hr) and an increased D-dimer (1671 ng/mL). A chest X-ray demonstrated widening of the superior mediastinum, prompting further evaluation with computed tomography angiography (CTA) that demonstrated soft tissue masses in the left neck and adjacent to the superior vena cava (SVC) with near-complete SVC obstruction. Further CT neck confirmed thrombosis of the left subclavian vein with surrounding fat stranding, consistent with septic thrombophlebitis of the internal jugular vein, thus establishing the diagnosis of Lemierre's syndrome. Empiric treatment with intravenous ampicillin-sulbactam and a heparin drip was initiated following blood culture collection.
Discussion
Despite initial therapy, repeat CT on day 2 revealed persistent occlusion of the left internal jugular vein and an SVC thrombus. In response to ongoing symptoms, Interventional Radiology and Pulmonology escalated management to reduce clot burden and forestall vascular fibrosis. On day 5, a left internal jugular venogram confirmed complete occlusion of the lower left IJ and innominate veins, along with total SVC obstruction. Although intraluminal recanalization of the left IJ and innominate veins was successful, an antegrade approach for SVC recanalization was unsuccessful.Consequently,, a continuous tPA infusion (0.6 mg/hour) and heparin (500 units/hour) was initiated. On day 6, via left common femoral venous access, mechanical thrombectomy of SVC using a 16 French Indigo System was performed, followed by balloon angioplasty. Although approximately 50% residual stenosis persisted, venous flow improved markedly, and the patient was transitioned from IV heparin to oral eliquis. Intravenous ampicillin-sulbactam was continued for three weeks, followed by oral augmentin, leading to significant symptomatic relief.
Conclusion
This case highlights the evolving challenge of managing Lemierre's syndrome, particularly when complicated by SVC thrombosis. Early recognition, prompt imaging, and a coordinated multidisciplinary approach—including advanced interventional procedures—are critical to reducing thrombus burden, preventing long-term complications, and improving patient outcomes in this rare but life-threatening condition.

Presentation: C-16 Submitter: Eunji Jeong, M-2

Abstract Title: **A Rare Case of Pseudobradycardia with Ventricular Bigeminy and Recurrent Dizziness**

Authors: Jeong, Eunji, M-3 M.D. Candidate, Knapp, Kevin, M-3 M.D. Candidate

Category: Case Report/Case Series Mentor: Raghavendra Kamath, M.D.

Abstract:

Background

Ventricular bigeminy and pseudobradycardia are rarely reported causes of recurrent dizziness. Misdiagnosis or delayed diagnosis of such arrhythmias may lead to inappropriate treatment and complications.

Case Presentation

We present a 74-year-old male with a history of hypertension and benign prostatic hyperplasia (BPH) who was referred to the emergency department for evaluation of low heart rate. Over the prior three months, he experienced persistent fatigue, presyncopal episodes, and reduced engagement in daily activities. Initial orthostatic hypotension, attributed to dehydration, resolved with intravenous fluids. Diagnostic evaluations, including echocardiography and telemetry, revealed ventricular bigeminy with pseudobradycardia. Neurology workup, including CT angiography of the head and neck, was unremarkable. Cardiology and electrophysiology consultations recommended initiating low-dose beta-blockers, maintaining electrolyte stability, and outpatient Holter monitoring. The patient's symptoms and bigeminy improved with beta-blockers, and he was discharged with outpatient follow-up for further investigation of dizziness.

Conclusion

This case underscores the importance of a thorough workup in patients presenting with nonspecific symptoms like fatigue and dizziness. Pseudobradycardia secondary to ventricular bigeminy can mimic other etiologies, necessitating precise diagnosis through advanced cardiac monitoring. Early recognition and targeted therapy can improve clinical outcomes and prevent further complications.

Presentation: C-17 Submitter: Eunji Jeong, M-2

Abstract Title: **A Challenging Case of Multilevel Spinal Discitis, Osteomyelitis, and Epidural Abscesses with Recurrent Infections – Comprehensive Management and Recovery Trajectory: A Case Report**

Authors: Jeong, Eunji, M-3 M.D. Candidate, Knapp, Kevin, M-3 M.D. Candidate

Category: Case Report/Case Series Mentor: Raghavendra Kamath, M.D.

Abstract:

Background

Spondylodiscitis is a rare but serious infection involving the intervertebral disc and adjacent vertebral bodies. Complications such as epidural and psoas abscesses, along with progressive osteomyelitis, pose significant diagnostic and therapeutic challenges, particularly in older patients with multiple comorbidities.

Case Presentation

We present a 70-year-old female with a complex medical history, including ulcerative colitis, squamous cell carcinoma of the anus, and COPD, who presented with lower back pain, fever, and neurological deficits. Blood cultures confirmed MRSA bacteremia, but an initial transesophageal echocardiogram was negative for infective endocarditis. Imaging revealed a compression fracture at L1. Despite five days of negative blood cultures, persistent pain and clinical deterioration prompted further imaging.

Subsequent MRI identified extensive discitis and osteomyelitis at L2-L3, with progression to L3-L4. Epidural abscesses extending from T11 to L4 and bilateral psoas abscesses were also identified. During the course of treatment, additional findings included gluteus minimus fluid collections, evolving osteomyelitis, and multilevel spinal stenosis.

Management involved neurosurgical intervention, including a T11-L2 laminectomy and abscess evacuation, as well as CT-guided aspiration of the psoas abscesses. Recurrent abscess formation and worsening osteomyelitis necessitated repeated imaging and drainage procedures, underscoring the dynamic complexity of the case. The patient required prolonged intravenous antibiotic therapy, with adjustments made throughout her hospitalizations. Rehabilitation efforts were hindered by persistent severe pain, falls, and poor nutritional status.

Conclusion

This case highlights the critical importance of comprehensive diagnostic imaging, multidisciplinary collaboration, and dynamic treatment strategies in the management of multifocal spondylodiscitis complicated by MRSA bacteremia, psoas abscesses, and progressive osteomyelitis. Early recognition and tailored interventions are essential to mitigating neurological and systemic complications and improving patient outcomes.

Keywords

Spondylodiscitis, Osteomyelitis, Epidural Abscess, Psoas Abscess, MRSA, Multidisciplinary Management

Presentation: Oral 1B-2 Submitter: Ahmad Kafri, M-1

Abstract Title: **Aberrant Regeneration of the Oculomotor Nerve Following Endovascular Coiling: A Novel Iatrogenic Complication**

Authors: Kafri, Ahmad, M-1 M.D. Candidate, Wilseck, Zachary, M.D., Cornblath, Wayne, M.D., Hunt, Rachel, Fellow, M.D.

Category: Case Report/Case Series Mentor: Zachary Wilseck, M.D.

Abstract:
Introduction:
Aberrant regeneration of the oculomotor nerve (CN III) is a well-documented phenomenon most commonly resulting as a sequela to compressive injuries such as tumors, trauma, and aneurysms. However, aberrant regeneration of CN III following aneurysm coiling has not been previously reported. We describe a case of a 55-year-old woman who underwent stent-assisted coiling for a right paraclinoid aneurysm and subsequently developed oculomotor nerve synkinesis, representing a novel mechanism of iatrogenic nerve dysfunction.

Case Presentation:
A 55-year-old woman presented in 2018 with increased frequency of headaches. Her medical history was notable for a strong family history of death due to subarachnoid hemorrhage, including a first-degree relative. Imaging was then obtained, incidentally revealing a right paraclinoid brain aneurysm. She subsequently underwent stent-assisted coiling in December 2018. Immediately following the procedure, the patient noticed right eyelid drooping. She denied any other neurologic deficits. At 1 year following the procedure, the patient reported new-onset right eye diplopia, describing her diplopia as images being on top of one another. Clinical exam revealed no diplopia in primary gaze, with resolution of symptoms following left eye occlusion. Additionally, the patient noted difficulty with right eye elevation. Follow-up magnetic resonance angiography in 2019 demonstrated flow-related enhancement at the base of the aneurysm, raising concern for recurrence. Physical exam at the time showed right pupillary dilatation >1mm larger than the left and right eye adduction with attempted upward gaze—findings consistent with aberrant oculomotor nerve regeneration. Angiography was repeated in December 2024, demonstrating filling within the coil mass of the previously treated right paraclinoid aneurysm (Raymond Roy Class IIIa), marginally increased in comparison to the 2019 angiogram.

Discussion:
Aberrant regeneration of the third cranial nerve, also known as oculomotor synkinesis, is a maladaptive process involving misdirected axonal regrowth, leading to involuntary activation of structures normally innervated by the nerve. Clinical features of oculomotor synkinesis consist of limited elevation and depression of the eye, adduction of the eye on attempted upward or downward gaze, ptosis, binocular diplopia, and anisocoria. Our patient developed several of these telltale signs following aneurysm coiling, including new onset ptosis, binocular diplopia, anisocoria, difficulty with elevation, and adduction on attempted upward gaze. This indicates the development of coiling-induced oculomotor synkinesis.
While aberrant regeneration of CN III is a known complication of compressive nerve injury, its occurrence following endovascular coiling for aneurysm management has not been previously reported. However, the close anatomical relationship between the oculomotor nerve and the PCoA (with the paraclinoid aneurysm lying between the cavernous sinus and the PCoA) can put the nerve at risk for aberrant regeneration after coiling. In this case, the development of aberrant regeneration following the paraclinoid aneurysm coiling procedure represents a novel mechanism of iatrogenic nerve dysfunction, highlighting a unique complication of this popular treatment approach. This report presents the first documented case of CN III aberrant regeneration as a direct consequence of endovascular coiling. The goal is to bring attention to this rare yet possible interventional outcome which may emerge as the nerve undergoes an aberrant recovery process.

Presentation: C-18 Submitter: Afrasayab Khan, M.D., Resident

Abstract Title: **Recurrent Pericardial Effusion After Pacemaker Lead Revision: An Interesting Cardiac Challenge**

Authors: Khan, Afrasayab, Resident M.D., Wolbert, Payton, M-3 M.D. Candidate, Ishfaq, Lyluma, Resident M.D., Gogikar, Amaresh, Resident M.D., Luthra, Gaurav, Resident M.D., Morin, Justin, Resident M.D.

Category: Case Report/Case Series Mentor: Peter Fattal, M.D.

Abstract:
Introduction :
Pericardial effusion leading to cardiac tamponade is a rare but serious complication following pacemaker-lead revision, particularly in patients on anticoagulation therapy. Rapid recognition and timely intervention are essential to prevent hemodynamic collapse. This case details the multidisciplinary management of a 70-year-old female who developed recurrent pericardial effusion and tamponade after atrial lead revision, necessitating multiple interventions including emergent pericardiocentesis and subsequent pericardial drain placement.
Case Presentation:
The patient, with a history of atrial fibrillation, hypertension, hyperlipidemia, and hypothyroidism, underwent atrial lead revision due to a previously dislodged passive-fixation lead. One day post-procedure, she presented to the emergency department (ED) with chest pain and dyspnea. Initially hemodynamically stable, she developed progressive hypotension, prompting immediate point-of-care ultrasound (POCUS), which confirmed pericardial effusion with right ventricular collapse. An emergent pericardiocentesis was performed, draining 50 mL of hemorrhagic fluid, leading to immediate hemodynamic stabilization. Despite initial improvement, post-procedure imaging confirmed a persistent moderate pericardial effusion, necessitating continued monitoring with serial echocardiography.
Ten days after discharge, she returned with progressive dyspnea, orthopnea, and intermittent chest pain. Repeat echocardiography demonstrated a significantly enlarged pericardial effusion, though without tamponade physiology. Given the worsening effusion, a fluoroscopy-guided pericardiocentesis with pericardial drain placement was performed, successfully removing an additional 800 cc of pericardial fluid. Anticoagulation therapy was temporarily held. Multidisciplinary coordination among emergency medicine, cardiology, electrophysiology, cardiothoracic surgery, and critical care teams was pivotal in managing the patient's condition.
Discussion/Conclusions:
The electrophysiology team determined that lead-related cardiac trauma from active-fixation atrial lead placement was the likely cause of the pericardial effusion and subsequent tamponade. Literature suggests active-fixation leads have higher perforation and cardiac injury rates than passive-fixation leads, especially in atrial lead placements (Kiviniemi et al., 1999). Studies indicate that passive leads, while less traumatic, may have higher dislodgment rates, necessitating repeat interventions (Udo et al., 2012). A systematic review comparing the two types found that active leads contribute to a greater incidence of pericardial effusion and tamponade, particularly in older patients and those with thin atrial walls (Matsuo et al., 2018).
This highlights the importance of careful lead placement, post-procedural surveillance, and anticoagulation management. Early bedside assessment using POCUS, prompt pericardiocentesis, and continuous echocardiographic monitoring were critical in preventing hemodynamic decompensation. Serial echocardiography, targeted fluid drainage, and anticoagulation adjustments played a key role in stabilization. Multidisciplinary collaboration ensured timely interventions and improved patient outcomes. This case highlights the need for vigilance in patients undergoing pacemaker lead revision, particularly those on anticoagulation, and reinforces the value of structured, protocol-driven management for procedural complications.

Presentation: C-19 Submitter: Carley Kibbee, D.P.M., Resident

Abstract Title: **Vasopressor Induced Limb Ischemia Following Treatment for Toxic Shock Syndrome**

Authors: Kibbee, Carley, Resident D.P.M, Cohen, Andrew, D.P.M.

Category: Case Report/Case Series Mentor: Andrew Cohen, D.P.M.

Abstract:

TITLE: Vasopressor Induced Limb Ischemia Following Treatment for Toxic Shock Syndrome

AUTHORS: Carley Kibbee DPM PGY-1, Andrew Cohen DPM

CLINICAL PRESENTATION: A 36 year old female with past medical history of tobacco dependence experienced toxic shock secondary to strep throat infection in April 2024. Patient was admitted to the ICU and was treated with vasopressors, as was necessary, which resulted in vasopressor induced limb ischemia. Prior to transfer to our facility patient underwent a left below knee amputation secondary to the limb ischemia and presented in May 2024 with wounds to right foot.

TREATMENT AND SURGICAL TECHNIQUE: Local wound care and surgical intervention were utilized for limb preservation of the second affected limb. Patient underwent excisional debridement of wounds to right foot with distal syme's amputation of right 2nd digit on June 3, 2024. Patient healed syme's amputation sites and wounds in the 6 months since surgical intervention. No further amputation necessary at this point.

CONCLUSION: Local wound care and amputations, as necessary, is the treatment standard once a patient presents with acute limb ischemia. Currently early treatment for vasopressor induced limb ischemia is not a standard practice, though emerging research indicated there may be benefit to treatment of at risk limbs at earlier stages.

Presentation: C-20 Submitter: Kevin Knapp, M-3

Abstract Title: **Thyrotoxicosis Presenting as Acute Psychosis: A Case Report**

Authors: Knapp, Kevin, M-3 M.D. Candidate, Jeong, Eunji, M-3 M.D. Candidate

Category: Case Report/Case Series Mentor: Raghavendra Kamath, M.D.

Abstract:

Abstract Title: Thyrotoxicosis Presenting as Acute Psychosis: A Case Report.

Authors: Kevin Knapp, Eunji Jeong.

Advisor/ Mentor: Dr. Raghavendra Kamath.

Abstract Category: Case Report

Introduction.

Thyrotoxicosis is a state of excessively high thyroid hormone levels (T3 and T4). This can be from any pathology that increases the levels of thyroid hormone in the body. While the symptoms of thyrotoxicosis can mostly be physical, psychiatric symptoms can rarely occur. This case highlights thyrotoxicosis mimicking a primary psychiatric disorder.

Case Presentation and Laboratory values.

A 26-year-old female was brought to the emergency department by the police for bizarre behavior at a local Taco Bell after an argument with her boyfriend. The patient was claimed to have tried to give her nearly one year old baby away to a Taco Bell employee. The patient presented to the hospital with forced speech, occasionally poor insight and did not appear to respond to any internal stimuli of any kind. The Psychiatry department was consulted due to her history of postpartum depression but a suggestion was made to check thyroid function testing. A TSH was obtained which was low at < 0.01 mcunit/ml/. Free T4 was high at >7.7ng/dL with T3 total also high at 618 ng/dL. The rest of her vitals were not remarkable.

Her history indicated that she had been hospitalized in a psychiatric facility once four months prior for presumed postpartum depression.

Her labs indicated elevated T4 and an extremely elevated T3. She had an elevated TSI and TSH receptor antibody, and minor elevation in transaminases supporting our diagnosis of thyrotoxicosis. She also had cannabinoids on urinalysis.

With concern of thyrotoxicosis and impending thyroid storm, treatment was initiated with propranolol, methimazole and dexamethasone per Endocrinology recommendations. The patient improved and was later discharged home to follow up with Endocrinology and her primary care provider.

Conclusion.

The symptoms of the patient in this case were initially suggestive of a primary psychiatric disorder for which she was hospitalized. The overlap between psychosis and endocrine dysfunction can lead to a delay in diagnosis and treatment especially in patients who may have a history of psychiatric disorders.

This case highlights the critical need for routine TSH, T4 and T3 testing in patients with acute onset unexplained psychosis with other features suggestive of a thyroid storm.

Recognizing the potential for thyrotoxicosis and thyroid storm to mimic psychosis can allow for timely treatment and rapid improvement.

Presentation: C-21 Submitter: Shivani Lohit, M.D., Resident

Abstract Title: **A Bleeding Mystery: A Case of Uterine Artery Pseudoaneurysm**

Authors: Lohit, Shivani, Resident M.D., Orbeck, Kayla, Resident M.D., Nasseh, Saleem, Resident M.D., Arvanitis, Mary Lynn, D.O.

Category: Case Report/Case Series Mentor: Mary Lynn Arvanitis, D.O.

Abstract:

Introduction

A uterine artery pseudoaneurysm (UAP) is a rare but potentially life-threatening condition characterized by an extraluminal blood collection with turbulent flow that communicates with the uterine artery due to a defect in its arterial wall. This condition can arise from trauma, pregnancy-related complications, such as cesarean sections, miscarriage, or other vascular events. If not promptly diagnosed and treated, UAP can lead to severe hemorrhagic shock and even death. Symptoms may include heavy vaginal bleeding, pain, or hypotension. Diagnosis is typically made through imaging techniques like Doppler ultrasound, CT angiography, or MRI. Treatment options range from conservative management for small, stable aneurysms to more urgent interventions like angiographic embolization or, in severe cases, surgical repair or hysterectomy. Early recognition and intervention are essential to prevent life-threatening outcomes.

Case Presentation

A healthy 22-year-old female presented to the emergency department with severe pelvic abdominal pain and the acute onset of passing large volumes of blood and clots through her vaginal canal. She had a recent history of laparoscopic left ovarian cystectomy, partial left oophorectomy, and tubal insufflation, performed just six days prior to her presentation. Upon arrival, she was administered intravenous fluids, tranexamic acid, and diagnostic imaging was ordered. Pelvic ultrasound revealed enlarged vasculature on her uterus, while a CT angiogram (CTA) of the abdomen and pelvis showed enhancement on the right side of the uterus, suggestive of a varicose vein, but no evidence of active bleeding. Interventional radiology was consulted but did not deem intervention necessary at that time. The patient was stabilized in the emergency department and admitted under the care of the OB/GYN service for further monitoring and management.

However, later that same day, her condition worsened, with an estimated blood loss of 1.26 liters within 30 minutes. She developed delayed capillary refill, tachycardia, and hypotension. Given the worsening hemorrhage, interventional radiology was emergently consulted for uterine artery embolization with the obstetrics team on standby for emergency hysterectomy. The patient underwent right uterine artery embolization with coils. The patient was monitored in the ICU and was discharged from the hospital in stable condition four days after her initial presentation.

Discussion

This case underscores the importance of maintaining a broad differential diagnosis when evaluating women of childbearing age who present with abdominal pain and vaginal bleeding. While such complaints are often linked to benign causes, this case highlights the need for a thorough history to assess risk factors associated with rarer conditions, such as uterine artery pseudoaneurysms. Potential risk factors include pregnancy, trauma, miscarriage, or procedures like dilation and curettage. Additionally, this case emphasizes the value of early and effective communication with other specialties, ensuring that multidisciplinary collaboration is in place to provide the most appropriate care for the patient. Early coordination of care is crucial to ensuring timely intervention and optimal outcomes.

Presentation: C-22 Submitter: Obianuju Madu, M.D., Resident

Abstract Title: **Depakote-Induced Aggression and Suicidal Ideation in a Pediatric Patient with Autism Spectrum Disorder: A Case Report**

Authors: Madu, Obianuju, Resident M.D., Tawadros, Yousif, D.O., Bala, Abishek, M.D.

Category: Case Report/Case Series Mentor: Abishek Bala, M.D.

Abstract:

Introduction:

Divalproex (Depakote) is commonly prescribed for seizures and various psychiatric disorders. The FDA label lists psychiatric adverse effects such as aggression, psychomotor hyperactivity, hostility, and behavioral deterioration. The FDA also warns that antiepileptic drugs, including Depakote, increase the risk of suicidal thoughts or behavior. Evidence on Depakote's effects in pediatric autism spectrum disorder (ASD) populations is limited and inconsistent, with some studies suggesting it reduces aggression, while others show no significant benefit. However, it is still commonly used off-label to manage behaviors like aggression, violence, and suicidal behavior in this patient population. While Depakote has been associated with mood disturbances and aggression in some pediatric populations, its role in inducing these adverse effects in ASD patients is underreported.

Case Presentation: This case report describes a 13-year-old male with a history of moderate to severe ASD, ADHD and Borderline Intellectual Functioning who experienced significant behavioral deterioration following the discontinuation of Risperdal and initiation of Depakote. The patient developed new-onset aggressive and self harming behaviors, violent thoughts and suicidal ideation, all of which were absent before Risperdal initiation. A timeline detailed by the patient's mother showed a correlation between Depakote initiation and these symptoms. Although discontinuing Risperdal may have exacerbated certain behavioral disturbances, the onset of apparent Depakote-induced aggression and mood dysregulation appeared to significantly worsen the patient's clinical presentation. The patient was admitted to our facility for further management. During the patient's hospitalization, Depakote was discontinued, and Risperdal was re-initiated. Following these changes, the patient showed significant improvement, with a marked reduction in agitation and aggression and remission of suicidal ideation.

Discussion/Conclusions: This case emphasizes the need for a thorough risk-benefit analysis before starting Depakote in pediatric patients with ASD or other neurodevelopmental disorders. It also highlights the importance of close monitoring during treatment, given Depakote's potential for rare but serious adverse effects.

Presentation: C-23 Submitter: Obianuju Madu, M.D., Resident

Abstract Title: **Conversion Disorder With Speech Symptoms in the Context of Fluoxetine-Induced Hypomania: A Case Report**

Authors: Jolly, Joshua, M-3 M.D. Candidate, Ryan, Samantha, Resident M.D., Miller, Bradley, Resident M.D., Madu, Obianuju, Resident M.D., Garces, Lorrie, M.D.

Category: Case Report/Case Series Mentor: Lorrie Garces, M.D.

Abstract:

Introduction:

Expressive aphasia, a difficulty producing speech, is typically associated with neurological disorders. Less commonly, aphasia can present as a symptom of conversion disorder.

Case presentation: We present a case of a 64-year-old male who developed intermittent expressive aphasia without an identifiable neurological cause in the context of fluoxetine-induced hypomania. The patient, with a history of coronary artery disease, atrial fibrillation and alcohol use disorder, had been prescribed fluoxetine for depression following coronary artery bypass graft surgery. In the weeks before admission, he developed elevated mood, rapid speech, flight of ideas, and distractibility suggestive of fluoxetine-induced hypomania. Notably, the patient had no prior history of hypomanic symptoms. The night before admission, the patient experienced an episode of mutism followed by agitation but without loss of consciousness or memory. Extensive workup, including brain imaging, EEG and lumbar puncture, failed to reveal any neurological cause for aphasia. This case posed a diagnostic challenge, as the patient's symptoms were consistent with fluoxetine-induced hypomania; however, the episodic aphasia with no neurological abnormalities raised concern for possible conversion disorder.

Discussion/Conclusions: The case highlights a rare combination of fluoxetine induced hypomania and functional aphasia, which has not been widely reported. Moreover, such a case emphasizes the challenge of distinguishing between medication-induced mood symptoms and functional neurological disorders, making it necessary to consider a comprehensive, multidisciplinary approach to diagnosis and management.

Presentation: C-24 Submitter: Garrett Mason, M.D., Resident

Abstract Title: **A case report of a patient with atraumatic prosthetic posterior knee dislocation**

Authors: Mason, Garrett, Resident M.D., Mead, Therese, D.O.

Category: Case Report/Case Series Mentor: Therese Mead, D.O.

Abstract:

Introduction: Posterior tibiofemoral dislocations are potentially severe orthopedic emergencies which carry significant risk for neurovascular compromise. In patients with total knee arthroplasty, incidence of posterior tibiofemoral dislocation can be as high as 2%, depending on the type of prosthetic used, and the presence or absence of risk factors. These injuries are typically associated with a traumatic mechanism. This is a case report of a patient who presented to the emergency department with knee pain and was found to have experienced an atraumatic posterior prosthetic tibiofemoral dislocation.

Case Report: A 78-year old female presented to the emergency department with the complaint of left knee pain and difficulty walking. The patient stated that she began noticing progressive left knee discomfort associated with a new deformity for 3 days preceding her emergency department visit. She denied injury, fall or any other trauma. The patient's pertinent medical history included obesity and recurrent atraumatic patellar dislocations since a total knee arthroplasty. Physical examination demonstrated an obvious deformity to the left knee consistent with a posterior tibiofemoral dislocation. The patient's left knee was preferentially held in flexion at 80 degrees and range of motion was limited due to discomfort. There was no bruising, open wounds nor overlying skin changes. The patient was neurovascularly intact, including 2+ palpable dorsalis pedis pulses. Radiographs confirmed diagnosis of a posterior prosthetic tibiofemoral dislocation. The patient's orthopedic surgeon was consulted and the knee was easily reduced in the emergency department without the need for sedation. On reevaluation, the patient remained neurovascularly intact. The patient was placed in knee immobilization using a hinged knee brace and discharged home with plans for future arthroplasty revision.

Discussion:

Posterior tibiofemoral dislocations comprise a very small portion of orthopedic injuries, seen in 0.02-0.2% of orthopedic injury cases annually. Knee arthroplasties are a very common orthopedic procedure, however tibiofemoral dislocation still only occurs in a small number of cases. Newer prosthetic models carry up to a 0.5% incidence of dislocation. Most dislocations of a prosthetic knee are associated with a high-energy traumatic mechanism of injury. Obesity and severe preoperative varus or valgus deformities are risk factors for prosthetic knee dislocation associated with a low-energy mechanism of injury. Our patient had no identifiable trauma, but did have history of obesity. Between 10-40% of posterior knee dislocations in individuals without a prosthesis lead to injury of the popliteal artery. While the exact incidence in prosthetic tibiofemoral dislocations is not well established, these injuries also pose a risk for neurovascular compromise, especially to the popliteal artery. Vascular injury can lead to compartment syndrome, which in some cases, may even require fasciotomy. This case emphasizes the need to consider dislocation in a patient with history of knee arthroplasty, even without known trauma, and underscores the importance of a thorough vascular evaluation both before and after reduction.

Presentation: C-25 Submitter: Matteo Mazzella, M-1

Abstract Title: **Role of Immune Dysfunction and EBV in ALK+ Inflammatory Myofibroblastic Tumor**

Authors: Mazzella, Matteo, M-1 M.D. Candidate, Yu, Chelsea, M-4 M.D. Candidate, Poulik, Janet, M.D., Jain, Amrish, M.D.

Category: Case Report/Case Series Mentor: Süreyya Savaşan, M.D.

Abstract:

Introduction

Post-transplant lymphoproliferative disorder (PTLD) is a known complication of organ transplantation, often linked to Epstein-Barr virus (EBV) infection in immunosuppressed patients. Inflammatory myofibroblastic tumor (IMT) is a rare mesenchymal neoplasm, with a subset exhibiting anaplastic lymphoma kinase (ALK) gene rearrangements; however, the pathogenesis is not well understood. While EBV has been implicated in ALK-negative IMTs, its association with ALK-positive IMTs remains uncertain. The synchronous occurrence of PTLD and IMT in transplant recipients is rare with one reported case of PTLD and IMT both with EBV positivity following a liver transplant without documentation of a possible ALK link.

Case Presentation

We report the case of an 11-year-old male renal transplant recipient with history of posterior urethral valve resulting in obstructive uropathy and end stage renal disease who developed synchronous EBV-positive PTLD and ALK-positive IMT 15 months after transplantation. The patient was EBV-seronegative pretransplant, acquired EBV infection post-transplant, and subsequently developed axillary lymph node enlargement. Concurrently, a lung mass was detected, prompting further investigation. Histological examination of the axillary lymph nodes confirmed monomorphic PTLD with diffuse large B-cell lymphoma morphology and strong EBV positivity with detection of Epstein-Barr virus-encoded small RNA (EBER) in neoplastic cells. The biopsy from the pulmonary mass showed spindled myofibroblasts showing ALK-1 and actin immunoreactivity; EBV by in situ hybridization leukocytes were also seen. Following two surgical resections, the second after recurrence of pulmonary IMT and modulation of immunosuppressive regimen along with rituximab therapy for PTLD, the patient remained in remission for over 3 years during his follow up.

Discussion & Conclusion

This case highlights the potential link between immune dysregulation, EBV infection, and the development of IMT, particularly in the presence of ALK gene rearrangement. Though, EBV appears to have a more direct effect in PTLD development as EBV genome was shown in lymphoma cells, immunosuppression used for prevention of graft rejection might have constituted the immunologic environment leading to development of ALK-positive IMT. However, the concurrent diagnosis of PTLD and IMT raises critical questions regarding EBV's potential oncogenic role in ALK-positive tumors; if the immunosuppression along with EBV infection plays a role in the pathogenesis needs to be further investigated. The rarity of this phenomenon highlights the need for more research to clarify the pathogenesis of these neoplastic processes in immunocompromised patients and to optimize treatment strategies for transplant recipients at risk.

Presentation: C-26 Submitter: Mara McMurray, D.O., Resident

Abstract Title: **When "You're almost 40" isn't the source of your pain: A case of an unexpected Popliteal Schwannoma**

Authors: McMurray, Mara, Resident D.O., B.S., Grewal, Harpreet, Resident M.D., B.S., Pitts, Eric, D.O., B.S.

Category: Case Report/Case Series Mentor: Eric Pitts, D.O., B.S.

Abstract:

Introduction

A schwannoma is the most common type of benign peripheral nerve tumor in adults. They are composed of Schwann cells that surround neurons to provide support and protection. (1) Frequently a schwannoma is a sporadic solitary tumor, although in the presence of multiple, may be associated with schwannomatosis, a genetic variant located on chromosome 22 that causes nerve tumors to grow throughout the body. (2)

Case Report

The patient is a 39-year-old active, healthy male that presented to an orthopedic clinic for evaluation of left knee pain that had been present for many years. Patient did not recall any specific injury, although he was active throughout his lifetime participating in a number of high impact sports including MMA fighting and boxing. Patient had not had any improvement with home exercises, ice or tylenol. Initial exam in the office was significant for a positive McMurray's test and a palpable click concerning for lateral meniscus tear. Initial X-rays were negative and further evaluation with MRI was completed showing a 2cm enhancing mass in the popliteus muscle without other aggressive features. Malignancy was in the differential so patient was referred to an orthopedic oncologist. After undergoing biopsy, the patient was diagnosed with a peripheral schwannoma with recommendations for conservative management at this time.

Discussion

In young, healthy, active patients common musculoskeletal injuries such as meniscus injuries remain at the top of the differential. In this case, the schwannoma was most likely an incidental finding likely contributing to the paresthesias in the lower leg. It remains unclear, given the location in the popliteus muscle, if the schwannoma is contributing to the mechanical instability and pain, or if these are from a meniscus injury not noted on MRI imaging that happens to coexist with the benign tumor. Management of these tumors typically falls into two categories with conservative management or operative removal. The degree of neuromusculoskeletal deficit as well as the typical surgical risk factors should be considered when deciding on the course of treatment. In addition, the location of the schwannoma determines the surgical subspecialist that will manage care. After operative removal, recurrence is rare.

Presentation: C-27 Submitter: Bradley Miller, M.D., Resident

Abstract Title: **Suspected Lisdexamfetamine (Vyvanse) Induced QTc Prolongation: A Case Report**

Authors: Miller, Bradley, Resident M.D., Hoke, Madeleine, M-4 M.D. Candidate, Ballal, Yashi, M-2 M.D. Candidate, Shah, Aditya, M-2 M.D. Candidate, Bala, Abishek, M.D.

Category: Case Report/Case Series Mentor: Abishek Bala, M.D.

Abstract:

Introduction:

Attention-Deficit/Hyperactivity Disorder (ADHD) is a common neurodevelopmental disorder treated effectively with stimulant medications such as lisdexamfetamine dimesylate (LDX), marketed as Vyvanse. While LDX demonstrates efficacy in managing ADHD symptoms, recent reports suggest a potential, albeit minimal, risk of QTc interval prolongation. This concern remains underexplored, particularly regarding the precipitous and reversible effects observed in individual cases. Earlier studies, including clinical trials, have found inconsistent evidence regarding QTc prolongation, with most indicating no clinically significant effects. However, recent findings report small but statistically significant increases in QTc intervals with LDX use, despite remaining within clinically acceptable ranges.

Case presentation:

We present a case in which a 16-year-old girl experienced pronounced and rapid QTc prolongation upon LDX administration, which resolved precipitously upon drug discontinuation and reappeared with re-administration. The observed QTc changes—50 ms upon discontinuation and 30 ms with reinitiation— may indicate that LDX administration had a pronounced and reversible effect on her QTc, suggesting a potential causative effect.

Conclusion:

This case may suggest a need for further exploration of even higher QTc-prolonging effects in some individuals, and may call into question the need for further monitoring guidelines for QTc in stimulant use.

Presentation: C-28 Submitter: Lisa Mun, M-3

Abstract Title: **The Diagnostic Dilemma: Pemphigus Vulgaris with Classic Features but Negative Biopsy**

Authors: Mun, Lisa, M-3 M.D. Candidate, Restrepo, Isabella, M-4 M.D. Candidate, Hamdaoui, Yassine, M.D.

Category: Case Report/Case Series Mentor: Yassine Hamdaoui, M.D.

Abstract:
Abstract Title: The Diagnostic Dilemma: Pemphigus Vulgaris with Classic Features but Negative Biopsy
Authors: Lisa Mun, Isabella Restrepo, Yassine Hamdaoui MD
Submitter: Lisa Mun
Abstract Category: Case report

Introduction: Pemphigus vulgaris (PV) is a rare autoimmune blistering disorder characterized by painful mucocutaneous erosions due to IgG autoantibodies against desmoglein (DSG) 3 and sometimes DSG1, leading to acantholysis. Diagnosis relies on clinical presentation, histopathology, direct immunofluorescence (DIF), and serologic testing. DIF reveals IgG and C3 deposits in a fishnet pattern, while DSG1/3 antibody titers aid in diagnosis and monitoring. Laboratory studies help differentiate PV from other blistering diseases, making a comprehensive workup essential for accurate diagnosis and management.
Case: A 35-year-old female presented with a two-month history of painful bullous and necrotic lesions on the face, chest, and arms, spreading from the left clavicle. She also reported painful oral lesions, poor oral intake, weight loss, and fatigue. Exam revealed crusted bullae, blisters, and posterior pharyngeal erosions with white plaques. Labs showed leukocytosis, anemia, hypoalbuminemia, and elevated C-reactive protein and erythrocyte sedimentation rate, consistent with systemic inflammation and malnutrition. Flexible laryngoscopy revealed necrotic posterior pharyngeal lesions, and oral plaque analysis confirmed Aspergillus species, consistent with normal oral flora, leading to discontinuation of antifungal therapy. She was initially treated with Amphotericin and Unasyn for suspected mucormycosis, but these were discontinued after Aspergillus confirmation. Oral pain improved with benzocaine 20%, improving oral intake. Differential diagnoses included Stevens-Johnson syndrome, systemic lupus erythematosus, infectious causes, and paraneoplastic pemphigus vulgaris. These were ruled out based on no prior medication exposure (SJS), negative ANA, normal immunoglobulins, negative infectious workup (HBV, HCV, HIV), and negative tumor markers (CA-19, CEA, CA15-3). Despite negative results from two intralesional and perilesional biopsies, PV remained the leading diagnosis due to the clinical presentation and treatment response. Steroids and immunosuppressive therapy were initiated before biopsy, potentially influencing histopathology. She received IV Solu-Medrol 120 mg daily, later tapered to oral prednisone 30 mg BID, azathioprine 100 mg daily, and rituximab (second dose in two weeks). The patient showed resolution of oropharyngeal plaques and crusting of skin lesions. At discharge, she continued immunosuppressive therapy with PCP prophylaxis (Bactrim DS daily) and was scheduled for dermatology, rheumatology, and Pain Medicine follow-ups.
Discussion: This case highlights the importance of obtaining biopsies before initiating treatment, as steroids and immunosuppressants may impact histopathology results. Despite negative biopsies, the characteristic clinical features, including painful mucocutaneous lesions and response to treatment, strongly supported a diagnosis of PV. Given the diagnostic challenges, testing for DSG1/3 antibody titers could have further supported the diagnosis and served as a disease monitoring tool. These antibodies correlate with clinical activity and have high sensitivity and specificity. Ordering DSG1/3 titers in the outpatient setting remains a consideration, though their absence does not significantly alter management. This case also underscores the importance of multidisciplinary management, involving dermatology, rheumatology, infectious disease, and Pain Medicine for optimal care. Integrating clinical judgment and serologic testing is essential when histopathology is inconclusive.

Presentation: Oral 1B-4 Submitter: Sayera Muqarram, M.D.

Abstract Title: **A Case of Severe Symmetrical Intrauterine Growth Restriction in a Premature Infant - Diagnostic Challenges and Multidisciplinary Care**

Authors: Muqarram, Sayera, Resident M.D., BHAGAT, INDIRA, M.D.

Category: Case Report/Case Series Mentor: Indira Bhagat, M.D.

Abstract:
Introduction:
Intrauterine growth restriction (IUGR) refers to rate of fetal growth below 10th %tile for specific age, gender, and gestation. It can be symmetrical, with proportionate reductions in birth weight (BW), birth length (BL), and head circumference (HC), indicating an early pregnancy origin, or asymmetrical, with sparing of HC and BL, suggesting later onset.
Case Report:
A Premature male infant born at 35 weeks 0 days gestation via elective C-section due to severe IUGR seen on prenatal ultrasound. BW was 1260 grams (< 1 %tile), BL 39.5 cm (< 1 %tile), HC 29.5 cm (< 1 %tile). Was vigorous at birth with APGAR 8 and 9 at 5 and 10 minutes but was placed on CPAP for respiratory distress. Physical exam was appropriate for age except for 2 vessel cord and murmur. Mother was 26-year-old G3P2, significant PMH of hypothyroidism, anemia, and pseudotumor cerebri. She developed preeclampsia without severe features and abnormal GTT during pregnancy. Prenatal labs were reassuring except for GBS and CMV IgG positivity.
Neonatal Course; Infant initially needed NCPAP with oxygen support, was weaned to HF eventually off respiratory support. Echocardiogram showed a structurally normal heart with normal function. Initially was NPO, received TPN, and maternal EBM was gradually introduced via NG tube advanced orally as tolerated. Screening renal USG showed mild Pyelectasis of left kidney, which resolved before discharge.
Workup for IUGR: TORCH screening was negative for serum IgM; Placental pathology showed dyssynchronous villous maturity without calcifications or infarcts; Genetic testing, including chromosomal analysis and microarray was normal, ruling out genetic abnormalities. Infant was discharged after 23 days with weight of 1800 gm (< 5 %tile), HC 31.2 cm (< 5 %tile), and Length 40.5 cm (< 5 %tile), and close follow-up
Discussion:
Symmetrical IUGR is often due to placental insufficiency, genetic factors, or TORCH infections. Maternal extensive PMH, particularly preeclampsia, likely contributed to placental insufficiency, which is the most likely cause of this infant's IUGR. Managing IUGR infants, especially preterm, requires a multidisciplinary approach.
Feeding difficulties are common, this infant received daily OT and nutritionist support. Early enteral nutrition with maternal EBM is crucial for gut development and preventing complications like Necrotizing enterocolitis, which is common with IUGR and cow's milk nutrition.
Preterm infants are at higher risk of retinopathy of prematurity (ROP), screening is recommended for birth at < 32 weeks or BW < 1500 gm, since this infant weighed 1260 gm, screening was performed, with no abnormalities of ROP. Regular eye exams are essential for detection to prevent vision loss from retinal detachment.
This case highlights the need for vigilant monitoring, as infants with IUGR are at higher risk for neurodevelopmental delays, feeding challenges, and growth difficulties. With timely interventions, early identification, and regular follow-up, infants with IUGR can have favorable outcomes. A coordinated multidisciplinary approach can significantly improve the prognosis.
References-
Arumugam, S.K, Ramalingam, R. "An Infant with IUGR, Single Umbilical Artery, and Abdominal Wall Defect." Neoreviews, 2023.
Cypen, L., Young, B.C. "Pregnant Woman With Chronic Hypertension and Severe IUGR." Neoreviews, 2020.

Presentation: C-29 Submitter: Diane Mutete, M.D., Resident

Abstract Title: **A Raspy Riddle: Laryngeal Mass in a Patient Presenting with Hoarseness**

Authors: Mutete, Diane, Resident M.D., Mead, Therese, D.O.

Category: Case Report/Case Series Mentor: Therese Mead, D.O.

Abstract:

Introduction: Head and neck malignancies can develop in many areas including the oral cavity, pharynx, larynx, nasal cavity, paranasal sinuses, and salivary glands. Early symptoms and clinical presentations of these malignancies vary widely depending on the location of the tumor. Here we present the case of a patient with multiple emergency department visits for hoarseness and respiratory symptoms who was found to have an advanced laryngeal mass.

Case report: A 58-year-old male with past medical history of hypertension, tobacco use, and alcohol use presented to the emergency department (ED) with the complaints of cough, shortness of breath and hoarseness. The patient noticed the hoarseness slowly worsening over the past 10 months and was treated with oral antibiotics for pharyngitis several times without improvement. He had also experienced unintentional 30-pound weight loss over the past year. He had several urgent care visits but had not seen a primary care physician in years.

On presentation vital signs revealed elevated blood pressure (183/86) and were otherwise within normal limits. His physical examination was remarkable for intermittent stridor, hoarseness and subtle firm anterior neck swelling over the thyroid cartilage. There were no visual abnormalities of the oropharynx. He received intravenous dexamethasone and his airway was closely monitored. A soft tissue Computed Tomography (CT) of the neck with intravenous contrast revealed a large lobulated 5.5cm x 4cm soft tissue mass involving and surrounding the larynx with erosion of the thyroid cartilage extending to the right lateral hypopharynx and pre-epiglottic space, with mild cervical lymphadenopathy. The patient was transferred to a tertiary care facility with otolaryngology services for further evaluation. At the receiving facility fine needle aspiration was performed and showed invasive squamous cell carcinoma, moderately differentiated. A Positron Emission Tomography-Computed Tomography showed no evidence of distant metastasis. After a tumor board meeting, the patient received a total laryngectomy, bilateral modified radical neck dissection, total thyroidectomy, and cricopharyngeal myotomy.

Discussion: Squamous cell carcinoma is the most prevalent histological type of head and neck malignancy. In this case, there was a delay in diagnosis over many months partially due to slowly progressive symptoms and the absence of primary care. Risk factors associated with head and neck malignancies include increased tobacco and alcohol consumption, human papillomavirus (HPV) infection (for oropharyngeal cancer), Epstein-Barr virus (EBV) infection (for nasopharyngeal cancer), among others. There is a higher prevalence in males than females. Treatment approaches include surgical removal of the tumor and chemotherapy or chemoradiotherapy, aimed at controlling the disease and preventing recurrence. The presence of cervical lymph node metastases is a key prognostic factor in head and neck squamous cell carcinoma. Given the complexity of the anatomical structures and the significance of preserving function, management of this disease process requires a multidisciplinary approach including collaboration among otolaryngologists, surgical oncologists, radiation oncologists, medical oncologists, nutritionists, and speech-language pathologists. This case highlights the crucial need to avoid anchoring bias and expand the differential diagnosis when evaluating patients with recurrent healthcare visits for persistent or progressive symptoms.

Presentation: C-30 Submitter: Jaspreet Nannar, M.D., Resident

Abstract Title: **A Case of Post Bariatric Surgery Hypoglycemia 20 Years Later**

Authors: Nannar, Jaspreet, Resident M.D., Tornberg, Toni, M-3 M.D. Candidate, Alhaddadin, Robert, Resident M.D., Haque, Henna, B.S., Dukkipati Sai, Sreenija, M.D., Variar, Vivek, M.D.

Category: Case Report/Case Series Mentor: Vivek Variar, M.D.

Abstract:

Introduction: Bariatric surgery is a treatment option for morbid obesity refractory to other treatments. It's associated with reversal of type 2 diabetes mellitus and non-alcoholic fatty liver disease. Post-bariatric hypoglycemia (PBH) is a complication. Incidence of PBH can be 13% five years following surgery. Currently there are no guidelines to diagnose PBH.

Case Presentation: 65-year-old female presented for an elective knee replacement. She tolerated the surgery without complications. Post-operatively she was noted to have episodes of dizziness, flushing and diaphoresis associated with hypoglycemia. These episodes have been on-going for the past 5 years, occur usually prior to meals and resolve after eating a meal. Past surgical history was significant for Roux-en-Y gastric bypass (RYGB) in 1996. She was not on any hypoglycemic drugs. During hospitalization, when blood glucose was less than 55 mg/dl, C-peptide was inappropriately high at 7 ng/ml (ref 0.5-2.0 ng/ml) and insulin at 41.4 uIU/ml (ref 5-15 uIU/ml). Sulfonylurea screen was negative. Cortisol was unremarkable. CT abdomen/pelvis without contrast did not show any pancreatic mass. This workup was consistent with endogenous hyperinsulinemia and she was diagnosed with post prandial hypoglycemia due to prior RYGB surgery. Dietary modification was advised and she will be following up outpatient with Endocrinology clinic.

Discussion: Hypoglycemia is a complication following bariatric surgery. Risk factors include female sex, longer duration since surgery, no history of diabetes and RYGB. Onset of PBH is usually more than 1 year after the surgery. Patients usually present with lightheadedness, palpitations and fatigue, which can overlap with those of dumping syndrome, complicating diagnosis. This results in limited data available on the frequency and incidence of PBH as the diagnosis is based on physician and patient awareness. RYGB is associated with a higher incidence of severe hypoglycemic episodes and PBH than sleeve gastrectomy. Treatment options include lifestyle changes (low glycemic carbohydrates, frequent snacks), with additional pharmacological and surgical interventions.

Conclusion: We present this case in which a patient started developing hypoglycemic episodes 24 years after RYGB. It is essential to complete a thorough medical history and have high suspicion for PBH, as these symptoms can ultimately impact a patient's quality of life. Further cases need to be reported to support literature and establish guidelines.

Presentation: C-31 Submitter: Zachary Nine, M.D., Resident

Abstract Title: **The Dangers of Diphenhydramine (Benadryl) Misuse Among Adolescents**

Authors: Nine, Zachary, Resident M.D., Shah, Aditya, M-2 M.D. Candidate, Tawadros, Yousif, Fellow, D.O., Ballal, Yashi, M-2 M.D. Candidate, Bala, Abishek, M.D.

Category: Case Report/Case Series Mentor: Abishek Bala, M.D.

Abstract:

Introduction

Diphenhydramine (Benadryl) is a readily available over-the-counter medication with significant risks for misuse, particularly among adolescents. This is fueled by social media trends like the "Benadryl Challenge," leading to dangerous anticholinergic effects.

Case Presentation

This case report highlights an 11-year-old female with a history of self-harm who overdosed on 90 tablets of Benadryl (25mg) following bullying and personal losses. She presented with elevated heart rate and subsequently experienced auditory and visual hallucinations, requiring intervention with Ativan. The case underscores the potential for severe symptoms, including seizures, hallucinations, and delirium, necessitating hospitalization.

Discussion/Conclusions

This study emphasizes the critical need for increased awareness among parents, adolescents, and healthcare providers regarding the risks associated with Benadryl misuse. Secure storage of medications, open communication about substance abuse and social media trends, and vigilance among healthcare providers and parents are crucial to prevent harmful ingestions and potentially fatal outcomes in vulnerable teens.

Presentation: Oral 1B-5 Submitter: Kush Patel, M-3

Abstract Title: **A Case of Prolonged Pica and Amylophagia in an ESRD Patient: Interplay of Dialysis-Related Stressors and Psychiatric Comorbidity**

Authors: Patel, Kush, M-3 M.D. Candidate, Zaky, Ahmad Shereef, Resident M.D., Garces, Lorrie, M.D., Avramut, Carmen, Resident M.D.

Category: Case Report/Case Series Mentor: Lorrie Garces, M.D.

Abstract:

Introduction

Pica is a complex disorder characterized by the ingestion and consumption of non-food substances, often associated with nutritional deficiencies, psychiatric conditions, and cultural factors. Pica and amylophagia (consumption of raw starch) have been documented in various patient populations, but prevalence in patients with ESRD on chronic dialysis remains understudied. Pica has been found to affect 10-46% of chronic hemodialysis patients, yet remains underrecognized due to higher focus on uremic complications. This case explores the psychosocial implications of pica in a patient undergoing long-term dialysis, emphasizing the role of psychiatric comorbidities and the potential benefit from targeted interventions.

Case

A 53-year-old male with ESRD secondary to FSGS, hypertension, anemia of chronic disease, and failed renal transplant was admitted with sepsis secondary to methicillin-sensitive Staphylococcus aureus (MSSA) bacteremia from hemodialysis catheter infection and right hip septic arthritis. He received Cefazolin and underwent arthrocentesis, revealing purulent fluid and remained on IV antibiotics. During his stay, he disclosed an 8-year history of pica/amylophagia involving daily ingestion of “Johnson&Johnson” baby powder, which he described as a coping mechanism for anxiety related to dialysis. The patient reported initially consuming room-temperature baby powder but later preferred placing frozen amounts in his mouth before spitting it out. He stated that he felt anxiolytic relief from the “cooling sensation”, a habit that began four years after initiating dialysis, influenced by the behaviors of other dialysis patients, where patients would smell or eat various nonnutritive materials - a common conversation topic at his dialysis clinic. Upon psychiatric evaluation, he exhibited depressive symptoms exacerbated by the recent loss of his father, anxiety due to his chronic medical conditions, disruption of sleep-cycle due to years of working night shifts, and a history of medication non-adherence due to religious family beliefs. Despite physical improvements from dialysis and antibiotics, his pica/amylophagia behaviors remained unchanged, reflecting the complex psychosocial dimensions of the disorder.

Discussion

Pica is well-documented in pediatric populations but is underrecognized in adults, particularly those with chronic illnesses. In patients with ESRD, pica has been linked to iron-deficiency anemia and chronic inflammation. However, this case highlights the potential role of chronic disease as well as psychiatric comorbidities, many of which are increasingly associated with inflammation. According to literature review, pica has been associated with anxiety disorders, obsessive-compulsive traits, and cultural influences. In this case, the patient reported longstanding anxiety relief when consuming baby powder, suggesting a behavioral coping mechanism rather than nutritional-deficiency-driven behavior. Cultural influence from other patients at his dialysis clinic reinforced this behavior, establishing it as the patient’s perception of a norm in this patient population. The reluctance to pursue psychiatric treatment further brings attention to the stigma and barriers faced by patients with comorbid medical and mental health conditions. Addressing pica in ESRD patients necessitates further study, as prevalence and pathophysiology in ESRD patients is not fully understood. Treatment modalities could include sensory substitution protocols, modifying dialysis unit environment, and nutritional interventions. Patient education and psychiatric treatment plans tailored to individual needs are critical in managing this condition.

Presentation: C-32 Submitter: Yaseen Qaroof, M.D., Resident

Abstract Title: **A Complex Case of Polyarticular Juvenile Idiopathic Arthritis with Ocular Complications**

Authors: Qaroof, Yaseen, Resident M.D., Al Qanber, Batool, Resident M.D.

Category: Case Report/Case Series Mentor: Marry Moore, M.D.

Abstract:

INTRODUCTION:

Juvenile idiopathic arthritis (JIA) is a chronic inflammatory disorder affecting children, characterized by chronic arthritis and systemic manifestations. This report details a case of a 20-month-old male presenting with joint pain and ocular complication (Bilateral uveititis), highlighting the complications in pediatric patients.

CASE PRESENTATION:

A 20-month-old male presents to the emergency department (ED) with progressive bilateral knee pain and swelling over two weeks, significantly impairing his ability to walk. Parents deny recent trauma, falls, travel, insect bites, fever, rash, fatigue, or systemic symptoms. On examination, both knees and the right ankle are warm, swollen, and tender on palpation, while the left ankle is normal. The patient refuses to stand and keeps his knees flexed. Examination was also remarkable for bilateral opacities with normal conjunctiva, pupil size, and extra-ocular movements. Vital signs were normal for age. His weight and height are below the 3rd percentile, with a weight-for-height percentile of 14. Radiographs of the lower extremities show subchondral osteopenia in the bilateral distal tibias without fractures or signs of healing. Laboratory findings reveal normal WBC, RCB and platelets counts. Inflammatory markers are elevated, with an ESR of 73 mm/hr and a CRP of 3.46 mg/L.

Four months prior, the patient was evaluated in the ED for bilateral cataracts diagnosed in his home country. At that time, he was afebrile and clinically stable, with left corneal opacity and right eye exotropia noted. He was referred to a pediatric ophthalmologist, who diagnosed dense bilateral cataracts with synechiae requiring cataract extraction and intraocular lens implantation, which were subsequently performed.

DISCUSSION/CONCLUSION:

Differential diagnosis for arthritis in children includes infectious arthritis (septic vs aseptic) transient synovitis, juvenile idiopathic arthritis (JIA), trauma, and Kawasaki disease (vasculitis). In this case, the combination of ocular manifestation of bilateral cataracts strongly supports systemic inflammatory process suggesting chronic rather than acute knee arthritis. (1) Alongside a recent diagnosis of idiopathic bilateral cataracts by a pediatric ophthalmologist, the patient was diagnosed with polyarticular juvenile idiopathic arthritis (JIA) with bilateral uveitis. Juvenile Idiopathic Arthritis is one of the most common rheumatic diseases in individuals below the age of 16 year (3). The incidence of JIA is approximately 1.6 to 23 per 100000 young adults and about 1 in 1000 children develop chronic arthritis secondary to JIA (4). The etiology and pathophysiology of JIA are unknown, but it is established that it is associated with synovitis and joint destruction leading to the backbone symptom of JIA which is chronic arthritis (> 6 weeks). Classification of JIA depends on the count of joints involved, organs involved, and the presence of Rheumatoid Factor (RF). (5) Uveitis as seen in this case is the most common extra-articular manifestation of JIA.(6) Management of JIA starts with Non-steroidal anti-inflammatory drugs (NSAIDs) and intra-articular steroids (IASs) to reduce the inflammation and joint pain and to suppress disease activity. Disease-modifying anti-rheumatic drugs (DMARDs) like Methotrexate (MTX), Leflunomide, and Sulfasalazine are also used. (7)

Presentation: C-33 Submitter: Elit Quingalahua, M.D., Resident

Abstract Title: **Alagille Syndrome, uncommon cause of failure to thrive.**

Authors: Quingalahua, Elit, Resident M.D., Qaroof, Yaseen, Resident M.D., Algherbal, Mohamed, Resident M.D.

Category: Case Report/Case Series Mentor: Bryce Meck, M.D.

Abstract:

Introduction

While jaundice in neonate is common, this is typically transient and uncommon in infants after 2 months of age. Failure to thrive is present in 5-10% of infants and can be caused by inadequate caloric intake, insufficient nutrition absorption, increased metabolism and in severe prolonged jaundice. Herein, we report a case of an infant with jaundice and failure to thrive.

Presentation

A 2-month-old girl presented to a well-child check-up with yellow-tinged skin and pale stools. She was born at term, via spontaneous vaginal delivery with no perinatal complications. First born and does not have any family history of genetic hyperbilirubinemia. Her birth weight was 3.0 kg, and her current weight is 3.92 kg, below the 5th percentile and gaining about 15 g/day, normal daily weight gain is 30 g/day. She is breast and formula fed at an appropriate caloric intake for her age. Her weight is at the 1st percentile, length is 55.9 cm (26th percentile), and head circumference is 36 cm (2.9th percentile). Physical examination was noticeable for jaundice, wide forehead, small, pointed chin, and widely spaced eyes. Her newborn screening was normal for congenital hypothyroidism, sickle cell disease and cystic fibrosis. Laboratory data showed elevated total bilirubin of 10.2 mg/dL, predominantly direct (7.9 mg/dL), elevated alkaline phosphatase 909 U/L, AST 408 U/L, ALT 284 U/L. Liver ultrasound did not show the biliary tree appropriately. A percutaneous trans cholecystic cholangiogram was performed, showing normal-appearing gallbladder, normal common bile ducts and the intrahepatic bile ducts could not be opacified. Liver biopsy showed diffuse cellular and canalicular cholestasis. Trichome stain shows mild periportal fibrosis. CK7 highlights mild ductular reaction. CMV, alfa-1 antitrypsin negative. PAS shows no abnormal deposition. Genetic testing was done and showed a mutation on the JAG 1 gene, diagnostic of Alagille syndrome. The patient was initiated on high-caloric formula, fat-soluble vitamins, ursodiol and rifampin, with improvement in both weight and jaundice.

Discussion

Alagille syndrome (ALGS) is an autosomal dominant disorder caused by a mutation in the JAG 1 or NOTCH 2 gene that occurs in ~ 1:50,000 live births. Jaundice is invariably present in almost all patients and occurs due to hepatic cholestasis caused by the paucity of intrahepatic interlobular bile ducts. Facial features are also common, including prominent forehead, deep-set eyes with moderate hypertelorism, pointed chin, and straight nose with a bulbous tip. Other system abnormalities include pulmonary stenosis, butterfly vertebrae, opaque ring in the cornea and uteropelvic obstruction. While jaundice is most often present in the neonatal period, our patient manifested first with failure to thrive and jaundice developed later during early infancy. In ALGS failure to thrive is a well-established problem and is associated with decreased caloric intake, fat malabsorption from cholestasis, and a possible role of JAG1 in growth deficiency. Management is by a multidisciplinary team according to clinical manifestations. Treatment is with ursodeoxycholic acid, cholestyramine, rifampin and naltrexone for pruritus and xanthomas, with some patients who require liver transplantation. Infants will require a high caloric diet and supplementation with fat soluble vitamins.

Presentation: C-34 Submitter: Christelle Rahme, M.D., Resident

Abstract Title: **Pembrolizumab-Associated Immune-Mediated Pleuritis with Pleural Effusion: A case report**

Authors: Rahme, Christelle, Resident M.D., Chaudhry, Zara, M-2 M.D. Candidate

Category: Case Report/Case Series Mentor: Houman Nourkeyhani, M.D.

Abstract:

Introduction: Pembrolizumab is a humanized monoclonal antibody that targets programmed death 1 (PD-1) and programmed death-ligant 1 (PDL-1). Since the Keynote study it has become a key drug in the treatment of advanced non-small cell lung cancer (NSCLC). Its immune-mediated adverse effects include pneumonitis, thyroiditis, and dermatologic reactions. However, pleuritis with pleural effusion is a rare and unreported side effect.

Case presentation We present the case of a 77-year-old male with metastatic PD-L1-positive adenocarcinoma of the right lung treated with pembrolizumab, pemetrexed, and zoledronic acid. Despite significant disease regression on imaging, the patient developed persistent pleural effusion and worsening pulmonary function requiring home oxygen. This was initially attributed to disease progression. Cytological analyses from multiple thoracenteses from August 2023 to July 2024 consistently showed no evidence of malignancy. It wasn't until august 2024 that an immune-mediated pleuritis secondary to pembrolizumab was suspected. Immunotherapy was discontinued, and the patient was started on prednisone. This led to significant clinical improvement.

Discussion This case highlights the diagnostic challenge of distinguishing immune-mediated side effects of pembrolizumab from disease progression. The delay in recognizing pembrolizumab-associated pleuritis resulted in delay in treatment. Clinicians should maintain a low threshold for suspecting autoimmune reactions, even for rare side effects, in patients undergoing immunotherapy. Early identification and management with corticosteroids can significantly improve outcomes.

Conclusion Pleuritis with pleural effusion is a rare immune-mediated adverse effect of pembrolizumab. However, this should remind clinicians to maintain a high index of suspicion for autoimmune phenomena in patients on checkpoint inhibitors, especially when clinical findings and disease progression appear contradictory.

Presentation: C-35 Submitter: Alan Ross, M-3

Abstract Title: **When Pneumonia Is Not Just Pneumonia: Recognizing Daptomycin-Induced Eosinophilic Pneumonia**

Authors: Gariaqoza, Yousif, M-3 M.D. Candidate, Ross, Alan, M-3 M.D. Candidate, Ballout, Ramy, Resident M.D., St-Germain, Charles, Resident M.D., Al-Khateeb, Wasef, Resident M.D.

Category: Case Report/Case Series Mentor: Lindsey Nichols, M.D.

Abstract:
Introduction:
Eosinophilic pneumonia is a rare, poorly understood, and underrecognized condition first described in 1989, often mimicking typical pneumonia. An abnormal increase in eosinophils within the lung parenchyma occurs due to infectious and non-infectious causes. Non-infectious causes can be linked to a variety of medications, including anti-inflammatory drugs, anticonvulsants, antidepressants, and antibiotics – in this case daptomycin. Affected patients commonly present with fever, shortness of breath, increased oxygen demand, and new infiltrates on imaging. Although diagnosis frequently relies on bronchoalveolar lavage (BAL), a limited number of case reports describe successful diagnosis without BAL. This case report strives to highlight the importance of possessing a high index of suspicion as a physician. When coupled with the evidence of peripheral eosinophilia, the appropriate diagnosis and management of this rare condition can be made.
Case Presentation:
A 70-year-old man with a history of coronary artery disease with stent, transient ischemic attack, hypertension, type 2 diabetes mellitus, and left total hip arthroplasty. Recently, he was diagnosed with a left psoas abscess and prosthetic joint infection of the left hip, which grew Staphylococcus epidermidis. Drainage, irrigation, and debridement were performed, and the patient was discharged on a six-week course of intravenous cefazolin. However, persistent drainage prompted prosthetic hip removal and antibiotic spacer placement. Although intraoperative cultures were negative, he received intravenous daptomycin for ongoing management of the hip infection.
On this admission, he is presenting with progressive shortness of breath, increased home oxygen requirements, and fever. Physical examination showed diminished breath sounds in the bilateral lower lung fields. Laboratory studies revealed leukocytosis, and contrast-enhanced chest CT identified multiple ground-glass and subsegmental densities consistent with multifocal pneumonia. Daptomycin was discontinued; vancomycin and cefepime were initiated to cover both the pneumonia and the left hip infection. The patient's respiratory status improved over three days, and sputum cultures were negative. Consequently, vancomycin and cefepime were discontinued, and daptomycin was resumed for the persistent infection of the hip.
Within two days of restarting daptomycin, the patient experienced renewed shortness of breath and rising oxygen requirements. A repeat chest X-ray showed worsening bilateral densities, and laboratory testing revealed peripheral eosinophilia (absolute eosinophil count 1.5 × 10^3/μL). An extensive infectious workup was negative, heightening suspicion for daptomycin-induced eosinophilic pneumonia. Daptomycin was discontinued, and intravenous vancomycin was restarted to address the hip infection. The patient's respiratory status and eosinophilia improved within days, and supplemental oxygen was weaned. Patient was discharged to a skilled nursing facility following the complete resolution of respiratory symptoms.
Discussion/Conclusions:
Eosinophilic pneumonia is a significant reversible medical condition that can lead to respiratory decline in patients receiving prolonged daptomycin antimicrobial therapy. This condition could be isolated from other causes of respiratory decline by having a high clinical suspicion and ordering alternative diagnostic modalities beyond bronchoalveolar lavage. Early recognition, quick cessation of daptomycin, and prompt transition to an alternative therapy often leads to rapid clinical improvement.

Presentation: C-36 Submitter: Jacob Surma, M-2

Abstract Title: **Case Report: Crohn's Disease Diagnosed Intraoperatively During a Trauma Exploratory Laparotomy**

Authors: Surma, Jacob, M-2 M.D. Candidate, Humphries, Danielle, Resident M.D., Riggan, Nathaniel, Resident M.D., Cirocco, William, M.D., Alashari, Akram, M.D.

Category: Case Report/Case Series Mentor: Akram Alashari, M.D.

Abstract:

Introduction: Crohn's disease, a chronic inflammatory bowel disease, commonly presents with abdominal pain, diarrhea, and weight loss, typically leading to diagnosis through endoscopic or imaging studies. Its incidental discovery during emergent trauma surgery is exceedingly rare.

Case Presentation: We report the case of a 25-year-old male who sustained blunt abdominal trauma in a dirt bike accident. Emergent exploratory laparotomy for a suspected bowel perforation revealed characteristic "creeping fat" and inflammatory adhesions, suggesting undiagnosed Crohn's disease. Postoperatively, the patient developed recurrent intra-abdominal abscesses, pleural effusions, and malnutrition, necessitating additional surgical drainage, targeted antibiotics, and nutritional optimization. A multidisciplinary team—including trauma surgeons, gastroenterologists, infectious disease specialists, and interventional radiologists—collaborated to manage both acute injuries and the newly recognized chronic inflammatory condition. Following his treatment, final pathology revealed multifocal colonic mucosal ulceration with acute inflammation, ileocolic fistula formation and colonic perforation, consistent with Crohn's ileocolitis.

Conclusion: This case illustrates the importance of maintaining a broad diagnostic perspective during trauma surgery and highlights how an unrecognized inflammatory bowel disease can complicate postoperative recovery. Early suspicion and tailored interventions are crucial for mitigating complications such as abscess formation and sepsis. A prompt gastroenterology consult and confirmatory investigations are recommended to guide long-term management of Crohn's disease. Ultimately, this report underscores that vigilance for atypical findings in emergent settings can significantly improve patient outcomes.

KEY WORDS: Crohn's Disease, Trauma, Operative Trauma, Exploratory Laparotomy, Incidental Finding

Presentation: C-37 Submitter: Toni Tornberg, M-3

Abstract Title: **Use of U-500 regular insulin in pregnancy for suboptimal control using high doses of U-100 regular insulin**

Authors: Tornberg, Toni, M-3 M.D. Candidate, Syed, Usheem, Resident M.D., Nannar, Jaspreet, Resident M.D., Dukkipati Sai, Sreenija, M.D., Variar, Vivek, M.D., Habib, Zeina, M.D.

Category: Case Report/Case Series Mentor: Vivek Variar, M.D.

Abstract:

Background:

Pregestational diabetes mellitus (DM) complicates 1-2% of pregnancies, increasing risk of adverse maternal and fetal outcomes such as pregnancy loss, macrosomia, and congenital anomalies. [1,2] We report the use U-500R insulin in a patient with pregestational DM requiring high doses of U-100 insulin.

Case Report:

A 40-year-old Caucasian female with type 2 DM, class 3 obesity, hypertension, dyslipidemia, and a history of 14 pregnancy losses was referred at 24 weeks of pregnancy for hyperglycemia management. Prepregnancy, she was on metformin, pioglitazone, and a GLP-1 agonist. She was transitioned to insulin in early pregnancy. At 29 weeks, despite being on more than 600 U per day of insulin, control was suboptimal with two hospitalizations for hyperglycemia. She was switched to U-500R insulin 185 U thrice daily and aspart 70 U with meals. U-500R doses were gradually adjusted, reaching 230 U with breakfast/lunch and 220 U with dinner by the third trimester, with improved A1c from 12.5% to 6.7%. At 36 weeks, she delivered a healthy 7.1-lb infant via elective cesarean section.

Discussion:

During pregnancy, insulin resistance increases due to human placental lactogen and progesterone[3]. For patients with pregestational type 2 DM, insulin U-100 is the drug of choice, traditionally NPH and regular insulins due to long-term safety profile, and more recently long-acting (detemir or glargine) and short-acting (aspart or lispro) insulin analogs[3,8]. U-500R insulin is more concentrated and has a longer duration of action than U-100R insulin. A few case reports described the use of U-500R in pregnant women with high insulin requirements, via continuous subcutaneous infusion (pump), or as thrice daily injections, alone or in combination with a rapid-acting insulin analog. In these cases, using U-500R resulted in improved glycemic control and delivery of healthy babies.

Conclusions:

Our case supports the use of U-500R insulin for pregnant patients with type 2 DM and high insulin requirements when glucose control cannot be achieved with traditional insulin regimens. Our patient's outcomes align with prior reports of improved glycemic control and delivery of healthy infants [6-8]. However, limited data on U-500R insulin in pregnancy requires further studies to evaluate safety and efficacy [6-8].

Presentation: Submitter: Stephen Weatherholtz, D.P.M., Resident

Abstract Title: **Charcot Foot Complications Following Bunion Surgery in a Diabetic Female: A Case Report**

Authors: Weatherholtz, Stephen, Resident D.P.M, Cohen, Andrew, D.P.M.

Category: Case Report/Case Series Mentor: Andrew Cohen, D.P.M.

Abstract:

Title: Charcot Foot Complications Following Bunion Surgery in a Diabetic Female: A Case Report

Background:

Charcot foot is a progressive condition seen in diabetic patients with neuropathy, causing joint destruction, deformity, and instability. It typically develops due to trauma combined with impaired sensation but can also occur post-surgically. This report highlights Charcot foot complications following bunion surgery in a diabetic female, emphasizing early diagnosis and management.

Case Presentation:

A 51-year-old female with type 2 diabetes and peripheral neuropathy underwent bunionectomy in May 2022. Post-surgery, she experienced persistent pain and non-compliance with recommended care. Eight weeks later, she developed swelling, warmth, erythema, and deformity in the midfoot without trauma. Radiographs revealed metatarsal collapse and joint dislocations, consistent with Charcot arthropathy. The patient had no sensation in the affected area, and her blood glucose was poorly controlled.

Management and Outcome:

Charcot foot was diagnosed and managed conservatively with non-weight-bearing protocols and a CAM walker. Despite non-compliance, she was referred to a multidisciplinary team for charcot and diabetes management. Blood glucose control was optimized, and she received foot care education. Inflammation subsided, but joint deformities persisted, confirmed by follow-up imaging showing osteolysis and further collapse and deformity.

Discussion:

Charcot foot can arise post-surgery in diabetic patients, especially with neuropathy. Non-compliance in this case resulted in significant deformity, underscoring the importance of patient education. Optimizing glucose control and ensuring offloading are key to managing Charcot foot and preventing complications.

Conclusion:

Early detection and interdisciplinary care are critical for preventing severe deformity and disability from Charcot foot post-surgery in diabetic patients.

Presentation: C-38 Submitter: Benjamin West, M-3

Abstract Title: **Chest Quivering: A Complication of Multi-Lead Dislodgement in CRT-D Implantation**

Authors: West, Benjamin, M-3 M.D. Candidate, Mohammed, Adil, Resident M.D., Yunus, Asim, M.D.,

Category: Case Report/Case Series Mentor: Sohaib Mandoorah, M.D.

Abstract:

Cardiac resynchronization therapy (CRT) is a proven method to improve heart function and enhance overall patient outcomes in those with heart failure with reduced ejection fraction (HFrEF). Complications of CRT implantation include lead dislodgement, pocket hematoma, pneumothorax, and coronary vein perforation. In this case, we present a patient who underwent CRT implantation and developed complications and a potentially life-threatening outcome.

A 50-year-old Caucasian male with a history of atrial fibrillation on Xarelto, heart failure with reduced ejection fraction (HFrEF), hyperlipidemia, GERD, obstructive sleep apnea on CPAP, and morbid obesity presented to the emergency department with atrial fibrillation with rapid ventricular response. He started guideline-directed medical therapy (GDMT) with an antiarrhythmic. A few months later, he returned with the same condition. Cardiology recommended ablation therapy and CRT-D implantation, which was performed. Seven months later, he returned with chest quivering, and AICD firing. Device interrogation revealed right atrial lead dislodgement causing diaphragmatic stimulation, which was resolved by turning off the lead. Ten days after this, he presented again with AICD firing. The patient complained of a twitching chest sensation, similar to his prior episode. Device interrogation revealed 21 shocks. Cardiac telemetry showed occasional ventricular pacing at 80 bpm despite intrinsic AV block at 50 bpm. Amiodarone bolus and drip were administered, terminating the AICD discharges. On the phone, Electrophysiology (EP) recommended physical exam to determine if the twitching and heart rate were in sync, which they were, confirming lead dislodgement. The defibrillator component was then turned off, external pads placed, amiodarone discontinued, and the patient was monitored overnight until EP could arrive in 6 hours. A PA and lateral chest X-ray revealed a dislodged right ventricular lead in the right atrium, with the coronary sinus lead difficult to visualize. EP took the patient to the OR, confirming the right ventricular lead had migrated to the right atrium, stimulating the phrenic nerve and causing twitching. The left ventricular lead was also dislodged but remained in the posterior lateral vein of the coronary sinus, limited by a hooklike root. The likely cause of AICD firing was the right ventricular lead sensing atrial fibrillation as ventricular fibrillation—an unusual occurrence. Remarkably, the coronary sinus lead's position may have prevented cardiac arrest. Given the dislodged lead, it was fortunate the patient reached the hospital in time. Temporary transvenous pacing and lead replacement were critical. The dislodgment likely resulted from morbid obesity, anatomy, and frequent left-hand use.

Lead dislodgement after CRD-D occurs in 1-8% of cases, with left ventricular leads more prone to dislodgement. Early dislodgements, especially atrial leads, often require reintervention. Obesity and frequent movement post-procedure increase risk. Lead dislodgements are classified as macro (visible on X-ray) or micro (affecting function). This case involved one macro-dislodgement (RV) and two micro-dislodgements (RA, LV), with the LV lead remaining in the coronary sinus, preventing cardiac arrest. Compared to prior cases in literature, this was unique due to multiple lead dislodgements months post-implantation. Treatment involved temporary transvenous pacemaker and replacement of all leads, highlighting an approach to complex lead dislodgement.

Presentation: C-39 Submitter: Carrie Wild, D.O., Resident

Abstract Title: **Acute Fatty Liver in Pregnancy**

Authors: Wild, Carrie, Resident D.O., Rachwitz, Allie, Resident M.D., Kinaschuk, Veronika, M.D., Sundstrom, Renee, D.O.

Category: Case Report/Case Series Mentor: Veronika Kinaschuk, M.D.

Abstract:

Abstract:

Transaminitis during pregnancy, characterized by elevated liver enzymes (ALT and AST), presents a broad differential diagnosis and often requires further evaluation. Common causes include viral hepatitis, cholestasis, pre-eclampsia, and less frequently, HELLP syndrome and acute fatty liver of pregnancy (AFLP). Though rare, AFLP is a serious, potentially life-threatening condition, associated with hepatic dysfunction, hypoglycemia, hyperammonemia, and multi-organ failure. Early recognition of AFLP is crucial, as it often necessitates immediate delivery, regardless of gestational age, to prevent maternal complications. Timely diagnosis and intervention are key to improving outcomes for both the mother and fetus.

Case Report:

A 27-year-old G3P2002 female at 22 weeks gestation presented to the emergency department with a sore throat and mild tachycardia. Laboratory results revealed elevated lactate, CRP, procalcitonin, and liver enzymes. Imaging showed fatty liver metamorphosis and mild gallbladder thickening. Initially, the patient was treated with broad-spectrum antibiotics (Zosyn) due to concerns for infection. Further evaluation revealed hypoglycemia and hyperammonemia, treated with D50 and lactulose, respectively. Her labs were trended overnight revealing continual increase of lactic acid and LFTS, with coagulopathy suggesting acute liver failure and suspected AFLP. At that point the decision was made to transport patient to a location with transplant capabilities. She was accepted to Henry Ford Hospital. During transport, the patient experienced preterm premature rupture of membranes (PPROM). OB/GYN evaluation revealed a breech presentation with a fetal foot in the vaginal canal, leading to delivery of a nonviable fetus. Immediately postpartum, the patients liver enzymes peaked. Hepatology consultation ruled out autoimmune liver disease and viral hepatitis, and stool studies for C. difficile and other bacterial infections were negative. Given her septic presentation, differential diagnoses included chorioamnionitis, gastrointestinal infection related to her ulcerative colitis, and urinary tract infection. Post-partum her condition improved normalization of liver enzymes, and stabilization of coagulopathy. She was transferred to the postpartum unit and discharged in stable condition.

Discussion/Conclusion:

This case highlights the challenges in diagnosing and managing transaminitis during pregnancy. The differential diagnosis includes viral infections, sepsis, HELLP syndrome, pre-eclampsia with severe features (PreE with SF), and AFLP. In this case, the patient's recent treatment for ulcerative colitis (UC) initially raised suspicion for a viral illness. However, as further workup was conducted, AFLP became the most likely diagnosis. Early identification and intervention, including multidisciplinary collaboration, are essential for managing this serious complication in pregnancy. Although AFLP is typically seen in the third trimester, this case is unique due to its occurrence in the second trimester, when AFLP is less common. Additionally, the presence of a previable fetus added complexity to the management. This case underscores the importance of considering AFLP when faced with acute liver failure during pregnancy, even in earlier stages. Furthermore, suggesting the considerating of adding glucose and ammonia levels to the workup of pregnant patients with acute transaminitis, as these simple and cost-effective tests could help raise suspicion for AFLP and improve early recognition.

Presentation: Cl-1 Submitter: Abdulghafoor Alani, M-2

Abstract Title: **Robotic-Assisted Appendectomy: Is It Safe and Effective in Urgent Settings?**

Authors: Alani, Abdulghafoor, M-3 M.D. Candidate, Soliman, Diaa, Resident M.D., Mishreky, Christopher, M-4 M.D. Candidate, Dakka, Nada, M-4 M.D. Candidate, Alani, Abdulghafoor, M-3 M.D. Candidate, Shaear, Mohammad, Resident M.D., Alashari, Akram, M.D.

Category: Clinical Mentor: Akram Alashari, M.D.

Abstract:

Background

Laparoscopic and open techniques are widely used for urgent general surgery procedures. However, the role of robotic assistance in urgent operations is an area of growing interest. Comprehensive data on clinical outcomes, particularly in newly established robotic surgery programs, remains limited.

Objective

This study aims to evaluate the safety and efficacy of robotic-assisted appendectomies in patients with acute appendicitis, including cases complicated by perforation or abscess formation.

Methods

This is a retrospective review of data collected between August 2023 and September 2024 from a tertiary healthcare referral center. The study included 46 patients who underwent urgent robotic-assisted appendectomies for acute appendicitis. Data were obtained from surgical records and patient follow-up interviews. Outcomes assessed included overall morbidity, serious morbidity, mortality, conversion to open surgery, length of hospital stay, readmissions, and patient satisfaction.

Results

Among the 46 patients, 55.2% were female and 44.8% were male, with a mean BMI of 31.12 (±7.3) and a median age of 44 years [IQR: 34.5-57]. Acute appendicitis accounted for 62.07% of cases, perforated appendicitis for 28%, and acute appendicitis with abscess for 10%. Four patients (8.7%) with perforated appendicitis required intraoperative drain placement. Overall morbidity was 6.5% (n=3), with no serious morbidity (Clavien-Dindo Grade 3 or 4). Complications included three intra-abdominal fluid collections, two requiring interventional radiology-guided drainage and one managed with IV antibiotics. The median length of hospital stay was 1 day [IQR: 0-1.5]. One case (2.2%) required conversion to open surgery. Two patients (4.3%) were readmitted, and no mortalities were reported.

Conclusions

This retrospective analysis provides an initial evaluation of robotic-assisted surgery in the management of acute appendicitis and its complications. Our findings suggest that robotic appendectomy is safe and effective, with low morbidity, no significant complications requiring major interventions, minimal conversion to open surgery, and favorable hospital stay and readmission rates.

Significance

The findings of this study contribute to the growing body of evidence supporting the use of robotic-assisted surgery in urgent settings. These results may serve as a foundation for future research and the development of registries to track outcomes in robotic emergency surgical interventions.

Presentation: CI-2 Submitter: Margaret Beyer, M-2

Abstract Title: **Comparing Outcomes of Mechanical and Manual CPR in Out-of-Hospital Cardiac Arrest: A Retrospective Cohort Study**

Authors: Beyer, Margaret, M-3 M.D. Candidate, Mowbray, Fabrice, Ph.D., Wanis, Nicole, B.S., Berger, David, M.D., Brent, Christine, M.D., Dunne, Robert, M.D., Shields, Teri, Other, Ball, Matthew, M.D., Miller, Joseph, M.D.

Category: Clinical Mentor: Howard Klausner, M.D.

Abstract:

Background: Out-of-hospital cardiac arrest (OHCA) is a leading cause of death in the United States, with over 350,000 per year. Despite improvements in care, OHCA outcomes remain low. Chest compressions can be administered manually or via an automated mechanical device. Mechanical CPR (mCPR) devices are designed to achieve return of spontaneous circulation (ROSC) by delivering consistent compression depth and rate. This retrospective cohort of the Michigan Cardiac Arrest Registry to Enhance Survival (CARES) compared survival to hospital discharge with good neurological status (CPC 1 or 2) between manual and mechanical CPR.

Methods: The CDC collaborated with Emory University in 2004 to develop a national registry of OHCA data. CARES uses Utstein-style reporting guidelines, which provide a standard, structured framework to collect and report data of cardiac arrest. From the Michigan CARES registry, a retrospective cohort of 65,641 OHCA from 2013 to 2022 were reviewed. After excluding pediatric arrests (N&#3f1,454), cases where ROSC was achieved before EMS arrival (N&#3f519), and missing data on CPR modality (N&#3f12,650) were left with 51,018 for analysis. Multivariable logistic regression was used to conduct 1:1 nearest neighbor propensity score matching and to estimate the adjusted average marginal effect of mCPR used on hospital discharge with good neurological status, defined as CPC of 1 or 2.

Results: Patient population was described as subgroups of mCPR and manual CPR. Average age was (67.0, 64.2) years with (62.5%, 59.7%) being male. (17%, 16.4%) of our sample had shockable cardiac rhythm. After statistically adjusting for age, sex, arrest location, witnessed arrest, AED application, etiology of arrest (cardiac vs noncardiac), shockable cardiac rhythm, and epinephrine use, no difference in risk of surviving to hospital discharge with good neurological status between those who received manual and mCPR was found (Risk Difference = -0.001; S.E = 0.002; 95%CI = – 0.0005 - 0.04; p = 0.81)

Conclusions: Previous analysis from 2015 indicated worse neurological outcome for mCPR, our propensity matched analysis has demonstrated no difference in risk of survival to hospital discharge with good neurological status between those who received manual and mCPR. This study contributes valuable insights to the discussion surrounding OHCA management. There may be future benefit to identify subgroups most likely to benefit from mCPR.

Presentation: Submitter: Kasandra Bienkowski, M-2

Abstract Title: **A Scoping Review of Single Versus Double Incision Fasciotomy for Acute Compartment Syndrome**

Authors: Bienkowski, Kasandra, M-2 M.D. Candidate, B.S, Price, Kennedi, M-2 M.D. Candidate, B.S., Dooley, McKenna, M-2 M.D. Candidate, B.S., Griepp, Anna, M-2 M.D. Candidate, B.A., Taheri, Branson, Resident M.D., Schauer, Steven, D.O.

Category: Clinical Mentor: Steven Schauer, D.O.

Abstract:

INTRODUCTION

Acute compartment syndrome (ACS) is a limb-threatening condition requiring urgent fasciotomy to relieve elevated intracompartmental pressure (Masquelet, 2010). The choice between single and double incision fasciotomy remains a topic of debate, with each approach offering distinct advantages and potential complications (Bible et al. 2013). This review aims to compare resolution of ACS, complication rates, and long-term functional recovery in patients undergoing single versus double incision fasciotomy for lower leg ACS.

MATERIALS AND METHODS

We conducted a scoping review of literature related to double and single fasciotomies to resolve acute compartment syndrome published between 2010-2024. A comprehensive search was performed using PubMed, Cochrane, Scopus, the Military and Government Collection (EBSCO), and the Military Database (ProQuest). The PRISMA-Scr checklist guided our review of this topic.

RESULTS

Six papers met our inclusion criteria and provided outcome data comparing single versus double incision fasciotomies. The majority of studies were retrospective, with only one prospective cohort study. All cases of compartment syndrome were acute and related to traumatic injuries, most notably tibial fractures. Over 350 cases of compartment syndrome were analyzed across the included studies.

CONCLUSION

Our review consolidated existing literature comparing single versus double incision fasciotomies for acute compartment syndrome. Key aspects evaluated included resolution of ACS, complication rates, and long-term follow-up results, with considerable data centered on infection rates, sensorimotor deficits, and non-union rates post-fasciotomy. We identified a need for further research directly comparing the two approaches to better evaluate their efficacy and safety.

Presentation: Oral 2-9 Submitter: Andie Blankenstein, M-2

Abstract Title: **Impact of Delivery Mode on Infant Intestinal Microbial Diversity and Postoperative Infection after Cardiopulmonary Bypass**

Authors: Blankenstein, Andie, M-2 M.D. Candidate, Prout, Andrew, M.D.

Category: Clinical Mentor: Andrew Prout, M.D.

Abstract:

Background: The intestinal microbiome is essential for immune system maturation. Infants born via C-section have different composition of the intestinal microbiome compared to those born vaginally, with decreased colonization of immune-stimulating anaerobes and increased colonization of pathogens. These changes cause immune dysfunction in preclinical models, but their clinical relevance is unclear. Infants with congenital heart disease (CHD) are at high risk for infection, particularly after heart surgery with cardiopulmonary bypass (CPB).

Objective: We performed this study to describe the composition of the intestinal microbiome in infants with CHD undergoing cardiac surgery with CPB. We compared the intestinal microbiome and risk of postoperative infection in infants born via C-section with those born vaginally. We hypothesized that infants born via C-section would have altered composition of the intestinal microbiome and increased risk of infection compared to those born vaginally.

Methods: We analyzed 31 patients under 6 months of age who underwent cardiac surgery with CPB at the Children's Hospital of Michigan. We obtained and analyzed a fecal sample after surgery. Microbiome analysis was performed using 16S rRNA sequencing. Absolute bacterial abundance was obtained using digital droplet PCR (ddPCR). We tested for differences in alpha and beta diversity based on delivery mode using Tukey testing of Shannon diversity and PERMANOVA analysis respectively. We performed rank abundance analysis and tested whether prominent taxa differed by delivery mode. We used random forest analysis to assess the contribution of C-section birth to infectious risk, followed by logistic regression on the most predictive variables to determine associations between delivery mode and infection.

Results: In infants under 6 months of age, no significant difference in absolute bacterial abundance was observed based on mode of delivery. Rank abundance and taxa comparisons showed that Dysgonomonas ($p=0.016$) and Lachnospiraceae ($p=0.05$) were higher with C-section delivery, while no significant differences were found across other taxa. Random forest analysis identified Dysgonomonas, preterm birth, and prior ICU stay as the strongest predictors of infection, while C-section was not highly predictive. In multivariate logistic regression, C-section was not associated with infection. PERMANOVA analysis indicated no significant differences in beta diversity between C-section and vaginal birth infants ($p=0.5$, $r^2=0.03$). Shannon diversity analysis showed slightly higher alpha diversity in C-section infants, but Tukey's test did not detect a statistically significant difference between groups ($p=0.076$).

Conclusions: These findings suggest that while C-section delivery influences early gut microbiota composition, its impact on infection risk in this population is limited. The association of Dysgonomonas and Lachnospiraceae with C-section delivery highlights potential microbial shifts in early infancy.

Significance: This study underscores the role of delivery mode in shaping the early gut microbiome, though its impact on infection risk remains unclear. These findings could inform neonatal care strategies for high-risk infants undergoing cardiac surgery, by identifying microbiome-related factors that contribute to immune development and post-surgical outcome.

Presentation: CI-3 Submitter: Andie Blankenstein, M-2

Abstract Title: **Optimizing Malnutrition Screening as a Predictor of Acute Kidney Injury and ICU Outcomes in Critically Ill Children**

Authors: Blankenstein, Andie, M-2 M.D. Candidate, Kankam, Agartha, B.S., Desmarais, Aline, Resident M.D., Hasson, Denise, M.D.

Category: Clinical Mentor: Denise Hasson, M.D.

Abstract:

Introduction: Malnutrition and acute kidney injury (AKI) are both independent risks factor for poor outcomes in critically ill pediatric patients. Patients with AKI are at greater risk of malnutrition, but it is uncertain whether malnutrition is associated with AKI in pediatric intensive care unit (PICU) patients. Early identification of malnutrition can identify patients for whom nutritional interventions will be most impactful. Currently, malnutrition is assessed using weight-for-length (WFL) and body mass index (BMI) Z-scores in the PICU. However, several anthropometric measures are available, including weight-for-age (WFA), length-for-age (LFA), and mid-upper arm circumference (MUAC). It is unknown which measure has the strongest association with acute kidney injury (AKI) and PICU outcomes.

Objective: To determine whether malnutrition is associated with AKI, and if so, which malnutrition screening method most accurately predicts, AKI as well as ICU length of stay (LOS) and mortality in PICU patients.

Methods: We conducted a prospective observational cohort study of patients aged 0–21 years who were at high risk for AKI. After obtaining consent, we recorded basic anthropometrics from the electronic health recorded and measured MUAC. Malnutrition was defined as moderate/severe by Z-scores of ≤-2, per WHO criteria. AKI was defined by Kidney Disease: Improving Global Outcomes serum creatinine and urine output criteria, which were abstracted from the EHR. We used Fisher's Exact Test to assess associations between anthropometric measure and AKI and ICU outcomes.

Results: We enrolled 37 patients with a median [IQR] age of 6.3 [2.4-13.8] years, weight of 20.6 [12.5-39.1] kg, of whom 16 (42%) were female and 9 (24.3%) were White. Thirteen (34%) patients had AKI. Median [IQR] PICU LOS was 8.8 [2.85-13.43] days, and 5 patients died in the PICU (14.7%). Only 4 (11.1%) patients met criteria for malnutrition by WFL and BMI criteria, while 13 (36.1%), 5 (21.7%), and 0 (0%) met criteria by LFA, WFA, and MUAC respectively. Malnutrition by BMI occurred in 15% of patients with AKI compared to 8.3% of patients without AKI, which was not statistically significant. Malnutrition by BMI was associated with a PICU LOS < 7 days ($p = 0.0175$). No other anthropometric measures were associated with increased AKI or mortality.

Conclusions: LFA and WFA may identify malnutrition more frequently than BMI and WFL; however, their ability to predict ICU outcomes remains uncertain. Contrary to our hypotheses, malnutrition by BMI appears to be associated with shorter ICU LOS; further research is needed to clarify this relationship. The absence of significant associations between malnutrition and AKI or mortality suggests that malnutrition alone may not be the primary determinant of these outcomes, or that our sample size was insufficient to detect true effects.

Significance: Malnutrition is a known risk factor for poor outcomes in PICU patients; however, accurately identifying malnutrition in this population remains challenging. This study highlights the variability in malnutrition detection across different anthropometric measures and their potential associations with AKI, ICU LOS, and mortality. Further research is needed to refine malnutrition screening tools and better understand their impact on critical care outcomes.

Presentation: Oral 1A-4 Submitter: Zara Chaudhry, M-2

Abstract Title: **Prenatal Opioid Exposure and Early Child Growth**

Authors: Chaudhry, Zara, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:

Background and objectives: Opioid use during pregnancy is common and has been shown to impact fetal growth development. Neonatal opioid exposure has increased to 6.5 per 1,000 hospitalizations in 2014 (O'Conner). This has coincided with an increase in neonatal abstinence syndrome (NAS), which has an incidence between 70 and 95 percent (Smith). Infants born with NAS have a greater chance of low birth weight compared to other newborns. Furthermore, previous research conducted by Dr. Bailey found an association between pregnancy opioid use and a higher incidence of fetal growth restriction. The study found that compared to a control group, infants exposed to opioids in utero had a higher incidence of fetal growth restriction, lower weight, and decreased length and head circumference in utero and at delivery (Bailey). The goal of the current study was to determine if growth deficits observed at birth in opioid-exposed infants persisted over the first year of life.

Methods: The study retrospectively reviewed medical charts of outpatients from two large university-affiliated pediatric practices in the Midwestern United States. The data for the current study were taken from a larger parent study that screened medical records of pediatric patients born since July 2016 for biochemical evidence of use/non-use of various substances during pregnancy. Those included here were those whose mothers used opioids at any level during pregnancy, along with non-exposed controls.

Results: A total of 242 participants were available for the current report, 53 were exposed to opioids in utero and 189 controls. These two groups differed significantly ($p<.05$) on only two background factors, race (exposed more likely to be white, non-Hispanic) and pregnancy marijuana use (exposed less likely to have used), and these two background differences were statistically controlled in subsequent growth analyses. With respect to intrauterine growth restriction (IUGR), those exposed to opioids were four and half times more likely to be diagnosed than the non-exposed (18.9% vs 5.3%, adjusted OR=4.07 (95% CI: 1.59 – 10.40)). Regression analysis revealed that the significantly decreased length observed in opioid exposed infants compared to those not exposed that was observed at birth remained statistically significant out to age 1 year. The difference in length was statistically significant at birth with p< 0.01. Adjusted mean length percentile differences ranged from greater than 5 percentile points to nearly 8 percentile points at well-child visits from 1 month to 12 months of age. Differences in weight and head circumference trended toward opioid-exposed children remaining smaller but were not statistically significant.

Conclusions: Overall, this study found that growth, namely length, was restricted in children who were exposed to opioids in utero, and this effect persisted beyond the neonatal period. However, our data show that there is at least some level of catch-up effect with opioid-exposed children approaching normal weight and head circumference by the end of the first year of life. Further study, with larger samples, is needed to better explore longer-term effects and more subtle growth differences.

Presentation: CI-4 Submitter: Catherine Crow, M-2

Abstract Title: **Examining the Relationship between Substance Use during Pregnancy and Mode of Delivery: Potential Variations by Substance Used**

Authors: Crow, Catherine, M-2 M.D. Candidate, Liu, Jessica, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Delivery by Cesarean section (c-section) is a common procedure, and it has well-documented risks for the mother and the neonate. This mode of delivery is associated with maternal mortality and morbidity due to hemorrhage and thromboembolisms, as well as increased labor complications in future pregnancies. The child has increased risks of asphyxiation from anesthesia and neonatal respiratory morbidity. While substance use during pregnancy is relatively common, there is little research available about how this may affect the delivery mode. Proposed mechanisms of substance use during pregnancy leading to increased rate of c-section may include fetal distress, preterm labor, or maternal hypertension.

Objective: The goal of this study was to investigate the relationship between substance use during pregnancy and mode of delivery (c-section versus vaginal).

Methods: Data are from the Maternal-Child EMR Project, which is reviewing electronic medical records of maternal-child dyads at two academic pediatric practices in the U.S. Participants were maternal-child dyads involving children born since July 2016 with pediatric medical records available through age 12 months, with maternal prenatal and delivery records also available. Medical records were manually reviewed for variables including maternal medical history, background factors, and child outcomes. For this project, the first 242 maternal-child dyads were included. In this investigation, the use of different substances (marijuana, tobacco, prescription and non-prescription drugs) during pregnancy were examined in relationship to rates of vaginal delivery versus c-section. Mothers were considered positive for a substance if they self-reported during pregnancy, had a positive drug screen, or if the baby had a positive cord test. The data was analyzed on SPSS using regression models to control for background differences between those who did and did not use substances during pregnancy.

Results: Opioid users had a c-section delivery rate of 47.2% compared to non-drug users' rate of 32%. After controlling for type of health insurance, maternal race/ethnicity, and prenatal care utilization, it was found that those who used opioids during pregnancy were more than two and a half times more likely to have a c-section than non-opioid users. There were no significant relationships between other substance use and delivery mode.

Conclusions: These results indicate that opioid use during pregnancy is a significant predictor of c-section delivery. Further research with a larger sample size is planned to examine maternal substance use versus sub-types of c-section (elective and emergency), and to explore reasons for this relationship. Additionally, further research is warranted to examine the mechanism of opioids on delivery mode, such as its effect on labor progression, fetal heart rate, and maternal complications.

Significance: Drug use may predict c-section delivery due to its association with obstetric complications, fetal distress, and maternal health issues, which can increase the need of surgical intervention. By conducting cross-substance comparisons, this investigation discerned which substances exhibit an association with increased c-section rates versus vaginal deliveries, thereby providing insights into prenatal care strategies and informed delivery approaches. Since there is a significant relationship between opioid use and c-sections, this can guide providers in adopting knowledgeable delivery strategies.

Presentation: CI-5 Submitter: Jenna Currier, M-2

Abstract Title: **A Retrospective Cohort Study: The Safety and Feasibility of Biologic Infusions in Dermatology Practice**

Authors: Currier, Jenna, M-2 M.D. Candidate, B.A., Fortunato, Diana, B.S., Murakawa, George, M.D., Ph.D.

Category: Clinical Mentor: George Murakawa, M.D., Ph.D.

Abstract:

Background: Infusion biologics have significantly improved patient outcomes in several dermatologic conditions. Our single-physician dermatology practice has routinely administered infliximab, rituximab, cemiplimab, and mogamulizumab with positive outcomes and limited adverse effects.

Objective: To evaluate the safety profile and feasibility of administering in-office biologic infusions.

Methods: This retrospective cohort study reviewed 123 patients who received in-office infusions from 2005 to 2025. Patients were identified through billing codes, followed by a thorough chart review of adverse effects.

Results: Adverse events occurred in 13 of 75 (17.3%) infliximab patients, 0 of 6 (0%) cemiplimab patients, 7 of 38 (18.4%) rituximab patients, and 2 of 4 (50%) mogamulizumab patients. The most common adverse events were infusion-related reactions, including hives, flushing, pruritus, and nausea. One serious adverse event, anterior ischemic optic neuropathy, occurred due to an infliximab infusion. Patients restarting biologic therapy after a prolonged respite were at increased risk for adverse events, with reactions in 3 of 6 (50%) patients who restarted infliximab, and 4 of 4 (100%) patients who restarted rituximab.

Conclusions: In-office biologic infusions were generally well tolerated, with most adverse events being mild and manageable, such as headache and fatigue. Pre-medication strategies effectively mitigated infusion reactions, and serious complications were rare.

Significance: This study demonstrates the safety and feasibility of administering IV biologic infusions in a dermatology practice. Given the low incidence of adverse events, these findings support the broader adoption of in-office infusion therapy as a convenient and practical option for dermatologic care.

Presentation: CI-6 Submitter: Jenna Currier, M-2

Abstract Title: **A Retrospective Cohort Study: The Efficacy of Omalizumab in Treating Chronic Idiopathic Urticaria and Concomitant Atopic Dermatitis**

Authors: Currier, Jenna, M-2 M.D. Candidate, B.A., Murakawa, Ryan, B.A., Murakawa, George, M.D., Ph.D.

Category: Clinical Mentor: George Murakawa, M.D., Ph.D.

Abstract:

Background: Omalizumab is an anti-IgE monoclonal antibody that serves as a third-line treatment for refractory chronic idiopathic urticaria (CIU) and is also used off-label for atopic dermatitis (AD), a common comorbidity. Both CIU and AD are Th2-mediated diseases that fall within three interconnected branches: pruritus, eczema, and urticaria. Therapy targeting one branch of Th2-driven disease may lead to improvements across multiple branches.

Objective: To evaluate the efficacy of omalizumab in the treatment of Th2-mediated diseases, including urticaria and atopic dermatitis.

Methods: This retrospective cohort study analyzed 127 patients with CIU and concomitant AD through chart review at a single private practice. Subjects were stratified by AD severity and categorized by treatment response: almost complete or complete remission, partial remission, or inadequate response.

Results: Among those receiving at least three doses, 47.2% achieved complete or almost complete remission, 31.8% had partial remission, and 20.0% had an inadequate response for both AD and CIU. Overall, 72.5% reported improvement in both conditions. Minimal adverse effects were observed, with the exception of one case of anaphylaxis.

Conclusions: These findings support omalizumab as a promising treatment option for refractory CIU and concomitant AD, as most participants experienced clinical improvement in both conditions. Given the overlap in Th2-mediated diseases, a single Th2-targeted therapy may benefit multiple conditions, but treatment should prioritize the most severe manifestation. Further randomized controlled trials are needed to confirm these results.

Significance: This study reinforces the growing role of biologic therapies in managing complex dermatologic diseases. Omalizumab may offer a comprehensive approach to Th2-driven conditions, such as those with urticaria and atopic dermatitis. For individuals with limited treatment options and symptoms spanning multiple branches of Th2-mediated disease, a single targeted therapy could offer meaningful relief.

Presentation: CI-7 **Submitter:** Christa Deban, M-2

Abstract Title: **Mental health effects on pregnancy outcomes in patients with intellectual and developmental disabilities using the National HCUP Database**

Authors: Deban, Christa, M-2 M.D. Candidate, Beeharry, Sarah, M-3 M.D. Candidate, Do, Pauline, M-3 M.D. Candidate, Moufawad, Michelle, M-3 M.D. Candidate, Hoque, Asef, Other

Category: Clinical Mentor: Neli Ragina, Ph.D.

Abstract:

Background: Studies have shown that adults with disabilities have a significantly higher prevalence of mental health disorders (MHD) compared to those without disabilities. In the United States, it is approximated that 12% of women within reproductive age have a physical or an intellectual disability (ID), with prenatal care being less accessible to those with disabilities. Women with intellectual and developmental disabilities (IDDs) present with increased risks for gestational diabetes, preeclampsia, and small birth weight.

Objective: This study aims to utilize the HCUP National Inpatient Sample (NIS) to explore outcomes of MHDs on pregnancy and fetal outcomes in patients with IDDs, including the incidence of gestational diabetes, preterm birth, and low birth weight compared to those in the general population.

Methods: A total of 4,476,951 hospitalization cases were identified through HCUP using ICD-10 codes that met the inclusion criteria for this study. Inclusion criteria: peripartum women, peripartum women with MHDs, peripartum women with IDDs, peripartum women with IDDs and MHDs. Exclusion criteria: patients who do not meet inclusion criteria. The Mann-Whitney U test and Pearson's chi-square test is used to compare differences between patients with and without IDDs. For the multivariate analysis, a survey weighted logistic regression model is used to examine the association between IDD diagnosis and outcome of MHD. All analyses are conducted using Stata version 18 (StataCorp LP, College Station, TX) and are considered statistically significant when $p < 0.05$.

Results:

- IDD vs without IDD groups significantly differed in terms of median age, median length of stay, total charges, race, hospital characteristics, median household income, primary payer insurance, obesity, maternal hypertension, MHD, screenings for social determinants of health, preeclampsia or eclampsia, diabetes, abortion, preterm birth and low birth weight.

- Bivariate analysis indicated the two groups significantly differed for MHD, hospitalizations with IDD had significantly higher rates of mental health disorder diagnoses than those without IDD (28.7% vs 8.7%, $p < 0.001$).

- The multivariate logistic regression results indicated that pregnancy hospitalization with IDD (aO.R. = 2.872, 95% CI = 2.716 - 3.037) were associated with significantly higher odds of MHD diagnosis compared to those without IDD.

Conclusions: After adjusting for all factors, pregnant hospitalization cases with IDD have an approximately 2.8 times increased likelihood of MHD diagnosis, such as anxiety and depression, compared to the general pregnant population without IDD. This supports the hypothesis that pregnant patients with IDD have a higher prevalence of MHD. Results also suggest that risk of MHD was significantly associated with pregnancy complications and screenings for social determinants of health.

Significance: This study aims to bring to light the barriers faced by pregnant individuals with IDDs, specifically MHD effect on pregnancy and fetal outcomes. More research is needed to evaluate maternal and fetal outcomes in individuals with IDDs who receive adequate MHD care. Future goals for researchers and clinicians can include informing prenatal care including MHD in patients with IDDs.

Presentation: CI-8 Submitter: Joel DeJonge, M-3

Abstract Title: **Unrecognized Endocrine Contributions in Women with Recurrent Fractures: The Need for Better Screening**

Authors: DeJonge, Joel, M-3 M.D. Candidate, Sacchetti, Michael, M-4 M.D. Candidate, Haryadi, Neehar, M-3 M.D. Candidate, Desai, Shivam, M-4 M.D. Candidate, Hoque, Asef, Other, Bailey, Beth, Ph.D., Maser, Christina, M.D.

Category: Clinical Mentor: Christina Maser, M.D.

Abstract:
Introduction:
Parathyroid hormone (PTH) is a key endocrine regulator of calcium homeostasis, mobilizing bone calcium stores, upregulating vitamin D production, and increasing intestinal calcium absorption. Primary hyperparathyroidism (PHPT), defined by PTH secretion above 65 pg/mL, is often diagnosed via routine hypercalcemia screening but may also present in normocalcemic individuals with fractures, prompting further evaluation. While PHPT's association with increased fracture risk is well established, less is known about its correlation with recurrent fractures or whether elevated PTH levels independently predict fracture risk. Additionally, existing literature and our data suggest that PTH testing following fractures is underperformed, potentially leading to delayed diagnosis and treatment.

Objective:
Given the aging U.S. population and rising prevalence of osteoporosis, this study aims to investigate the relationship between fractures and underlying endocrine disorders—particularly PHPT—by analyzing disease history and laboratory values.

Methods:
We conducted a retrospective chart review of female patients over age 40 who presented to the emergency department or urgent care with a fracture between 2017 and 2022. Data collection included demographics, medical history, fracture characteristics, osteoporosis treatment history, and laboratory values related to metabolic and endocrine diseases, including PTH and calcium levels.

Results:
Our dataset included 468 female patients aged 40 or older with at least one fracture. Of these, 134 (28.6%) had chronic kidney disease (CKD), while 334 (71.4%) did not. Notably, only 71 patients (15.2%) had documented PTH levels, whereas 397 (84.8%) did not undergo PTH testing. After adjusting for age, BMI, CKD, and diabetes, patients with two or more fractures had a significantly higher likelihood of elevated PTH levels (>65 pg/mL) (adjusted OR = 4.515, 95% CI = 1.038–19.639).

Conclusions:
The significant association between multiple fractures and elevated PTH levels highlights a potential gap in screening for underlying endocrine disorders. The low rate of PTH testing observed in our dataset suggests that many cases of PHPT may go undiagnosed, delaying appropriate treatment.

Significance:
Improving awareness of the relationship between PHPT and fracture risk could lead to earlier and more consistent PTH screening in patients with recurrent fractures. Implementing routine endocrine evaluations in this population may facilitate earlier intervention, improve patient outcomes, and reduce future fracture risk.

Presentation: CI-9 Submitter: Mashood Farooqi, M-1

Abstract Title: **PREVALENCE AND IMPACT OF METABOLICALLY HEALTHY OBESITY ON IN-HOSPITAL OUTCOMES OF GERIATRIC PATIENTS HOSPITALIZED WITH OBSTRUCTIVE SLEEP APNEA: INSIGHTS FROM NATIONAL INPATIENT SAMPLE, 2019**

Authors: Farooqi, Mashood, Resident M.D., Singh, Sachin, Resident M.D., Jain, Muskan, M.B.B.S., Farooqi, Mashood, Resident M.D., Choudhary, Vatsalya, M.B.B.S., Danish, Ali, Resident M.D., Mohammed, Adil, Resident M.D., Garg, Eva, M.B.B.S., Chaudhry, Saad, M.D.

Category: Clinical Mentor: Rupak Desai, M.B.B.S.

Abstract:

* Background: Hospitalization outcomes in older adults (age>=65) with obstructive sleep apnea (OSA) remain understudied among different obesity phenotypes, such as metabolically healthy obesity (MHO), which is obesity without metabolic risk factors like hypertension, diabetes, or hyperlipidemia, and metabolically unhealthy obesity (MUHO), which includes these comorbidities.

* Objective: To evaluate the impact of metabolically healthy obesity (MHO) and metabolically unhealthy obesity (MUHO) on in-hospital outcomes, including all-cause mortality, atrial fibrillation (AF), and stroke, in older adults (age ≥65) hospitalized with obstructive sleep apnea (OSA).

* Methods: The National Inpatient Sample 2019 was utilized using pertinent ICD 10 codes to identify geriatric patients hospitalized with OSA. The Elixhauser comorbidity index was used for comorbidities. Primary outcomes were the prevalence of MHO, its impact on all-cause mortality, rate of atrial fibrillation (AF), and stroke.

* Results: Among 511,450 admissions, there was a higher prevalence of CKD, and prior MI in the MUHO group, versus cancer and prior VTE in the MHO group. MHO had higher all-cause mortality than MUHO (2.4% vs 1.8%), with no difference in the prevalence of AF. Stroke (2.8% vs 1%) and acute ischemic stroke (2.2% vs 0.6%) were more prevalent in MUHO. Adjusted regression analysis showed 41% higher odds of mortality in MHO vs MUHO (OR 1.41, 95%CI 1.15-1.73, P=0.001).

* Conclusions: MHO was associated with higher overall mortality compared to MUHO, while stroke and acute ischemic stroke were more prevalent in the MUHO group. Further studies are needed to enhance risk stratification and guide treatment strategies for this vulnerable population.

* Significance: Understanding the differential impact of MHO and MUHO on hospitalization outcomes in older adults with OSA is critical for refining risk stratification and improving management strategies. These findings challenge the assumption that MHO is a benign phenotype and underscore the need for targeted interventions to mitigate adverse outcomes in this patient population.

Presentation: CI-10 Submitter: Rica Generoso, M-3

Abstract Title: **National Trends of Using Total Neoadjuvant Therapy (TNT) for Locally Advanced Rectal Cancer: An Analysis of the National Cancer Database**

Authors: Generoso, Rica, M-3 M.D. Candidate, Shchatsko, Anastasiya, Fellow, Ramel, Mohamed, Resident M.D., Serpa, Eduardo, Resident M.D., Hoque, Asef, Other

Category: Clinical Mentor: Omar Marar, M.D.

Abstract:

Background: Non-metastatic locally advanced rectal cancer (LARC) has been traditionally treated with chemoradiation followed by surgery and adjuvant chemotherapy. Total neoadjuvant therapy (TNT), first introduced into National Comprehensive Cancer Network (NCCN) guidelines in 2018, involves administration of chemoradiotherapy plus neoadjuvant chemotherapy before surgery with the goal of delivering uninterrupted systemic therapy to eradicate micrometastases. TNT has improved overall survival, pathological complete response rates, and tolerability to therapy, addressing prior adjuvant therapy compliance issues.

Objective: 1) To explore the trends of TNT use in patients with non-metastatic locally advanced rectal cancer, and 2) to determine factors associated with increased TNT use between 2004 and 2020.

Methods: National Cancer Database (NCDB) patients diagnosed with non-metastatic LARC staged as T3/4 and/or N1/2 from 2004 to 2020 were evaluated. We performed a 1-to-1 propensity score matched analysis to assess relative postoperative outcomes between patients who received TNT (TNT group) and patients who underwent surgery with or without chemotherapy or radiation (non-TNT group), controlling for age, gender, race, ethnicity, number of comorbidities, insurance types, facility type, and tumor grade. Disease characteristics and postoperative outcomes were compared between groups using chi-square and Fisher's exact tests. National trends of LARC, upfront surgery, TNT therapy utilization with surgery, and non-TNT therapy utilization with surgery from 2004 to 2020 were also assessed.

Results: 152,818 patients with LARC were identified. Two-thirds underwent surgery (101,973, 66.7%). TNT followed surgery in 32,292 cases (21.1%). Propensity score match analysis yielded 31,094 patients. TNT group membership was associated with a higher rate of R0 resection (93.9% vs. 92.5%, $p < 0.001$) and a higher proportion of minimally invasive approach used in surgery (47.7% vs. 45.2%, $p < 0.001$). For surgical outcomes, TNT patients experienced a shorter average length of stay (6.66 vs. 7.04, $p < 0.001$), lower rate of 30-day mortality (0.3% vs. 0.9%, $p < 0.001$), lower rate of 90-day mortality (0.8% vs. 1.8%, $p < 0.001$), and higher overall survival rate compared with non-TNT patients (68.2% vs. 62.7%, $p < 0.001$). From 2004 to 2020, the rate of TNT preceding surgery increased from 0% to 29% in LARC patients overall, a rise which began in 2006 at 16.8% and increased abruptly in 2018 from 22.2% to 26.5%, then to 29.0% for 2019 and 2020.

Conclusion: The findings of the present study indicate that utilizing TNT is a promising strategy for treating locally advanced rectal cancer, demonstrating superior outcomes compared to standard therapy that parallels increased use. Further research is needed to investigate its long-term impact on disease recurrence and overall survival.

Significance: The increasing adoption of TNT reflects a paradigm shift in the management of locally advanced rectal cancer, driven by its association with improved surgical and survival outcomes. Understanding factors influencing TNT utilization can help optimize treatment strategies and guide future clinical decision-making.

Presentation: CI-11 Submitter: Rica Generoso, M-3

Abstract Title: **National Trends of Using Immunotherapy for Locally Advanced Rectal Cancer: An Analysis of the National Cancer Database.**

Authors: Generoso, Rica, M-3 M.D. Candidate, Shchatsko, Anastasiya, Fellow, Sravani, Sripathi, Resident M.D., Solh, Wael, M.D.

Category: Clinical Mentor: Omar Marar, M.D.

Abstract:

Background: Immunotherapy for rectal cancer is recommended for mismatch repair deficient (dMMR) and/or microsatellite instability-high (MSI-H) non-metastatic, locally advanced rectal cancer (LARC). The dMMR type of LARC is highly sensitive to neoadjuvant single-agent programmed cell death protein (PD-1) blockade, resulting in a high complete response rate. According to the latest study updates from Cercek et al., all 42 patients with mismatch repair-deficient (dMMR) rectal cancer treated with dostarlimab, an immunotherapy agent that works by blocking the PD-1 pathway, achieved a complete clinical response, meaning none required radiation or surgery.1,2 Immunotherapy is poised to transform rectal cancer treatment due to its effectiveness, low toxicity, potential for rectal preservation, and ability to mitigate the side effects of pelvic radiotherapy.

Objective: To explore the trends of immunotherapy use in patients with rectal cancer.

Methods: This retrospective cohort study was conducted using the National Cancer Database (NCDB). We evaluated all patients with rectal adenocarcinoma who were diagnosed from 2004 to 2020. Given that the NCDB does not record the dMMR/MSI-H status of rectal cancer patients, we looked at aggressive histology (colloid, signet ring cell, and mucinous cancers) and high grade (poor tumor differentiation) among patients receiving immunotherapy to estimate if it can be used as a substitution for dMMR/MSI-H status.

Results: A total of 332,869 patients with rectal adenocarcinoma were identified in the NCDB from 2004 to 2020. Of these, 10,434 (3.1%) patients received immunotherapy. LARC patients (T3-T4 N any or T1-2 N1-2) constituted 10.6 % of the entire group of rectal cancer patients receiving immunotherapy. The use of immunotherapy increased from 0.2-0.7% in 2004-2008 to 3.4% in 2013, and further to 7.8% in 2020 among all patients with rectal cancer. From 0.3 to 2% in LARC and from 0 to 10% in metastatic rectal cancer patients. Unfavorable histology (colloid, signet ring cell, and mucinous cancers) was found only in 1.3% of patients who received immunotherapy. However, poor tumor differentiation was found in 89% of patients with metastatic rectal cancer receiving immunotherapy and only in 7% of patients with immunotherapy for LARC.

Conclusion: The use of immunotherapy in patients with rectal cancer has significantly increased on a national level from 0.2% to 7.8%, with the most prominent growth occurring since 2013. Poor tumor differentiation is associated with metastatic rectal cancer receiving immunotherapy in 89% of cases.

Significance: The increasing utilization of immunotherapy highlights its growing role in rectal cancer treatment, particularly for metastatic cases with poor tumor differentiation. Further research is needed to refine patient selection criteria and evaluate long-term outcomes, especially in the context of non-metastatic locally advanced rectal cancer.

References

Cercek A, Sinopoli JC, Shia J, et al. Durable complete responses to PD-1 blockade alone in mismatch repair deficient locally advanced rectal cancer. JCO 42, LBA3512-LBA3512(2024). doi:10.1200/JCO.2024.42.17_suppl.LBA3512

Cercek A, Lumish M, Sinopoli J, et al. PD-1 Blockade in Mismatch Repair-Deficient, Locally Advanced Rectal Cancer. N Engl J Med. 2022;386(25):2363-2376. doi:10.1056/NEJMoa2201445

Presentation: CI-12 Submitter: Amaresh Gogikar, M.D., Resident

Abstract Title: **Long-Term Mortality Risk in TAVR Patients with Mitral Stenosis: A Systematic Review and Meta-Analysis**

Authors: Gogikar, Amaresh, Resident M.D., Patel, Jay, M-4 M.D. Candidate, Danish, Ali, Resident M.D., Gogikar, Amaresh, Resident M.D., Patel, Rishwa, M-4 M.D. Candidate, Anmol, Kumar, M-4 M.D. Candidate, Bobbillapati, Abhishek, M-4 M.D. Candidate, Ghantasala, Paritharsh, M.D.

Category: Clinical Mentor: Rupak Desai, M.B.B.S.

Abstract:

Background:

Transcatheter aortic valve replacement (TAVR) has emerged as a preferred intervention for severe aortic stenosis, yet the impact of concomitant mitral stenosis (MS) on long-term outcomes remains unclear. Given the hemodynamic interplay between the mitral and aortic valves, understanding the prognostic significance of MS in TAVR patients is crucial.

Objective:

To assess the long-term mortality risk in TAVR patients with concurrent mitral stenosis through a systematic review and meta-analysis of available literature.

Methods:

A comprehensive literature search was performed in PubMed, Google Scholar, and Scopus up to December 2024, adhering to PRISMA guidelines. Studies evaluating the association between MS and all-cause mortality in TAVR patients were included. Pooled odds ratios (ORs) were estimated using a random-effects model. Heterogeneity was assessed using I^2 statistics, and sensitivity analyses, including a leave-one-out approach, were conducted.

Results:

A total of five studies comprising 55,769 patients (6,024 with MS) with a median follow-up of 2.1 years were analyzed. The mean/median patient age ranged from 78–83 years, with 39.44% being male. The unadjusted analysis indicated an OR of 1.31 (95% CI: 0.94–1.83; p=0.11; I^2=81.9%), while the adjusted analysis demonstrated an OR of 1.42 (95% CI: 0.88–2.29; p=0.16; I^2=89.75%). Although a trend toward increased mortality was observed in patients with MS, statistical significance was not achieved. Sensitivity analysis revealed that omitting Masahiko Asami et al. resulted in significant adjusted odds, highlighting the influence of this study on overall findings.

Conclusions:

This meta-analysis suggests a potential association between mitral stenosis and increased long-term mortality in TAVR patients. However, substantial heterogeneity and a lack of statistical significance necessitate further large-scale studies to confirm these findings and refine risk stratification in this patient population.

Significance:

The findings of this study emphasize the need for careful pre-procedural evaluation of mitral valve pathology in TAVR candidates. As TAVR adoption expands to broader patient populations, recognizing the impact of concomitant valvular diseases may guide clinical decision-making and post-procedural management strategies, ultimately improving patient outcomes.

Presentation: Cl-13 Submitter: Neehar Haryadi, M-3

Abstract Title: **Does Hypothyroidism Confer an Increased Fracture Risk in Postmenopausal Osteoporotic Women Who Have a History of Joint Replacement: A Retrospective Study**

Authors: Haryadi, Neehar, M-3 M.D. Candidate, Desai, Shivam, M-4 M.D. Candidate, DeJonge, Joel, M-3 M.D. Candidate, Sacchetti, Michael, M-4 M.D. Candidate, Hoque, Asef, Other, Maser, Christina, M.D.

Category: Clinical Mentor: Christina Maser, M.D.

Abstract:
Background:
Hypothyroidism represents one of the most common endocrine disorders. Current literature shows this to be especially true in females, with the prevalence of hypothyroidism to be nearly 10%. This presents significant clinical consequences in that these individuals may experience decreased bone density, increasing the risk of fractures. Similarly, joint replacement surgeries have been linked to an elevated risk of fractures and with an aging population, there are more joint replacement surgeries and consequently, more post-op fractures. While it is evident that studies investigating these variables individually exist, there are no studies evaluating the effect of thyroid status on fracture risk following joint replacement surgery. As such, we investigate this question specifically in a population of postmenopausal osteoporotic women.
Objective:
To evaluate the effect of thyroid status on fracture risk following joint replacement surgery in a population of postmenopausal osteoporotic women.
Methods:
A retrospective chart review was carried out on patients identified to be female, over the age of 40, and had a fracture over the past 5 years. We collected and recorded patient demographics, characteristics of fractures, any history of thyroid disease, as well as history of joint replacements. Data pertaining to joint replacements, number of fractures, and thyroid status was analyzed using an independent sample t-test.
Results:
Our dataset included 468 female patients aged 40 or older with at least one fracture. Of these, 146 (31.2%) had hypothyroidism, 13 (2.78%) had hyperthyroidism, and 352 (75.2%) were euthyroid. Additionally, 136 (29.1%) patients had at least one joint replacement surgery before their initial fracture. After adjusting for age and BMI, the data showed no significant association between hyperthyroidism and having two or fractures following joint replacement surgery (Adjusted OR = 0.542, 95% CI = 0.062-4.692, p-value = 0.550). There was no significant association between hypothyroidism and having two or fractures following joint replacement surgery (Adjusted OR = 0.580, 95% CI = 0.269-1.247, p-value = 0.162).
Conclusion:
There was no significant increase in fractures based on patients' thyroid status given that the patient had a joint replacement surgery. This highlights the fact that although joint replacement surgery and thyroid status individually can increase a patients' risk for a future fracture, both of these variables together do not significantly increase risk of a future fracture. This shows that a patient with both of these risk factors does not significantly elevate their risk of fracture resulting in fewer postoperative complications, despite increased prevalence of joint replacement surgeries.
Significance:
Spreading awareness of the lack of an association between thyroid status and fracture risk given a previous joint replacement can lead to better clinician and patient education when considering joint replacement surgery leading to an increase in the number of qualified surgical candidates. Overall, this would ultimately increase patient quality of life without compromising patient outcomes in the long term.

Presentation: CI-14 Submitter: Emily Heinrich, M-3

Abstract Title: **Comprehensive Systematic Review of Spinal Cord Injuries in Equestrian Athletes: Incidence, Risk Factors, and Outcomes**

Authors: Heinrich, Emily, M-3 M.D. Candidate, Crane, Kayleigh, M-3 M.D. Candidate, Chiaramonti, Nicholas, M-3 M.D. Candidate

Category: Clinical Mentor: Julien Rossignol, Ph.D.

Abstract:

Objective: The goal of this systematic review is to identify common themes amongst acute spinal cord injuries (SCI) in equestrian athletes. Over 27 million individuals ride horses annually and SCIs are one of the most severe forms of injury with life-altering outcomes.

Design: A qualitative systematic review was performed using PubMed, CINAHL Plus with Full Text (EBSCO), Cochrane Library, and Scopus with pre-determined MESH terms. The initial search returned 354 studies. Following PRISMA guidelines, 13 articles were included in the final study. Exclusion criteria included injuries to the horse instead of the rider, non-English language, cauda equina, and case reports. Data extraction was completed, and common findings were evaluated narratively due to heterogeneity of data.

Results: Articles that were included in the final analysis ranged from 1993 to 2021. Seven manuscripts listed specific horse-related activities that caused SCI, with fall from horse as the highest precent of injury. Nine articles identified the injury region, with large variations and no clear dominant area of injury. Five articles identified the length of hospital stay with ranges from 1 to 82 days. Four articles looked at the association of professional vs non-professional riders, with three of the articles identifying a higher risk of SCI in non-professional riders. Only two articles evaluated use of helmet at time of injury, with one article showing 81% of those with SCI used helmets, and the other showing only 35.6% utilized this safety measure.

Conclusion: SCI in equestrian athletes can have a wide presentation, with large variation on location of injury, length of stay, and other factors. However, non-professional riders are at a greater risk of SCI and individuals are more likely to sustain injury from a fall from a horse rather than a kick or another modality of injury. More work can be done to elicit presenting symptoms, types of surgical intervention used, and long-term outcome and recovery.

Significance: Horseback riding is a high-risk sport that attracts hundreds of thousands of people to participate in. Research surrounding the nature of life-altering injuries in this sport can inform changes in helmet and body protector designs to better suit the riders and reduce the risk of SCI. These studies can also contribute to improved response strategies, earlier interventions, and enhanced rehabilitation techniques to promote better outcomes and lessen the potential for long-term disability.

Presentation: CI-15 Submitter: Benjamin Herdman, M-3

Abstract Title: **Looking Beyond the Immune Response: Relationships Between Allergies and Mental Health**

Authors: Herdman, Benjamin, M-3 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:
Background: Depression and anxiety profoundly impact U.S. patients, affecting 8.4% and 5.7% of adults respectively. Previous studies have suggested a potential link between respiratory allergies and depression, but effects on this relationship as well as other types of allergies have not been studied.
Objectives:
The goal of this study was to examine whether having allergies predicts depression and generalized anxiety, and to explore whether type of allergy (respiratory, medication, food, topical) or patient factors such as sex, location of residence, race/ethnicity, income, and asthma influence these relationships.
Materials/Methods

This study used data from the Health Care Cost and Utilization Project (HCUP) National Inpatient Sample (NIS) years 2016-2019, and included 23,663,161 patients aged 18+ who survived their hospitalization. ICD-10 codes determined allergy subtypes, and depression and anxiety diagnoses. Analyses included chi-square, and logistic regression analysis controlling for significant demographic variables.
Results
Overall, all allergy types were more strongly associated with anxiety than depression. While not predictive of depression, presence of any allergy resulted in a 47% increased risk for anxiety. Respiratory allergies had the most effect, increasing risk for depression and anxiety by 60% and 89% respectively. Food and topical allergies were only shown to increase risk for anxiety. Females had a significantly greater risk of depression and anxiety than males for all non-food allergies. Respiratory allergies were the most predictive, and females showed a 101% (CI:1.98 – 2.04) increased risk of anxiety and a 76% (1.70 – 1.84) increased risk of depression, while males were at a 66% (1.62 – 1.70) and 31% (1.24 – 1.39) increased risk for each. Rural patients had increased risk to develop anxiety with allergies compared to urban patients, while urban patients with respiratory allergies had a higher risk of depression. Rural patients had a 103% (1.98-2.09) increased risk for anxiety, while urban patients had an 86% increased risk. (1.83-1.89)
Race/ethnicity also moderated the link between allergies and mental health. Non-white, Non-Hispanic patients had a higher risk for both outcomes compared White non-Hispanic patients, particularly for respiratory allergies, where depression risk increased by 95% (CI: 1.81-2.10) vs. 53% (CI: 1.47-1.60), and anxiety risk increased by 127% (CI: 2.20-2.33) vs. 82% (CI: 1.79-1.84). Results were similar for topical allergies.
Low-income patients had a higher risk for anxiety, but not depression, across all allergy types. Asthma status moderated these relationships. Non-asthmatics were found to have an increased risk of 65% (1.60-1.71), however asthmatics had an increased risk of 16% (1.03-1.30). This was also true regarding anxiety risk, with 96% increased risk in asthmatics (CI: 1.96-1.99) vs. 34% in non-asthmatics (CI: 1.28-1.39).
Conclusions
Allergies having a greater impact on anxiety than depression is likely due to the physiologic stress and concern for safety during an allergic episode. Gender differences may be due to stigma surrounding mental health in males, while rural-urban disparities likely reflect lack of healthcare access. Findings related to differences by race/ethnicity, socioeconomic status, and presence of asthma highlight the need for targeted interventions, and provide direction for further research investigating these disparities.

Presentation: CI-16 Submitter: Phoebe Hu, M-2

Abstract Title: **Pain Features in Acute Demyelinating Optic Neuritis**

Authors: Hu, Phoebe, M-2 M.D. Candidate, B.A., Pan, Yue, Other, De Lott, Lindsey, M.D.

Category: Clinical Mentor: Lindsey De Lott, M.D., Other

Abstract:

Background: Acute Optic Neuritis is a focal inflammatory disorder affecting the optic nerve. Ocular pain is common among acute Optic Neuritis (ON) patients and is hypothesized to be exacerbated by eye movement because of the proximity of the extraocular muscles to the optic nerve sheath particularly at the orbital apex. However, limited investigation has been conducted into the patient characteristics associated with variability of pain perception.

Objective: This study intends to describe eye pain experienced by patients diagnosed with optic neuritis (ON) using the Optic Neuritis Treatment Trial (ONTT) and the 15-year Longitudinal Optic Neuritis Study (LONS). We aim to understand the impact of gender and race on acute ocular pain, and characterize associations between patient-level factors and ocular pain through the lens of social determinants of health.

Methods: This is a secondary analysis of pre-existing data from the Optic Neuritis Treatment Trial (ONTT) and subsequent 15-year Longitudinal Optic Neuritis Study (LONS). Associations between baseline pain, and demographic and clinical features (e.g., optic disc edema) were assessed using univariate logistic regression for dichotomous variables, two-tailed t-tests for continuous variables, and Chi-square for categorical variables.

Results: Among the 455 patients enrolled in the ONTT (2 excluded for compressive optic neuropathy), men had lower odds of ocular pain compared to women (OR 0.48, 95% CI 0.24, 0.98) and significantly less severe pain (P = 0.006). No differences in the presence of pain were observed between White, Black, or other minoritized racial participants. However, when pain was present, it was significantly more severe among Black and other minoritized participants (P = 0.049).

Conclusion: Similar to other acute pain conditions, ocular pain presence and pain severity in ON are greater among women and minoritized racial groups. We presume that these disparities may be attributable to differences in social determinants of health. Racial/ethnic minorities experience higher unemployment, food insecurity, lack of reliable transportation, cost barriers for needed medical care, and lack of health insurance coverage on a national level. These disparities are even further emphasized when you look closer at women from within these minority groups.

Significance: This study identifies key demographic characteristics that can exacerbate the odds of a patient with ON experiencing more debilitating pain. These conclusions can guide future research regarding how social determinants of health may impact pain perception, and the influence of acute pain and pain perception on quality of life and response to treatment for patients diagnosed with ON.

Presentation: CI-17 Submitter: Husna Hussaini, M-1

Abstract Title: **Redefining Remote Healthcare: Evaluating Older Adults' Perspectives Towards a Telehealth Robot**

Authors: Hussaini, Husna, M-1 M.D. Candidate, Olatunji, Samuel, Ph.D.

Category: Clinical Mentor: Samuel Olatunji, Ph.D.

Abstract:

Background: With the growth in the aging population and caregivers who need healthcare support, telehealth tools such as assistive robots are emerging as feasible options to augment care for older adults. Telehealth robots provide a medium for healthcare personnel and/or caregivers to remotely carry out healthcare tasks without requiring the care recipient to commute to the healthcare center or for the caregiver to travel to the recipient's home. However, current telehealth robots are not fully functional or adaptable for some of these tasks and use case scenarios. Moreover, for the care of older adults, the perceptions, preferences, and attitudes of the older adults are not factored into the design of the robots to make them usable and useful for them. A deeper understanding of their needs, perceptions, and disposition towards telehealth robots is required.

Research Aim: This research investigated older adults' perceptions and attitudes toward a telehealth robot supporting their health checkups at home.

Methods: We conducted a mixed-methods study with ten older adults to understand their perceptions of telehealth robots in a home environment. We showed them videos of the robot prototype carrying out healthcare tasks and assessed their perceptions about this type of robot in their home and other use cases that they would envisage.

Results: The older adults conveyed overall positive first impressions towards the safety and flexibility of the soft robotic arm capabilities. Some participants who had negative views of the robot still found them useful, diligent, capable, and accurate.

Conclusion: This research allowed us to investigate older adults' perceptions and attitudes towards a novel telehealth robot. We identified a broad range of preferences and potential healthcare use cases to guide design requirements for robots in telehealth contexts.

Presentation: CI-18 Submitter: Sharat Kamath, M-3

Abstract Title: **The Effectiveness and Safety of Mavacamten for the Treatment of Obstructive Hypertrophic Cardiomyopathy: A Systematic Review**

Authors: Kamath, Sharat, M-3 M.D. Candidate, Naik, Nidhi, Graduate Student

Category: Clinical Mentor: Ahmad Hakemi, M.D.

Abstract:

Background and Objective:

Hypertrophic cardiomyopathy is an autosomal dominant heart disease characterized by significant hypertrophy of the myocardium. Its prevalence is between 1:200 to 1:500 individuals, with approximately two-thirds demonstrating the obstructive phenotype (oHCM), which is associated with dynamic left ventricular outflow tract obstruction (LVOTO), leading to symptoms of dyspnea, angina and syncope. Current treatment is limited to either symptomatic management with beta blockers and/or calcium channel blockers or septal reduction therapy. Mavacamten, an FDA approved cardiac-specific myosin inhibitor, represents an exciting advancement in oHCM treatment due to its ability to favorably remodel the underlying myofibrillar disarray and the abnormal mitral valve structure which contributes to LVOTO and hypercontractility. This systematic review of the literature explored the effectiveness of mavacamten in improving outcomes in patients with oHCM.

Methods:

This systematic review of the literature followed the PRISMA guidelines. This review searched the literature databases, PubMed, Cochrane, Scopus, and CINAHL using the following terms: “Mavacamten”, “Camzyos” and “MYK-461” up until October 2nd, 2024. After screening 416 articles, 20 articles were included in the final dataset. There were 15 placebo-controlled clinical trials, 3 non-randomized open-label clinical trials, 2 prospective observational studies, and 1 retrospective study.

Results:

From the 20 included articles, patients were started on either a 2.5 mg or 5 mg dose of mavacamten which was titrated as needed as the study progressed. The endpoints were compared either between mavacamten and placebo or mavacamten and beta blocker use. Across all the articles, mavacamten was associated with a significant decrease in LVOT gradient, improvement in the New York Heart Association by at least one class, reduction in proportion of patients requiring SRT, improvement in quality of life which was assessed with the Hypertrophic Cardiomyopathy Shortness of Breath questionnaire and Kansas City Cardiomyopathy Questionnaire, and reduction in concentration of cardiac markers such as Troponin I and NT- proBNP. Mavacamten also resulted in favorable cardiac structural changes which reduced left ventricular strain, improved diastolic function by at least one grade and improved peak exercise time. Although transient, mavacamten was associated with reduced left ventricular ejection fraction in some studies.

Conclusions and Significance:

Overall, mavacamten had a positive effect on improving the obstruction, diastolic dysfunction, and the overall quality of life in patients across the 20 studies. While long term safety and effectiveness is yet to be studied, mavacamten proves to be a promising therapeutic agent in treating oHCM. One of the major current limitations includes gender and ethnicity. Majority of the patients across the included studies were white, apart from one which strictly included the Chinese population, and the predominant gender was males. Future studies should be aimed at assessing the efficacy of mavacamten across different ethnicities and comparing outcomes between men and women.

Presentation: CI-19 Submitter: Afrasayab Khan, M.D., Resident

Abstract Title: **Comparative Outcomes of MitraClip Therapy Versus Surgical and Conservative Management for Mitral Regurgitation: A Meta-Analysis and Systematic Review**

Authors: Khan, Afrasayab, Resident M.D., Ishfaq, Lyluma, Resident M.D., Wolbert, Payton, M-3 M.D. Candidate, Luthr, Gaurav, Resident M.D., Gariaqoza, Yousif, M-3 M.D. Candidate

Category: Clinical Mentor: Peter Fattal, M.D.

Abstract:
Background:
Mitral regurgitation (MR) is a prevalent valvular disease contributing to significant morbidity and mortality. While surgical repair or replacement remains the standard of care, transcatheter mitral valve repair (TMVR) with the MitraClip offers a less invasive alternative for high-risk surgical candidates. This meta-analysis evaluates the efficacy, safety, and durability of MitraClip therapy compared to surgical and conservative management.
Objective:
To compare the clinical outcomes of MitraClip therapy versus surgical and conservative management in patients with mitral regurgitation (MR), assessing its efficacy, safety, and long-term durability.
Methods:
A comprehensive literature search of databases including PubMed, Embase, Cochrane Library, and Google Scholar was done to identify relevant studies comparing MitraClip, surgical repair/replacement, and medical therapy. A systematic review and meta-analysis were conducted using data from six key studies: Benito-González et al. (2017), Wang et al. (2020), Wan et al. (2013), Giannini et al. (2018), Oh et al. (2020), and Yuan et al. (2021). Selection criteria were applied to ensure high-quality evidence, and a random-effects model was used to pool outcome estimates, ensuring statistical robustness.
Results:
All-cause mortality: MitraClip had comparable 30-day mortality rates to surgery (2.06% vs. 2.06%) but demonstrated improved one-year survival over medical therapy (15.14% vs. 29.04%).
Heart failure hospitalizations: MitraClip combined with medical therapy significantly reduced HF-related admissions compared to medical therapy alone (OR 0.57, 95% CI: 0.36–0.91, p=0.02).
Recurrent mitral regurgitation: Residual MR (≥ moderate) was higher in the MitraClip group compared to surgery (17.2% vs. 0.4%, $p < 0.0001$), indicating superior MR resolution with surgery.
Reoperation rate: MitraClip patients experienced higher reoperation rates compared to surgical patients (OR 5.28, 95% CI: 3.43–8.11, $p < 0.01$).
Length of stay: MitraClip patients had significantly shorter hospital stays (-3.86 days, $p < 0.01$), though concerns remain about long-term durability.
Stroke and pacemaker implantation: No significant differences were observed between treatment groups.
Conclusions:
MitraClip therapy presents a valuable alternative for high-risk patients, offering comparable short-term mortality and fewer HF hospitalizations relative to surgery and medical therapy. However, its association with increased recurrent MR and reoperation rates does raise concerns regarding long-term durability. Surgical intervention remains the better option for eligible patients, given its superior MR resolution and lower reoperation rates. Optimal treatment decisions should consider anatomical suitability, comorbidities, and quality of life expectations. Further research is necessary to refine selection criteria and improve MitraClip technology for enhanced long-term outcomes.
Significance:
This analysis demonstrates that MitraClip is a valuable option for high-risk MR patients while showcasing the need for continued advancements in TMVR technology and patient selection strategies to optimize clinical outcomes.

Presentation: CI-20 Submitter: Afrasayab Khan, M.D., Resident

Abstract Title: **Cardiovascular Outcomes of GLP-1 Receptor Agonists in Heart Failure with Reduced Ejection Fraction: A Systematic Review**

Authors: Khan, Afrasayab, Resident M.D., Ishfaq, Lyluma, Resident M.D., Gariaqoza, Yousif, M-3 M.D. Candidate, Wolbert, Payton, M-3 M.D. Candidate, Luthra, Gaurav, Resident M.D.

Category: Clinical Mentor: Peter Fattal, M.D.

Abstract:
Background:
Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are widely used for diabetes management and have demonstrated cardiovascular benefits in patients with atherosclerotic cardiovascular disease. However, their role in heart failure with reduced ejection fraction (HFrEF) remains uncertain. While some studies suggest a potential improvement in cardiac function, others indicate a neutral or even negative effect on heart failure-related hospitalizations. Understanding the overall impact of GLP-1RAs on key cardiovascular outcomes in HFrEF is crucial for optimizing treatment strategies in this high-risk population.
Objective:
To evaluate the effects of GLP-1RAs on left ventricular ejection fraction (LVEF), heart failure hospitalizations, cardiovascular mortality, and major adverse cardiovascular events (MACE) in patients with HFrEF.
Methods:
A comprehensive literature search was performed in PubMed, Embase, and Cochrane Library to identify relevant studies assessing the effects of GLP-1RAs in HFrEF. A systematic review was conducted using six high-quality studies, including randomized controlled trials and prior meta-analyses. The analysis incorporated findings from six key studies: Lepore et al., Margulies et al., Munaf et al., Dicembrini et al., Sattar et al., and Kristensen et al. The primary outcomes included changes in LVEF, incidence of heart failure hospitalizations, cardiovascular mortality, and MACE. Pooled effect sizes were calculated using an inverse-variance random effects model, and a forest plot was generated to visualize the findings.
Results:
LVEF improvement: A modest but statistically significant increase in LVEF was observed (+1.45%, 95% CI: 1.40% to 1.50%).
Heart failure hospitalizations: Mixed results were reported, with some studies indicating a neutral effect (Margulies et al.), while others (Dicembrini et al.) showed a reduction in hospitalizations.
MACE reduction: A reduction in MACE was observed in studies by Sattar et al. and Kristensen et al., supporting the cardioprotective role of GLP-1RAs.
Study-specific findings: The study by Lepore et al. on albiglutide showed no significant improvement in cardiac function but a slight increase in peak oxygen consumption. Munaf et al. demonstrated a small but positive impact on LVEF. Margulies et al. found that liraglutide did not improve post-hospitalization clinical stability.
Conclusion:
GLP-1RAs demonstrate potential cardiovascular benefits in HFrEF, particularly in improving LVEF and reducing the risk of MACE. However, their impact on heart failure hospitalizations remains unclear, with conflicting evidence across studies. While some trials suggest beneficial effects, others report neutral outcomes, emphasizing the need for further research. Given their established benefits in diabetes and cardiovascular disease, GLP-1RAs warrant further investigation in the heart failure population.
Significance:
This review demonstrates the potential role of GLP-1RAs in HFrEF treatment, however, there is a need for large-scale randomized trials to better define their effectiveness in heart failure management. Future studies should focus on identifying patient subgroups that may derive the greatest benefit from GLP-1 therapy.

Presentation: CI-21 Submitter: Abimbola Kolawole, M-2

Abstract Title: **Factors Contributing To Achilles Tendon Re-rupture: A Systematic Review**

Authors: Kolawole, Abimbola, M-2 M.D. Candidate, Kolawole, Temidun, B.S.

Category: Clinical Mentor: Robert Ablove, M.D.

Abstract:

Background: Achilles tendon rupture is a common injury in athletes with an incidence of 2.17 per 100 000 persons annually. Differing re-rupture rates have been reported across populations, and the factors contributing are vague.

Objective: The aim of this review is to determine how Achilles tendon re-rupture rates in early middle-aged persons are influenced by sport participation, season of the year, percutaneous Tenolig vs surgical repair, and onset of weight bearing after surgery.

Methods: Two reviewers used four databases [PubMed, Web of Science, Cochrane Library, CINAHL Plus with Full text (EBSCO)] in identifying articles for the systematic review.

Results: Following exclusion criteria using PRISMA guidelines, three studies were included in the systematic review. 57% of patients that sustained a tendon rupture participated in Badminton (24%), soccer (22%), or floorball (11%). There was a 27% tendon re-rupture rate with percutaneous Tenolig repair, a 1.3% re-rupture rate with open repair, and a 0% re-rupture rate with minimally invasive repairs. 17.5% of patients with partial weight bearing immediately after tendon repair had a tendon re-rupture. 12.5% of patients with non-weight bearing for a period of four weeks after tendon repair had a tendon re-rupture ($p = 0.81$).

Conclusions: Badminton, soccer, and floorball are higher risk sports in sustaining tendon rupture. Tendon rupture sustained in the summer has a higher risk of re-rupture. Soccer and badminton may be contributing to the higher re-rupture rates in the summer. Percutaneous repair with Tenolig carries higher risk of re-rupture compared to open and minimally invasive repairs. Not statistically significant, partial weight bearing immediately after tendon repair showed higher re-rupture rates.

Significance: The information from this systematic review can guide our modes of Achilles tendon rupture treatments and rehabilitation as well as open directions for preventative measures against Achilles tendon re-rupture. Research on Achilles tendon re-rupture should be increased and expanded upon.

Presentation: CI-22 Submitter: Konrad Lautenschlager, M-1

Abstract Title: **A Systematic Review of Recent Developments in Platelet-Rich Plasma Therapy in Hip Osteoarthritis: Variability in Protocols and Clinical Outcomes (2019–2024)**

Authors: Lautenschlager, Konrad, M-1 M.D. Candidate, Awdish, Emily, M-1 M.D. Candidate, Other, Muszynska, Marlena, M-1 M.D. Candidate, Other, Hamad, Ali, Resident D.O.

Category: Clinical Mentor: Ali Hamad, Resident D.O.

Abstract:

Background:

Hip osteoarthritis (OA) is a prevalent degenerative joint disorder marked by chronic pain, reduced mobility, and diminished quality of life. Traditional conservative treatments are often inadequate, which has spurred interest in regenerative therapies such as Platelet-Rich Plasma (PRP). PRP leverages autologous growth factors to potentially improve symptoms and delay joint replacement. However, the optimal PRP formulation remains debated: leukocyte-rich (LR-PRP) may provoke a stronger inflammatory response due to higher white blood cell content, while leukocyte-poor (LP-PRP) tends to yield a milder reaction, possibly offering advantages in minimizing tissue inflammation.

Objective:

This study synthesizes and critically evaluates literature from 2019 to 2024 on PRP's efficacy in treating hip OA, focusing on studies that use the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC) and the Visual Analog Scale (VAS) as outcome measures. The aim is to identify trends, methodological limitations, and directions for future research, particularly concerning PRP preparation protocols.

Methods:

A systematic PubMed search identified randomized controlled trials and systematic reviews examining PRP for hip OA that reported WOMAC and VAS outcomes. Data on study design, PRP protocols (including leukocyte content, activation methods, and injection frequency), follow-up duration, and patient demographics were extracted and analyzed.

Results:

The review found significant variability in PRP preparation techniques, including differences in platelet and leukocyte concentrations, activation protocols, and injection timing. Overall, studies reported improvements in WOMAC and VAS scores for patients with mild-to-moderate OA, whereas outcomes for severe OA were less favorable. LR-PRP, with its higher leukocyte content, was associated with a more pronounced inflammatory response that may hinder healing in some tissues. In contrast, LP-PRP demonstrated a milder inflammatory profile, which might be beneficial for conditions where reducing inflammation is crucial. Notably, short-term benefits (3–6 months) were more evident than long-term outcomes (12+ months).

Conclusions:

PRP therapy shows promise as a minimally invasive treatment for hip OA, particularly in its early stages. However, inconsistencies in preparation protocols and limited long-term data call for standardized guidelines and further research. Future studies should stratify outcomes by OA severity and patient demographics to better tailor clinical recommendations.

Significance:

By highlighting current evidence and research gaps, this review underscores the potential of PRP as a regenerative treatment for hip OA. Standardizing PRP preparation could enhance its therapeutic efficacy and guide more precise, patient-specific treatment strategies in musculoskeletal medicine.

Presentation: CI-23 Submitter: Jessica Liu, M-2

Abstract Title: **Utilization of Medical Services Among Infants with a History of Prenatal Substance Exposure**

Authors: Liu, Jessica, M-2 M.D. Candidate, Crow, Catherine, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Prenatal substance exposure, including to opioids, tobacco, and marijuana, has been linked to adverse health outcomes in children. However, the relationship with early childhood medical service utilization is not well understood, particularly in distinguishing between specific substances. Gaining insights into these relationships can guide patient education and optimize healthcare delivery and availability for affected populations.

Objective: To explore patterns of medical service utilization during the first year of life, including non-well child pediatrician visits, emergency department (ED) visits, and inpatient hospitalizations, in infants with prenatal substance exposure.

Methods: Data from 242 cases were analyzed from the Maternal-Child EMR project, focusing on prenatal exposure to opioids, tobacco, and marijuana. Statistical models controlled for significant confounding background variables. Outcomes included pediatrician non-well child visits, ED visits, and hospital admissions, examined both dichotomously for whether they occurred at all, and as a total number.

Results: A comparison of those with and without substance exposure exhibited no differences in birthweight, gestational age, and prenatal care adequacy, among other factors. However, significant differences were identified in rates of maternal hypertension and medical insurance status. Analyses controlled for the two significant background factors revealed that prenatal opioid exposure was associated with a higher number of non-well child pediatrician and ED visits and a higher rate of inpatient hospitalization compared to controls. Contrastingly, prenatal marijuana and tobacco exposure were linked to fewer ED and additional pediatrician visits.

Conclusions: These findings highlight the heightened healthcare requirements for infants exposed to opioids prenatally, emphasizing the importance of tailored care plans. Additionally, the decreased service utilization in tobacco and marijuana exposure cases warrants further exploration into parental healthcare-seeking behaviors and alternative explanations. Overall, this study underscores the need for public health initiatives to address the varied impacts of prenatal substance exposure on infant healthcare.

Presentation: CI-24 Submitter: Miranda Manzo, M-2

Abstract Title: **Postpartum Depression Following a Substance-Exposed Pregnancy: The Roles of Age, Race/Ethnicity, and Prior Mental Health Experience**

Authors: Manzo, Miranda, M-2 M.D. Candidate, Aguilar, Natalie, M-2 M.D. Candidate, Fakhoury, Patrick, M-3 M.D. Candidate, Surma, Jacob, M-2 M.D. Candidate

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:
Objective:
Our aim is to explore the impact of age, race/ethnicity, and history of depression on the prevalence of postpartum depression (PPD) among individuals who are pregnant and using substances.

Background:
Associations exist between substance use during pregnancy and PPD, however it remains unclear how this varies among different age groups, racial/ethnic groups, or how a history of depression influences these outcomes. PPD is one of the most prevalent morbidities related to pregnancy, affecting 13% to 19% of women who give birth. There is significant research highlighting the risks associated with PPD emphasizing the prevalence and negative outcomes for both the mother and child. Maternal age, notably adolescents and mothers above age 30, were correlated with a higher risk of acquiring PPD.
Methods:
We performed a retrospective chart review from two pediatric practices in Michigan: CMU Medical Education Partners Outpatient Pediatric Practice (Saginaw), and Children's Hospital of Michigan Ambulatory Generalist Practice (Detroit). Participants were limited to maternal-child dyads involving children born since July 2016 with pediatric medical records available through age 3 and linked maternal prenatal/delivery records available.
Results:
Preliminary analyses showed that those who experienced PPD were significantly more likely to be private insurance holders and to use marijuana during pregnancy. There was a non-significant trend for those who use marijuana to have had a pre-existing mental health issue and to be single/not cohabitating with a partner. Predictors accounted for nearly a third of the variance in PPD. Marijuana use in pregnancy nearly quintupled the risk of PPD, while private insurance more than quadrupled it. While having a prior mental health issue increased the likelihood of developing PPD nearly four-fold, this relationship was not statistically significant.
Conclusions:
Data showed that various predictors contribute to PPD following a substance exposed pregnancy, particularly marijuana and insurance status. Some predictors showed an increase in PPD among substance exposed pregnancies, though these findings were not statistically significant, highlighting the need for more research in this area. A history of mental health conditions prior to pregnancy also showed an increased risk of PPD, although these results were not statistically significant, suggesting that this may be a confounding factor influencing our findings. Age and minority race/ethnicity were also not significant predictors of PPD status but are factors that we will further investigate in subsequent analyses.
Significance:
Among mothers experiencing PPD, studies suggest a possible correlation to their ethnic minority status. From 2004 to 2012, PPD rates in minority groups were more than twice as high as those observed in White, Non-Hispanic mothers. These disparities persist even when controlling for socioeconomic factors. A maternal history of depression has also been found to be significantly correlated with PPD. The risk of developing PPD was 20 times higher for those women with a history of depression. A meta-analysis showed that 29% of pregnant women who used substances during pregnancy experienced PPD. However, there remains an uncertainty of the role that age, race/ethnicity, and history of depression play in the risk of PPD in substance-using pregnant people.

Presentation: CI-25 Submitter: Matteo Mazzella, M-1

Abstract Title: **Mesenchymal Stem Cells And The Effect of Allogeneic Hematopoietic Stem Cell Transplantation in Shwachman-Diamond Syndrome**

Authors: Mazzella, Matteo, M-1 M.D. Candidate, Gadgeel, Manisha, M.B.B.S.

Category: Clinical Mentor: Süreyya Savaşan, M.D.

Abstract:
Background
Shwachman-Diamond syndrome (SDS) is primarily caused by bi-allelic mutations in SBDS which is characterized by exocrine pancreatic insufficiency, bone marrow failure (BMF), and skeletal dysplasia. The role of mesenchymal stem cells (MSC) in SDS remains controversial. Some studies suggest defective MSC function, with reduced MSC frequency in SBDS deficiency and impaired bone marrow stroma, affecting hematopoietic stem cell growth and angiogenesis. However, other studies indicate normal MSC function, with no contribution to hematological defects. Following allogeneic hematopoietic stem cell transplantation (HSCT), reduced MSC presence has been linked to poor graft function and lower survival, with some cases of primary or secondary graft failure. SBDS deficiency has been shown to impair graft function in the bone marrow microenvironment. This study reports MSC growth patterns in two SDS siblings, including one of the siblings after HSCT who underwent HSCT for BMF as well, compared to six healthy bone marrow donors. The investigation was prompted by persistent thrombocytopenia and low bone marrow cellularity in one sibling post-HSCT, exploring potential MSC-related mechanisms of poor graft function.
Objective
This study aimed to evaluate MSC growth patterns in two SDS siblings, including one post-HSCT case, and compare them with healthy bone marrow donors and to determine if the MSC growth was affected by HSCT and played a potential role in bone marrow function.
Methods
Bone marrow samples were collected from two SDS siblings at different times and six healthy HSCT donors in an IRB-approved study. MSC were cultured from bone marrow mononuclear cells (BMMC) and characterized using immunophenotyping, CellTrace Violet proliferation assays, and passage 2 MSC culture experiments. The impact of HSCT on MSC growth was analyzed by comparing pre- and post-HSCT MSC proliferation in one SDS sibling. MSC are proven to be recipient and blood cells of donor origin by XY fluorescence in-situ hybridization study.
Results
MSC growth yield at day 14 of culturing when the same number of BMMC were plated was lower with a 4-10-fold reduction at baseline and post-HSCT SDS patients in comparison to healthy controls which could be due to the decreased bone marrow cellularity at sampling. When the same number of MSC was cultured, MSC growth yield at 5 days was significantly lower at baseline in SDS patient samples compared to controls; there was almost normalization of MSC proliferation in post-transplant SDS case suggesting a potential improvement in bone marrow microenvironment.
Conclusion
Our findings suggest that while MSC growth is impaired in SDS, HSCT appeared to have significantly restored proliferation of recipient MSC. However, the role of GVHD and other post-HSCT factors in bone marrow dysfunction reflected as peripheral cytopenia warrants further investigation in such cases.
Significance
Understanding MSC function in SDS and the impact of HSCT on the bone marrow microenvironment may provide crucial information for the improvement of transplant outcomes in SDS and in general. This study highlights the need for larger-scale investigations to determine the variability of MSC responses post-HSCT and their potential therapeutic implications in SDS in this rather controversial topic.

Presentation: CI-26 Submitter: Madison Miller, M-2

Abstract Title: **Effects of COVID-19 on Breast Cancer Outcome**

Authors: Miller, Madison, M-2 M.D. Candidate, B.S., Demarinis, Sierra, M-2 M.D. Candidate, B.S., Ragina, Neli, Ph.D.

Category: Clinical Mentor: Xia Wang, M.D., Ph.D.

Abstract:

Background: COVID-19 has significantly impacted various aspects of society, including healthcare. Current research presents conflicting views on COVID-19's impact on cancer outcomes, with some studies suggesting it induces remission, while others indicate increased recurrence rates. Potential mechanisms include inflammation, immune mediated tumor reawakening, and hypoxic environments influencing drug resistance or dormancy. This study will fill the gap of knowledge regarding if COVID-19 clinically impacts breast cancer progression.

Objective: To determine how COVID-19 infections affect breast cancer treatment responses and recurrence rates compared to patients without COVID-19 after their diagnosis of breast cancer.

Methods: This is a retrospective chart review study using a database of patients diagnosed with both COVID-19 and breast cancer at Covenant Health Care Saginaw from January 2020 - December 2024. This study was approved by IRB #2181549-2. Data analysis involves univariable and multivariable Cox regression analyses to compare primary and secondary outcomes such as breast cancer progression and recurrence. P value of < 0.05 will be considered statistically significant.

Results: Charts of 50 patients with an active breast cancer diagnosis as well as COVID infection diagnosis during the study period were reviewed and data was extracted. Breast cancer pathology types were categorized along with treatment modalities, therapy interruption, recurrence, progression, or remission. COVID-19 severity was categorized as asymptomatic, mild, moderate, or severe based on NIH guidelines. Patients were divided into two groups: breast cancer with concurrent covid (CC) defined as patients whose COVID diagnosis precedes breast cancer diagnosis, and breast cancer without concurrent COVID (WOCC) defined as patients whose COVID diagnosis occurred after breast cancer diagnosis. There were 22 cases in the CC group and 24 cases in the WOCC group. Preliminary data compared these two groups which showed no significant difference on the rate of cancer interrupted therapy, progression, recurrence, and severe COVID. Interrupted therapy was present in 4 cases of CC group and 3 in WOCC group. Progression was present in 1 case in the CC group and 1 case in the WOCC group. Recurrence was present in 4 cases in CC group and 1 case in WOCC group. Severe COVID was present in 2 cases in CC group and 2 cases in WOCC group.

Conclusion: Preliminary data showed no significant difference in the impact of COVID on the cancer course between CC and WOCC groups. However, we hypothesize with a larger patient chart review, recurrence rates may be statically significant.

Significance: Although this study has a small sample size this data is significant to breast cancer patients and physicians because it provides initial insight into the clinical relevance of the effects of COVID-19 on breast cancer. The course of breast cancer is complex and highly individualized, with each patient presenting a unique clinical narrative. The results show there is further research needed to determine the clinical relevance of the impact of COVID-19 on breast cancer outcomes. We hope that with a larger chart review, conclusions can be drawn to improve breast cancer patients' access to care and overall prognosis.

Presentation: CI-27 Submitter: Lisa Mun, M-3

Abstract Title: **Mind Over Picking: A Systematic Review of Nonpharmacological Interventions for Skin Picking Disorder**

Authors: Mun, Lisa, M-3 M.D. Candidate, Loftus, Harrison, M-3 M.D. Candidate, Cassidy, Caroline, M-3 M.D. Candidate, Jafferany, Mohammad, M.D.

Category: Clinical Mentor: Mohammad Jafferany, M.D.

Abstract:

Abstract Title: Mind Over Picking: A Review of Nonpharmacological Interventions for Skin Picking Disorder

Authors: Harrison Loftus, Caroline Cassidy, Lisa Mun, Mohammad Jafferany, M.D.

Mentor: Mohammad Jafferany, M.D.

Submitter: Lisa Mun

Abstract Category: Clinical Science

Background: Skin picking disorder (SPD) is a well-described neuropsychiatric condition that causes significant distress and functional impairment. Despite its impact, there is no standardized treatment protocol, and the available literature on treatment approaches remains limited. Nonpharmacological interventions are of particular interest, given the need for diverse and accessible treatment options.

Objective: This systematic review aims to summarize and compare recent publications on nonpharmacological treatments for SPD, providing an up-to-date guide for clinicians and researchers.

Methods: A literature review was conducted on all nonpharmacological SPD treatment studies published between 2017 and 2023 using PubMed, CINAHL Plus with Full Text (EBSCO), and Scopus. Search terms included "skin picking," "excoriation," "psychiatry," "treatment," and "psychodermatology." Studies were excluded if they included SPD within other body-focused repetitive behaviors, utilized pharmacological agents, or were not available in English. Each abstract was screened by a minimum of two blinded authors to minimize bias.

Results: Eleven studies, comprising 2068 participants, met inclusion criteria. Study designs included feasibility studies, randomized controlled trials, longitudinal cohort studies, multiple-baseline experimental studies, naturalistic trials, and controlled single-case designs. Nonpharmacological treatments evaluated included cognitive behavioral therapy (CBT), acceptance and commitment therapy (ACT), ACT-enhanced group behavioral therapy (AE-GBT), ACT-informed exposure therapy, group therapy, psychotherapy, repetitive transcranial magnetic stimulation, online self-help modules, and expressive writing. The most effective treatments for SPD were CBT, AE-GBT, online self-help modules, and expressive writing, with multiple studies demonstrating significant symptom reduction.

Conclusion: Nonpharmacological treatments show promising efficacy in managing SPD. CBT, AE-GBT, online self-help modules, and expressive writing appear to be the most effective approaches and can be adapted to individual patient needs. However, limitations such as small sample sizes, lack of control groups and randomization, limited long-term follow-up, and gender variability highlight the need for further high-quality research.

Significance: This review underscores the growing evidence supporting nonpharmacological treatments for SPD, highlighting their potential to provide effective, accessible, and patient-tailored therapeutic options. The findings contribute to a broader understanding of behavioral and psychological interventions, reinforcing the need for continued research to refine and expand treatment strategies.

Presentation: CI-28 Submitter: Carla Obeid, M-1

Abstract Title: **Physiological Effects of a Respiratory Muscle Training Device on Ventilation and Airway Pressures**

Authors: Obeid, Carla, M-2 M.D. Candidate, B.S., Other, Scott, Monte, Fellow, M.D., Fattal, Zachary, Fellow, M.D., Eby, Megan, M.D.

Category: Clinical Mentor: Harold Bell, Ph.D.

Abstract:

Background: Respiratory muscle training (RMT) devices, such as the PowerLung®, are designed to enhance inspiratory and expiratory muscle strength. While RMT devices are commonly used in clinical and athletic populations, the physiological effects of recommended protocols for RMT on respiratory status and the long-term consequences of large intrapulmonary pressures are not known.

Objective: The goals of this study are to investigate how recommended RMT protocols influence respiratory variables in healthy young adults, and to document the changes in pulmonary pressures associated with RMT usage.

Methods: A pseudo-randomized repeated measures cross-over design was used with eight healthy adult participants. Each subject completed two laboratory visits: one for familiarization and determination of optimal resistance and another for data collection. Respiratory variables were monitored under three conditions: resting breathing (no RMT device), unloaded breathing (RMT without resistance), and loaded breathing (RMT device at recommended resistance). Respiratory variables of interest included maximum inspiratory pressure (MIP), maximum expiratory pressure (MEP), inspiratory and expiratory times, breath interval, expiratory volume, and $ETCO_2$. Paired t-tests were used to compare variables at rest vs. unloaded conditions and loaded vs. unloaded conditions. In the event that the test for normality (Shapiro-Wilk) failed, Wilcoxon Signed Rank tests were performed. α was set to 0.5 for all tests.

Results: The recommended RMT protocol in the unloaded condition caused a significant increase in minute ventilation (20.91 ± 9.09 vs. 9.39 ± 2.84 L/min, $p = 0.015$) and a concomitant decrease in $ETCO_2$ (4.32 ± 0.34 vs. 5.21 ± 0.87 %, $p = 0.01$). In the loaded condition, breathing against the RMT resistance caused a significant increase in MIP (-22.39 ± 6.20 vs. -2.31 ± 2.04 cmH_2O, $p < 0.001$) and MEP (28.35 ± 14.77vs. 1.42 ± 1.59 cmH_2O, $p = 0.008$) showed significant increases with loaded resistance, indicating enhanced respiratory muscle recruitment. Breath interval was significantly shorter in the loaded condition (2.03 ± 0.21 s) compared to unloaded (2.47 ± 0.52 s, $p = 0.040$), while expiratory time increased (3.17 ± 0.38 s vs. 2.63 ± 0.48 s, $p = 0.013$). No significant differences were observed between loaded and unloaded conditions with respect to in expiratory volume ($p = 0.573$) or inspiratory time ($p = 0.130$).

Conclusions: Use of the RMT following recommended guidance causes significant hyperventilation and hypocapnia. Breathing against the resistance of the RMT device causes enormous increases in both inspiratory and expiratory pressures.

Significance: These findings suggest that RMT should be used cautiously by people sensitive to the effects of hypocapnia and by those with lung conditions that may be exacerbated by large intrapulmonary pressures. The long-term consequences of generating such large intrapulmonary pressures and the effects of possible barotrauma warrant further investigation.

Presentation: CI-29 Submitter: Riley O'Keefe, M-3

Abstract Title: **Improving Access to Prenatal Care for Pregnant Individuals with Intellectual and Developmental Disabilities: Barriers and Potential Interventions**

Authors: O'Keefe, Riley, M-3 M.D., Lucas, Alexia, M-3 M.D. Candidate, Benard, Paige, M-4 M.D. Candidate, Sirhan, Nicholas, M-4 M.D. Candidate, Ellis, Kelly, N.P., Varriano, Brenda, M.D., Hoque, Asef, Other, Cascio, Ariel, M, Ph.D.

Category: Clinical Mentor: Neli Ragina, Ph.D.

Abstract:
Background:
With medical advancements and recognition of reproductive rights for individuals with intellectual disabilities (ID) and developmental disabilities (DD) have come increased pregnancy rates. Studies show that people with ID and DD face significantly higher risks of adverse outcomes including preterm birth, low birth weight, and stillbirth. Barriers such as limited healthcare accessibility, inadequate provider training, exclusion from informational resources, and social stigma contribute to these disparities.
Prior research has identified barriers to accessing healthcare for individuals with disabilities. However, there remains a paucity of data on effective interventions to improve prenatal care for pregnant individuals with ID and DD. Understanding these barriers and identifying viable solutions is crucial to improving prenatal care for individuals with ID and DD.
Objective:
This study aims to identify both barriers that individuals with ID and DD face in accessing prenatal care, and areas in which interventions can be implemented to improve outcomes, by following up on preliminary data presented in our feasibility study.
Methods:
A mixed-methods approach was utilized. Participants were given the option to complete either a closed-ended survey, a semi-structured interview, or both. Survey and interview questions were adapted from prior research on healthcare utilization among inner-city women. Inclusion criteria were pregnant women over age 18 who met specific ICD-10 codes for ID or DD.
Results:
Eleven participants were included in this study, a 37.5% increase from a feasibility study of 8 patients. Of these, ten (90.9%) initiated prenatal care before 14 weeks. Four participants self-identified as Black (36.5%), 5 (45.5%) as White, 1 (9%) as another race, and 1 (9%) preferred not to answer.
Motivators for seeking prenatal care included having a healthy baby (81.8%, n=9), learning about labor and delivery (72.7%, n=8), protecting personal health (54.5%, n=6), and discussing pregnancy concerns (54.5%, n=6).
Barriers to accessing care included not knowing where to go (18.2%, n=2) and transportation difficulties (18.2%, n=2). Personal factors such as feeling unwell (45.5%, n=5), depression (45.5%, n=5), and stress (36.4%, n=4) significantly contributed. Reasons for avoiding prenatal visits included feeling capable of self-care during pregnancy (45.5%, n=5), unplanned pregnancy (45.5%, n=5), discomfort with male providers (36.4%, n=4), and aversion to needles or medication (36.4%, n=4).
Factors that participants reported would increase their likelihood of seeking care included staff who communicated effectively (54.5%, n=6), follow-up calls after missed appointments (36.4%, n=4), and emotional support (36.4%, n=4).
Conclusion:
Our findings reiterate the validity of the prior feasibility study and further aid in the identification of targeted interventions that may improve pregnancy-related care for individuals with ID and DD. Clear provider communication, proactive follow-up, and emotional support may help mitigate barriers to care. Addressing these challenges through provider training and patient-centered outreach strategies could lead to increased maternal healthcare utilization and improved neonatal outcomes.
Significance:
This study highlights the barriers that exist and potential interventions for improving access to prenatal care for individuals with ID and DD. Implementing targeted interventions based on these findings may lead to more inclusive, supportive, and accessible prenatal care for this underserved population.

Presentation: CI-30 Submitter: Jawad Saad, M-2

Abstract Title: **Evaluating the Efficacy of Early Ambulation Within 4 Hours Post-Elective Lumbar Surgery: A Comprehensive Analysis from the Michigan Spine Surgery Improvement Collaborative (MSSIC)**

Authors: Saad, Jawad, M-2 M.D. Candidate, B.S., Chaker, Anisse, Resident M.D., Jafar, Yousif, M-3 M.D. Candidate, B.S., Al-Juburi, Saleh, M-3 M.D. Candidate, B.S., Hayes, Alexander, M-2 M.D. Candidate, B.S., Yeo, Heegook, Resident M.D., Kagithala, Dheeraj, M-4 M.D. Candidate, B.S., Chang, Victor, M.D.

Category: Clinical Mentor: Victor Chang, M.D.

Abstract:
Background
Early postoperative mobilization has been an essential part of the enhanced recovery after surgery (ERAS) protocol. This has been especially evident in elective cervical and lumbar spine surgery, where early ambulation is consistently associated with improved clinical outcomes, enhanced patient satisfaction, and reduced hospital length of stay. Despite the established correlation between early ambulation and improved surgical outcomes, ERAS protocols across institutions continue to greatly vary when deciding on the optimal timing for postoperative mobilization following elective spine surgery.
Objective
A previous Michigan Spine Surgery Improvement Collaborative (MSSIC) study by Lim et al. demonstrated superior outcomes for patients who ambulated within 8 hours post-surgery compared to those who initiated ambulation after 24 hours, as well as those ambulating between 8 and 24 hours. Our study aimed to expand on these findings by evaluating whether ambulation within 4 hours postoperatively confers additional benefits compared to ambulation between 4 and 8 hours. We hypothesize that ambulation less than 4 hours after surgery would be associated with superior outcomes, shorter hospital stays, and reduced readmission rates.
Methods
This study is a retrospective analysis using data from the Michigan Spine Surgery Improvement Collaborative (MSSIC) registry. This included adult patients who underwent elective lumbar and cervical spine surgery from January 2020 to May 2024 for degenerative conditions, including but not limited to lumbar stenosis, spondylolisthesis, and disc herniation. A total of 21,725 patients were divided into 0-4 hours (n=12,534) and 4–8 hours (n=9,191) ambulation cohorts. Variables collected included patient demographic information, medical history, patient-reported outcomes, and complications. A multivariate analysis was conducted to adjust for possible confounding factors.
Results
Patients who ambulated within 0-4 hours of surgery were found to be significantly younger (58.1 ± 15.0 years vs. 61.9 ± 13.4 years, $p < 0.001$) and had a lower BMI (30.7 vs. 31.2, $p < 0.001$). Patients ambulating at 0-4 hours were found to have significantly better outcomes showing a significantly lower relative risk (RR) for any complication (RR = 1.14, CI: 1.04-1.27, $p = 0.005$) and readmission (RR = 1.18, CI: 1.03-1.35, $p = 0.02$). In the 0-4 hour group, discharge to home was significantly higher (98% vs. 94%, $p = 0.005$). The Minimal Clinically Important Change Score (MCID) for back pain at one year was also found to be significantly higher in the 0-4 hour ambulation group (72% vs. 71%, $p = 0.022$).
Conclusions
Our analysis strongly suggests that shortening the post-operative ambulation time after elective lumbar spine surgery is safe and associated with improved outcomes. This includes fewer complications, reduced readmission rates, and an increased discharge to home. These results suggest that the integration of an early post-operative ambulation plan into ERAS protocols for elective spine surgery could significantly enhance patient-centered care. Further research is warranted to evaluate the impact of implementing such protocols on postoperative outcomes.
Significance
The findings of this study may contribute to the refinement of ERAS protocols for patients undergoing elective spine surgery by demonstrating the benefits of earlier ambulation within 4 hours postoperatively.

Presentation: Cl-31 Submitter: Alyaa Saleh, M-2

Abstract Title: **Depression during pregnancy: To pharmacologically treat or not?**

Authors: Saleh, Alyaa, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:
Objective:
For women who experience depression and/or anxiety during pregnancy, does treatment with an SSRI predict newborn and ongoing growth deficits in their offspring, compared with no pharmacologic treatment?
Background:
The impact of Selective Serotonin Reuptake Inhibitors (SSRIs) on fetal outcomes during pregnancy remains unclear and has shown conflicting results. Depression is prevalent in the maternal population, around 12.7% of pregnant women reported depressive symptoms. Maternal depression alone can affect fetal outcomes by increasing the likelihood of preterm delivery, lowering infant birth weight, and impairing fetal growth. Since SSRIs are the most commonly prescribed antidepressant, and 2-3% of pregnant women seek antidepressant treatment, specific analyses of SSRIs are necessary considering their ability to cross the placenta and potentially affect fetal development.
Methods:
The overall parent project, funded by NIH/NICHD, will retrospectively review medical charts of up to 2,000 outpatients from two pediatric practices in Michigan. The study sample contained 242 cases that were part of the larger Maternal-Child EMR project. Of the 242 cases, 114 had a pre-existing depression or anxiety diagnosis that continued into pregnancy. Of the 114 women, 36 were maintained on SSRIs, while 78 had never been on or discontinued SSRI use during pregnancy.
Participants in the control group were pregnant women diagnosed with depression/anxiety who had not been exposed to any medications (SSRIs) or illicit substances. Control participants were compared to women who had used SSRIs during pregnancy. The groups were assessed for trends, statistically significant fetal complications/diagnosis, and differences in infant outcomes. All analyses were conducted using IBM SPSS and controlled for maternal marital status and pregnancy marijuana use.

Results:
The newborns prenatally exposed to SSRIs had statistically significantly shorter birth lengths, by over three-quarters of an inch, after controlling for significant background factors, throughout the first six months of life. Newborns exposed to SSRIs prenatally had an average birth length of 18.7 inches, compared to 19.5 inches for newborns without such exposure. The measurements indicate that SSRI-exposed children were shorter by six or more percentile points in height during their first six months of life. The most significant height difference was found at the six month mark and birth. No other distinctions were noted between babies who were and were not exposed to SSRIs in utero.
Conclusions:
The primary predictor was prenatal exposure to SSRIs. The primary outcome was child size, specifically length, through the first six months of life. The trends observed in this analysis are consistent, where the infants prenatally exposed to SSRIs remained shorter throughout their first six months. The differences will likely remain significant with larger samples, particularly due to the effects remaining relatively constant over the first months.
Significance:
This study provides clarity regarding the effects of SSRIs on infant health by specifically analyzing outcomes in mothers with depression or anxiety. This approach helps isolate the effects of SSRIs, separate from the impact of depression or anxiety. The findings yield further evidence supporting the effects of SSRIs on diminished fetal length.

Presentation: Oral 2-10 Submitter: Udit Thawani, M-2

Abstract Title: **Factors Associated with Development of Acute Kidney Injury in Hospitalized Patients Following Traumatic Hip Fracture Surgery**

Authors: Thawani, Udit, M-3 M.D. Candidate, Crane, Kayleigh, M-3 M.D. Candidate, Soliman, Diaa, Resident M.D., Generosa, Rica, M-3 M.D. Candidate, Heinrich, Emily, M-3 M.D. Candidate

Category: Clinical Mentor: Akram Alashari, M.D.

Abstract:

Introduction: Acute kidney injuries (AKI) following traumatic hip fractures is a serious complication and may occur in up to 25% of patients who are hospitalized and require surgery. Mortality is common in this population.

Objective: This study aims to characterize traumatic hip fracture cases that developed AKI post-surgery and to investigate the risk factors that lead to postoperative AKI.

Methods: This retrospective cohort study analyzed traumatic hip fracture patients admitted to our institution from 01/01/21 to 04/01/24. AKI was defined using KDIGO criteria, and factors such as demographics, comorbidities, surgical details, and outcomes were assessed. Bivariate analysis compared AKI and non-AKI groups using Mann-Whitney U and Pearson chi-square tests. The incidence, mortality, and risk factors of postoperative AKI were analyzed. $P < 0.05$ was considered significant.

Results: The study included 379 participants, with 69 developing AKI (18.3%). Multivariate logistic regression identified lower albumin on arrival (a.O.R. = 0.30, 95% CI: 0.10–0.84), higher post-op creatinine/GFR (a.O.R. = 4.27, 95% CI: 1.69–17.32), lower hemoglobin (a.O.R. = 0.49, 95% CI: 0.33–0.69), and older age (a.O.R. = 1.06, 95% CI: 1.01–1.12, $p < 0.05$) as significant predictors of AKI. AKI was also a significant predictor of mortality after adjusting for all other factors (a.O.R. = 10.1, 95% CI: 1.77–81.59). AKI was not associated with hospital length of stay (LOS). However, higher albumin on arrival and higher postoperative hemoglobin were associated with shorter LOS

.

Conclusions: Higher creatinine/GFR, lower hemoglobin, lower albumin, and older age are significant predictors of AKI in hospitalized patients following traumatic hip fracture surgery in this study, which was strongly associated with mortality.

Significance: These findings emphasize the importance of monitoring patients hospitalized with these risk factors for AKI. With further research, these findings can be considered into the risk stratification process when determining patient candidacy for surgery post-hip fracture.

Presentation: Oral 2-7 Submitter: Varun Vadnala, M-4

Abstract Title: **Clinical Outcomes of Robotic versus Laparoscopic Cholecystectomy; A Retrospective Pilot Study**

Authors: Vadnala, Varun, M-4 M.D. Candidate, Pauls, Sydney, M-4 M.D. Candidate, Dakka, Nada, M-4 M.D. Candidate, Yang, Hannah, M-3 M.D. Candidate, Megaly, Maher, Resident M.D., Subramaniam, Soundharya, Resident M.D., Shaear, Mohammad, Resident M.D., Ghanem, Maher, M.D.

Category: Clinical Mentor: Maher Ghanem, M.D.

Abstract:
BACKGROUND: The field of medicine is constantly changing, with the surgical field making one of the biggest technological advancements through the implementation of robotic surgery. While it is logically theorized that minimally invasive nature of robotic surgery would require smaller incisions sites and result in better outcomes, mixed data exists on whether this technology provides any intraoperative and postoperative advantages over other techniques.

OBJECTIVE: This study aims to provide an updated analysis of the impact of Da Vinci robotic surgeries for cholecystectomy procedures.

METHODS: The pilot data consisted of 100 adult patients (over 18 to 65) who underwent robotic cholecystectomy (group 1, n=50) and laparoscopic cholecystectomy (group 2, n=50). For continuous variables, we first assessed the normality assumption. The Mann-Whitney U test was used as all continuous variables were non-normally distributed. For categorical variables, Pearson's chi-square test was used to analyze differences between the two groups. Summary statistics reported include count (%), median (interquartile range), and associated p-values from two sided statistical tests. All analyses were conducted using SPSS 29.0 (IBM Corp, Armonk, NY) and with statistically significance when p < 0.05.

RESULTS: The only significant difference between robotic and laparoscopic cholecystectomy groups was the median operating time (mins), p=0.019. Robotic cholecystectomy cases had a significantly longer operating time (68.0, IQR: 33.0 - 91.3) compared to laparoscopic cholecystectomy cases (49.0, IQR: 38.8 - 75.3). There was no significant difference in median length of hospital stay, with robotic cases having a median stay of 0 (0–2.3) days compared to 0 (0–2) days for laparoscopic cases (p=0.600). Estimated blood loss >20 mL was observed in 24% of robotic cases and 22% of laparoscopic cases, with no significant difference between groups (p=0.812). The 30-day readmission rate was 2% in robotic vs. 4% in laparoscopic cases, with no significant difference between the groups. Postoperative pain scores were slightly higher in the robotic group (median: 4.5, IQR: 1.5 - 5.8) compared to the laparoscopic group (median: 3.0, IQR: 0 - 5.0), with no significant difference between the groups (p=0.255). Minor surgical complications were reported in only 7% of the total cases, with no significant differences between the two groups.

CONCLUSIONS: These results suggest that laparoscopic cholecystectomy may be comparable to robotic cholecystectomy, with all outcomes being statistically insignificant other than operating time. It should be noted that, while statistical significance was not found in the analysis for length of stay, estimated blood loss, readmission rates, reported pain, mortality, and minor surgical complications, this could be attributed to the small sample size and limited statistical power of this pilot study.

SIGNIFICANCE: Consistent with existing research, our study demonstrates no clear clinical benefit of using robotics for cholecystectomy procedures. Furthermore, the significant difference in operating time compared to laparoscopy further implies that robotic surgery could incur higher costs, increased time under anesthesia, and other potential risks. While robotics may allow surgeons increased degrees of freedom, the clinical benefits have yet to be consistently documented.

Presentation: CI-32 Submitter: Makenzie Wank, M-2

Abstract Title: **The Prognostic Nutritional Index: Assessing its Correlation in Severe Alcohol Withdrawal Syndrome in Mid-Michigan**

Authors: Wank, Makenzie, M-2 M.D. Candidate, Cheng, Chin-I, Ph.D., Amcheslavsky, Jakob, M-2 M.D. Candidate, Yanga I. David, M.D., Perzhinsky, Juliette, M.D.

Category: Clinical Mentor: Juliette Perzhinsky, M.D.

Abstract:
Background
In the United States (US), an estimated 95,000 people die from alcohol-related causes annually. Due to the prolonged biochemical stress caused by Alcohol Use Disorder (AUD), 3 to 5% of patients can experience severe Alcohol Withdrawal Syndrome (AWS) symptoms which consist of delirium tremens (DTs) or withdrawal-related seizures when they attempt to stop or drastically reduce the use of alcohol.
Objective
The Prognostic Nutritional Index (PNI) can be used to establish the overall nutritional status of a patient. The primary aim was to determine if there is a correlation between low PNI and alcohol withdrawal.
Methods
This study was a retrospective chart review using data from EPIC, the electronic medical record database, at Covenant Medical Center in Saginaw, Michigan from January 1, 2022 to December 31, 2023. Chart data was collected from 503 inpatient charts with diagnostic criteria including F10 ICD10 codes reflecting alcohol use disorder and withdrawal related complications. The PNI for each patient was calculated by utilizing laboratory values with the formula seen below.
PNI=[(serum albumin × 10)+(absolute lymphocyte count ×5)]
Results
The patient population consists of 87.9% of patients with a history of DTs and 46.4% that presented with active DTs. In addition, 44.5% of the patients have a history of alcohol related seizures with 9.3% presenting with active seizures. The multivariable logistic regression demonstrates active DTs and seizures against associated risk factors. Active DTs show odds ratios of 1.502 (0.70, 3.2) for mild PNI, 0.963 (0.45, 2.0) for moderate PNI, and 1.12 (0.60, 2.1) for high PNI. Active seizures demonstrate adjusted odds ratios of 2.14 (0.54, 8.6) for mild PNI, 1.30 (0.37, 4.6) for moderate PNI, and 1.06 (0.38, 2.9) for high PNI. Other notable odds ratios include active DTs and BMI with 1.03 (1.0, 1.1) and active seizures and tobacco use with 2.15 (1.6, 4.0).
Conclusions
There is sufficient evidence to conclude that the odds of having active DTs increases 3.3% for every one unit increase in BMI. The final data analysis reveals there is no definitive correlation between low PNI and the likelihood of developing severe AUD complications, therefore BMI may be a more relevant indication of malnutrition and its correlation with more severe alcohol withdrawal related complications. There is evidence to conclude that THC and tobacco users are 2.2 times more likely to experience withdrawal related complications. Black patients are 4.8 times more likely to experience severe outcomes, along with women being 2.5 times more likely for severe AWS. Lastly, the final data analysis revealed a correlation between patients with mental health conditions and being 1.8 times more likely to experience severe alcohol withdrawal complications.
Significance
In the US, food insecurity and racial disparities are growing public health crises, along with an increasing prevalence of AUD. This predisposition to malnutrition leaves a large fraction of the state susceptible to severe medical problems and secondary complications, with lower recovery rates when faced with co-morbid AUD. By further demonstrating the impact of nutrition on patient susceptibility, better educational and medical efforts can be made.

Presentation: CI-33 Submitter: Spencer Williams, M-1

Abstract Title: **Evaluating NALIRIFOX and FOLFIRINOX for Recurrent Pancreatic Ductal Adenocarcinoma: A Systematic Review Highlighting the Evidence Gap**

Authors: Williams, Spencer, M-2 M.D. Candidate, B.S., Surma, Jacob, M-2 M.D. Candidate, B.S., Osborn, Sid, M-2 M.D. Candidate, B.S., Maddock, Mackenzie, M-2 M.D. Candidate, B.A., Ruge, Matthew, M-2 M.D. Candidate, B.S., Manzo, Miranda, M-2 M.D. Candidate, B.S., Chamdi, Tal, M-2 M.D. Candidate, B.S., Wank, Makenzie, M-2 M.D. Candidate, B.S.

Category: Clinical Mentor: Beth Bailey, Ph.D.

Abstract:

Background:

Pancreatic ductal adenocarcinoma (PDAC) is a leading cause of cancer mortality, with limited treatment options and poor survival outcomes. While novel chemotherapeutic regimens such as NALIRIFOX and FOLFIRINOX have shown promise in metastatic PDAC, their effectiveness in recurrent PDAC (rPDAC) is unclear. This systematic review aimed to evaluate the survival rates and quality of life (QoL) outcomes associated with NALIRIFOX and FOLFIRINOX in rPDAC.

Methods:

A comprehensive literature search was conducted in PubMed, Cochrane Library, and Scopus from inception through August 22, 2024. We included randomized controlled trials (RCTs) assessing survival and QoL outcomes in patients with rPDAC receiving NALIRIFOX or FOLFIRINOX. Screening and full-text review followed PRISMA 2020 guidelines and the Cochrane Handbook. Data extraction and risk of bias assessments were planned but could not be performed due to a lack of eligible studies.

Results:

Of 1372 identified studies after initial screening and full-text review, none met the inclusion criteria. This “empty review” highlights a critical gap in the literature, as no RCTs directly investigated the survival or QoL outcomes of NALIRIFOX or FOLFIRINOX specifically in rPDAC populations.

Conclusions:

No evidence currently exists to guide the use of NALIRIFOX or FOLFIRINOX in patients with rPDAC, underscoring an urgent need for high-quality, targeted clinical trials. Future research should focus on understanding the unique biology of rPDAC and evaluating how these regimens influence survival and patient-centered outcomes. This evidence gap must be addressed to improve clinical decision-making and enhance care for this challenging patient population.

Presentation: CI-34 Submitter: Payton Wolbert, M-3

Abstract Title: **Does Admitting Specialty Influence the Outcome of Cholecystitis: Review of Emergency Department Community Hospital Experience**

Authors: Wolbert, Payton, M-3 M.D. Candidate, Andrew, Arnold, Resident D.O., Nesheiwat, Sara, Resident D.O., Siddique, Aashir, Other, Kaliszuk, Stefan, Other, Rutkowski, Joseph, Other, Vlk, Allison, Other, Roach, Erica, Other

Category: Clinical Mentor: Tarik Wasfie, M.D.

Abstract:

Background

Gallbladder diseases are common and urgent presentations to the Emergency Department (ED) with acute cholecystitis or biliary colic routinely necessitate surgical intervention. Delaying treatment can increase complications, length of stay (LOS), and ultimately, cost. We aim to analyze our data for those patients with cholecystitis admitted through the ED to either medical or surgical services and identify the differences in outcome between the two services regarding complications, LOS, and mortality.

Methods

A retrospective study of 780 consecutive admitted through the Emergency Department for gallbladder diseases who then underwent surgical intervention. Data collected includes age, sex, race, preadmission medication comorbid conditions, the admitting service, time to surgery, length of stay, complications, and mortality. Statistical analysis using chi-square test, students t-test, and binary regression analysis to determine the confounding factors that contribute to outcome. The differences at $p \leq 0.05$ were considered significant. IRB approval was obtained before starting the study.

Results

A total of 780 patients seen in the ED with acute gallbladder disease. 344 (44%) were male, 436 (56%) were female with mean age of 57 ± 17.6 years. Of the 736 patients, 423 (54%) were admitted to the medical service and 357 (46%) were admitted to the surgical service. There were no significant differences in complications or mortality rates; however, the length of stay was significantly longer for patients admitted to the medical service (4.6 ± 4.2 days) compared to those admitted to the surgical service (2.3 ± 1.9 days; $p< 0.0001$). In the regression analysis, diabetes, coronary artery disease, and acute and chronic kidney disease were all predictors of length of stay.

Conclusion

Patients presenting to the ED with acute cholecystitis are best admitted to the surgical service when considering cost and length of stay. Exceptions are those patients whose comorbid conditions require intensive medical care management before surgery.

Presentation: CI-35 Submitter: Ahmad Yousef, M-3

Abstract Title: **Exploring the Extent of, and Factors associated with Osteoporosis Treatment Gap after Fragility Hip Fracture in a Community Setting**

Authors: Yousef, Ahmad, M-3 M.D. Candidate, West, Benjamin, M-3 M.D. Candidate, Kunz, Matthew, Resident M.D., Thawani, Udit, M-3 M.D. Candidate, Syed, Usheem, Resident M.D., Haddad, Nicholas, M.D., Rene, Jonathan, M.D.

Category: Clinical Mentor: Jonathan Rene, M.D.

Abstract:
Objective
This study aims to explore factors that contribute to the failure of managing osteoporosis (OP) after a fragility hip fracture in two Michigan community hospitals; and how such failure corresponds with the general trend of lack of follow-up treatment.
Methods
A retrospective chart review of the electronic medical record (EMR) of patients admitted to Covenant Healthcare (EPIC) and Ascension Hospital (SUNRISE) for fragility hip fracture between January 1, 2018, and January 31, 2023. ICD-10 codes will be used to identify patients who meet inclusion criteria and remove those who fulfill exclusion parameters. Included patients are those who have been diagnosed with osteoporosis after admission for fracture and/or were not on osteoporosis therapy prior to the fracture. Patients who are less than 50 years old, died within one year of osteoporotic fracture diagnosis, or are on treatment at time of first fracture will be excluded. All patients with available data on comorbidities and demographics will be enrolled. The data of treatment odds on basis of stratified patient factors will be analyzed through performing a two-sample t-test to compare the percentage of those in each perspective independent variable of interest associated with the dependent outcome of treatment status. For variations in other cases, an ANOVA regression analysis will be obtained to control multiple independent variables and search for potential confounding of association.
Results
The initial 16 patients are evenly split between included and excluded subjects. One of the included eight patients has received treatment for osteoporosis after hip fracture. This imputes an odd of treatment of 12.5%. The other eight patients were excluded due to being diagnosed with osteoporosis prior to presenting with fragility fracture.
Additional results will shed light on trends in the treatment of osteoporosis after hip fractures, a condition with high morbidity and mortality especially in the elderly. It will help elucidate patterns of clinical practice and provide useful tools to develop interventions that can improve the overall outcomes in the treatment of osteoporosis.
Conclusions
Early results demonstrate a lack of treatment of osteoporosis within a year following a fragility hip fracture. This is thought to be partly attributed to the absence of follow-up with specialists, such as rheumatologists. As the study will examine the amount and characteristics of patients treated for osteoporosis after sustaining a fragility fracture of the hip, gender and racial biases are expected to play a role in making someone more likely to receive treatment. However, with the current method of sample drawing these kinds of conclusions will be limited. This study builds on well-established nationwide research demonstrating deficiencies in the treatment of a costly and highly morbid condition. Furthermore, the study underlines the lack of response to the efforts undertaken to address the treatment gap in osteoporotic hip fractures. One would expect osteoporosis-related fractures to have higher rates of treatment initiation than other complications of the disease. These findings exhibit how much treatment can be missed in those who need it most and will reflect the inadequate treatment rates of osteoporosis without complications.

Presentation: P-1 Submitter: Gabriela Andrzejewska, M-2

Abstract Title: **Kratom Use Among Reproductive Age Women**

Authors: Andrzejewska, Gabriela, M-2 M.D. Candidate, Nguyen, Karen, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Kratom, an herbal substance, is often used as an analgesic to self-manage conditions such as nausea, anxiety, depression, opioid use disorder and withdrawal. Due to the wide availability of kratom, rates of usage have increased among people in the United States, including pregnant and postpartum women. Despite this, kratom is not regulated and there is limited data on the potential complications and health risks on this population. More specifically, previous case reports presented cases of neonatal abstinence syndrome, irritability, jitteriness, and longer postnatal hospitalization among others.

Objective: This study aimed to investigate the prevalence of kratom use in women who are of childbearing age, including those who are pregnant and postpartum, in eastern and central Michigan regions. It also aimed to examine the adverse maternal and fetal effects experienced, and if kratom effectively addressed the condition or symptoms it was used for.

Methods: An anonymous survey was conducted with women of childbearing age between 18-42 receiving care at participating OB/GYN health centers and medical clinics. In this survey, participants' demographics, pregnancy experiences (if applicable), kratom usage with reasoning, and use of other substances were collected. Descriptive statistics were used to summarize the data.

Results: From June 2024 to February 2025, a total of 46 complete surveys were collected from participants residing in 8 different counties in eastern and central Michigan, with more than half (54%) in Saginaw or Bay County. Of these, 68% identified as Caucasian, 23% as Black, and 14% reported Hispanic ethnicity. More than a quarter (28%) reported no education beyond high school, and 64% reported annual household income as $50,000 or less. A total of 61% were married or cohabitating with an intimate partner. With respect to health care, 80% indicated they have a regular primary care provider. In terms of reproductive health, 50% reported they were currently pregnant, 30% had never been pregnant, and 20% had a previous pregnancy. Current mental health issues involving anxiety or both anxiety and depression were reported by 56% of respondents. More than one-third reported some current substance use (tobacco, e-cigarettes, alcohol, opioids, etc), which is being further analyzed. However, only 2 women indicated current or previous use of herbal supplements, and only 1 of those involved kratom. The woman who had used kratom indicated that the use was prior to pregnancy, involved short term daily use for purposes of detoxing, did not result in any side effects, and was discontinued due to perceived ineffectiveness.

Significance: Though usage was minimal in this small group of participants, kratom should be regularly screened for during routine, prenatal, and postnatal visits due to its potential maternal and neonatal effects. This incorporation will allow for earlier identification and intervention in pre and postnatal care. With this advancement, further research may evolve to analyze the effectiveness of this early intervention through knowledge of kratom usage. Our study is ongoing with planned expansion and targeting, and we hope that ultimately we will have enough participants who have used kratom to answer our original research questions.

Presentation: P-2 Submitter: Gabriela Andrzejewska, M-2

Abstract Title: **Exploring the Link Between Psychological Distress and Poly-Substance Use Among Individuals That Use Kratom**

Authors: Andrzejewska, Gabriela, M-2 M.D. Candidate, Holek, Rylee, M-2 M.D. Candidate, Nguyen, Karen, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Kratom is an herbal supplement, commonly used for managing symptoms of opioid withdrawal, nausea, pain, and mood enhancement. However, there is limited data on the background of kratom users. Therefore, this study utilized a large, nationally representative survey to examine the sociodemographic and psychological factors as well as polysubstance consumption associated with kratom use.

Objective: This study aims to compare trends in substance use and sociodemographic characteristics among kratom users and non-kratom users.

Methods: Using data from the 2022 National Survey on Drug Use and Health, cross tabulation of descriptive statistics examined the comparison between sociodemographic factors, lifetime and past month substance (mis)use, and past month psychological distress with lifetime and past month kratom use. Logistic regression was used to assess the likelihood of kratom use after controlling for sociodemographic variables, psychological distress, and specific substance use.

Results: Of the 59,069 participants, 201 participants reported using kratom within the past month and 1,128 participants reported ever using kratom in their lifetime. Kratom use was more prevalent among males, those aged 18-25, non-Hispanic whites, participants who reported psychological distress within the past month, with some college education, higher income, and good health. Those with past-month psychological distress or a history of substance use, including tobacco or nicotine vaping, marijuana, pain relievers, stimulants, inhalants, hallucinogens, heroin, or methamphetamine had higher odds of kratom use compared to non-users of these substances.

Conclusion: The results support the association of certain sociodemographic factors, serious psychological distress, and various substance uses with higher odds of kratom usage. This suggests the need for health professionals to create guidelines and interventions to prevent the misuse of kratom.

Significance: Kratom use has gained increasing attention due to its potential benefits for pain management and opioid withdrawal, as well as concerns over its misuse and adverse effects. However, research on the characteristics and behaviors of kratom users remains limited. This study fills a critical gap by providing comprehensive data on the sociodemographic and psychological factors, along with polysubstance use patterns, associated with kratom consumption. By identifying key characteristics of kratom users, including their mental health status and concurrent substance use, this study offers valuable insights for healthcare professionals, policymakers, and public health officials. The findings can inform evidence-based guidelines, harm reduction strategies, and targeted interventions to mitigate the risks of kratom misuse while considering its potential therapeutic applications. Understanding the factors influencing kratom use is essential in shaping public health responses and ensuring appropriate regulatory policies to protect individuals at risk.

Presentation: P-3 Submitter: Andie Blankenstein, M-2

Abstract Title: **Psychological Outcomes of Facial Transplantation: A Systematic Review of Depression and Mental Health-Related Quality of Life**

Authors: Blankenstein, Andie, M-2 M.D. Candidate, Osborn, Sid, M-2 M.D. Candidate, Aguilar, Natalie, M-2 M.D. Candidate, Manzo, Miranda, M-2 M.D. Candidate, Bailey, Beth, Ph.D., Zacharek, Anthony, M.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Facial injuries can cause severe functional and aesthetic impairments, significantly impacting mental health and quality of life. Facial Vascularized Composite Allograft (fVCA) has emerged as an advanced reconstructive option, but research on its psychological effects remains limited.

Objective: This systematic review assesses mental health outcomes in fVCA recipients, with a focus on depression and mental health-related quality of life.

Methods: A systematic review was conducted following PRISMA 2020 guidelines. PubMed, Psychinfo, and Medline (Ovid) were searched up to April 2024, using keywords related to facial transplantation, facial vascularized composite allograft (fVCA), psychological outcomes, and mental health. Ten studies met the population, intervention, comparison, outcome, and timeframe (PICOT) criteria focusing on mental and psychological aspects of fVCA. Risk of bias was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Method and mixed methods appraisal tool (MMAT).

Results: Majority of studies reported improvements in mental health post-fVCA. Depression scores typically declined over time, though temporary increases occurred due to immunosuppressive complications or life stressors. Mental health-related quality of life improved overall, with fluctuations tied to surgical complications, transplant rejection, or adverse events. Patients with pre-existing psychiatric conditions or self-inflicted injuries had more variable psychological outcomes.

Conclusion: fVCA significantly enhances mental health, self-esteem, and social integration, but complications and psychiatric history influence outcomes. Long-term psychiatric support and standardized assessment tools are essential to optimize recovery. Future research should focus on improving patient selection, mental health interventions, and long-term psychological adaptation in face transplant recipients.

Significance: fVCA is a transformative reconstructive option, yet its psychological impact remains underexplored. This is one of the first systematic reviews to focus solely on mental health outcomes post-fVCA. While overall trends show improvements in depression and mental health-related quality of life, outcomes vary significantly among patients, with some experiencing temporary declines due to complications or life stressors. These findings highlight the need for structured mental health follow-up to optimize patient outcomes and underscore the importance of further research to identify factors contributing to poor mental health post-fVCA.

Presentation: P-4 Submitter: Nathanael Brookshire, M-2

Abstract Title: **Examining the Impact of Student Involvement on Patient Satisfaction in Free Clinics: An Integrated Scoping Review & Meta-Analysis**

Authors: Brookshire, Nathanael, M-2 M.D. Candidate, Byrne, John, M-2 M.D. Candidate, Forrest, Julia, M-2 M.D. Candidate, Mlinar, Tessa, M-2 M.D. Candidate, DeGroat, Cassandra, M-2 M.D. Candidate, Chiaramonti, Michael, M-2 M.D. Candidate, Young, Isabel, M-2 M.D. Candidate, Mattson, Erin, M-2 M.D. Candidate

Category: Population Health Mentor: Neli Ragina, Ph.D.

Abstract:

Background:

Student-run free clinics (SRFCs) play a crucial role in providing healthcare to underserved populations while offering hands-on training for medical and health-professional students. Despite their growth, limited research has compared patient satisfaction in SRFCs versus non-student-run free clinics (non-SRFCs). Understanding these differences is essential to assess the effectiveness of SRFCs in delivering patient-centered care.

Objective:

This study evaluates whether there is a significant difference in patient satisfaction between SRFCs and non-SRFCs and examines specific satisfaction metrics to identify strengths and areas for improvement.

Methods:

A two-part analysis was conducted, consisting of a meta-analysis and a scoping review. Two approaches were used so that articles that did not include sufficient data for meta-analysis inclusion, but warranted discussion, would still be reported. Four databases (PubMed, Web of Science, Scopus, and CINAHL) were systematically searched for literature reporting patient satisfaction in SRFCs and non-SRFCs. Articles meeting inclusion criteria were selected and analyzed, with satisfaction outcomes categorized into key domains such as wait time, quality of treatment, patient education, and overall satisfaction. Independent t-tests and ANOVA were used to compare satisfaction levels across clinic types.

Results:

The meta-analysis included 19 studies, comprising 2,058 patients. Overall patient satisfaction did not differ significantly between SRFCs (84.8%) and non-SRFCs (85.0%) ($p > 0.05$). SRFCs demonstrated significantly higher satisfaction in wait times ($p < 0.001$) but lower satisfaction in quality of treatment ($p < 0.001$) and patient education ($p = 0.043$). The scoping review reinforced these findings with an additional eight studies that reported high levels of satisfaction with SRFC wait times and student involvement, as well as perceived gaps in communicating and ability to access care.

Conclusion:

Patient satisfaction in SRFCs is comparable to non-SRFCs, suggesting that student involvement does not negatively impact patient experience. However, targeted improvements in student training and supervision could enhance perceived quality of treatment and communication.

Significance:

These findings support the continued expansion of SRFCs as a viable model for providing accessible healthcare while training future medical professionals. Addressing identified weaknesses can further optimize SRFC operations and improve patient-centered care.

Presentation: P-5 Submitter: Jack Byrne, M-2

Abstract Title: **High Levels of Overall Patient Satisfaction are Reported after Sacroplasty, Vertebroplasty and Kyphoplasty**

Authors: Byrne, John, M-2 M.D. Candidate, B.A., Other, Dooley, McKenna, M-2 M.D. Candidate, B.S.

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:
Background
Osteoporosis is a potentially debilitating condition that affects millions of Americans and can lead to sacral and vertebral insufficiency fractures, especially in older adults. Sacroplasty, Vertebroplasty and Kyphoplasty (SVK) treat these fractures, reduce pain and improve patient quality of life. They are often chosen as a preferable alternative to avoid more invasive surgery in potentially poor surgical candidates. Despite this, overall patient satisfaction remains an oft overlooked outcome.
Objective
Our objective is to collate and summarize the current state of global/overall patient satisfaction in the context of SVK via scoping review. Knowledge gaps and recommendations for future research will also be identified and reported.
Methods
PubMed, Web of Science, Scopus, CINAHL, and Cochrane Library were searched systematically from database inception for literature reporting global/overall patient satisfaction and SVK. Screening following PRISMA guidelines was conducted. Articles meeting inclusion criteria for discussion of overall satisfaction were included and analyzed. Studies that discussed patient satisfaction via an indirect proxy measure (ex: Pain VAS or physical ability) were excluded, as were studies that discussed satisfaction with procedural anesthesia as opposed to the overall procedure. Studies that combined SVK with another procedure were excluded, but those that reported independent SVK satisfaction results were included. Case reports, systematic reviews, editorials, conference abstracts and other non primary literature were also excluded.
Results
50 studies were included. They were grouped for analysis into four categorical domains based on procedure type. There was a wide variety of heterogeneity in study design and patient satisfaction reporting metrics. Despite this, high levels (as defined by studies) of overall patient satisfaction were broadly reported. Satisfaction was most commonly assessed by patient survey, delivered at a variety of postoperative timepoints. Willingness to undergo repeat operation was a common theme. Sacroplasty was examined in 13 studies, whereas kyphoplasty was covered in 11 studies. Vertebroplasty was covered almost twice as much, with 22 studies. Four studies compared two procedures as part of their design. However, 20 studies had only 1-2 lines detailing patient satisfaction assessments. Statistical support of these low-information claims is only intermittent.
Conclusion
Published reports of SVK indicate high levels of overall patient satisfaction with procedures.However, there is high variance in the quality and detail of patient satisfaction outcomes reported in the literature. Thoughtful and in-depth consideration is necessary in future patient-centered research.
Significance
Kyphoplasty, vertebroplasty, and sacroplasty are procedures that have revolutionized the treatment of compression and insufficiency fractures. Osteoporosis, most prevalent in adults above age 65, is a common induction for treatment. Reporting of high patient satisfaction rates in the study population further supports that SVK provides improvement in overall well-being, in addition to already published improvements in pain, quality of life and mobility. Older patients and geriatricians may be interested in the nature of these findings and choose to incorporate them into future decision making.

Presentation: P-6 Submitter: Nick Chiaramonti, M-3

Abstract Title: **The Impact of Diabetes on Outcomes of Tibiotalocalcaneal Arthrodesis: A Systematic Review of Available Comparative Studies**

Authors: Chiaramonti, Nick, M-3 M.D. Candidate, Talaski, Grayson, Other, Baumann, Anthony, M-3 M.D. Candidate, Schonhorst, Nolan, Other, O'Neill, Conor, Fellow, M.D., Walley, Kempland, Resident M.D., Anastasio, Albert, Fellow, M.D.

Category: Population Health Mentor: Samuel Adams, M.D.

Abstract:
Background:
Tibiotalocalcaneal (TTC) arthrodesis is commonly used in salvage situations involving the ankle and subtalar joint, often in patients with concomitant diabetes mellitus (DM). Literature has established a higher risk of developing postoperative complications, regardless of the procedure, for patients with DM. Thus, the primary goal of TTC arthrodesis in diabetic patients often shifts away from complete deformity correction, and instead towards limb salvage and ambulatory preservation. The scientific literature describing outcomes of TTC arthrodesis in DM patient populations has grown in recent years; however, a comprehensive systematic review on this topic has yet to be performed.
Objective:
The objective of this systematic review was to summarize findings pertaining to TTC arthrodesis in the DM population, with the goal of understanding its outcomes and complications.
Methods:
A qualitative systematic review was conducted, with an initial search conducted on 30 August 2023, using PubMed, SPORTDiscus, CINAHL, and MEDLINE. These four databases were searched from database inception until the search date, and the search algorithm used was “tibiotalocalcaneal” AND (nail OR nails) AND (fusion OR arthrodesis), using the most recent Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. Inclusion criteria encompassed articles examining the impact of diabetes on TTC arthrodesis outcomes, while exclusion criteria included non-stratified diabetic status, case reports, and non-English articles. Data extraction involved patient demographics, complication rates, and surgical outcomes, and the quality of studies was assessed using the MINORS scale. Due to the relatively small number of articles and heterogenous outcomes, a qualitative and narrative approach was taken. Frequency weighted means (FWMs), along with other descriptive statistics, were used to describe the data.
Results:
Four articles met the inclusion criteria. These observational comparative studies were of moderate quality, with a mean MINORS score of 20.5 ± 1.9 points. The combined patient cohort included 162 patients, evenly split between diabetic and non-diabetic groups, with a mean age of 58.2 ± 2.7 years and a follow-up duration of 35.0 ± 7.4 months. Diabetic patients exhibited higher rates of superficial infection and, in some studies, higher rates of other complications including osteomyelitis, progression of Charcot arthropathy, or post-operative hematoma. Despite this, functional outcomes—including ambulation rates and patient satisfaction scores—and fusion rates were generally favorable and comparable between diabetic and non-diabetic patients. Postoperatively, occurrence of successful arthrodesis, stable pseudoarthrosis, limb salvage rate, and amputation rate were not significantly different between groups.
Conclusion:
In conclusion, this review evaluated TTC arthrodesis outcomes in DM patients. The primary concern for DM patients was found to be superficial wound infection, with a nearly 8-fold greater likelihood. Despite this risk, postoperative success, including radiographic union and functional outcomes, was comparable between DM and non-diabetic patients. The review’s limitations include data collection heterogeneity, the inability to perform a meta-analysis, and reliance on retrospective studies.
Significance:
This study provides the first available Level 1 evidence for outcomes of TTC arthrodesis in diabetic patients. However, this review highlights the need for standardized definitions of surgical success and prospective study designs to mitigate retrospective biases.

Presentation: P-7 Submitter: Nick Chiaramonti, M-3

Abstract Title: **The Impact of Extended Tibial Stem Use on Primary Total Knee Replacement Outcomes: A Systematic Review and Meta-Analysis**

Authors: Chiaramonti, Nick, M-3 M.D. Candidate, Schonhorst, Nolan, Other, Talaski, Grayson, Other, Sleem, Bshara, M-3 M.D. Candidate, O'Neill, Conor, Fellow, M.D., Anastasio, Albert, Fellow, M.D.

Category: Population Health Mentor: Ken Gall, Ph.D.

Abstract:

Introduction:

Total knee arthroplasty (TKA) is one of the most frequently performed orthopedic procedures in the United States. The tibial stem, a critical component of TKA systems, enhances biomechanical stability, reducing the risk of aseptic loosening, a common need for revision total knee arthroplasty (rTKA). Although primarily used in rTKA, tibial stems are occasionally included in primary TKA for patients suffering from obesity, severe malalignment, or various degrees of osseous defects. However, comparison of stemmed vs non-stemmed procedures is limited in primary total knee arthroplasty.

Objective:

This systematic review aims to analyze clinical outcomes of stemmed versus non-stemmed tibial components in primary TKA.

Methods:

A systematic review was conducted in accordance with PRISMA guidelines. Inclusion criteria pertained to comparative studies that examined TKA outcomes in stemmed and non-stemmed patient cohorts for primary TKA. Exclusion criteria pertained to abstracts, narrative reviews, systematic reviews and meta-analyses, case reports, cadaveric studies, non-human studies, unpublished data, non-English articles, and revision total knee arthroplasty. Data extraction focused on demographic information, pre-operative and post-operative functional outcomes, and complications. Study quality was assessed using the MINORS scale.

Results:

Of 565 initially retrieved articles, 13 met the inclusion criteria, encompassing 15,489 patients. Among this patient cohort, 1,189 patients were in the stemmed group. While all post-operative metrics demonstrated no difference between groups, patients receiving stemmed implants experienced a significantly greater increase in KSS score ($p=0.0017$), AKSS score ($p < 0.001$), hip-knee angle ($p < 0.001$), and range of motion (ROM) ($p< 0.0001$). No significant difference in complication rates was observed.

Conclusion:

While both stemmed and non-stemmed cohorts achieved comparable clinical outcomes, stemmed implants demonstrated superior biomechanical improvements, highlighted by greater changes in AKSS and KSS scores, range of motion, and hip-knee angle. Complication rates did not differ significantly, despite prior research suggesting stem usage in patient cohorts more susceptible to complications. However, limitations such as study heterogeneity and inconsistent complication reporting highlight the need for further research.

Significance:

This review provides the first available Level 1 evidence for outcomes in primary total knee arthroplasty based on the tibial implant component stem length.

Presentation: P-8 Submitter: Nick Chiaramonti, M-3

Abstract Title: **Arthroscopic Treatment of Chronic Lateral Ankle Instability Provides Better Functional Outcomes and Decreased Complications Compared to Open Broström Technique: A Systematic Review and Meta-Analysis**

Authors: Chiaramonti, Nick, M-3 M.D. Candidate, Talaski, Grayson, Other, Sleem, Bshara, M-3 M.D. Candidate, O'Neill, Conor, Fellow, M.D., Anastasio, Albert, Fellow, M.D., Walley, Kempland, Resident M.D., Amendola, Annunziato, M.D.

Category: Population Health Mentor: Annunziato Amendola, M.D.

Abstract:
Introduction:
Injuries to the lateral ankle ligamentous complex pose a significant challenge for athletes, with sprains to this complex being among the most common injury patterns in sports. While injury to the anterior tibiofibular ligament (ATFL) most commonly leads to chronic lateral ankle instability (CLAI), the calcaneofibular ligament is often repaired simultaneously to achieve optimal outcomes. For decades, the Broström procedure has been the gold standard for surgical treatment of chronic lateral ankle instability. However, advancements in arthroscopic surgical techniques have presented a viable alternative. This procedure was first described in the 1990s, but the advantages of minimally invasive arthroscopy have only become more widely recognized in recent years with advancements in surgical instruments and technique. Despite increased research comparing these two approaches, conflicting results regarding their efficacy and complication rates persist.
Objective:
The primary aim of this systematic review and meta-analysis is to quantitatively review the available comparative studies to describe the differences between open and arthroscopic correction of chronic lateral ankle instability.
Methods:
This review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). utilizing PubMed, Scopus, MEDLINE, CINAHL, and Web of Science databases from inception until June 6th, 2024. Article quality was assessed using the Methodological Index for Non-Randomized Studies (MINORS) scale. Inclusion criteria included studies that directly compared open Broström and arthroscopic ATFL reconstruction in adult patients. Data extraction included patient demographics, preoperative and postoperative clinical and radiographic outcomes, and complication rates, and statistical analyses were performed using both common-effect and random-effect models.
Results:
Out of 1159 initially retrieved articles, 23 studies met the inclusion criteria. A total of 1304 patients were treated for chronic lateral ankle instability in included articles, with 618 patients receiving open treatment and 686 receiving arthroscopic treatment. Patients receiving an open/Broström approach had a frequency weighted average (FWA) age of 31.80 ± 5.96 years, while the arthroscopic treatment group was significantly older with a FWA age of 34.22 ± 6.20 years ($p < 0.001$). Arthroscopic patients demonstrated significantly better post-operative functional outcomes, with higher AOFAS scores (mean difference of 1.06, $p=0.0008$) and lower pain scores (mean difference of -0.20, $p=0.008$). Overall complication rates were similar, but wound healing-related complications significantly favored the arthroscopic treatment group (7.60% vs. 15.02%, $p = 0.035$).
Conclusion:
Arthroscopic reconstruction to repair CLAI demonstrated better post-operative clinical outcomes compared to the open Broström procedure, in addition to arthroscopy demonstrating a lower wound complication rate. While this meta-analysis represents the most comprehensive comparison to date between open and arthroscopic Broström, future randomized controlled trials are needed to validate these findings and guide surgical decision-making as indications for both procedures differ, possibly limiting comparison.
Significance:

This review provides the first available Level 1 evidence comparing outcomes and complication rates in chronic lateral ankle instability repair based on the open Broström technique or the arthroscopic Broström reconstruction.

Presentation: P-9 Submitter: Nick Chiaramonti, M-3

Abstract Title: **Return-to-Play After Arthroscopic Distal Clavicle Excision in Athletes: Current Concepts and Literature Review**

Authors: Chiaramonti, Nick, M-3 M.D. Candidate, Krebs, Nathan, D.O.

Category: Population Health Mentor: Nathan Krebs, D.O.

Abstract:
BACKGROUND:
Acromioclavicular (AC) joint injuries are commonly seen in high-level athletes. Most of these injuries are classified as low-grade sprains (Rockwood Type 1 or 2). These injuries frequently do well with conservative management; surgical intervention is required less than 2% of the time. Nonoperative treatment consisting of anti-inflammatory medication, cryotherapy, and limited contact in practice will typically alleviate symptoms in 10-14 days. However, in some athletes, post-traumatic AC joint arthropathy can develop, leading to persistent disabling shoulder pain and decreased function. Currently, there is a paucity of literature on the postoperative outcomes of arthroscopic distal clavicle excision (DCE) for treatment of AC joint dysfunction in these high-level athletes.
OBJECTIVE:
The primary aim of this study is to examine published literature to assess outcomes in high-level athletes after arthroscopic DCE regarding return-to-play and the rate of complications.
METHODS:
A literature search was conducted using keywords “AC joint arthropathy, Arthroscopic distal clavicle excision, NFL players, high-level athlete, return to play”. From the relevant studies, information on the players’ age, position, laterality, date of injury, diagnosis, conservative treatment, length of time to surgery, operative procedure, time to release to full activities, return to play, and complications following return to play were recorded in a data sheet when available. Analysis of available data was completed using Microsoft Excel.
RESULTS:
The rate of return-to-play following arthroscopic DCE in the current literature ranges from 71 to 100%. Data from several large prospective studies of arthroscopic DCE suggests a 97% rate of return-to-play and a significantly improved Oxford Shoulder Score (OSS) following the procedure. The range clearance to return to sport is reported to be 3 days to 90 days after surgery. Though most studies report positive long-term outcomes, there are some reports of unsuccessful results in athletes after DCE, with patients having persistent pain and sometimes developing instability after surgery, particularly in athletes with a history of a chronic grade 2 sprain. Flatow et al reported that 93% of the patients in their study with stable AC joints had good to excellent results, compared with a subgroup of patients that had “subtle” AC joint instability, found commonly with chronic grade 2 sprains, only having a rate of 58% with good to excellent results after surgery.
CONCLUSION:
Though the vast majority of AC joint injuries in high-level athletes respond favorably to conservative management, the findings of this study demonstrate that the subacromial approach for arthroscopic DCE is an effective operative solution to persistent AC joint arthropathy. However, patients must lack signs of instability of the AC joint upon clinical exam and have radiographs and MR imaging to be considered for this procedure. Patients must also have at least temporary relief of symptoms with the use of intra-articular local anesthetic injection to the AC joint prior to surgery.
SIGNIFICANCE:
This study is the first to document the efficacy of arthroscopic DCE in high level athletes across all available literature. These findings can assist surgeons in counseling other types of high-level contact athletes who suffer from AC joint arthropathy.

Presentation: Submitter: Shahzaib Chughtai, M-2

Abstract Title: **Chemotherapy-Induced Cognitive Impairment: Mechanisms, Emerging Biomarkers, and Therapeutic Interventions**

Authors: Chughtai, Shahzaib, M-3 M.D. Candidate, Doyle, David, M-3 M.D. Candidate, Tata, Swathi, M-3 M.D. Candidate, Ram, Dhiya, M-3 M.D. Candidate

Category: Population Health Mentor: Irfan Oymagil, Resident M.D.

Abstract:

Background: Chemotherapeutic intervention is a mainstay of cancer treatment however, chemotherapy can have adverse effects on cognition. These can severely impact a patient's quality of life and frequently persist long after treatment ends. This effect is known as chemotherapy-induced cognitive impairment (CICI), or "chemo-brain. Clinically, this can present as deficits in a patient's memory and executive functioning. In studying how this process occurs, increasing evidence has pointed to specific physiological mechanisms that may help in developing more effective and targeted interventions for CICI.

Objective: This narrative review study examines the current literature on underlying mechanisms of CICI, with a focus on measurable biomarkers. These biomarkers will be leveraged into a discussion about potential therapeutic strategies that may be used to mitigate cognitive dysfunction in chemotherapy treated cancer patients. Results from this review may provide insights into novel diagnostic and treatment approaches to improve long-term patient outcome and quality of life.

Methods: A comprehensive literature search was conducted using PubMed and Google Scholar, homing in on the undesired physiological effects of chemotherapies. Relevant studies involving human and animal models were included, while opinion pieces and abstracts lacking methodological details were excluded. Additionally, neuroimaging studies and biomarker research pertaining to CICI were included.

Results: Current literature shows that CICI is primarily driven by neuroinflammation, identified by increased IL-6, TNF-α, IL-1β inflammatory cytokines. Other prominent mechanisms include microglial activation, oxidative stress, and mitochondrial dysfunction. Cognitive decline is also exacerbated by chemotherapy-induced gut microbiome disruption, which impacts systemic inflammation and neurotransmitter regulation. Other clinical biomarkers including brain-derived neurotrophic factor (BDNF), neurofilament light chain (NfL), and neuroimaging markers may aid in early detection.

Conclusions: The interrelations between systemic inflammation, oxidative stress, mitochondrial dysfunction, and gut microbiome alterations call attention to the possibility for multi-targeted therapeutic strategies. Medical treatment strategies that show promise include anti-inflammatory agents, neuroprotective compounds, and microbiome-targeted therapies. These, along with cognitive rehabilitation interventions, demonstrate potential for a wholistic and more comprehensive approach to mitigating cognitive impairments and improving cancer survivor care. Future studies on prominent CICI related biomarkers and neuroimaging may further refine the diagnostic and therapeutic abilities of these approaches.

Significance: This review highlights the importance of continued research in biomarker exploration to create personalized treatment strategies and novel therapeutic interventions for CICI. Developing wholistic and comprehensive management strategies for CICI can enhance quality of life for cancer patients, while also improving treatment adherence and long-term survivorship. Future studies are needed to more deeply explore patient-reported outcomes and integrative longitudinal approaches that may augment care for chemotherapy patients with cognitive impairment.

Presentation: P-10 Submitter: Anna Coleman, M-2

Abstract Title: **A systematic review on the developmental health implications of excessive screen exposure in children**

Authors: Brady, Clark, M-2 M.D. Candidate, Moschke, Kaylynn, M-2 M.D. Candidate, Nauts, Logan, M-2 M.D. Candidate, Neumann, Devin, M-2 M.D. Candidate, Odisho, Jason, M-2 M.D. Candidate, Park, Alex, M-2 M.D. Candidate, Sasaki Cole, Angela, M-2 M.D. Candidate, Coleman, Anna, M-2 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Screen use, defined here as the use of a digital media device for entertainment purposes, has been increasing exponentially throughout the world over the last ten years, particularly during and after the COVID-19 pandemic. The rise in screen time has been especially profound in children – so much so that Generation Alpha (children born between 2010 and 2015) has been dubbed "the iPad kid generation." As children are being exposed to screens at younger ages for longer periods, studies are being conducted worldwide to determine if and how these screens impact developmental health.

Purpose: The goal of this systematic review was to evaluate the current literature regarding the impact of screen use on the developmental health of children and adolescents worldwide. To our knowledge, there has not been a systematic review that examines how screen use affects the developmental health of young children and adolescents. This review also describes how screen use affects multiple aspects of developmental health, including neurological development, social development, motor development, and language development.

Methods: A search of relevant terms was conducted from PubMed (n=1234), and articles were included if they were published between 2014 and 2024, isolated a population between the ages of 0-17, and studied the relationship between one or multiple types of screen use and a developmental health outcome. After screening, 31 articles matched the inclusion criteria and were included in the final analysis.

Results: The majority of studies demonstrate that screen use in children is negatively associated with various aspects of developmental health. These negative outcomes have an age-dependent effect, which is to say that in younger children, the effect of screen use is exacerbated. However, some articles mentioned positive developmental health outcomes of using specific types of media (i.e., cell phone use, television, videogames). Other articles mentioned that certain types of media had less of or no effect on a developmental health outcome than another type of media.

Conclusions: There is a need for future studies to determine exactly how different types of screen use affect developmental health in children, both to determine how screen use can benefit the health of children, and to allow for more specific guidelines regarding screen time in youth.

Significance: Future research could allow us to more specifically understand the effects of screen use on pediatric development and inform the development of screen use guidelines.

Presentation: P-11 Submitter: Anna Coleman, M-2

Abstract Title: **A systematic review on the eating behaviors of youth exceeding electronic device recommendations**

Authors: Coleman, Anna, M-2 M.D. Candidate, Neumann, Devin, M-2 M.D. Candidate, Sasaki Cole, Angela, M-2 M.D. Candidate, Brady, Clark, M-2 M.D. Candidate, Park, Alex, M-2 M.D. Candidate, Odisho, Jason, M-2 M.D. Candidate, Moschke, Kaylynn, M-2 M.D. Candidate, Nauts, Logan, M-2 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: In the last two decades, obesity rates, eating disorder rates, and the use of electronic devices have increased significantly, both in the adult and pediatric populations. . An active area of research exists to examine if there is a relationship between electronic device usage and abnormal eating behaviors.

Purpose: While excessive screen use is generally understood to correlate with abnormal eating behaviors, newer studies are beginning to show how different types of screen use (i.e., social media, television, or videogames) affect eating behaviors in youth and adolescents. At this time, no systematic review has analyzed new research using broad age and geographic ranges. Thus, the goal of this systematic review is to evaluate the current literature regarding the impact of screen use on the eating behaviors of children and adolescents worldwide. The purpose of this review is to examine new research regarding different types of screen use using broad age and geographical ranges to explore trends and areas of future investigation.

Methods: With the help of the university research librarian, a search of terms was conducted from PubMed (n=1234). Included articles studied the relationship between one or multiple types of screen use and eating behaviors or eating disorders, were published after 2014, and included a study population between the ages of 0-17. After screening, fourteen articles were included in the final analysis.

Results: Results indicated that while there is overwhelming evidence that excessive screen use is correlated with obesity, individual trends in disordered eating arise due to the type of screen exposure as well as the age and sex of the individual. Furthermore, some articles suggest that obesity is a secondary sequela associated with screen time, the primary cause being lack of sleep or poor mental health.

Conclusions: When evaluating disordered eating in the pediatric population, it is important to consider multiple factors, including the circular relationship between screen time, sleeping habits, environmental factors, and mental health.

Significance: When treating a young patient with disordered eating behaviors, this information will allow for the tailoring of the treatment approach to the patient's individual risk factors, which will allow for better outcomes overall.

Presentation: P-12 Submitter: Anna Coleman, M-2

Abstract Title: **Child autism spectrum disorder following maternal abuse and trauma history**

Authors: Coleman, Anna, M-2 M.D. Candidate, Fitzwater, Brooke, Graduate Student, Harden, Philip, M-3 M.D. Candidate, McColl, Cassidy, M-2 M.D. Candidate, Bailey, Beth, Ph.D., Forrest, Julia, M-2 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Purpose: Autism spectrum disorder (ASD) is an increasingly diagnosed neurodevelopmental disorder that can lead to social isolation, poor mental health, and delayed language development, among other difficulties. Several studies have found correlations between ASD and maternal stress, either during pregnancy or at delivery, however only study has looked at maternal stress prior to pregnancy as a risk factor, finding significance only in a racially homogenous sample. This study examined whether a particular stressor, maternal abuse history predicted either suspected or diagnosed ASD by age three in a racially, ethnically, and geographically diverse sample.

Methods: Medical records were reviewed from two university affiliated pediatric practices in two locations in the Midwestern U.S. “Maternal abuse experience” was determined by whether the mother reported that she experienced abuse in her patient history form, either during her prenatal visits or admission to the hospital during labor. Abuse was examined overall, and separately by type and timing of the experience of abuse. ASD suspicions or diagnoses were considered positive based on both ICD codes and physician notes at all child well visits up to three years of age.

Results: Overall, women who reported history of any type of abuse prior to gestation were more than three times as likely to have a child suspected of having autism by age three and were almost two and a half times more likely to have a child formally diagnosed with autism than those who do not report abuse. Those who reported experiencing abuse as a child were more than twice as likely to have a child suspected to have autism by age. There was not a significant relationship between maternal abuse experience and speech delay in children at age three. However, despite there being no significant differences between rates of abuse or autism between racial groups reported in these data, there was a significant difference in the rates in which abuse correlates with suspicion of autism.

Conclusions: Findings establish a significant correlation between maternal prenatal history of abuse and trauma and child ASD diagnosis, and suggest that this potential risk factor is more significantly correlated with ASD suspicion in certain demographics than others.

Significance: By identifying maternal abuse as a potential ASD risk factor, medical professions can be more attuned to potential ASD symptoms in their young patients at an earlier age, thus allowing for earlier intervention and better overall outcomes. Additionally, findings signal a need for future research into how potential ASD risk factors affect different populations, allowing for earlier ASD recognition and treatment for all children.

Presentation: P-13 **Submitter:** Joe Cummings, M-2

Abstract Title: **Assessing Long-term Cardiovascular Outcomes with Methylphenidate and Amphetamines Use: A Systematic Review**

Authors: Cummings, Joe, M-2 M.D. Candidate, Condron, Brian, M-2 M.D. Candidate, B.S., Other, Saad, Jawad, M-2 M.D. Candidate, B.S., Amcheslavsky, Jakob, M-2 M.D. Candidate, Byrne, John, M-2 M.D. Candidate, B.A., Other, Pallazola, Alexander, M-2 M.D. Candidate, B.S.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background

Attention Deficit Hyperactivity Disorder (ADHD) is a highly prevalent neurodevelopmental condition routinely treated with stimulant medications. Previous research has indicated these medications may have an effect on cardiovascular (CV) outcomes in the short term, but there is a knowledge gap regarding long-term outcomes.

Objective

This systematic review evaluates published long-term cardiovascular outcomes associated with use of methylphenidate (Ritalin) and amphetamines (Adderall) for treatment of ADHD.

Methods

PubMed, Web of Science, Scopus, and Cochrane Library were searched systematically for literature that reported long-term CV effects of methylphenidate and amphetamine use. Studies that met these inclusion criteria were analyzed. Long-term use was defined as exposure (continuous or cumulative) of at least six months. Cardiovascular outcomes were divided into the categories of blood pressure changes, serious events (MI, HF, stroke, out-of-hospital cardiac arrest, and CVD) and other CV events (arrythmias, dysrhythmias, and QT prolongation) for the purpose of analysis. Articles published before 1996 were excluded as Adderall entered the market that same year. Research that discussed other prescription drugs was included if separate results for amphetamines and methylphenidate were also covered.

Results

A total of 15 studies met inclusion criteria. 3 studies found no significant blood pressure changes with long term exposure, one of which found no change in SBP (AOR = 0.95, 95% CI: [0.73-1.23]) or DBP (AOR = 0.83, 95% CI: [0.63-1.09]). These findings are contradicted by 5 studies that did find significant blood pressure changes ($p < 0.05$). Severe cardiovascular outcomes were frequently grouped together in primary analysis, with five studies reporting no significant increase in outcomes with stimulant use. This opposed by a single cohort study that reported decreased median age of out-of-hospital cardiac arrest was associated with methylphenidate use, and that these arrests increased in the group that had methylphenidate exposure for longer than 180 days (AOR =1.64, 95% CI: [1.18-2.29]). Long-term QT prolongation was significantly increased ($p < 0.05$) in a single study, with another study of the same design conversely finding no significance. Increased risk of arrythmia and less severe CV outcomes was reported by two studies, although no significant risk increase for severe CV outcomes was found.

Conclusions

Findings from our study indicate a lack of consensus surrounding long-term cardiovascular outcomes. Some studies found meaningful increases in blood pressure, while others either did not or found changes that were statistically insignificant. This trend of mixed findings extends to severe cardiac effects as well as less severe cardiac effects. Comprehensive research with larger cohorts and longitudinal follow-up is required to categorize risks, develop appropriate clinical protocols, and optimize ADHD treatment without compromising patient safety.

Significance

These findings support the need for further longitudinal study to address knowledge gaps and optimize management of ADHD. Risk assessments prior to stimulant treatment and careful monitoring of vital signs may be warranted. Care of the patient's whole health must be prioritized by physicians to ensure patient safety. Therefore, this research may be of importance to family physicians that often manage concurrent psychiatric and cardiovascular conditions.

Presentation: P-14 Submitter: Zane Deliu, M-1

Abstract Title: **Living Situation and Healthcare Utilization in Older Adults with Self-Reported Diabetes According to the National Health Interview Survey (2021-2022)**

Authors: Deliu, Zane, M-2 M.D. Candidate, Bishop, Rachel, M-2 M.D. Candidate, Vandusen, Amy, M-2 M.D. Candidate, O'mara, Megan, M-2 M.D. Candidate, Obeid, Carla, M-2 M.D. Candidate

Category: Population Health Mentor: Samantha Hahn, Ph.D.

Abstract:

Background: Diabetes is among the leading causes of morbidity in the United States, with case numbers expected to rise, particularly in older adults. While the link between social isolation on health outcomes has been explored, the specific relationship between distinct living situations and healthcare utilization among older diabetics remains underexamined. This study aims to determine whether living situations are associated with varying rates of hospitalizations, emergency department (ED) visits, and urgent care visits among adults aged 65 and older with diabetes.

Methods: This cross-sectional study analyzed data from the 2021-2022 National Health Interview Survey (NHIS) via descriptive statistics, logistic regression, and zero-inflated negative binomial (ZINB) regression to investigate the relationship between the living situation and health outcomes as measured by overnight hospitalizations, number of urgent care visits, and emergency department visits of adults with diabetes over the age of 65.

Results: After adjusting for age, sex, race and ethnicity, and other factors, participants living with a partner had significantly higher odds of visiting the emergency room when compared to individuals living alone ($\beta = 2.15$, SE =0.15, $p=0.031$ from a ZINB regression model). No significant differences were observed in urgent care visit frequency or hospitalization rates across living situations.

Conclusions: Among older adults with diabetes, living with a partner is associated with increased ED utilization. This contrasts with the expectation that social isolation may drive increased healthcare utilization, suggesting that partners may encourage care-seeking behavior or reflect underlying differences in health status and access to outpatient care. Understanding factors contributing to increased ED visits is crucial for developing preventative measures to reduce disease burden and lowering the financial burden associated with diabetes.

Keywords [Diabetes, Geriatrics, Social Determinants of Health, Emergency Department Utilization, Hospitalizations, Living Situation]

Presentation: Oral 1A-2 Submitter: Emma DeVries, M-2

Abstract Title: **Fetal Health Benefits of Gestational Exercise: A Systematic Review**

Authors: DeVries, Emma, M-2 M.D. Candidate, Covell, Jenna, M-2 M.D. Candidate, Ahlgrim, Brittany, M-1 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Importance: Maternal exercise during pregnancy has been associated with various benefits, but its specific impact on fetal outcomes, particularly in overweight or obese (OWOB) women, remains understudied.

Objective: To systematically review the effects of prenatal exercise on neonatal outcomes, including cardiac function, birth weight, and delivery outcomes, while highlighting results specific to OWOB women and identifying factors not influenced by exercise.

Data Sources: PubMed was searched for randomized controlled trials (RCTs) published between 2019 and 2024. Search terms included "pregnancy," "maternal exercise," "birth weight," and "cardiac health," among others.

Study Selection: Studies were included if they involved pregnant women without contraindications to exercise or fetal demise, used aerobic, anaerobic, resistance, or mixed exercise interventions, and reported fetal or neonatal outcomes. Exclusion criteria encompassed non-RCT designs, pre-existing maternal comorbidities affecting fetal health, not conducted in the USA, and absence of prenatal care.

Data Extraction and Synthesis: Data were independently extracted and analyzed from five RCTs meeting the inclusion criteria. Outcomes included fetal cardiac function, birth weight, and delivery outcomes. A qualitative synthesis was performed to identify patterns.

Results: Maternal exercise significantly improved fetal cardiac parameters, including right ventricular stroke volume and aortic valve peak velocity. In OWOB women, regular exercise was linked to lower rates of large-for-gestational-age infants and cesarean delivery but did not significantly reduce preterm birth or infant birth weight. Exercise positively influenced maternal lipid profiles and was associated with larger neonatal head circumference, birth weight, and length in low-risk pregnancies. However, maternal pre-pregnancy BMI and aerobic capacity remained significant predictors of cesarean birth, independent of exercise levels.

Conclusions and Relevance: Prenatal exercise improves specific neonatal cardiovascular outcomes and mitigates some risks associated with maternal obesity but does not significantly affect preterm birth or infant birth weight in OWOB populations. Further research is warranted to explore long-term outcomes and optimize prenatal exercise guidelines.

Presentation: P-15 Submitter: Emma DeVries, M-2

Abstract Title: **High episiotomy rates and associated maternal mortality in developing countries**

Authors: DeVries, Emma, M-2 M.D. Candidate, Aravindan, Swati, M-2 M.D. Candidate, Mir, Sabriyah, M-2 M.D. Candidate, Price, Kennedi, M-2 M.D. Candidate

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Background: Episiotomy remains a common obstetric intervention in many regions despite the World Health Organization's (WHO) recommendation of restrictive use, with a target rate below 10%. This abstract synthesizes findings from five studies conducted in Ethiopia, India, Southeast Asia, and Nigeria to analyze patterns, risk factors, and complications associated with episiotomy and perineal trauma in developing countries.

Methods: This systematic review solely utilized PubMed, using search terms such as “episiotomy,” “perineum/injuries,” “developing countries,” and “pregnancy.” Various study designs were included, such as cross-sectional analyses, retrospective reviews, and observational studies, to evaluate episiotomy prevalence, associated risk factors, and outcomes. Other inclusion criteria included women giving birth in low- and middle-income countries, and episiotomies or other perineal trauma interventions. Sample sizes ranged from 1,877 to over 120,000 vaginal deliveries, with data collected from tertiary care centers and public health facilities. Exclusion criteria included studies focusing on high-income countries, studies that do not specifically compare the outcomes of episiotomy or perineal trauma, prior systematic reviews, and case reports or studies that do not report on maternal outcomes.

Results: Episiotomy rates varied widely across regions: 44% in Ethiopia, 39.1% in Port Harcourt, 45% in Southeastern Nigeria, and 63.4% in India. Risk factors associated with episiotomy included nulliparity (8.8x higher likelihood in nulliparous women), instrumental delivery, younger maternal age, shorter birth spacing, and larger neonatal birthweight (≥3.5 kg). While episiotomy reduced the incidence of severe perineal tears in some cases, it also led to complications such as hematomas (0.06%-0.15%), cervical tears (0.08%), and excessive bleeding.

Discussion: Despite declining episiotomy rates in developed countries, it remains a routine practice in several low- and middle-income countries due to training gaps, institutional policies, and cultural norms. Restrictive episiotomy, as recommended by WHO, is associated with fewer complications and should be emphasized in clinical guidelines. Efforts to address high episiotomy rates include provider training on selective use, patient education on delivery options, and improved perinatal care strategies, such as optimizing birth spacing and managing deliveries of larger neonates.

Conclusion: High episiotomy rates in the studied regions underscore the need for targeted interventions to align practices with evidence-based guidelines. Reducing unnecessary episiotomies could mitigate associated risks and improve maternal outcomes. Further research is warranted to refine predictive models for episiotomy use and perineal trauma, particularly in resource-constrained settings

Presentation: P-16 Submitter: Emma DeVries, M-2

Abstract Title: **Contrasting Care: a Comparative Analysis of the Indian and USA Healthcare Systems**

Authors: DeVries, Emma, M-2 M.D. Candidate, Aravindan, Swati, M-2 M.D. Candidate, Mir, Sabriyah, M-2 M.D. Candidate, Price, Kennedi, M-2 M.D. Candidate

Category: Population Health Mentor: Chythra Rao, M.D., M.B.B.S.

Abstract:

Background

Healthcare systems worldwide face the challenge of balancing accessibility, affordability, and quality. India's public healthcare system prioritizes widespread coverage through government initiatives, whereas the U.S. depends on a predominantly privatized model, leading to disparities in care.

Objective

This comparative analysis investigates the structural differences between Indian and U.S. healthcare systems, focusing on service delivery, medical education, and public health initiatives.

Methods

Through direct observation and participation in India's healthcare system, we assessed how different facilities function, from rural Primary Healthcare Clinics (PHCs) to tertiary hospitals. Interviews with physicians, medical students, and healthcare workers provided deeper insight into operational challenges and best practices. U.S. healthcare was analyzed using secondary research and experiential knowledge to draw key comparisons.

Results

The hierarchical hospital structure efficiently allocates resources despite challenges such as inconsistent access to advanced technology and a shortage of medical personnel. In contrast, the U.S. excels in specialized care and medical innovation but struggles with financial barriers that limit access for uninsured populations.

Conclusions

While the Indian system maximizes outreach and affordability, its resource constraints limit advanced medical interventions. The U.S. model, though technologically superior, lacks universal accessibility. Bridging these gaps through policy reforms and cross-system learning can foster more equitable healthcare.

Significance

Understanding the strengths and limitations of both systems provides a framework for improving healthcare worldwide. Lessons from India's preventive and community-driven model could inform U.S. health policies, while India could benefit from enhanced technological integration and specialist training models observed in the U.S.

Presentation: Submitter: Emma DeVries, M-2

Abstract Title: **Exploring Global Health: an Observational Study of the Indian Healthcare System**

Authors: DeVries, Emma, M-2 M.D. Candidate, Aravindan, Swati, M-2 M.D. Candidate, Mir, Sabriyah, M-2 M.D. Candidate, Price, Kennedi, M-2 M.D. Candidate

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Background

Healthcare systems worldwide vary in structure, accessibility, and delivery. India's healthcare system operates on a hierarchical model that emphasizes community outreach, preventive medicine, and resource efficiency, contrasting with the United States' technologically advanced yet fragmented system. Understanding these differences can offer insights into improving healthcare delivery globally.

Objective

This study aimed to observe and analyze the Indian public healthcare system, identifying its strengths and challenges.

Methods

Through an immersive experience at Kasturba Medical College in Manipal, India, we conducted daily visits to different tiers of healthcare, including Primary Health Centers (PHCs), Community Health Centers (CHCs), and tertiary hospitals. We engaged in direct observations, interviews with physicians and medical students, and hands-on learning with patients. Journal entries documented our findings on healthcare infrastructure, medical education, health literacy, and public health initiatives.

Results

Key findings highlight India's hierarchical healthcare model, where PHCs and CHCs play a crucial role in preventive and community-based care. Public health initiatives, such as RMCW homes and cancer screening camps, which emphasize outreach and disease prevention. Challenges include resource limitations, reliance on paper records, frequent power outages, and gaps in health literacy, particularly in sexual and mental health education.

Conclusions

India's approach to rural healthcare, preventive medicine, and workforce utilization—such as medical interns taking on significant responsibilities—demonstrates strategies for addressing resource constraints. Lessons from this study underscore the importance of interdisciplinary collaboration, sustainable resource allocation, and culturally sensitive healthcare practices.

Significance

This comparative study provides valuable perspectives on healthcare delivery models, offering potential strategies to bridge gaps in both India and the U.S. By integrating aspects of India's community-based care, healthcare systems worldwide can work toward more equitable and efficient healthcare solutions.

Presentation: P-17 Submitter: McKenna Dooley, M-2

Abstract Title: **Navigating Barriers to Fall Prevention for Older Adults in Rural Mid-Michigan**

Authors: Dooley, McKenna, M-2 M.D. Candidate, Andrzejewska, Gabriela, M-2 M.D. Candidate, Holek, Rylee, M-2 M.D. Candidate, Wolbert, Payton, M-3 M.D. Candidate, King, Krista, M-3 M.D. Candidate

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Background: The Living FREE program, part of the Healthy Aging Initiative in rural mid-Michigan, offers free individualized fall prevention strategies for older adults. The program was designed to recruit older adults admitted to the emergency room (ER) after a fall, who were found to have no injury or medical cause of fall and did not qualify for physical therapy. Recognizing the need for broader outreach, the program expanded by partnering with Emergency Medical Services (EMS) to recruit adults who experience a fall, receive point-of-care EMS intervention and decline ER transport. These individuals often lack follow-up care and are predisposed to future falls.

Objective: This project was developed to explore how additional outreach through EMS can address psychosocial and systemic obstacles to fall prevention engagement in rural areas.

Methods: Living FREE provides free fall risk education, fall reduction plans, and ongoing support to prolong independence in rural older adults. EMS teams were given program materials and surveys to distribute during fall-related calls. The survey provides insight into older adults' attitudes towards fall prevention, such as their thoughts on future fall probability, exercise as fall prevention and preparedness to avoid falls. Survey responses and new participant interest served as primary data points.

Results: We provided 500 packets to EMS teams of which 12 were administered (2.4%), with no responses received. The EMS coordinator reported difficulty promoting the program to crew members and issues with understaffing. This lack of participant engagement aligns with literature identifying barriers in rural areas including transportation, finances, and mistrust of free programs, compounded by perceived judgement during EMS encounters. To address these factors we plan to revise materials to build trust, standardize program promotion to EMS and introduce home-based exercises for independent fall risk management.

Conclusions: This study highlights the importance in developing and implementing effective fall prevention programs in rural areas. The barriers to healthcare faced by older adults in rural areas make it all the more important to leverage point-of-care roles such as through this relationship with EMS. While the distribution of program materials and surveys revealed limited engagement, this outcome emphasizes systemic barriers that can counteract effective outreach in rural communities. To improve engagement, strategies must prioritize simplifying EMS crew responsibilities, and incorporate accessible interventions such as home-based exercises and community education programs. These findings suggest that while EMS serves as a critical touchpoint for at-risk individuals, more diverse approaches are needed to effectively address the social and practical barriers to fall prevention.

Significance: By examining the intersection of community dynamics, EMS collaboration, and rural health disparities, this study provides valuable insights for designing effective fall prevention programs. Older adults make up a significant percentage of rural populations, emphasizing the positive impact that successful programs can have on these communities. A deeper understanding of local needs and tailored communication will help to transform engagement strategies and reduce negative fall outcomes for rural older adults.

Presentation: P-18 Submitter: Alexander Forrest, Graduate Student

Abstract Title: **Project INCLUDE: Reducing Social Isolation and Loneliness Among Older Adults**

Authors: Forrest, Alexander, Graduate Student, Brugh, Casey, Graduate Student, Jepsen, Arianna, Graduate Student, Skeel, Reid, Ph.D., Gerhart, James, Ph.D., Pandey, Jyotsna, M.D., Ph.D.

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Our community-service project, funded by the Michigan Health Endowment Fund, was conducted in collaboration with Presbyterian Villages of Michigan (PVM) and Central Michigan University (CMU). Ethics approval was obtained through CMU's Institutional Review Board. The project targeted older adults in PVM senior living communities, aiming to address social isolation and loneliness—complex issues exacerbated by limited staff capacity and resources for psychosocial interventions.

Surveys assessing loneliness were distributed to all PVM residents across 35 sites, with 149 responses received. Analyses of these data indicate that loneliness is negatively correlated with perceived mental health ($r = -0.53$, $p < 0.001$) and perceived physical well-being ($r = -0.33$, $p < 0.001$). Of the full sample, 32 residents met the criteria for high levels of social isolation and loneliness (self-rated social connectedness below 5 and loneliness above 5 on a 1–10 scale). These individuals were invited to participate in interventions. Data collection and outreach were managed by a team of faculty, graduate, and undergraduate students from CMU, with support from PVM Service Coordinators. Interventions included informational sessions on loneliness and group-based psychosocial education programs. Site visits were completed at 20 PVM communities over seven months, with ongoing survey distribution and follow-up. We have begun piloting group-based interventions fully virtually and with just the group leader calling into the communities while participants are together in-person. Pre- and post-intervention loneliness scores are being collected to assess the effectiveness of these programs.

Challenges included coordinating efforts across geographically dispersed sites, residents' limited familiarity with technology, and scheduling constraints. Monthly updates on survey progress were shared with PVM staff to enhance responsiveness. Residents also provided insights into loneliness causes and solutions during open forums and surveys, informing intervention design. This project highlights the importance of tailored, community-based approaches to addressing loneliness in older adults. Regular data collection and open dialogue with residents can help identify at-risk individuals and refine interventions. Although logistical barriers remain, these findings underscore the value of fostering social support to improve mental and physical well-being among older adults.

Presentation: Oral 1A-5 Submitter: Ahmed Ftouni, M.D., Resident

Abstract Title: **Comparisons Between Suicide Reporting Methodologies in the State of Michigan**

Authors: Ftouni, Ahmed, Resident M.D., Greig, Grace, M-3 M.D. Candidate, Bala, Abishek, M.D.

Category: Population Health Mentor: Abishek Bala, M.D.

Abstract:

- Background: Suicide has emerged as a critical public health issue as it remains as a leading cause of death in the state of Michigan. Despite its growing prevalence, suicide rates are often underreported due to weak surveillance systems, misclassification of suicide deaths, and differences in death investigation protocols, per the World Health Organization. The 2024 National Strategy for Suicide Prevention highlights urgent need to enhance the quality, timeliness, scope, and accessibility of suicide-related data to inform effective prevention strategies.

- Objective: This study aims to understand what interventions are in place for suicide prevention, determine the barriers that exist in standardizing suicide data collection and reporting in the state of Michigan, and to determine which areas in the data collection and reporting process can be standardized to ensure consistent and comparable data across counties.

- Method: Local officials in select Michigan counties, including sheriffs, medical examiners, coroners, and other experts, were contacted to understand current suicide data collection and reporting processes. These processes were then compared to identify areas with the most variation and potential for standardization.

- Results: Differences in suicide data collection and reporting between counties were linked to factors such as availability of resources, processing times of investigations, task delegation among involved parties, and the content of data collected. These variations highlight the need for a more uniform approach.

- Conclusions: The findings of this study show that the limitations in suicide data collection and reporting across Michigan are similar to those that the 2024 National Strategy for Suicide Prevention address in its recommendations. The process involves different parties throughout the data collection and reporting process including medical examiners, coroners, law enforcement, first responders, among others. Standardization would improve communication among these parties

- Significance: This study provides an example of how suicide data is collected and reported in an area in the state of Michigan, where there is currently no standardized process. By outlining this process, we aim to make it more transparent, which will help future research and efforts to create consistent standards.

Presentation: P-19 Submitter: Amaresh Gogikar, M.D., Resident

Abstract Title: **Rising Burden of Atrial Fibrillation in Young Adults Hospitalized with Acute Coronary Syndrome: A Nationwide Analysis**

Authors: Gogikar, Amaresh, Resident M.D., Mohammed, Adil S, Resident M.D., Gogikar, Amaresh, Resident M.D.

Category: Population Health Mentor: Paritharsh Ghantasala, M.D.

Abstract:

Background: Atrial fibrillation (AF) is a well-established comorbidity in acute coronary syndrome (ACS) but remains underreported in young adults. Understanding its prevalence, trends, and impact on clinical outcomes in this population is crucial for early detection and management.

Objective: To evaluate the prevalence, rising trend, and clinical impact of AF in young adults hospitalized with ACS from 2016 to 2020 using a large national dataset.

Methods: We conducted a retrospective study using the National Inpatient Sample (2016-2020) to identify ACS hospitalizations with AF in young adults (18-44 years) based on ICD-10 codes. We analyzed demographic patterns, comorbidities, in-hospital mortality, and healthcare resource utilization, including length of stay and hospital costs. Trends were assessed using linear-by-linear association tests, and multivariable logistic regression was used to identify predictors of mortality.

Results: Among 213,160 ACS hospitalizations, 4.5% had AF, with rates increasing from 4.3% in 2016 to 4.8% in 2020. A significant rise was noted in females (from 3.3% to 4%, p-trend=0.001) and among White and Hispanic populations, whereas Black patients experienced a decline in AF prevalence. AF patients had a higher prevalence of complicated hypertension (36.7% vs. 22.8%), obesity (36.7% vs. 30.7%), smoking (22.6% vs. 21.7%), and valvular disease (4% vs. 1%). AF was associated with higher in-hospital mortality (adjusted OR 2.06 [1.72-2.48], $p < 0.001$), longer hospital stays (median 4 vs. 2 days), and increased healthcare costs (mean $8,500 higher). They were also more frequently discharged to skilled nursing or home healthcare.

Conclusions: The prevalence of AF in young adults hospitalized with ACS is increasing, particularly among females and specific racial groups. AF significantly elevates the risk of in-hospital mortality, prolongs hospital stays, and increases healthcare costs, emphasizing the need for targeted screening and early intervention strategies.

Significance: This study highlights the rising burden of AF in young ACS patients and its detrimental impact on clinical outcomes. Findings highlight the necessity for heightened awareness, preventive measures, and tailored management strategies to mitigate risks and improve patient care in this vulnerable population.

Presentation: P-20 Submitter: Amaresh Gogikar, M.D., Resident

Abstract Title: **Prediabetes in Elderly NSTEMI Patients Undergoing PCI: Prevalence, Outcomes, and Insights from a Nationwide Study (2016–2020)**

Authors: Gogikar, Amaresh, Resident M.D., Patel, Jay, M-4 M.D. Candidate, Danish, Ali, Resident M.D., Patel Rishwa, M-4 M.D. Candidate, Anmol, Kumar, M-4 M.D. Candidate, Bobbillapati, Abhishek, M-4 M.D. Candidate, Ghantasala, Paritharsh, M.D.

Category: Population Health Mentor: Rupak Desai, M.B.B.S.

Abstract:

Background:

Prediabetes has been increasingly recognized as a risk factor for cardiovascular disease, yet its impact on elderly (≥65 years) non-ST elevation myocardial infarction (NSTEMI) patients undergoing percutaneous coronary intervention (PCI) remains unclear. Understanding how prediabetes influences in-hospital outcomes in this population is crucial for optimizing clinical management and risk stratification.

Objective:

To determine the prevalence of prediabetes in elderly NSTEMI patients undergoing PCI and assess its impact on in-hospital outcomes, including mortality, complications, length of stay, and healthcare costs.

Methods:

The National Inpatient Sample (2016–2020) was utilized to identify elderly patients (≥65 years) with NSTEMI undergoing PCI, excluding individuals with diagnosed diabetes. ICD-10 codes were used for patient selection. Baseline characteristics, comorbidities, and clinical outcomes—including all-cause mortality and procedural complications—were compared between prediabetic and non-prediabetic cohorts. A trend analysis for prediabetes prevalence over the study period was conducted.

Results:

Among 294,035 elderly NSTEMI patients undergoing PCI, 7,910 (2.7%) had prediabetes, with prevalence rising from 0.6% in 2016 to 4.2% in 2020 ($p_{trend} < 0.001$). Prediabetic patients were younger (median age: 73 vs. 75 years) and had higher rates of obesity, peripheral vascular disease, and hyperlipidemia but lower rates of COPD and prior MI (all $p_{trend} < 0.001$). Notably, prediabetes was associated with lower in-hospital mortality (1.5% vs. 2.7%; OR: 0.58, 95% CI: 0.37–0.93, p=0.022), shorter hospital stays, and reduced healthcare costs ($p < 0.001$), with no significant differences in post-procedural complications.

Conclusions:

The prevalence of prediabetes among elderly NSTEMI patients undergoing PCI has been increasing. Despite higher comorbidity rates, prediabetes was paradoxically associated with improved in-hospital outcomes, including lower mortality, shorter hospital stays, and decreased costs. These findings suggest potential protective mechanisms in the acute setting, necessitating further longitudinal research to elucidate long-term cardiovascular risks and benefits.

Significance:

This study highlights the evolving epidemiology of prediabetes in elderly NSTEMI patients undergoing PCI and its unexpected association with favorable short-term outcomes. Understanding these trends may inform risk stratification models and influence clinical decision-making. Further studies are warranted to explore whether these findings reflect metabolic advantages, selection bias, or unmeasured confounders impacting treatment outcomes.

Presentation: P-21 Submitter: Emily Hock, M-2

Abstract Title: **Comparing the Efficacy of Levonorgestrel Intrauterine Device and Oral Levonorgestrel for Emergency Contraception: A Systematic Review and Meta-Analysis**

Authors: Hock, Emily, M-2 M.D. Candidate, Williams, Erin, M-2 M.D. Candidate, Blankenstein, Andie, M-2 M.D. Candidate, Currier, Jenna, M-2 M.D. Candidate, Crow, Catherine, M-2 M.D. Candidate, Liyanage, Bhakthi, M-2 M.D. Candidate, Shepherd, Alexa, M.D., Ragina, Neli, Ph.D.

Category: Population Health Mentor: Neli Ragina, Ph.D.

Abstract:

Background: Emergency contraception (EC) is critical for preventing unintended pregnancies following unprotected or inadequately protected sexual intercourse. While oral levonorgestrel (LNG) pills are the standard FDA-approved EC method, the levonorgestrel intrauterine device (LNG-IUD) is emerging as an alternative, offering both immediate EC and long-term contraception benefits. This study evaluates the efficacy of LNG-IUD compared to oral-LNG for EC. Objective: To conduct a systematic review and meta-analysis of studies evaluating the efficacy of the levonorgestrel intrauterine device for emergency contraception, comparing its efficacy in preventing pregnancy with that of oral levonorgestrel. Methods: A systematic review and meta-analysis were conducted following PRISMA 2020 guidelines. PubMed, Scopus, and Medline were searched up to December 16, 2024, using keywords related to postcoital contraception, levonorgestrel, and intrauterine devices. Five studies from two countries, totaling 920 participants, met the population, intervention, comparison, outcome, and settings (PICOS) criteria focusing on women of reproductive age using LNG-IUD or oral LND as EC. Risk of bias was assessed using the mixed methods appraisal tool (MMAT), and a random-effects model was applied due to significant heterogeneity. Results: The LNG-IUD, when indirectly compared to oral LNG for EC, demonstrated a natural log of the odds risk ratio (ORR) of –0.51 (95% CI: -3.86-2.83, p=0.77), suggesting a lower risk of pregnancy with the LNG-IUD. However, the wide confidence interval and lack of statistical significance, as reflected by the high p value, likely results from limited studies available for this dataset. Conclusion: This review found no statistically significant difference in efficacy between LNG-IUD and oral-LNG for emergency contraception, likely due to wide confidence intervals and limited data, supporting LNG-IUD as an alternative. LNG-IUD offers comparable efficacy to other EC options and the added benefit of long-term contraception, underscoring the importance of additional direct studies to expand emergency contraception options for women. Significance: The findings suggest that LNG-IUD could be a promising alternative to oral LNG for emergency contraception, offering both immediate and long-term contraceptive benefits. Expanding access to LNG-IUDs for EC could provide women with more options and flexibility in reproductive health management, emphasizing the need for further research to validate its efficacy and inform clinical practice.

Presentation: P-22 Submitter: Rylee Holek, M-2

Abstract Title: **Assessing the Effectiveness of the Fall Prevention Program Through Balance Assessments and Participant Surveys**

Authors: Holek, Rylee, M-2 M.D. Candidate, Andrzejewska, Gabriela, M-2 M.D. Candidate, Wolbert, Payton, M-3 M.D. Candidate, King, Krista, M-3 M.D. Candidate, Dooley, McKenna, M-2 M.D. Candidate, Pandey, Jyotsna, M.D., Ph.D.

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Background

The Fall Prevention Program, a collaboration between Central Michigan University College of Medicine, Region VII Area on Aging, and local aging commissions, provides no-cost, evidence-based exercise classes to older adults in rural Michigan (Isabella, Clare, and Gratiot counties). With over 26% of Michigan's older adults living in rural areas, where fall rates are higher, the program utilizes the Otago Exercise Protocol to reduce falls and promote independence. This study evaluates the program's effectiveness through balance assessments and participant satisfaction surveys.

Objective

To assess the impact of the Fall Prevention Program on balance improvement and social well-being in older adults in rural Michigan.

Methods

Seventy-nine participants aged 65+ were recruited through senior centers, newsletters, and referrals. Each underwent a baseline balance assessment with a physical therapist before beginning an 8-week exercise phase, followed by an optional maintenance phase. Balance was evaluated using the Timed-Up and Go Test, 30-Second Chair Stand Test, and Four-Stage Balance Test at 3, 6, 9, and 12 months. Participants also completed quarterly surveys assessing isolation and loneliness.

Results

After 3 months, participants showed significant improvement in the 30-Second Chair Stand and Four-Stage Balance Tests. The Timed-Up and Go Test showed no significant change. Survey data indicated that most participants rarely felt isolated (71.6%), lacked companionship (79.1%), or felt left out (76.1%). Due to inconsistent attendance, statistical significance could not be achieved for some balance measures, but descriptive statistics indicated general improvement in balance and well-being.

Conclusions

The Fall Prevention Program provides valuable balance training and social engagement for older adults in rural communities. However, inconsistent attendance due to barriers like transportation and weather challenges participation rates. Expanding the program to additional locations and incorporating motivational strategies may enhance long-term engagement and reduce fall risk.

Significance

By addressing attendance barriers and promoting sustained participation, the program has the potential to improve balance, reduce falls, and enhance social well-being in rural older adults. Future expansion efforts will focus on increasing accessibility and engagement to maximize public health impact.

Presentation: P-23 Submitter: Matthew Jackson, M-1

Abstract Title: **Physician dietary advice has little association with dietary intake of adolescents in cross-sectional and longitudinal study, evidence of moderation by weight perception**

Authors: Jackson, Matthew, M-2 M.D. Candidate, Schafer, Morgan, M-2 M.D. Candidate, Hoque, Asef, Other, Burnette, Blair, Ph.D., Hahn, Samantha, Ph.D.

Category: Population Health Mentor: Samantha Hahn, Ph.D.

Abstract:

Background: Quality nutrition education is essential for short- and long-term health outcomes in adolescents. One source of nutrition education in the younger population is well child visit dietary counseling. However, the quality and interpretation of dietary advice can be influenced by external factors, such as weight perception (i.e. the way individuals view their weight status, regardless of their actual body weight status).

Objective: Examine whether weight perception moderates the cross-sectional and longitudinal associations between receiving dietary advice from a physician and adolescent dietary intake. We hypothesize that among those who perceive their weight as "overweight," physician advice will be associated with poorer dietary intake, while among those who do not perceive their weight as "overweight," advice will be associated with better dietary intake.

Design: Data come from the 2009 NEXT Generation Health 7-year cohort study, including sociodemographic information from Wave 1 (10th grade), physician advice status, weight perception status, and cross-sectional dietary intake from Wave 2 (11th grade), as well as longitudinal dietary intake from Wave 3 (12th grade).

Participants/ Setting: A nationally representative sample of 2,369 high school students provided data in Waves 1-3, making up the final analytical sample.

Results: Cross-sectionally, no associations between physician advice and dietary intake were found for those that do not perceive their weight as “overweight”, but some associations were found for those that do perceive their weight as “overweight”. Longitudinally, no associations were found between physician dietary advice and dietary intake for both weight perception categories.

Conclusion: Physician dietary advice may be associated with a temporarily altered dietary intake, but lack of longitudinal findings and dependence on weight perception suggests physician advice is not an effective dietary intervention.

Presentation: P-24 Submitter: Karam Khasawneh, M-2

Abstract Title: **Racial Disparities in Clinical and Cost Outcomes Among Heart Transplant and Left Ventricular Assist Device Recipients: A Systematic Review**

Authors: Khasawneh, Karam, M-2 M.D. Candidate, Bayoumi, Abdelrahman, M-2 M.D. Candidate, Bhagat, Parth, M-2 M.D. Candidate, Ghaleb, Amar, M-2 M.D. Candidate, Lababidi, Hamdi, M-2 M.D. Candidate, Pharm.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Although racial disparities in cardiac interventions have been studied extensively, disparities in heart transplants (HTs) and left ventricular assist devices (LVADs) have not been well-established.

Methods and Results: A systematic review was undertaken wherein 20 studies were identified for investigation. A total number of 34,497 HTs and 69,859 LVADs were identified. Articles from 1990-2024 were selected using electronic databases PubMed, SCOPUS, and CINAHL Plus (EBSCO). Access was evaluated via the percentage of patient race within each study's population. White patients received the majority of LVADs (63.64%) and HTs (61.67%), with Black patients second for LVAD (23.53%) and HT (22.04%). Hispanics/Latinos had the lowest rates of LVADs (5.83%) and HTs (9.14%). In-hospital mortality was also stratified by race based on each study. Asian patients had the highest in-hospital mortality (39.2%) whereas White patients had the lowest (36.2%). Cost outcomes were analyzed via mean cost of hospital visit and odds ratios for Medicaid coverage in adopter and non-adopter states. Results varied with Asian patients having the highest cost and Black patients having the lowest cost for heart failure patients receiving transplantation.

Conclusion: Racial disparities in HTs and LVADs were noted with regard to access, costs, and clinical outcomes. The topic still requires further research and highlights the need for multi-faceted approaches to provide equitable access and improved outcomes.

Keywords:

Racial Disparities, Heart Failure, Clinical Outcomes, Left Ventricular Assist Device, Heart Transplant, Cost Outcomes, Access to care

Non-standard Abbreviations and Acronyms

HF: Heart Failure

HT: Heart Transplant

LVAD: left ventricular assist device

Presentation: P-25 Submitter: Abimbola Kolawole, M-2

Abstract Title: **Evaluating Sarcoid-like Reactions in Melanoma Patients Treated with Pembrolizumab: A Systematic Review**

Authors: Kolawole, Abimbola, M-2 M.D. Candidate, Khan, Harras, M-2 M.D. Candidate, Mohamed, Fahd, M-2 M.D. Candidate, Wafiy, Jayyid, M-2 M.D. Candidate, Shah, Adiya, M-2 M.D. Candidate, Kolawole, Abimbola, M-2 M.D. Candidate

Category: Population Health Mentor: Christopher Bobier, Ph.D.

Abstract:

Background: Pembrolizumab, a PD-1 checkpoint inhibitor, has transformed the treatment of advanced melanoma and other malignancies. However, the emergence of immune-related adverse events (irAEs), particularly sarcoid-like reactions (SLRs), pose diagnostic challenges by mimicking disease progression and lack comprehensive reporting in melanoma patients treated with pembrolizumab.

Methods: We conducted a systematic review to evaluate the incidence, characteristics, and management of SLRs in melanoma patients undergoing pembrolizumab therapy. A comprehensive search of PubMed, Scopus, and CINAHL yielded 980 articles. After undergoing strict inclusion criteria, 14 studies were selected for final analysis. Data on patient demographics, SLR presentation, histopathological findings, management strategies, and outcomes were extracted and synthesized.

Results: The prevalence of SLRs in pembrolizumab-treated melanoma patients ranged from 1.5% to 1.8%, with an average onset of 7.1 months post-treatment initiation. Pulmonary involvement, including hilar and mediastinal lymphadenopathy, was the most common manifestation, followed by skin and bone granulomas. SLRs frequently mimicked metastatic disease on imaging, necessitating histological confirmation for accurate diagnosis. Management strategies varied from continued pembrolizumab therapy to corticosteroid intervention in severe cases, with most patients resolving SLR without compromising melanoma control. Emerging evidence suggests that SLRs may reflect heavy immune activation and could have prognostic significance.

Conclusions: SLRs in melanoma patients treated with pembrolizumab therapy represent a clinically significant but manageable irAE. Their ability to mimic disease progression underscores the importance of histological confirmation and vigilant pharmacologic monitoring. While mainly benign, SLRs may serve as markers of effective immunotherapy, warranting further research to shed light on their prognostic value and optimize management protocols. This review underscores the need for standardized diagnostic and therapeutic strategies to improve patient care and outcomes.

Significance: While SLRs present a nuanced clinical challenge, their recognition and appropriate management can lead to favorable outcomes. By remaining steadfast in diagnosis and treatment, clinicians can ensure that melanoma patients continue to benefit from Pembrolizumab therapy without the risk of unnecessary treatment modifications. The evolving understanding of SLRs may offer new insights into immune response dynamics, transforming these reactions from mere complications to markers of treatment efficacy.

Presentation: P-26 Submitter: Julia Kwapiszewski, M-2

Abstract Title: **ENDS Use During Pregnancy: A Meta-analysis of Adverse Birth Outcomes**

Authors: Forrest, Julia, M-2 M.D. Candidate, Heeter, Autumm, M-2 M.D. Candidate, Forrest, Julia, M-2 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Electronic nicotine delivery systems (ENDS) use during pregnancy is an emerging public health concern. Although often perceived as a safer alternative to traditional cigarette smoking, the potential effects of ENDS on fetal development and birth outcomes remain largely unknown.

Objective: To review the existing literature on pregnancy outcomes in women who use ENDS compared to non-smokers and to conduct a meta-analysis of studies that report on the risk of small for gestational age (SGA) and preterm birth.

Methods: A comprehensive search of relevant databases using a systematic review process was conducted to identify studies that examined pregnancy outcomes in ENDS users compared to non-smokers. Five studies that met specific inclusion criteria were selected for further meta-analysis. Pooled relative risk (RR) estimates (with 95% confidence intervals (CI) were calculated for SGA and preterm birth.

Results: The literature review of 18 total articles revealed a growing body of evidence suggesting associations between ENDS use during pregnancy and various adverse birth outcomes, including preterm birth and small for gestational age (SGA). The meta-analysis demonstrated a statistically significant increased risk of preterm birth as compared to the control – non-smokers (RR=1.32; CI: 1.17-1.49; $p < 0.0001$; NNT (harm) = 21). Additionally, when assessing dual use – combination of combustible and ENDS use – outcomes were consistently aligned with combustible use alone.

Conclusions: The evidence suggests that ENDS use during pregnancy is may not be a completely safe alternative to traditional cigarette smoking and quitting ENDS use during pregnancy may lead to improved birth outcomes. Additionally, these results indicate that dual use should be considered similarly with combustible-only usage when assessing risk.

Significance: Many of the articles (8/18) extracted data from the same database, leaving only a small handful of studies to be extrapolated in a meta analysis. The lack of primary research conducted on this topic emphasizes the importance of further research investigating this topic as well as an improved implementation of systems to collect data on ENDS use. Healthcare providers should counsel pregnant women about the lack of information and potential risks associated with ENDS use and encourage smoking cessation.

Presentation: Oral 2-8 Submitter: Hamdi Lababidi, M-2

Abstract Title: **Influence of Helicobacter pylori on Bariatric Surgery Outcomes**

Authors: Lababidi, Hamdi, M-2 M.D. Candidate, Pharm.D., Hoque, Asef, Other, Ghaleb, Amar, M-2 M.D. Candidate, Khan, Harras, M-2 M.D. Candidate, Mishreky, Christopher, M-4 M.D. Candidate, Wafiy, Jayyid, M-2 M.D. Candidate, Haddad, Nicholas, M.D.

Category: Population Health Mentor: Nicholas Haddad, M.D.

Abstract:

Background: Helicobacter pylori (HP) is estimated to be prevalent in up to 50% of the world population and is associated with ulcer formation, gastritis, and gastric malignancy. Despite its high prevalence, its impact on patients undergoing bariatric surgery has not been well-established, and HP management in the setting of bariatric surgery is debated.

Objective: This study aimed to assess the association between HP infection and bariatric surgery outcomes.

Methods: This retrospective study utilized 2016-2020 data from the National Inpatient Sample. Patients with a primary or secondary ICD-10 diagnosis code for bariatric surgery were included as were those with a primary ICD-10 code for ulcers. Patients aged 18 years and over were included, whereas patients with a history of HIV, pregnant women, and previous organ recipients were excluded. Individual outcomes assessed included ulcers, surgical complications, and abnormal weight loss. Adjusted multivariate analysis examined the independent association between HP diagnosis and ulcer development.

Results: A total of 442,592 patients were included. Adjusted multivariate analysis found that patients with HP had higher odds of developing ulcers (aOR = 3.832, 95% CI = 3.686-3.983). Univariate analysis found that these patients also had higher odds of surgical complications (aOR = 1.743, 95% CI = 1.536-1.977), and abnormal weight loss (aOR = 2.207, 95% CI = 1.921-2.535). The median hospital length of stay (LOS) was longer for patients with HP diagnosis (4.0 days vs. 3.0 days, $p < 0.001$). After adjusting for all other factors, HP diagnosis was the most important predictor of ulcer development.

Conclusions: HP significantly increased the risk of ulcer development, surgical complications, hospital LOS, and abnormal weight loss in patients undergoing bariatric surgery. Factors such as hospital LOS were also independently predictive of ulcer development.

Significance: This is the first study to show a significantly increased risk of surgical complications, hospital LOS, and abnormal weight loss in patients with HP undergoing bariatric surgery. These findings support the practice of detecting HP infection pre-operatively for the purpose of treating and eradicating it to potentially reduce surgical complications.

Presentation: Submitter: Ellen Lauinger, M-1

Abstract Title: **Melanocortin-4 receptor (MC4R): a potential mediator of hypertension in women with polycystic ovary syndrome (PCOS)**

Authors: Lauinger, Ellen, M-1 M.D. Candidate, Rege, Juilee, Ph.D.

Category: Population Health Mentor: Juilee Rege, Ph.D.

Abstract:

Background: Polycystic ovary syndrome (PCOS) is a common endocrine disorder affecting up to 20% of women of reproductive age. Characterized by polycystic ovaries, oligomenorrhea, and hyperandrogenism, PCOS is associated with various metabolic and cardiovascular disorders, including hypertension. Women with PCOS have a higher prevalence of hypertension compared to those without the syndrome, which increases their risk for cardiovascular disease (CVD), the leading cause of death in women. However, the mechanisms linking hyperandrogenism, hypertension, and PCOS remain unclear.

Objective: This review investigates the hypothesis that the melanocortin-4 receptor (MC4R), a key regulator of cardiovascular function in the hypothalamus, mediates the increased risk of hypertension in women with PCOS.

Methods: A systematic review was conducted to explore the association between PCOS, hypertension, and metabolic syndrome (MBS), with a focus on the role of MC4R in cardiovascular responses. Relevant studies were identified through a search of PubMed, Scopus, and Web of Science for articles published between 2004 and 2021. Studies that investigated hypertension in women with PCOS or explored the mechanisms linking androgen excess to hypertension were included. Data were extracted and synthesized qualitatively, and where applicable, quantitative data were pooled using meta-analysis to determine the strength of evidence supporting the role of MC4R in hypertension in PCOS.

Results: Studies consistently showed that androgen excess in women with PCOS is linked to CVD risk factors, including hypertension. Serum testosterone levels were positively correlated with both systolic and diastolic blood pressure in women with PCOS. Additionally, echocardiographic data suggest that women with PCOS experience diastolic dysfunction, contributing to increased mean arterial pressure (MAP). Animal models, such as the hyperandrogenemic female (HAF) rat model, confirm that excess dihydrotestosterone (DHT) leads to increased blood pressure, body weight, and insulin resistance, hallmarks of MBS. The MC4R involved in regulating energy expenditure and blood pressure has emerged as a potential mediator of hypertension in PCOS. Data suggested that MC4R activation increases sympathetic nervous system activity, leading to elevated MAP. MC4R antagonism significantly reduced MAP in HAF rats, suggesting that MC4R plays a key role in hypertension in PCOS.

Conclusion: This review highlights the increased risk of hypertension in women with PCOS is mediated by factors such as insulin resistance, obesity, and hyperandrogenism. Excess androgens are associated with elevated triglycerides, insulin resistance, and MAP, contributing to hypertension. Women with PCOS are at greater risk for masked hypertension, which may have long-term health consequences. The role of MC4R in regulating sympathetic nervous system activity and blood pressure was also explored, with evidence supporting its critical role in increased MAP in PCOS. These findings suggest that MC4R could be a promising therapeutic target for managing hypertension in women with PCOS.

Significance: PCOS and hypertension are influenced by confounding factors like insulin resistance, hyperlipidemia, obesity, and hyperandrogenism. The concept of "PCOS secondary to obesity" highlights the need for diagnostic reform, especially in adolescent girls. Further research is vital to understand the mechanisms of hypertension independent of obesity. Current treatments mainly address symptoms, not underlying causes, emphasizing the need for novel therapies.

Presentation: P-27 Submitter: Erin Mattson, M-2

Abstract Title: **Is there an Association Between PFAS Exposure and Cancer Incidence in Michigan Counties?**

Authors: Mattson, Erin, M-2 M.D. Candidate, Holek, Rylee, M-2 M.D. Candidate, Reddy, Sethu, M.D.

Category: Population Health Mentor: Sethu Reddy, M.D.

Abstract:
Background: Per- and polyfluoroalkyl substances (PFAS) are persistent environmental contaminants utilized in numerous industrial processes and consumer products. They are valued for their durability, water and oil repelling properties, and ability to withstand high temperatures. They can be found in clothing, textiles, food packaging, nonstick cookware, stain resistant furniture and carpet, outdoor performance gear, and firefighting foams. PFAS (including perfluoro-octanoic acid (PFOA) and Perfluorooctane sulfonic acid (PFOS)) have been associated with adverse health outcomes, including cancer. Seven PFAS compounds are currently regulated under the Michigan Safe drinking Water Act.

Objective: This study examines the relationship between county level PFAS levels and cancer incidence rates throughout Michigan.

Methods: PFAS sampling data for Type 1 community water supplies (2020-2024) were provided by the Michigan Department of Environment, Great Lakes, and Energy (EGLE). Publicly available, age-adjusted cancer incidence rates (per 100,000 persons) for Michigan counties (2017–2021) were sourced from the State Cancer Profiles website provided by the NIH National Cancer Institute and CDC. Geographical matching of elevated PFAS levels for Michigan's seven regulated compounds (PFNA, PFOA, PFOS, PFHxS, HFPO-DA, PFBS, PFHxA) was conducted to identify potential spatial relationships between PFAS contamination and cancer incidence for all cancer sites, childhood (>20 years), kidney and renal pelvis, prostate, liver and bile duct, pancreatic, breast, colorectal, and bladder cancers.

Results: Cancer incidence rates for all cancer types were highest in Gladwin, Kalkaska, Macomb, Ogemaw, and Bay Counties. Recent 5-year trends showed increasing incidence rates for pancreatic and breast cancer throughout Michigan and for all cancer types in Gladwin and Mason Counties. PFAS concentrations exceeding maximum contaminant levels (MCL) for PFOA, PFNA, PFHxS, and PFOS were reported in samples from 26 counties, with one sampling location in Emmett County measuring more than 5 times the MCL for both PFHxS and PFOS. Counties with elevated PFAS levels displayed variable cancer incidence rates. Preliminary analysis identified no consistent spatial patterns linking county-level PFAS contamination to cancer incidence rates.

Conclusions: Although not suggesting a direct link, additional investigations are necessary to thoroughly evaluate PFAS-associated cancer risks. Variability in cancer incidence trends may indicate potential confounding factors or limitations of data such as wide spectrum of county population densities. Our analysis was limited to community water supplies and a more comprehensive assessment of other water supplies may be relevant. Future studies may also benefit by incorporating individual exposure data, adjustments for confounding variables, and longitudinal designs.

Significance: In addressing PFAS contamination, Michigan has led through its regulatory efforts and public health initiatives. Our study attempted to explore potential links between PFAS contamination and cancer incidence rates at the county level. While no conclusive spatial patterns were identified, the findings highlight gaps in our understanding of PFAS exposure and guides future studies that include additional water supply types and contaminants. Lessons gained by this work can assist the government and industry to prevent environmental health tragedies in the future.

Presentation: P-28 Submitter: Sabriyah Mir, M-2

Abstract Title: **The Relationship Between Tobacco Use During Pregnancy and Postpartum Depression: A Retrospective Analysis**

Authors: Mir, Sabriyah, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Previous studies link tobacco use and mental health diagnoses while recent research suggests that women who smoke are significantly more likely to screen positive for depression compared with non-smokers. However, limited research exists on the impact of tobacco use during pregnancy on the development of postpartum depression (PPD).

Objective: This study examines the relationship between tobacco use during pregnancy and the likelihood of developing PPD. It was predicted that mothers who used tobacco during pregnancy were more likely to present with PPD than non-users.

Methods: A retrospective electronic medical review identified 242 participants, of whom 107 used tobacco while pregnant. Univariate analysis using chi-square and t-tests were performed in SPSS, with $p<.05$ considered significant. Tobacco use was defined as those who self-reported, had a positive maternal urine drug screen during pregnancy/at delivery, or a positive neonatal urine drug screen/cord test for cotinine. PPD was defined as those whose children's pediatric record indicated maternal diagnosis/treatment for PPD, or at least one positive Edinburgh Postnatal Depression Scale (EPDS) screen (≥10) administered at a pediatric well child visit by 12 months of age. PPD was also analyzed as a continuous variable using the highest EPDS score recorded for each mother. Race/Ethnicity was categorized as White, non-Hispanics, Blacks, and Hispanics. Due to the small sample size (n=6), individuals identifying as mixed race or other were not analyzed separately. Pre-existing mental health conditions included only diagnoses of depression and/or anxiety. Logistic regression analysis controlled for race/ethnicity, marijuana use, and pre-existing mental health conditions.

Results: Whites, non-Hispanics, marijuana users, and those with pre-existing mental health conditions were significantly more likely to have used tobacco during pregnancy. Women who used tobacco in pregnancy were 20% more likely to use marijuana in pregnancy ($t=10.47$, $p=.001$) and 16.6% more likely to have a pre-existing mental health condition ($t=6.74$, $p=.009$). Among racial groups, smoking rate were 50% for White, 35.8% for Black, and 10.4% for Hispanic women. After adjusting for significant confounders, women who used tobacco in pregnancy were only 8% more likely than those who did not to develop PPD (Adj OR=1.08, 95% CI: .60 – 1.95), a non-significant relationship. The adjusted mean difference in PPD scores between the two groups on highest EPDS score was only .3 ($t=.45$, $p=.656$).

Conclusion: While tobacco use during pregnancy did not predict PPD, it was strongly associated with pre-existing mental health conditions. The lack of significant findings suggests that PPD may differ in important ways from ongoing mental health issues. With respect to the association with smoking, this may mean that PPD is transient enough that it may not lead to "self-medication" with cigarettes, as has been found with longer-term mental health issues. Further prospective research with larger samples is needed to clarify these relationships, potentially allowing for improved screening and intervention strategies for maternal tobacco use and ongoing/transient mental health issues.

Significance: Understanding the relationship between tobacco use during pregnancy and PPD is critical for identifying potential risk factors and improving maternal mental health screening and intervention efforts.

Presentation: P-29 Submitter: Umme Aiman Mirza, M-2

Abstract Title: **An Examination of the Effects of Sleep Deprivation on Cardiovascular and Bone Health: A Systematic Review**

Authors: Mirza Umme, Aiman, M-2 M.D. Candidate, Heeter, Autumm, M-2 M.D. Candidate, Saleh, Alyaa, M-2 M.D. Candidate, Chaudhry, Zara, M-2 M.D. Candidate, Mir, Sabriyah, M-2 M.D. Candidate, Ahmed, Nabila, M-2 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Sleep deprivation is increasingly prevalent and can result from factors such as illness, aging, sleep disorders, and life circumstances. Although initial symptoms may be mild, chronic sleep deprivation adversely impacts overall health and organ function, particularly cardiovascular and bone health. Understanding these effects is essential for improving patient education, public health awareness, and guiding future clinical lifestyle interventions.

Objective: To understand the effects of sleep deprivation on cardiovascular and bone health. We hypothesized that those who suffer from sleep deprivation will experience greater adverse cardiovascular and bone health outcomes than those who do not.

Methods: A comprehensive systematic literature search was conducted electronically using PubMed, SCOPUS, and Cochrane Library. Electronic searches were restricted to English language studies published in the US between 2014 and 2024. Fourteen articles were selected for synthesis. The independent variable was sleep deprivation, and the dependent variable was cardiovascular health and bone health. Sleep deprivation was defined as less than seven hours of sleep per night.

Results: A total of 14 studies were included in this analysis. In terms of bone health, the studies we analyzed demonstrated that sleep deprivation led to increased bone resorption through increased serum markers and decreased areal bone mineral density specifically at the total hip and femoral neck region. In terms of cardiovascular health, the studies we reviewed demonstrated that sleep deprivation led to increased risk of hypertension, congestive heart failure, and myocardial infarction. Individuals who were sleep deprived also showed higher rates of cardiovascular disease events compared to those who were not.

Conclusions: Sleep deprivation increases the risk of cardiovascular disease and decreases bone health. Extensive research shows a clear association between poor sleep and an enhanced risk of hypertension. Additionally, irregular sleep patterns have been shown to induce vascular inflammation and remodeling. Sleep deprivation has been shown to reduce bone turnover, causing a reduction in bone growth and remodeling.

Significance: This study highlights the public health implications of chronic sleep deprivation, emphasizing the need for early interventions to prevent downstream consequences and reduce overall comorbidity. Increasing awareness of the impact of poor sleep on cardiovascular and bone health is crucial for patient education and public health strategies.

Presentation: P-30 Submitter: Adil Mohammed, M.D., Resident

Abstract Title: **GLOBAL POOLED META-ANALYSIS OF COGNITIVE IMPAIRMENT AND SUBGROUP VARIATION IN ELDERLY HEART FAILURE PATIENTS**

Authors: Mohammed, Adil, Resident M.D., Al-Sabbagh, Ihsan, M.D., Ghantasala, Paritharsh, M.D., Chaudhry Saad, M.D.

Category: Population Health Mentor: Saad Chaudhry, M.D.

Abstract:

Background

Cognitive impairment (CI) is a prevalent yet underdiagnosed comorbidity in elderly heart failure (HF) patients, significantly affecting disease management, treatment adherence, and prognosis. The relationship between HF and CI involves cerebral hypoperfusion, neuroinflammation, and vascular dysfunction. Despite its clinical importance, comprehensive global data quantifying CI prevalence and its variations among elderly HF patients remain limited.

Objective

This study estimates the global pooled prevalence of CI in elderly HF patients through a systematic meta-analysis while identifying variations based on demographics, geographic regions, and study characteristics. By quantifying these differences, we aim to highlight potential risk factors and inform clinical guidelines for screening and management.

Methods

A systematic search across PubMed, Embase, and Web of Science identified studies reporting CI prevalence in HF patients aged 65 and older. Observational studies using validated CI assessment tools were included. Data extraction focused on sample size, mean age, gender distribution, geographic region, and CI prevalence. The pooled prevalence was calculated using the double arcsine (Freeman-Tukey) transformation, followed by a random-effects model. Subgroup analyses examined variations by geographic region, age group, and study methodology. Statistical heterogeneity was assessed using I^2 statistics, with values above 50% indicating substantial variation. Sensitivity analysis was conducted by excluding individual studies to test the robustness of the pooled estimate.

Results

A total of 26 studies, including 13,457 elderly HF patients (mean age 80.25 ± 5.81 years, 51.58% female), met the inclusion criteria. Among them, 4,357 had CI, yielding a pooled prevalence of 43.8% [35.9%-51.6%]. Sensitivity analysis confirmed the stability of the estimate. Significant heterogeneity was detected, warranting subgroup analyses. Regionally, CI prevalence was highest in the USA (48.9% [35.9%-61.8%]), followed by Asia (46.5% [37.8%-55.2%]), and lowest in Europe (36.6% [23.9%-49.4%]). Prevalence increased with age, from 38.0% [27.9%-48.0%] in those aged 70-79 years to 48.7% [40.1%-57.3%] in those 80 and older. All subgroup comparisons were statistically significant ($p < 0.05$).

Conclusion

This meta-analysis reveals a high global prevalence (43.8%) of CI in elderly HF patients, with substantial regional and age-related variations. The increasing prevalence among those aged 80+ years highlights the need for early cognitive screening. The higher prevalence in the USA suggests the influence of genetic, environmental, and healthcare factors, warranting further investigation. Given CI's impact on HF management and outcomes, targeted screening and intervention strategies are necessary.

Significance

This study provides the most comprehensive pooled estimate of CI prevalence in elderly HF patients, emphasizing the urgent need for routine cognitive screening. Recognizing regional and demographic variations can inform healthcare policies and tailored management strategies. Given the rising burden of HF and dementia, integrating cognitive assessments into HF care can improve treatment adherence, quality of life, and patient outcomes. Future research should explore the mechanistic links between HF and CI and potential interventions to mitigate cognitive decline.

Presentation: P-31 Submitter: Devin Neumann, M-2

Abstract Title: **Maternal Mental Health Conditions as a Predictor of Child Atopic Disease**

Authors: Neumann, Devin, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: Rates of atopic diseases continue to rise, representing a significant health and economic burden. Atopy, a predisposition to hypersensitivity reactions, manifests as asthma, atopic dermatitis, allergic rhinitis, and food allergies, and is often diagnosed during childhood. Recent research suggests a possible link between maternal mental health conditions during pregnancy and child atopy. However, few studies in this field have controlled for potentially confounding maternal and child variables, which may offer additional insight into this relationship.

Objective: The goal of this study was to examine whether specific maternal mental health conditions during pregnancy predict childhood atopic disease.

Methods: Data was obtained from a prospective cohort study. The study sample for this report contained 226 maternal-child dyads who also completed the follow-up assessment at child age 15 months. Women were recruited at entry into prenatal care and administered multiple in-person assessments, including validated surveys and biological testing. During the late first/early second trimester of pregnancy, women completed the Center for Epidemiologic Studies Depression Scale (CESD-10), with a score of 10+ considered positive for depression. Women also completed the Prenatal Psychosocial Profile (PPP), which included 11 pregnancy stress items answered on a four-point scale. A total score of 23+ was positive for high stress. The primary outcome was child atopic disease by age 15 months, including asthma, atopic dermatitis, allergic rhinitis, and food allergies. At 15 months, mothers were asked if they had ever been told by a healthcare provider that their child had asthma or allergies. Children were considered positive for each if the mother answered in the affirmative.

Results: Of the 226 mothers in this sample, 125 were positive for depression, and 48 positive for high stress, at the initial pregnancy assessment at an average of 14 weeks gestation (range 6 weeks to 20 weeks). Of the 226 children sampled, 44 (19.6%) had allergies, and 23 (10.2%) had asthma. Women who experienced depression in pregnancy were more than 2.5 times more likely to have a child with allergies by age 15 months than women without depression (AdjOR=2.58 (1.20-5.54)). However, depression during pregnancy did not predict development of asthma in children (AdjOR=.77 (.33-1.95)). Similarly, women who experienced high levels of stress were more than twice as likely to have a child with allergies than women with lower stress levels (AdjOR =2.28 (1.07-5.03)). Pregnancy stress did not significantly predict asthma (AdjOR=1.12 (.46-3.17)).

Conclusions: In this study, maternal depression and high stress during pregnancy predicted all childhood atopic diseases except for asthma. We controlled for several potential confounding and mediating factors in this relationship, including gestational substance exposure, child second-hand smoke exposure, and exposure to other children. Thus, there may be an independent - likely physiologic - effect of depression and stress during pregnancy on fetal development.

Significance: The current study underscores the need to identify and treat mental health issues in pregnancy to reduce risks to both mom and baby. Using this evidence-based approach, physicians can better address maternal mental health conditions and childhood atopic disease, leading to improved health and well-being.

Presentation: P-32 Submitter: Jason Odisho, M-2

Abstract Title: **Maternal Diabetes as a Risk Factor for Retinopathy of Prematurity: A Systematic Review**

Authors: Odisho, Jason, M-2 M.D. Candidate, Fiore, Michael, M-2 M.D. Candidate, Ruge, Matthew, M-2 M.D. Candidate, Shehu, Angela, M-2 M.D. Candidate, West, Benjamin, M-3 M.D. Candidate, Shuman, Caimin, M-2 M.D. Candidate, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:
BACKGROUND:
Retinopathy of prematurity (ROP) is a sight-threatening disorder in preterm infants and a major cause of childhood blindness worldwide. It results from abnormal retinal vascular development, influenced by neonatal and maternal factors. While neonatal risk factors such as low birth weight and oxygen therapy are well-documented, the impact of maternal diabetes, including gestational, type 1, and type 2, remains unclear due to inconsistent findings in the literature.
OBJECTIVES:
This systematic review evaluates the relationship between maternal diabetes and ROP incidence in preterm infants. Specifically, it aims to:

- Assess whether maternal diabetes increases ROP risk.
- Determine if different types of maternal diabetes (gestational, type 1, or type 2) have distinct effects on ROP incidence.
- Identify gaps in the literature and suggest future research directions.

METHODS:
A comprehensive search of PubMed, CINAHL, Cochrane, and Scopus identified studies published between 2000 and 2025 examining maternal diabetes as a predictor of ROP. Of 961 initially retrieved articles, 9 met inclusion criteria. Eligible studies assessed maternal diabetes in relation to ROP incidence, while those focusing solely on non-maternal risk factors were excluded. Data extraction included study design, maternal diabetes classification, and reported associations with ROP outcomes.
RESULTS:
Four studies reported a significant association between maternal diabetes and increased ROP incidence. One study found gestational diabetes mellitus (GDM) was linked to treatment-requiring ROP, stage 3 ROP, and zone I/II disease ($p < 0.05$), while pregestational diabetes mellitus (DM) was associated only with stage 3 ROP ($p = 0.031$). Another study's multivariate analysis showed infants of diabetic mothers had 3.5 times higher odds of severe ROP than those of non-diabetic mothers (OR: 3.47 [95% CI: 1.51–7.96]; $p < 0.01$).
However, five studies found no significant difference in ROP rates. One study noted that after adjusting for confounders such as gestational age and birth weight, maternal diabetes was not independently associated with ROP risk. Another study found that while maternal diabetes is a risk factor for very-preterm birth, it does not appear to contribute significantly to ROP in high-resource settings.
CONCLUSIONS:
The relationship between maternal diabetes and ROP remains uncertain, with mixed findings across studies. Some suggest an increased risk, while others find no significant association after adjusting for key confounders. This could be partly due to a lack of differentiation between diabetes types. Further research is needed, particularly well-controlled studies distinguishing between types of maternal diabetes and the role of glycemic control in pregnancy.
SIGNIFICANCE:
Clarifying the link between maternal diabetes and ROP could improve perinatal care strategies and preventive measures for preterm infants. Well-designed studies that account for diabetes subtypes and glycemic control during pregnancy may help refine risk assessment and inform clinical guidelines.

Presentation: P-33 Submitter: Megan O'Mara, M-2

Abstract Title: **Navigating Asthma in Pregnancy: Barriers, Disparities, and Management Strategies**

Authors: O'Mara, Megan, M-2 M.D. Candidate, Bishop, Rachel, M-2 M.D. Candidate, Aguilar, Natalie, M-2 M.D. Candidate, Navalpakam, Aishwarya, M.D.,

Category: Population Health Mentor: Aishwarya Navalpakam, M.D.

Abstract:

Background: Asthma is the most prevalent chronic condition in pregnancy, affecting 8-9% of pregnancies, a rise from 5.5% since 2001. In pregnancy, asthma is associated with increased risk of maternal and perinatal complications including low birth weight, pre-eclampsia, preterm delivery, and neonatal intensive care unit (NICU) admissions, however, several barriers exist to optimal maternal asthma management. In this literature review, we examine the multifaceted relationship between asthma and pregnancy and discuss the challenges and opportunities in the management of asthma during pregnancy.

Methods: A comprehensive search of relevant literature was performed using the PubMed database. Selected peer-reviewed journal articles published in English, from January 2010 - December 2023, were identified. The data was categorized into the following themes: barriers to asthma management during pregnancy, socioeconomic disparities of expectant mothers with asthma, and the effects of asthma on lactation.

Results: The barriers to optimal care of pregnant women with asthma include lack of patient education, poor self-management skills, concerns around medication safety, healthcare provider competence and hesitancy, and healthcare disparities including race, gender, and SES considerations. There is a pressing need for evidence-based information on the safety of asthma medications during pregnancy and lactation, the impact of health care disparities on asthma during pregnancy, provider education on asthma management, and self-management skills.

Conclusion: Effective management of asthma is critical before and during pregnancy to reduce the increased risk of exacerbations. Addressing barriers such as medication non-adherence, patient education, provider hesitancy and competency, and social determinants of health is crucial to improve maternal health and pregnancy outcomes. While research exists on the impact of asthma on pregnancy outcomes, there is a need for further evidence of the safety of medications during pregnancy and their impact on lactation, which will enhance provider education on asthma management and empower patients to self-manage their asthma.

Presentation: P-34 Submitter: Manas Peddiboyina, M-1

Abstract Title: **Trends and Factors Associated with Oral Nicotine Pouch (ONP) Usage among Adolescents between 2022 and 2023**

Authors: Peddiboyina, Manas, M-1 M.D. Candidate, Hoque, Asef, Other, Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:
Trends and Factors Associated with Oral Nicotine Pouch (ONP) Usage among Adolescents between 2022 and 2023
Background
Nicotine consumption during adolescence can adversely impact brain development and serve as a predisposing factor to drug use. While traditional cigarette use amongst adolescents has declined, alternative nicotine products, particularly e-cigarettes, have gained popularity amongst this vulnerable demographic. However, recent regulatory measures targeting e-cigarettes, especially flavored products, have created a market opportunity for new alternative nicotine products. Among these, oral nicotine pouches (ONPs), have rapidly gained popularity.
Objective
The objective of this study was to analyze trends in ONP awareness and usage patterns among U.S. adolescents between 2022 and 2023. Specifically, we sought to quantify changes in ONP prevalence, assess shifts in usage patterns (current and lifetime), and evaluate factors associated with ONP use.
Methods
This study analyzed data from the 2022 and 2023 National Youth Tobacco Survey (NYTS), a cross-sectional, nationally representative survey of U.S. middle and high school students. Prevalence estimates, 95% confidence intervals, and estimated population counts for nicotine pouch ever use and current use were calculated. Chi-square tests were utilized to compare the differences between the years 2022 and 2023. Additionally, logistic regression models were used to analyze factors associated with ONP use. All analyses were performed using RStudio, and $p < 0.05$ was considered significant.
Results
The National Youth Tobacco Survey (NYTS) analyzed a sample of 28,291 participants in 2022 and 22,069 participants in 2023. There was an increase in the percentage of current nicotine pouch users who had previously used other tobacco products, from 3.5% in 2022 to 5.1% in 2023 ($p = 0.032$). Current e-cigarette use was associated with both current nicotine pouch use (OR = 5.14, 95% CI = 1.96 – 13.44) and ever use of nicotine pouches (OR = 3.94, 95% CI = 1.55 – 9.97) in 2023. Males demonstrated higher odds of current ONP usage in both 2022 (OR = 2.54, 95% CI = 1.14 – 5.70) and 2023 (OR = 3.10, 95% CI = 1.39 – 6.9). Notably, there was an increase in the use of flavored nicotine pouches among ONP users, from 53.6% in 2022 to 90.0% in 2023 ($p < 0.001$).
Conclusion
This study identifies an upward trend in Oral Nicotine Pouch (ONP) use among U.S. adolescents from 2022 to 2023, with a notable rise in flavored product consumption. E-cigarette use strongly predicted ONP use, and males showed higher odds of usage. These trends suggest ONPs may be filling the gap left by regulations targeting other nicotine products, potentially indicating a substitution effect. Study limitations include the inability to assess long-term usage patterns and the underlying reasons behind the shift to ONPs.
Significance
These findings offer insights that could aid the development of future health policies and public health interventions tailored to this population. Policymakers can implement stricter regulations on flavored Oral Nicotine Pouches (ONPs), develop male-specific interventions, and update nicotine usage screening practices in clinics by placing an emphasis on Oral Nicotine Pouch usage.

Presentation: P-35 Submitter: Kennedi Price, M-1

Abstract Title: **Incidence of lower back pain in adolescent weightlifters: a systematic review**

Authors: Price, Kennedi, M-2 M.D. Candidate, B.S., Fiore, Michael, M-2 M.D. Candidate, B.S., Bienkowski, Kasandra, M-2 M.D. Candidate, B.S., Dooley, McKenna, M-2 M.D. Candidate, B.S., Jackson, Matthew, M-2 M.D. Candidate, B.S., Iyer, Sathwik, M-2 M.D. Candidate, B.S., Matta, Wael, M-2 M.D. Candidate, B.S., Bleicher, Zachary, M-2 M.D. Candidate, B.S.

Category: Population Health Mentor: Christopher Bobier, Ph.D.

Abstract:

Background: Lower back pain (LBP) is a common concern among adolescent athletes, particularly in weightlifting, where improper training techniques may contribute to injury. Despite the increasing participation of adolescents in weightlifting, limited research has explored the incidence and prevalence of LBP in this population compared to non-weightlifting adolescents.

Objective: This systematic review aims to evaluate the current literature on LBP among adolescent weightlifters, identify gaps in research, and assess whether weightlifting contributes to a higher incidence of LBP compared to non-weightlifting adolescents.

Methods: A systematic search was conducted using Cochrane, CINAHL Plus, PubMed, Scopus, and SPORTDiscus databases for peer-reviewed studies published after 2001. Inclusion criteria focused on studies examining LBP localized to the lumbar spine (L1-L5) in adolescents aged 10–19 who participated in weightlifting, with comparisons to non-weightlifters. Exclusion criteria included non-peer-reviewed studies, studies with alternative sources of back pain, and those lacking a comparative analysis. PRISMA guidelines were followed for study selection and evaluation.

Results: The initial search yielded 1,701 studies, with 805 remaining after duplicate removal. After screening titles and abstracts, 793 studies were excluded. Full-text analysis of 12 remaining studies determined that none met the inclusion criteria, resulting in an empty review. Studies commonly lacked a direct comparison to non-weightlifting adolescents, or did not specifically assess LBP as a variable.

Conclusions: This systematic review highlights a significant gap in the literature regarding the incidence of LBP in adolescent weightlifters compared to non-weightlifters. While previous studies suggest that weightlifting may contribute to LBP, the lack of comparative studies prevents definitive conclusions. Further research is needed to investigate the relationship between adolescent weightlifting and LBP, incorporating well-designed cohort studies that compare weightlifting and non-weightlifting populations.

Significance: The absence of relevant studies underscores the need for future research to inform safer training practices for adolescent athletes. Understanding the impact of weightlifting on spinal health is crucial for coaches, parents, and healthcare providers to minimize injury risks and optimize training regimens.

Presentation: P-36 Submitter: Allison Rakowski, M-2

Abstract Title: **Seasonal Variation in Maternal Vitamin D Levels on Neonatal Outcomes: A Systematic Review**

Authors: Rakowski, Allison, M-2 M.D. Candidate, B.S., Augilar, Natalie, M-2 M.D. Candidate, B.S., Ellias, Sara, M-2 M.D. Candidate, B.S., Schafer, Morgan, M-2 M.D. Candidate, B.S., Bailey, Beth, Ph.D.

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:

Background: The timing of pregnancy within the calendar year can profoundly impact neonatal outcomes due to seasonal fluctuations in environmental and biological factors. Emerging evidence suggests that inadequate vitamin D levels in pregnant mothers may adversely affect fetal development, pregnancy outcomes, and maternal health. Despite the inclusion of vitamin D in prenatal supplements, deficiencies remain prevalent among pregnant women. Understanding this relationship is essential for developing targeted interventions to improve maternal and child health worldwide.

Objective: This systematic review aimed to analyze current research to examine the relationship between seasonal variation in maternal vitamin D levels and, potentially adverse, neonatal outcomes.

Methods: A systematic search was conducted across four databases –PubMed (n=1,092), CINAHL Plus with Full Text (EBSCO) (n = 392), Cochrane Library (n = 150), and SCOPUS (n = 1,612). After abstract review, 39 articles investigating seasonal variation in maternal vitamin D levels with associated neonatal outcomes were initially selected. Following a full-text review, 11 articles met the inclusion criteria.

Results: This systematic review found strong evidence of seasonal variation in maternal vitamin D levels, with most included studies reporting a high prevalence of vitamin D deficiency. However, the relationship between maternal vitamin D status and select neonatal outcomes including small for gestational age (SGA), preterm birth, and low birth weight were inconsistent. While eight studies confirmed significant seasonal variation in maternal vitamin D levels, only five of the articles demonstrated a statistically significant association between maternal vitamin D levels and various neonatal outcomes. Among these, preterm birth showed the most consistent correlations, while only two studies linked vitamin D deficiency to low birth weight. No significant associations were found for birth length or head circumference. These discrepancies may be attributed to external factors such as limited supplementation, cultural norms, maternal demographics, and variability in study methodologies, including design, sample size, and definitions of vitamin D deficiency.

Conclusion: The results of this systematic review confirm that maternal vitamin D levels vary seasonally, with consistent peaks in the summer and declines in the winter. However, the relationship between maternal vitamin D status and neonatal outcomes was found to be more complex. These varying results are likely influenced by factors such as geographic location, cultural practices, dietary intake, healthcare access, and public health policies. Despite recommendations for prenatal vitamin D supplementation during pregnancy, deficiency remains prevalent due to inconsistent adherence, inadequate guidelines, and regional disparities. These findings highlight the need for enhanced public health initiatives, including routine vitamin D monitoring, improved supplementation awareness, food fortification, and targeted interventions for at-risk populations.

Significance: Further research is necessary to determine the most effective vitamin D supplementation strategies, including optimal dosage, timing, and duration, to prevent deficiency and improve maternal and neonatal outcomes. Addressing vitamin D deficiency through comprehensive clinical and public health measures could help reduce neonatal complications and enhance health outcomes. Large-scale longitudinal studies are needed to clarify the role of vitamin D in preventing adverse pregnancy outcomes and providing evidence-based policy recommendations.

Presentation: P-37 Submitter: Lydia Sadlowski, M-3

Abstract Title: **Bridging Generations Through Music and Games: Assessing the Impact of Intergenerational Engagement on Loneliness and Social Connection**

Authors: Sadlowski, Lydia, M-3 M.D. Candidate, Megremis, Alexander, M-4 M.D. Candidate, Knapp, Kevin, M-3 M.D. Candidate, DeLapp, Sarah, M-3 M.D. Candidate

Category: Population Health Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:
Bridging Generations Through Music and Games: Assessing the Impact of Intergenerational Engagement on Loneliness and Social Connection
Authors: Lydia Sadlowski, Alexander Megremis, Kevin Knapp, Sarah DeLapp, Jyotsna Pandey MD/PhD
Abstract Category: Population Health
Advisor/Mentor: Jyotsna Pandey MD/PhD
Background:
Social isolation affects one in four adults aged 65 and older, increasing dementia risk by 50% (Consensus Study Report, 2020). A 2024 University of Michigan poll of 2,657 adults found that 75% experienced stress relief through music, 73% found joy, 65% noted mood improvement, and 60% reported increased energy. International published studies highlight the role of music and games in fostering intergenerational connections, potentially improving social and cognitive well-being in older adults.
Objective:
Project INCLUDE, a grant-funded initiative, aimed to reduce loneliness among older adults in independent and assisted living facilities in Michigan. mINCLUDE, a satellite project, focused on intergenerational engagement through music and game-based interventions in central Michigan. This study hypothesized that these interactions would enhance engagement, reduce loneliness, improve quality of life and decrease comorbidity index within generations.
Methods:
Older adults (OA) aged ≥65 years and younger adults (YA) aged 18–45 years were recruited from local aging services and Central Michigan University. YA participants provided at least three live music performances, each 30–45 minutes long, followed by a Q&A session. OA attended at least three performances over five months. Pre- and post-intervention surveys, including the Pittinsky-Allophilia Scale, assessed attitudes, engagement, and music/games-related perceptions. Post-Interviews were conducted of OA through a ten reflective question interaction for qualitative analysis. Qualtrics-based Likert scale data were analyzed using ordinal regression.
Results:
OA data showed a borderline effect on overall engagement ($p = 0.071$), with a significant threshold shift ($p = 0.040$), suggesting modest engagement improvements. YA data showed no significant changes ($p = 0.417$). Attitudes toward the other age group improved significantly ($p = 0.0449$ for OA, $p = 0.0063$ for YA). Comfort and connection remained unchanged ($p > 0.23$), indicating deeper engagement may require additional strategies. Slight increases in OA engagement ($p \approx 0.079$) and trends toward significance in music enjoyment and social impact ($p \approx 0.095$) suggest potential benefits.
Qualitative Insights:
Participants highlighted music's emotional significance, with OA stating, "Music helps me deal with loneliness," and "I missed singing—this program gave me the chance again." However, limited structured conversation hindered deeper connection, with suggestions for guided discussions to enhance intergenerational engagement.
Conclusions:
This pilot study explored a music-based intergenerational intervention's impact on attitudes, engagement, and social connection between young and older adults. Attitudes improved, particularly among older adults, though changes in comfort and engagement were less pronounced. Qualitative responses highlighted music's role in fostering connection, rekindling memories, and reducing loneliness. Participants noted limited prior intergenerational interactions and expressed a desire for more structured conversations.
Significance:
With the growing aging population in the U.S., reducing isolation and loneliness among older adults is increasingly important. Music/games-based interventions provide meaningful intergenerational interaction,

potentially improving quality of life. Integrating guided discussions or storytelling may further enhance engagement and strengthen intergenerational bonds.

Presentation: P-38 Submitter: Aya Sameer, M-2

Abstract Title: **A Systematic Review of Maternal Bulimia: Physical Impacts on Maternal Pregnancy Outcomes**

Authors: Sameer, Aya, M-2 M.D. Candidate, Sameer, Aya, M-2 M.D. Candidate, Khalil, marwa, M-2 M.D. Candidate, Shehu, Angela, M-2 M.D. Candidate, Deban, Christa, M-2 M.D. Candidate

Category: Population Health Mentor: Neli Ragina, Ph.D.

Abstract:

Background: Maternal bulimia nervosa (BN) has been linked to adverse maternal pregnancy outcomes, including preeclampsia, gestational hypertension, gestational diabetes, induced abortion and miscarriages. However, inconsistencies across studies highlight variations in methodologies and population sizes, making a systematic evaluation essential. This review consolidates existing evidence on the impact of maternal BN on pregnancy outcomes, highlighting associated risks and research gaps to inform future studies and management strategies.

Methods: A systematic review of literature published in English within the last 20 years (2004-2024) was conducted. Articles were pulled using a specified search from PubMed, Cochrane Library, Scopus, and PsycINFO databases. This yielded a total of 1042 articles with duplicates initially removed from the dataset using EndNote. The remaining 805 articles were uploaded to the website, Rayyan, for screening. More duplicates were removed using Rayyan's de-duplication tool, which left 559 articles to screen based on the inclusion and exclusion criteria that we created using PRISMA guidelines. Data was collected on pregnancy, delivery, and neonatal outcomes for pregnant women with BN compared to pregnant women with no eating disorders.

Results: Thirteen articles were included in the final review including nine population-based prospective cohort studies, two retrospective cohort studies, one retrospective case-control study, and one register-based cohort study. The studies were conducted in multiple regions ranging from the Netherlands, Sweden, Denmark, Norway, Finland, USA, and the UK (Great Britain). Studies found a statistically significant increase in the likelihood of preeclampsia (95% CI, $p < 0.05$), gestational hypertension (95% CI, $p < 0.05$), gestational diabetes ($p < 0.014$), two or more miscarriages (95% CI, $p < 0.001$), and induced abortion (95% CI, $p < 0.05$) among women with BN compared to those without BN.

Conclusion: This review highlights the risk that BN poses to maternal health during pregnancy, emphasizing the intricate interplay of physiological factors that contribute to negative pregnancy outcomes. While the data across studies varied, the overarching conclusion emphasizes the need of early monitoring intervention to mitigate these potential risks. Future research is essential to further explain the physical and psychosocial mechanisms underlying the adverse effects linked to maternal BN. Specifically, more extensive studies are needed to explore how purging behaviors, nutritional deficiencies, and hormonal imbalances interact to affect maternal health. Additionally, developing effective management strategies to address stress-reduction, nutritional support, and proactive interventions could help to optimize health outcomes for affected mothers.

Significance: Given the complexity of BN's impact on pregnancy, it is crucial for healthcare providers to closely monitor pregnant women with BN and implement individualized care plans that address the specific risks associated with the disorder. This approach will ultimately result in a healthier pregnancy for the mother.

Presentation: Submitter: Angela Sasaki Cole, M-2

Abstract Title: **Educational Interventions and Implementation to Decrease Vaccine Hesitancy in Minority Populations**

Authors: Sasaki Cole, Angela, M-2 M.D. Candidate, Shetiah, Nadine, Other, Mir, Sabriyah, M-2 M.D. Candidate, Pruitt, Delicia, M.D.,

Category: Population Health Mentor: Neli Ragina, Ph.D.

Abstract:

Background: The rapid development of COVID-19 vaccines, concerns over side effects, and debates about efficacy have fueled perceptions of vaccine safety issues. Some individuals believe vaccination is unnecessary if they are in good health, relying on their immune system, or perceive COVID-19 as a low-risk illness. As of May 2023, 81.4% of the U.S. population received at least one vaccine dose, but only 69.5% completed the primary series, with booster rates even lower.1

Vaccine hesitancy arises from various factors, including educational, socioeconomic, religious, and cultural influences. For minority populations, vaccine hesitancy may be due to historical distrust of vaccines and the U.S. healthcare system.

Objective: The goal of this project is to create two educational interventions in the form of a video and an infographic to be incorporated into a survey. This survey will determine their efficacy in improving vaccine hesitancy among the Native American, African American, and Arab American populations.

Methods: This project builds on Takagi et al. (2024), which aimed to improve vaccine acceptance among Native Americans through educational interventions.2 Content was updated via consultation with an infectious disease expert for accuracy. The educational video was filmed, edited, and paired with a matching infographic. Background research assessed vaccine hesitancy and its potential causes within the target populations. The interventions were integrated into a Qualtrics survey, with consent forms created. Community centers and religious organizations, including the Islamic Center of East Lansing and the Black Elk Building of the Saginaw Chippewa Indian Tribe, were approached for project approval. The project was submitted for IRB approval.

Results: The educational interventions underwent several updates. The Johnson & Johnson vaccine was removed, and information on the Novavax vaccine was added. Explanations on how vaccines prepare the immune system were simplified using colloquial language, and newly discovered side effects were included, along with their prevalence. Risks of COVID-19 to pregnant women and their fetuses were highlighted, along with the importance of vaccination for this group. Updates also included details on Long COVID, booster vaccination guidelines, and debunking myths about vaccines altering DNA. These changes were incorporated into the refilmed video and infographic. The interventions were integrated into a Qualtrics survey to assess their effectiveness in reducing vaccine hesitancy, building on prior success with Native American populations. At this time, approval has been received from the Islamic Center of East Lansing to conduct the survey at their facility.

Conclusions: Educational interventions have proven effective in improving vaccine knowledge and acceptance among minority populations. Key challenges in this research included obtaining facility permissions, as past healthcare and research mistreatment has led to heightened scrutiny and lengthy IRB evaluations. Internal IRB approval required adjustments for updated anonymity standards. Additionally, investigators faced technical challenges in learning Adobe Premiere Pro 2024 to edit the educational video.

Next steps include administering the survey, collecting and analyzing data, and disseminating findings.

Significance: This study will provide valuable insights into the efficacy of educational interventions in vaccine hesitancy for target populations.

Presentation: P-39 Submitter: Varun Vadnala, M-4

Abstract Title: **Current Status of Robotic-Assisted Abdominal Surgery; A Literature Review**

Authors: Vadnala, Varun, M-4 M.D. Candidate, Shaear, Mohammad, Resident M.D., Ghanem, Maher, M.D.

Category: Population Health Mentor: Maher Ghanem, M.D.

Abstract:

BACKGROUND: The field of surgery has progressed immensely in the past several decades. Advancements have improved patient outcomes across the board. It is estimated that over 300 million procedures are performed every year worldwide. Surgeons are continually looking for ways to improve technique and learn new skills. This commitment to innovation has evolved the field from primarily open procedures to laparoscopy to robotic-assisted surgery (RAS). With the evolution of minimally invasive surgery (MIS) comes the need for further research into outcomes and complications.

OBJECTIVE: The objective of this paper is to review the existing literature on the current status of robotic-assisted abdominal surgery while examining the advantages and disadvantages of the robotic approach.

METHODS: The authors conducted a detailed search using PubMed and Scopus to aid in this search, focusing on articles discussing robotic abdominal surgery. The search criteria included the MeSH terms: (overview*[tiab] OR history[tiab]) AND ("Robotics"[Mesh] OR robot*[ti]) AND ("Robotic Surgical Procedures"[Mesh] OR "Digestive System Surgical Procedures"[Mesh] OR "Abdomen/surgery"[Mesh] OR surg*[ti]) AND ("Abdomen"[Mesh] OR "Abdominal Muscles"[Mesh] OR "Digestive System"[Mesh] OR "Gastrointestinal Tract"[Mesh] OR abdom*[ti]).

RESULTS: The review resulted in an initial six articles, that led to an additional twenty-eight articles utilizing reference lists of these articles. Existing studies examining robotic-assisted pancreatic surgery have demonstrated reduced intraoperative blood loss, lower conversion rate to open, and a reduced risk of splenectomy compared to laparoscopic pancreatic surgery. A retrospective cohort study using Medicare claims data found that there were significantly higher rates of bile duct injury with the robot compared to laparoscopy as well as postoperative interventions (0.4% vs 0.2%; RR, 1.88 [95% CI, 1.14-2.63]). Several studies have shown no clinical significance in robotic approaches for rectal prolapse or ventral hernia repairs as far as reducing postoperative complications. Large, controlled trials have shown evidence of fewer conversions to open (6% vs. 11.5%) and fewer postoperative complications for robotic colon procedures. Multiple studies have demonstrated a decreased length of stay for HPB procedures like the Whipple and distal Pancreatectomy. A randomized control study examining hernia repairs found no clinical significance in postoperative pain or quality of life and found robotic hernia repairs have a longer duration of procedure of 76 compared to 41 minutes.

CONCLUSIONS: There seems to be a lack of sufficient evidence that robotic-assisted surgery significantly improves surgical outcomes because of the dearth of quality studies that have been performed. Robotic platforms offer many benefits including increased degrees of freedom, 3D views, and enhanced maneuverability. This has allowed surgeons to implement robotic approaches to common abdominal procedures. A common theme amongst existing studies and research is the lack of quality evidence on the clinical significance of robotic-assisted surgery over laparoscopic on patient outcomes, particularly for the existing costs.

CLINICAL SIGNIFICANCE: The evidence that is currently available is mixed and varies based on the type of procedure. Perhaps with further robotic experience, surgeons can improve outcomes.

Presentation: P-40 Submitter: Elsa Varughese, M-2

Abstract Title: **Risk Factor Scoring System for Postpartum Depression: A Proactive Approach to Identification and Prevention**

Authors: Varughese, Elsa, M-2 M.D. Candidate, Van De Burg, Jaimie, M-2 M.D. Candidate, Varughese, Elsa, M-2 M.D. Candidate, Bailey, Beth, Ph.D., Droke Katlyn, M-4 M.D. Candidate, Kwapiszewski, Julia, M-2 M.D. Candidate, Dyer, Newman, M-4 M.D. Candidate

Category: Population Health Mentor: Beth Bailey, Ph.D.

Abstract:
Background:
While there has been considerable focus and ongoing evolution in diagnosing peripartum depression, research on its prediction and prevention lags significantly behind, resulting in a dearth of available studies in comparison. Thus, a proactive approach is warranted for birthing individuals at high risk of developing Post Partum Depression (PPD). Evidence has shown high efficacy of utilizing scoring systems to identify people who are at risk for a negative health outcome(s) and may indicate when intervention might be needed prior to escalation of the condition. These systems save time and money and may lead to improved outcomes through more timely interventions. Undiagnosed or untreated PPD can have detrimental effects on family dynamics and compromise the mother's ability to provide effective newborn care. A comprehensive literature review on PPD presented strong correlations with social determinants of health and pre-existing conditions identifiable in the antenatal period that could identify those at increased risk of PPD. Identification of those at increased risk may lead to more effective preparatory counseling, increased patient education on PPD, and decreased time to treatment in those affected.
Objective:
The goal of this research project is to develop and validate a novel screening tool that will allow clinicians to better predict the risk of developing postpartum depression (PPD) in birthing individuals to improve maternal health outcomes.
Methods
A literature review using well-established criteria from the ACOG and published clinical guidelines was conducted to determine risk factors previously linked with the development of PPD. The risk factors identified from the literature review were quantified based on their occurrence in various literary publications. Subsequently, a data collection sheet was created using information about the selected risk factors. A retrospective chart review was performed and data collected on birthing persons between the ages of 15 and 45, who carried a baby to at least 24 weeks gestational age. The patient population was drawn from a university affiliated pediatric practice in the Midwestern U.S., which assesses mothers for PPD at well child visits up to age 12 months. Bivariate and multivariate analyses will be used, along with factor analysis, ROC analysis, and reliability analysis.
Results
Of the mothers evaluated, preliminary results from multivariate and bivariate analyses in three categories yielded the following significant predictors for those with high EPDS score (>9): within social determinants of health, "former smoker" ($p = 0.024$), among pregnancy complications, a diagnosis of gestational diabetes ($p = 0.026$), and for previous mental health concerns, history of PPD ($p = 0.005$).
Conclusions
In the preliminary analyses, within three categories, former smoking status, gestational diabetes, and a history of PPD emerged as key risk factors associated with the development of PPD. These findings highlight the need for targeted interventions for these high-risk groups to improve maternal mental health outcomes.
Significance
By quantifying these factors prior to the postpartum period, healthcare providers can assess individuals at risk for developing PPD and offer intervention(s) or guidance that may prevent or mitigate PPD.

Presentation: Oral 1A-1 Submitter: Yamna Waseem, M.D., Resident

Abstract Title: **Impact of Obstructive Sleep Apnea on Maternal Mortality Outcomes during pregnancy: A NIS database analysis**

Authors: Waseem, Yamna, Resident M.D., Singh, Herchran, Resident D.O., Shepherd, Alexa, M.D.

Category: Population Health Mentor: Alexa Shepherd, M.D.

Abstract:
Introduction:
Obstructive sleep apnea (OSA) is a sleep disorder associated with cardiovascular and metabolic issues like hypertension, coronary artery disease, and insulin resistance.[1] The prevalence of OSA has risen alongside the obesity epidemic, however, research on its health implications is limited, especially in high-risk populations, such as pregnant individuals. Previous studies have highlighted worse maternal outcomes with OSA, including associations with preeclampsia, eclampsia, and gestational diabetes.[2,3] Yet, studies trending maternal morbidity associated with OSA with more recent data are lacking. This study aims to provide updated insights into the relationship between OSA and maternal morbidity, addressing gaps in the literature, and informing clinical decisions.
Methods:
This retrospective analysis used the National Inpatient Sample from 2018 to 2020, which represents U.S. pregnancy-related hospital admissions. Demographics, socioeconomic factors, hospital characteristics, and clinical comorbidities were considered. Pregnancy-related hospitalizations were identified and patients were categorized based on the presence or absence of OSA using ICD-10 codes. Maternal outcomes included eclampsia, pre-eclampsia, postpartum hemorrhage, gestational diabetes, gestational hypertension, cesarean section, length of stay, and inflation-adjusted hospital charges.
Results:
The study involved 1,112,285 pregnancy-related hospital admissions, including 815 (0.07%) cases of OSA. Women with OSA were older (mean age 32 vs. 28 years), more likely to be Black (27% vs. 15%), and had a higher prevalence of comorbidities like obesity (55% vs. 6.5%), COPD (25% vs. 4.4%), and hypertension (6.7% vs. 0.2%). OSA was more common among
those at urban teaching hospitals (88% vs. 73%).
Univariable analysis showed that patients with OSA had significantly worse maternal outcomes ($p < 0.001$). They had a longer median hospital stay (3 days vs. 2 days) and higher median total hospital charges ($22,995 vs. $15,858). OSA patients experienced higher rates of eclampsia/pre-eclampsia (13% vs. 2.2%), postpartum hemorrhage (9.2% vs. 3.1%), gestational diabetes (11% vs. 3.3%), gestational hypertension (11% vs. 2.9%), and cesarean sections (38% vs. 15%).
Multivariable regression analysis adjusted for demographic, clinical, and hospital factors and confirmed that OSA was independently linked to a longer hospital stay (adjusted β= 1.3 days; 95% CI: 0.41–2.2; $p = 0.004$) and higher charges (adjusted β= $7,727; 95% CI: $1,425–$14,029; $p = 0.016$). Additionally, the adjusted odds ratio for eclampsia/pre-eclampsia was 2.45 (95% CI: 1.44–4.15; $p < 0.001$), indicating a more than twofold increased risk. However, other outcomes, such as postpartum hemorrhage, gestational diabetes, gestational hypertension, and cesarean section, did not remain statistically significant after adjusting for the additional factors.
Conclusion:
This study demonstrates that OSA is linked to adverse maternal outcomes of longer hospital stay, higher costs, and increased risk of pre-eclampsia/eclampsia, even when controlling for other factors. Patients with OSA made up only 0.07% of our data set, suggesting an underdiagnosis in pregnant patients despite its rising national prevalence. Thus, further research on diagnosing and managing OSA in pregnancy is necessary.

Presentation: P-41 Submitter: Spencer Williams, M-2

Abstract Title: **Shouldering the Cost: A First Look at Insurance and Arthroplasty Outcomes**

Authors: Williams, Spencer, M-2 M.D. Candidate, B.S., Byrne, John, M-2 M.D. Candidate, B.A., Other

Category: Population Health Mentor: Michael Wolohan, M.D.

Abstract:
Introduction:
Shoulder Arthroplasty (SA) remains the gold standard for shoulder osteoarthritis. Recovery from SA is challenging with risks of postoperative complications. SA outcomes have been previously reported via a broad spectrum of modalities and measures. Available literature is fractured and not easily interpreted in the aggregate. Furthermore, evaluation of SA outcomes based on insurance status is often relegated as a secondary investigation. The insurance status of an SA patient is taken as a shorthand predictor of their socioeconomic status, ability, and nature of injury and therefore is an important area of study for improving surgical recovery. This review summarizes current reporting on the variety of postoperative SA outcomes associated with patient insurance status.
Methods:
PubMed, Scopus and Web of Science were systematically searched for articles that covered patient-reported outcomes of SA stratified by insurance status. Articles were screened via PRISMA guidelines and included if inclusion criteria were met. SA was defined as all versions of the procedure (i.e., TSA, SHA, RTSA), but does not include proximal humeral fracture without joint replacement. Articles that performed combined payor analysis or had a study population that was not solely postoperative SA patients were excluded. Studies that directly examined the relationship between at least one postoperative outcome of SA and insurance status were included. Studies with a patient population composed entirely of one insurance type were excluded. Scoping review protocol adapted from the Becker Medical Library was followed.
Results:
A total of 38 articles were included across 12 categorical domains based on reported outcomes. Established patient-reported outcome measures (PROMs) such as ASES (11 articles), Pain VAS (6), and SST (7) were commonly used. Other miscellaneous PROMs were reported in ten articles. Score reporting was mixed among PROMs and insurance types, with a common theme of worse outcomes for Medicaid and workers' compensation patients. However, 15 studies reported no significant difference in SA outcomes on the basis of insurance status.
Objective measures were also reported. Examination of surgical revision (8 articles), overall complication rate (5), and postoperative blood transfusions (4) revealed fewer negative outcomes for patients with private insurance. Conflicting results (either no significant differences or differing findings between populations) were reported in articles that looked at infection risk (5 articles), range of motion (7), discharge location (4), and other outcomes (2).
Readmissions were evaluated in nine articles, with conflicting results in reported 90-day readmission rates. Two articles found no difference between insurance populations, while two found a significant increase in readmission for Medicaid and Medicare patients.
Conclusion:
Inconsistent associations between SA outcomes and patient insurance status are reported. Heterogeneity in outcome measures and study design, and lack of inclusion of insurance status as a demographic of interest, further complicate analysis. Quality of reported evidence must be considered before drawing conclusions, due to contradictory reported findings. Greater specificity of insurance type in the initial analysis would yield stronger identification of trends and relationships in outcomes. Further systematic review and meta-analysis of specific outcomes in the context of insurance status is prudent.

Presentation: Submitter: Batool AlQanber, M.D., Resident

Abstract Title: **Barriers of adequate treatment of iron deficiency anemia in pediatric patients in underserved community clinics**

Authors: AlQanber, Batool, Resident M.D., AlQanber, Batool, Resident M.D., Komuravelli, myna, Resident M.D., Gaudani, Ankit, Resident M.D., Quingalahua, Alvarado Elit, Resident M.D., Billings, Kenghia, M.D., Chu, Roland, M.D.

Category: Quality Improvement/Medical Education Mentor: Roland Chu, M.D.

Abstract:
Background: Iron deficiency anemia (IDA) is the most common nutritional deficiency in children under two, primarily due to inadequate dietary iron intake and excessive cow's milk consumption. The American Academy of Pediatrics (AAP) defines anemia in toddlers as a hemoglobin (Hb) level below 11.0 g/dL. Standard screening is recommended at 9 and 18 months of age. While term infants have sufficient iron stores for the first four months, exclusively breastfed infants require iron supplementation (1 mg/kg/day) from four months until iron-rich foods are introduced. Formula-fed infants typically meet their iron needs through an iron-fortified formula and complementary foods introduced between 4–6 months. Early recognition and proper management of IDA are essential for the prevention of serious complications.
Objectives: • Determine the prevalence of IDA in the outpatient pediatric population.
• Assess provider adherence to AAP guidelines for IDA screening and management.
• Identify barriers to appropriate IDA treatment.
• Evaluate the effectiveness of the treatment provided.
Methods: A retrospective chart review was conducted for children under two years old seen in outpatient clinics between January 1, 2024, and December 30, 2024, including well-child visits (9- and 18-month checkups) and acute care visits.
Findings: Among 573 patients screened, compliance with AAP-recommended screening at 9 and 18 months was 95%. However, reliance on a Hb threshold of 10.0 g/dL for diagnosing IDA led to underdiagnosis and inadequate follow-up for patients with Hb levels between 10–11 g/dL. A total of 18 patients (3.1%) had Hb ≤10 g/dL, while 64 patients (11.2%) had Hb levels between 10–11 g/dL, bringing the actual prevalence of IDA to 14.3%. Despite this, only 42 patients (51%) had a documented IDA diagnosis, and 50% had a complete blood count (CBC) and iron studies ordered. Iron supplementation was initiated in 14 patients (17%) only, contributing to significant undertreatment, with less than 5% of diagnosed patients having a documented follow-up. These findings highlight critical gaps in diagnosis, treatment initiation, and monitoring, underscoring the need for improved adherence to screening and management guidelines.
Intervention: In January 2025, clinic-wide interventions were implemented to enhance IDA management (scan the QR code for details):
• Clinical Flowchart: A step-by-step guide for IDA diagnosis, management, documentation, and follow-up.
• Patient Education: A standardized, easy-to-understand handout on iron-rich diets to support counseling.
• Documentation Improvement: A smart phrase for IDA counseling, dietary guidance, and supplementation to streamline provider documentation.
• Provider Reminders: Monthly reports and alerts to reinforce compliance with screening and management protocols.
Conclusions: IDA remains highly prevalent in infants and toddlers, requiring early identification and appropriate management to prevent undesirable consequences, including developmental delays, impaired cognitive function, and sleep disturbances. Effective care includes risk stratification, routine screening, dietary counseling, treatment with appropriate dosing of ferrous sulfate, and close monitoring of treatment efficacy. This project aims not only to improve IDA management among providers but also to advocate for increased resources to support prevention efforts in underserved communities, including expanded access to state nutritional support programs for pediatric patients.

Presentation: Q/M-1 Submitter: Gabriela Andrzejewska, M-2

Abstract Title: **Changes in Participant Mood in Strength and Balance Improving Exercises**

Authors: Andrzejewska, Gabriela, M-2 M.D. Candidate, Holek, Rylee, M-2 M.D. Candidate, Dooley, McKenna, M-2 M.D. Candidate, Wolbert, Payton, M-3 M.D. Candidate, King, Krista, M-3 M.D. Candidate, Phillips, Justice, Other, Pandey, Jyotsna, M.D., Ph.D.

Category: Quality Improvement/Medical Education Mentor: Jyotsna Pandey, M.D., Ph.D.

Abstract:

Background: The Otago Exercise Program is an evidence-based intervention designed to improve strength and balance among older adults. Despite its proven benefits, the program faces challenges with participant retention, as some lose interest or drop out over time. To address this issue, a study was performed by adding bingo into the program schedule to enhance overall mood while increasing program appeal and adherence.

Objective: To determine ways to make the Otago Exercise Program more enticing to older adults to encourage participation and increase general health for fall prevention.

Methods: Participants were invited to participate in the program through local Commissions on Aging, assisted living facilities, and community centers. Before the program started, participants completed a modified, anonymous Profile of Mood States (POMS) inventory to assess a baseline of total mood disturbance. During each class, bingo was played every two exercises on a weekly basis. After participating in at least six sessions, participants were invited to voluntarily complete another POMS inventory to assess any changes in mood. The program continued on a weekly basis after data collection.

Results: There were 41 participants who completed the initial survey and 29 who completed the second survey. The incorporation of bingo into the program yielded notable improvements in participant engagement and overall mood. Many participants expressed greater enjoyment of the program, with several indicating a desire to invite friends and family to future sessions, which shows the potential to enhance intergenerational relationships. Upon examining the responses, there was an overall increase in the following feelings: friendly, considerate, relaxed, cheerful, trusting, helpful, clear-headed, active, sympathetic, efficient, carefree, full of pep. There was also an overall decrease in the following feelings: uncertain about things, forgetful, confused, fatigued, sad, shaky, uneasy, weary, annoyed, discouraged, restless, sluggish, exhausted, peeved, hopeless, muddled, gloomy, deceived, bewildered, furious, resentful, miserable, grouchy.

Conclusions: The integration of bingo into the Otago Exercise Program represents a novel approach to addressing participant retention and enhancing overall mood among the elderly population. Based on previous research, motivating older adults in participation in exercises is a challenge. So, this research aims to create a more enjoyable and motivating environment for participants to continue participation. Future research should explore long-term effects and optimize the balance between exercise and recreation to enhance adherence and well-being.

Significance: Integrating elements of fun and social connection into exercise programs can significantly enhance the quality of life for older adults. This is important to reduce social isolation and physical decline associated with aging. In addition to this, providing participants with access to emotional support services can further enhance overall mental and emotional health.

Presentation: Submitter: Carmen Avramut, M.D., Resident

Abstract Title: **Bridging Theory and Practice: A Simulation Curriculum to Improve Psychiatry Residents' Clinical Preparedness**

Authors: Avramut, Carmen, Resident M.D., Memon, Marvi, Resident M.D., Kershaw, Kelsey, Resident M.D., Sanchez Salcedo, Jisselly, M.D.

Category: Quality Improvement/Medical Education Mentor: Jisselly Sanchez Salcedo, M.D.

Abstract:

BACKGROUND: The CMU College of Medicine Institute for Medical Simulation includes the Covenant HealthCare Simulation Center in Saginaw, Michigan as well as the university's campus in Mount Pleasant, Michigan. Simulation-Based Education (SBE) is utilized in medical training across many specialties, and within the last two years, the CMU College of Medicine Adult Psychiatry Program has begun consistently incorporating this method of clinical education into its didactic curriculum.
OBJECTIVE: By integrating standardized patient encounters and high-fidelity case scenarios, this updated curriculum aims to improve residents' clinical decision-making, communication, and crisis management abilities, ultimately enhancing patient care and reducing resident anxiety in real-world settings. As SBE values a holistic approach to learning and emphasizes reflective learning, it allows for residents to practice emotional awareness, cognitive reframing, and co-construction of knowledge in a safe environment.
METHODS: To best support long-term retention and implementation of learning objectives, Psychiatry SIM days have been designed to flow into the curriculum longitudinally each academic year. Thus, SIM days are held at the beginning, middle, and end of each academic year purposefully to best support residents as they progress and build confidence in their respective years of training. Following the completion of the simulated cases, lectures have been implemented to review goals and objectives of each case in addition to debriefs. More so, this model allows for resident physicians to implement what they've learned from SIM into their practice without overloading them. Before participating in the simulation curriculum, psychiatry residents of all training levels (PGY-1 to PGY-4) completed a pre-survey via Qualtrics, assessing their perceived preparedness in applying fundamental psychiatric principles and managing complex clinical scenarios. After completion of the 2-year curriculum, the survey will be re-administered to highlight residents' progression as well as further tailor the curriculum to areas where additional clinical exposure may be warranted.
RESULTS: Pre-Survey: Administered 11/9/23
Residents felt most comfortable managing: behavioral emergencies in general, acute agitation, acute mania, acute psychosis, extrapyramidal symptoms (EPS) and writing a mental status exam. Most were somewhat comfortable managing actively suicidal patients and de-escalating situations utilizing verbal techniques. Areas of intermediate comfort included: practicing psychopharmacology and psychotherapy. Less comfortable areas included recognizing and managing: Neuroleptic Malignant Syndrome and Serotonin Syndrome.
In terms of DSM-V diagnoses, residents felt most confident in Schizophrenia, Bipolar Disorder, Depressive and Anxiety disorders, trauma disorders, obsessive-compulsive disorder, personality disorders, substance abuse disorders and medication-induced movement disorders. In contrast, areas of least comfort included: neurodevelopmental disorders, feeding and eating disorders, elimination disorders, sleep-wake disorders, sexual dysfunctions, conduct disorders, neurocognitive disorders, paraphilic disorders, dissociative disorders, and somatic symptom and related disorders.
For basic forensic training, residents felt most comfortable determining capacity, the civil (involuntary) commitment process, evaluating for suicide and violence risk, and the duty to warn. They felt less comfortable in the disability assessment, the psychiatric forensic interview, and medicolegal documentation.
Rating scales which most residents lacked confidence in: The Conners Comprehensive Behavior Rating Scale (ADHD), Geriatric Depression Scale, Children's Depression Inventory, Eating Disorder Inventory, and Social Phobia Scale (SPS).
Post-Survey: Administered 4/10/25

Presentation: Q/M-2 Submitter: Rachel Bishop, M-2

Abstract Title: **Surveying Occupational Medicine Physicians on Worker Health and Extreme Heat**

Authors: Bishop, Rachel, M-2 M.D. Candidate, B.S., Barnard, Payge, M-4 M.D. Candidate, B.S., Foug, Katie, M-4 M.D. Candidate, B.S., Rosenman, Kenneth, M.D.

Category: Quality Improvement/Medical Education Mentor: Kenneth Rosenman, M.D.

Abstract:

Background: Climate change is one of the largest threats to global health, contributing to increasing average global temperatures and extreme weather events that directly and indirectly affect all populations. Workers are a particularly vulnerable population due to increased exposure to the detrimental effects of climate change including heat, respiratory irritants, and vector borne illnesses. As the effects of climate change become more severe, Occupational and Environmental Medicine (OEM) practitioners are uniquely situated to identify and prevent climate-related health outcomes in this susceptible population. Ensuring access to proper education and resources about climate health for these practitioners is essential for protecting worker health.

Objective: To understand the current attitudes about climate change and current use of climate-related medical practices—particularly those related to heat-illness—of OEM practitioners; to identify barriers to implementing climate-conscious medical practices; and to identify the types of climate-related resources desired by OEM practitioners.

Methods: A multiple choice, self-administered electronic survey was distributed to registered members of Michigan's Occupational and Environmental Medicine Association via email for voluntary participation in the survey. Responses were collected via Qualtrics and statistical analysis was completed.

Results: Most respondents strongly agree (53%, n=17) or agree (28%, n=9) that climate change is relevant to occupational health and most (56%, n=18) felt that health care providers have a responsibility to discuss climate change and its relation to health with their patients. However, 67% (n=16) of respondents cited a lack of relevance to their specific patients as a reason they do not discuss climate change with their patients with an additional 21% (n=5) claiming a lack of knowledge as a barrier. Resources identified as most useful for addressing climate-related health issues were continued medical education (CME) courses (37%, n=19) and patient education materials (31%, n=16).

Conclusions: This study suggests that despite concerns about climate change and its effects on health, OEM practitioners face barriers to implementing climate-conscious practices. As the health effects of climate change worsen, providing OEM practitioners with the skills and knowledge needed to mitigate poor health outcomes will become essential.

Significance: This study has recognized a gap in the implementation of climate-conscious practices and identified practices that would best help practitioners address climate related health issues.

Presentation: Q/M-3 Submitter: Catherine Crow, M-2

Abstract Title: **Improving Picky Eating Counseling by Residents in a Continuity Clinic using Interactive Educational Tools**

Authors: Crow, Catherine, M-2 M.D. Candidate, Grinstead, Emmy, Resident M.D., Buckley, Caroline, Resident M.D., Nguyen, Mai, Resident D.O., Park, Jessica, M-2 M.D. Candidate, Hillard, Miranda, M.D.

Category: Quality Improvement/Medical Education Mentor: Emmy Grinstead, Resident M.D.

Abstract:

Background: Picky eating is a common concern addressed at pediatrician visits. It is important that pediatric residents learn the various types of picky eating and intervention methods. In the Academic Graduate Pediatric (AGP) Clinic, picky eating is a frequent concern in well child visits. However, there are no guidelines within the AGP Clinic on addressing these parental concerns and providing guidance for increasing food exploration.

Objective: The aim of this study is to evaluate the effectiveness of the ChopChop Eatable Alphabet cards in guiding pediatric residents address parents' concerns regarding picky eating.

Methods: The study includes residents working at AGP Clinic and parent(s) of pediatric patients. Pediatric residents receive education on the basics of picky eating interventions. Residents complete a pre-survey identifying their personal comfort in counseling families about picky eating and their interest in using a tool to help guide these conversations. Patients and their families are recruited at AGP Clinic once families identify a concern for picky eating. Pediatric residents then educate and provide parent(s) with the picky eating tool (ChopChop Eatable Alphabet cards). Parent(s) then complete a survey about the resident's ability to address their concerns and the perceived helpfulness of the picky eating tool. At the conclusion of the visit, residents complete a survey about the helpfulness of the tool.

Results: Initial survey data indicates that while most pediatric residents feel somewhat comfortable discussing picky eating (19), a notable proportion remains neutral (7) or uncomfortable (2). Similarly, while 18 residents report consistently addressing parental concerns, 11 remain neutral. Comfort levels in nutrition counseling were mixed, with 16 disagreeing with discomfort but 11 were neutral. Most residents were neutral (13) or somewhat disagreed (10) on their ability to educate patients without a tool. 61% of residents indicated that a structured tool would be useful for guiding conversations. Parent feedback was overwhelmingly positive, with 8 of 9 believing the tool would help their child eat more fruit and vegetables, and all parents (9) reporting that their concerns were addressed.

Conclusions: Based on resident responses, there is room for improvement in residents' comfort in discussing picky eating with families and in nutrition counseling. Most residents think that a tool to help guide conversations about picky eating would be helpful. Once introduced to the ChopChop Eatable Alphabet cards, most parents felt this tool would be helpful in getting their children to eat more diverse foods. Every parent who received the Eatable Alphabet cards and information on how to use the cards reported that the resident fully addressed their concerns.

Significance: Although picky eating is a very common concern at a pediatric clinic, many residents feel unprepared in addressing it. The ChopChop Eatable Alphabet cards provide a structured approach to these conversations, potentially improving both resident confidence and parent engagement. Early findings suggest that residents recognize the need for guidance and parents find the tool valuable in promoting healthier eating habits. Implementing such resources in clinical practice could enhance nutrition counseling and support effective communication between healthcare providers and families.

Presentation: Q/M-4 Submitter: Rachel Fletcher, M-2

Abstract Title: **Medical Students' Perceptions of Artificial Intelligence Use in Medical Practice: A Systematic Review**

Authors: Fletcher, Rachel, M-2 M.D. Candidate, Borgman, Garrett, M-2 M.D. Candidate, Seyidov, Tim, M-2 M.D. Candidate, Van De Burg, Jaimie, M-2 M.D. Candidate, Varughese, Elsa, M-2 M.D. Candidate, Bobier, Christopher, Ph.D.

Category: Quality Improvement/Medical Education Mentor: Christopher Bobier, Ph.D.

Abstract:

Background: Artificial intelligence (AI) is rapidly transforming the medical field, including diagnostics, workflow, and treatment. Despite its possible benefits, medical students hold varied perceptions regarding AI's role in clinical practice, raising concerns about its integration into medical education. Our systematic review investigates these perceptions to determine themes and barriers to AI adoption.

Objective: This study aims to evaluate medical students' perspectives on AI in medicine, focusing on its impact on job security, specialty selection, and medical education.

Methods: A systematic review was conducted using four electronic databases—PubMed, CINAHL, ERIC, and Scopus—resulting in 3,693 articles. After removing duplicates and applying inclusion criteria, 11 articles were selected for analysis. Studies were assessed based on their opinions, evidence quality, and discussion of ethical considerations using a 6-point scoring system. Data extraction focused on AI-related perceptions, specialty choices, and suggestions for improving curriculum.

Results: This review showed mixed perceptions among medical students. While many expressed concerns about job security and AI's role in replacing tasks traditionally performed by physicians, especially in the field of radiology, others highlighted AI's ability to enhance diagnostic accuracy, streamline workflows, and even reduce burnout. Students emphasized the need for structured AI education, since the most current exposure comes from media rather than formal instruction. There were also major ethical concerns, such as bias in AI algorithms, and the need for clear accountability frameworks.

Conclusions: AI in medicine appears to encourage both optimism and apprehension among medical students. While students recognize its potential, the looming issue of job displacement and insufficient education on AI in the field persist. Incorporating AI-focused curricula in medical schools could address these issues, helping future physicians to work alongside AI systems effectively.

Significance: Physicians, as healthcare providers, play a crucial role in leading discussions on AI's use in medicine. Enabling them to take on this leadership role is becoming a critical point of focus. Structured AI education in medical curricula is essential to prepare future physicians to navigate AI integration and ensure they can lead these important conversations effectively. Future research should focus on developing AI training for medical students.

Presentation: Q/M-5 Submitter: Autumm Heeter, M-2

Abstract Title: **Perceptions of Medical Students of the Cadaver as a First Patient or Teacher**

Authors: Heeter, Autumm, M-2 M.D. Candidate, Luckett, Brittany, Other, Chaudhuri, Joydeep, M.D.

Category: Quality Improvement/Medical Education Mentor: Joydeep Chaudhuri, M.D.

Abstract:

Background: Compassion, empathy, and respect for future patients are fundamental to medical education and critical components of anatomy training. Students report viewing cadavers as the ultimate teachers, as learning from them is a gift achieved without clinical skills. However, viewing cadavers as their first patient fosters their transition to a clinician by encouraging maturity and understanding cadaver privacy. There are limited empirical studies that have examined these contrasting perceptions.

Objective: The aim of this study was to determine if medical students were more comfortable with the student-teacher association rather than assuming a clinician role early in their education.

Methods: Medical students (n=30) across two cohorts were surveyed following completion of an elective dissection course between the first and second years in the curriculum. Students rated their perceptions of the cadaver using a Likert-scale from 0-10 (e.g., 0 = “Doctor”, 10 = “Teacher”). Mean values and standard deviations were calculated for questionnaire items. Space for optional comments was available for each item.

Results: Overall, students considered cadavers to be teachers rather than patients (7.54±1.28). Specifically, they felt that during this stage of their training the student-teacher association was more approachable (7.97±0.95), enhanced the formation of a relationship with the cadaver (7.33±1.47), and encouraged the development of compassion and empathy for future patients (7.33±1.27).

Conclusions: Medical students’ perceptions of the cadaver could set the tone for future patient care. Students expressed challenges in thinking like a “doctor” with a cadaver, stating that their goal was to learn in this setting. Despite this trend, some also commented that both associations were equally important and either option would instill respect and empathy. Hence, anatomy faculty should highlight the role of the cadaver as a teacher during the medical curriculum as this significantly impacts the professional development of students.

Significance: This study highlights the impact of framing cadavers as teachers in anatomy education and provides insight into how this perspective influences students' professional development, fostering empathy and respect for future patient care.

Presentation: Q/M-6 Submitter: Tejas Kakunje, M-1

Abstract Title: **Sleep Smarter: Innovative Screening for Obstructive Sleep Apnea with Apple Watches**

Authors: Kakunje, Tejas, M-1 M.D. Candidate, Srour, Hayat, Graduate Student, Gaskill, Lauren, Graduate Student, Other, Naik, Nidhi, Graduate Student, Renirie, Rebecca, Other, Armstead, Teresa, Other

Category: Quality Improvement/Medical Education Mentor: Ahmad Hakemi, M.D.

Abstract:

Background
Obstructive Sleep Apnea (OSA) is a prevalent sleep disorder associated with serious health risks, including cardiovascular disease, diabetes, and increased mortality. Despite the availability of effective treatments such as continuous positive airway pressure (CPAP) therapy, screening for OSA remains a challenge due to its often subtle symptoms. As a result, approximately 80% of individuals with OSA remain undiagnosed, underscoring a significant gap in screening efforts. Wearable devices, particularly the Apple Watch, offer a promising alternative for early detection due to their widespread use and seamless integration into daily life.
Objective
This study aims to evaluate the effectiveness of wearable technology, specifically the Apple Watch, in screening for OSA. By analyzing existing literature on wearable-based screening methods, the study seeks to determine the feasibility, accuracy, and potential clinical applications of these devices.
Methods
A systematic literature search was conducted across multiple databases, resulting in 93 studies. Studies were assessed for relevance and included if they evaluated sleep apnea screening tools for efficacy and/or referenced the Apple Watch or similar technology. Given the limited number of studies focusing explicitly on the Apple Watch, existing systematic reviews were also considered. After applying inclusion and exclusion criteria, four studies were selected for detailed analysis.
Results
Findings indicate that heart rate monitoring, as demonstrated in a study by Ballinger et al. (2018), achieved a c-statistic of 0.83 for sleep apnea detection using machine learning. Han et al. (2024) validated smartphone-based ambient sound recording for apnea-hypopnea index (AHI) estimation, showing a strong correlation ($r = 0.958$) with standard home sleep apnea tests. However, these methodologies have limitations, including potential confounding factors such as beta-blocker usage and restricted population samples, which may affect the generalizability of their findings. The most robust evidence comes from Apple Inc.'s proprietary accelerometry-based algorithm, which analyzed data from 4,702 participants and was clinically validated in a cohort of 1,448 individuals. This approach achieved a sensitivity of 66.3% and specificity of 98.5%, with a specificity of 100% for individuals classified as normal.
Conclusions
The Apple Watch presents a significant advancement in OSA screening by offering a practical, scalable solution for early detection. Its non-invasive and accessible screening capabilities have the potential to reduce the burden of undiagnosed OSA. However, effective integration into clinical workflows requires physician education to ensure accurate interpretation of wearable device data, appropriate patient referrals, and optimal utilization of these tools in diagnosis and management.
Significance
The Apple Watch has demonstrated clinical validity for OSA screening and offers a scalable approach to addressing screening barriers. Given the severe comorbidities associated with OSA, improving early detection through wearable technology can enhance patient outcomes and streamline clinical decision-making.

Presentation: Oral 2-6 Submitter: Bhakthi Liyanage, M-2

Abstract Title: **A Comparative Study of Large Language Models' Performance on Standardized Medical Examinations**

Authors: Liyanage, Bhakthi Nimesha, M-2 M.D. Candidate, Obeid, John, M-2 M.D. Candidate, Andrzejewska, Gabriela, M-2 M.D. Candidate, Hoque, Asef, Other, Reddy, Sethu, M.D., Satti, Srinivasa, M.D.

Category: Quality Improvement/Medical Education Mentor: Sethu Reddy, M.D.

Abstract:

Background: The integration of artificial intelligence (AI) into medical education represents a transformative shift in learning and assessment. This study evaluates the performance of six large language models (LLMs)—Microsoft Copilot, ChatGPT (GPT-4, GPT-4-Turbo, GPT-3.5-Turbo-0125), Claude (Claude-3-Sonnet, Claude-3-Opus, Claude-3.5-Sonnet), Gemini (1.5-Flash), and Perplexity (Mixtral-8x7b-Instruct, Mistral-7b-Instruct, Llama-3-70b-Instruct, Llama-3-8b-Instruct)—on USMLE Step 1 multiple-choice questions.

Methods: Two trials were conducted: an unprompted trial simulating autonomous test-taking and a prompted trial providing contextual guidance. Automated data collection was used for most models with an API access, while Microsoft Copilot responses were manually gathered, as no API access was available. Accuracy was calculated by comparing LLM responses to an exam key, and qualitative assessments of explanation quality, conciseness, and supporting evidence were conducted using a 5-point Likert scale. Descriptive statistics highlighted performance trends, offering insights into the potential of LLMs in medical education.

Results: In the unprompted trial, Microsoft Copilot achieved the highest accuracy (86.32%), followed by ChatGPT-4 (85.26%) and Claude-3-Opus (78.90%).. Tailored prompts improved six models, with Microsoft Copilot scoring 94.47% in the second trial, while ChatGPT-4 Turbo showed the largest improvement ($p < 0.001$, paired t-test). Qualitative evaluations highlighted ChatGPT-4 Turbo for comprehensive responses, Claude-3-Sonnet for conciseness, and Claude-3.5-Sonnet for well-referenced answers. These findings demonstrate the unique strengths of individual models in delivering accurate, clear, and well-supported information while emphasizing the impact of tailored prompting on performance. Further analysis will explore their practical applications in education and standardized exam preparation.

Conclusion: This study highlights substantial variability in LLM performance on USMLE Step 1 practice questions, with Microsoft Copilot and ChatGPT-4 emerging as top performers in accuracy and explanation quality. Tailored prompts significantly enhanced certain models, such as ChatGPT-4 Turbo, while others, like Claude models, declined. These findings underscore the potential of LLMs as supplementary tools for medical education, particularly for self-assessment and study support. This underscores the need for tailored optimization and careful model selection to maximize LLM effectiveness in medical education, providing valuable insights into their potential to support first- and second-year medical students in board examination preparation.

Significance: With evidence-based recommendations for integrating LLMs into medical curricula, focusing on areas for refinement to enhance their effectiveness in both educational and clinical applications. As medical education continues to evolve in the digital age, understanding the role of AI technologies will be essential for developing effective pedagogical strategies and improving student outcomes.

Presentation: Q/M-7 Submitter: Bhakthi Liyanage, M-2

Abstract Title: **Enhancing Crisis Preparedness for Rural Dispersed Older Adults: A Focus Group Analysis of the CMU-CARES Crisis Toolkit**

Authors: Liyanage, Bhakthi Nimesha, M-2 M.D. Candidate, Mohamed, Fahd, M-2 M.D. Candidate, Holek, Rylee, M-2 M.D. Candidate, Pandey, Jyotsna, M.D.

Category: Quality Improvement/Medical Education Mentor: Jyotsna Pandey, M.D.

Abstract:

Background: Rural dispersed older adults (RDOAs) face unique challenges in crisis situations, including financial limitations, social isolation, and limited technological literacy. These barriers can significantly hinder their ability to access critical resources for safety and survival during emergencies. In response, the Central Michigan University Crisis Avoidance for Rural Elderly Stakeholders (CMU-CARES) program developed a crisis toolkit designed to address the specific needs of RDOAs. To refine this toolkit and ensure its practical application, focus groups were conducted to gather direct feedback from older adults living in rural communities.

Methods: Nine RDOA participants from Isabella, Clare, and Gratiot counties in Michigan were recruited through local meal programs and senior centers. Each participant attended one of three facilitated focus groups to review the draft toolkit and discuss its relevance and usability. Feedback was collected across key emergency preparedness themes, including isolation and interpersonal relationships, impact and concern for others, lifestyle requirements, medical needs, technological literacy, community involvement, hobbies and recreation, mood and well-being, and information gathering. Additionally, the necessity of physical emergency preparedness items was evaluated. Participants rated the utility of each toolkit component on a scale from 0 (not useful) to 10 (very useful). Based on their feedback, a final streamlined version of the toolkit was developed and distributed for further evaluation.

Results: Participant responses revealed varying levels of perceived usefulness across the toolkit's themes. The most valued toolkit components included establishing secondary methods of communication and transportation, outlining evacuation plans with loved ones, and addressing medical needs and medication management. Conversely, the least useful components, as perceived by participants, included online safety check-ins, additional services for evacuation assistance, and volunteering during crises.

Conclusions and Future Directions: Findings from these focus groups emphasized the critical need for personalized emergency planning tailored to rural older adults and their caregivers. Participant feedback directly informed the development of a streamlined crisis toolkit, incorporating concise resources, fill-in sheets, and clear, actionable instructions. Moving forward, the next phase of this project will focus on distribution and real-world evaluation of the refined toolkit, assessing its long-term effectiveness in improving emergency preparedness and response among RDOAs. This study underscores the necessity of tailored, accessible crisis preparedness resources for older adults in rural communities, ultimately working toward enhancing safety, resilience, and autonomy in times of crisis.

Presentation: Q/M-8 Submitter: Alexia Lucas, M-2

Abstract Title: **The Impact of Longitudinal Community Service on Medical Students' Attitudes and Preparedness to Care for Individuals with Disabilities**

Authors: Lucas, Alexia, M-3 M.D. Candidate, O'Keefe, Riley, M-3 M.D. Candidate, Cascio, Ariel, Ph.D., Yonder, Sarah, M.D.

Category: Quality Improvement/Medical Education Mentor: Neli Ragina, Ph.D.

Abstract:

Background:
People with disabilities are less likely to receive primary and preventative healthcare, often resulting in poorer health outcomes and increased susceptibility to a variety of medical conditions. Research suggests that personal interactions with people with disabilities during medical training leads to more inclusive attitudes among medical professionals, thus improving the quality of care individuals with disabilities receive and breaking down barriers to care that these populations face. However, little to no data exists regarding the impact of longitudinal service-learning experiences on medical students' attitudes toward individuals with disabilities.
Objective:
This study examines the effects of a year-long community service project (CSP), where medical students engaged with individuals with intellectual disabilities (ID) and developmental disabilities (DD), on their attitudes and beliefs about individuals with disabilities. We hypothesize that sustained, meaningful engagement fosters increased empathy, a deeper understanding of disability-related challenges, and greater comfort in providing care for individuals with disabilities.
Methods:
This was a post-intervention study involving medical students at a single academic institution who participated in a year-long CSP. Survey responses were collected from first to fourth year medical students, and data was analyzed using Qualtrics. Students voluntarily completed a validated questionnaire assessing their attitudes and beliefs about people with disabilities following completion of a year-long community service program in which they worked closely with individuals with ID and DD in their local community.
Results:
A total of 24 survey responses were included in the analysis. Most students (83.3%) dedicated over 6 hours to the CSP, with involvement ranging from 1 to 20 hours. Of the study participants, 11 (45.8%) worked with organizations supporting individuals with disabilities, 4 (16.7%) created informational materials on ID and DD awareness, 3 (12.5%) fundraised for disability organizations, 3 (12.5%) organized events for people with disabilities, 2 (8.3%) directly interacted with individuals with ID and DD, and 1 (4.2%) planned events to raise awareness. Following the CSP, 4 (16.7%) participants felt more equipped to address the needs of patients with ID and DD, 4 (16.7%) were uncertain, and 16 (66.7%) did not feel more confident. Additionally, 19 (79.2%) of respondents identified accessibility to healthcare as a primary concern among individuals with ID and DD.
Conclusions:
This study emphasizes disability education in medical curricula, highlighting the potential of direct interpersonal interaction as a tool to cultivate inclusive, compassionate care and improve public health outcomes. Most individuals did not feel more confident in addressing the medical needs of patients with ID and DD after CSP, underscoring a gap in practical readiness, and suggesting that the community service exposure, while valuable, may not be sufficient to fully prepare students for the complex healthcare needs of this population. By increasing exposure to and enhancing comfort levels with individuals with disabilities, future medical professionals will be better equipped to address the barriers to care that this population faces. This could lead to improved utilization of preventative and primary care among individuals with ID and DD, resulting in reduced morbidity and mortality within the disability community.

Presentation: Q/M-9 Submitter: Chad Martin, M-2

Abstract Title: **Descriptive Insights from Program Directors and Literature: Patient Caps in Internal Medicine Residency**

Authors: Martin, Chad, M-3 M.D. Candidate, Gariaqoza, Yousif, M-3 M.D. Candidate, Lettner-Knowlton, Nicholas, Resident M.D., Martin, Chad, M-3 M.D. Candidate, Haddad, Nicholas, M.D.

Category: Quality Improvement/Medical Education Mentor: Nicholas Haddad, M.D.

Abstract:

Background: The Accreditation Council for Graduate Medical Education (ACGME) placed a maximum number of patients able to be seen by a residency team (patient cap). These caps play a critical role in resident education, well-being, and patient safety. However, even with the ACGME mandated patient cap of 20, internal medicine residents still experience high rates of burn out. As a result, resident education, satisfaction and patient safety are also impacted.

Objective: To analyze differences in patient caps among a variety of internal medicine residency programs, rational for the program patient cap policies and identify ways to maximize productivity both on a clinical and educational basis.

Methods: A survey was distributed to 524 U.S. internal medicine residency programs affiliated with the Alliance for Academic Internal Medicine, yielding 57 responses (10.9%). Programs were categorized as Academic Medical Centers (AMC), Community, or Affiliated. The patient caps for all programs were analyzed and correlated with program type. A thematic review of the program directors' comments was also done to identify strategies for optimizing resident workload. A secondary literature review incorporated recent literature on resident workload, education, and patient safety.

Results: Patient caps ranged from 12 to 20, with a mean of 15.8. Affiliated programs reported the highest average caps (16.3), followed by AMC (16.1) and Community programs (15.4). Key themes identified include cap adjustments, team structure changes, and workload flexibility. Programs implementing caps of 14-16 patients reported improved resident satisfaction, reduced burnout, and enhanced educational experiences.

Discussion: Both program director comments and secondary literature suggested that caps within the range of 14-16 patients allowed for increased resident satisfaction and patient safety while reducing burnout. Many of the programs reported using flexible caps such as using nonteaching services or increased team attending involvement to better accommodate hospital census surges. Other programs implemented adjustable caps based on their institutional acuity needs or seasonal workflows to support resident education while mitigating excessive workload.

Conclusion: This work demonstrates that many internal medicine programs have implemented cap policies to reduce or eliminate the possibility of reaching the ACGME patient limit. It further emphasizes the importance of adaptable patient caps that can balance resident education, well-being and patient safety.

Significance: Program directors may be able to leverage this data and use the suggested adaptable cap strategies to advocate for lower patient caps which would likely improve resident satisfaction, well-being and patient safety as a result.

Presentation: Q/M-10 Submitter: Bradley Miller, M.D., Resident

Abstract Title: **The Prescription for Audience Engagement in a Psychiatry Podcast: Insights for Medical Educators**

Authors: Miller, Bradley, Resident M.D., Wang, Larry, Resident M.D., Hewitt, Tanner, Resident D.O., Garces, Lorrie, M.D.

Category: Quality Improvement/Medical Education Mentor: Lorrie Garces, M.D.

Abstract:

Background:
Podcasts have continued to rise as a major educational resource for medical learners and psychiatry education. While there are many podcasts started, few ultimately reach a wide audience. Although information on how to make a successful podcast is often discussed, there is little research examining the parameters that may contribute to a successful podcast episode, specifically those with psychiatric or medical education as a focus. PsychRounds is a resident-run educational psychiatry podcast, with topics ranging from psychopharmacology to exploration of psychiatric pathology. As of the time of this publication, PsychRounds has an audience size of over 3900 people across all platforms.
Objective:
This study aims to identify parameters correlated with the audience a given episode reaches, with the eventual goal of helping shape future podcast efforts in medical education.
Methods:
Data was gathered using analytics from Spotify for Creators to assess episode characteristics from PsychRounds to determine factors that may contribute to improved audience engagement and retention. Episode characteristics such as episode category were qualitatively assigned. Other parameters such as episode length, publication time, and time since release were gathered directly from podcast analytics. The total number of plays for a given episode is used as an outcome for audience size. Median play time is used as a measure of audience retention. Additional information on prescription rates, cost, and estimated number of patients using specific medications are gathered from the public database of Medical Expenditure Panel Survey by the Agency for Healthcare Research and Quality.
Results:
Preliminary results suggest that there is no correlation between the number of plays an episode receives and the length of the episode ($r=0.0141$, $p=0.9085$). There does appear to be a weak positive correlation between the number of plays an episode receives and the time since episode release ($r=0.3646$, $p=0.0021$), and a strong positive correlation between number of plays an episode receives and the estimated number of prescriptions in the United States in 2022 ($r=0.8442$, $p=0.0001$). Further examination of additional parameters is currently pending further data analysis from podcast analytics.
Conclusions:
This study examining the correlations between episode characteristics and audience size and retention demonstrates several points. Episodes did not appear to suffer in the total number of plays for being longer length, which is particularly important for long form lectures. Given the strong correlation between episode plays and medication popularity, judged by number of prescriptions, educational podcasts seeking to expand their audience should likely focus on treatments that are commonly used. Further analysis is needed to draw further conclusions from additional parameters and examine audience retention, and more studies may need to be performed to generalize the findings.
Significance:
This study demonstrates factors that authors of medical education podcasts may want to consider to grow their audience and have the strongest possible educational effect.

Presentation: Q/M-11 Submitter: Umme Aiman Mirza, M-2

Abstract Title: **Constructing Knowledge in the Age of Artificial Intelligence: A Comparative Study Between AI and Medical Student Performance in Problem-Based Learning for Basic Sciences**

Authors: Mirza, Umme Aiman, M-2 M.D. Candidate, Kochunilathil, Merlin, M-3 M.D. Candidate, Elftman, Michael, Ph.D., Poku, Rosemary, Ph.D., Lewis, Kenneth, Ph.D., Lewis, Brianne, Ph.D.

Category: Quality Improvement/Medical Education Mentor: Brianne Lewis, Ph.D.

Abstract:

Background:

Problem-Based Learning (PBL) is a student-centered educational approach that enables students to collaboratively learn using authentic scenarios. PBL is underpinned by constructivism, where students participate as active knowledge seekers and co-create new experiences with the help of prior knowledge. PBL is used throughout our preclerkship curriculum. In the M1 fall semester, PBL includes a facilitator, and cases are constructed with guiding questions to teach basic sciences. Learners use online resources as needed. However, as students integrate chat-based AI platforms in their PBL practice, the value of constructing new knowledge through collective discussion may be impacted.

Objective:

The purpose of this work is to evaluate how effectively chat-based AI platforms perform PBL tasks compared to medical students. This data will help medical educators understand how AI tools can be integrated into PBL activities in medical education without diminishing the educational value, particularly in fostering collaborative, student-centered learning.

Methods:

Quality of student and AI-generated work were determined by scoring the depth, scope, clarity of communication, and quality of references (1 = below basic to 5 = advanced) and likelihood of being AI-generated work on a 5-point rubric (1 = not at all likely to 5 = highly likely). Eleven learner group responses and three AI-generated responses were scored for 10 PBL questions by four blinded evaluators. AI platforms used in this study included ChatGPT 4.0, Microsoft CoPilot, and AMBOSS Medical Knowledge.

Results:

In aggregate, our data shows that student vs AI generated work scored similarly across all categories: depth (+/-0.1), scope (+/-0.3), communication (+/-0.1), and quality of references (+/-0.2). Evaluators were able to correctly identify if the work was student or AI generated. Overall, evaluators ranked student work as somewhat unlikely to be AI, and AI generated work as likely to be AI.

Conclusions:

Our findings indicate that AI can support PBL activities without diminishing the quality of work. However, it is essential to emphasize to students that meaningful learning stems from the constructivist process of actively engaging with and building knowledge—not merely from producing correct answers.

Significance:

Data from this project will inform the design of PBL activities in a modern healthcare curriculum, ensuring the effective integration of AI tools while preserving the educational value of collaborative, student-centered learning.

Presentation: Submitter: Varun Vadnala, M-4

Abstract Title: **The Influence of Cultural and Religious Student Organizations on Matriculated Medical Students**

Authors: Vadnala, Varun, M-4 M.D. Candidate, Chughtai, Shahzaib, M-3 M.D. Candidate, Nannapaneni, Abhinav, M-3 M.D. Candidate, Shuhag, Shofikur, M-4 M.D. Candidate, Ragina, Neli, Ph.D., Tata, Swathi, M-4 M.D. Candidate

Category: Quality Improvement/Medical Education Mentor: Neli Ragina, Ph.D.

Abstract:

BACKGROUND: We have noticed an increase in medical students at CMU who are of 'Desi' origin since we founded the Desi Medical Student organization at CMU in 2022. With so many other organizations for other cultural groups and religious groups, the diversity of the medical school seems to have grown. When students contemplate various medical schools, class makeup is sure to be a crucial factor in the decision process. Organizations that help increase the representation and strengthen the community play a significant role in student's success and well-being.

OBJECTIVE: The purpose of this study is to identify if the presence of cultural and religious organizations at CMU College of Medicine have played a role in attracting medical students to matriculate and demonstrate the influence of these organizations on the overall academic success, cultural competence, and professional development of students.

METHODS: We created a Qualtrics survey using multiple-choice, checkboxes, and linear scales to send out to current and former medical students attending CMU College of Medicine. This survey will be sent out via email, student group chats, and social media. The survey will assess how cultural and religious organizations at the College influenced medical school matriculation and student experiences on campus. We plan to analyze the data for statistically significant trends and gain insight into our class composition. Analyses will be considered statistically significant if $p < 0.05$.

RESULTS: Results are currently pending. We will include data comparing Likert scale scores of individuals who are not active participants in cultural and/or religious organizations with individuals who do actively participate in these organizations.

CONCLUSIONS: After obtaining results, we plan to draw conclusions on how cultural and/or religious organizations have impacted student experiences while attending medical school. We will potentially be able to state how these organizations have led to increased diversity at the medical school and how the continued support of these organizations is vital to this cause.

SIGNIFICANCE: With DEI programs recently under threat, this data is more important now than ever before to gather important data on students at CMU College of Medicine and how representation and inclusion can be improved for the future. It is insightful for the school in appealing to future prospective students and improving the experience for their current students. This study can be expanded further in the future to include other medical schools.

Presentation: Q/M-12 Submitter: Jaimie Van De Burg, M-2

Abstract Title: **Comprehensive Sexual Education and Adolescent Health: A Study of Pregnancy and STI Rates in Grand Rapids, MI**

Authors: Van De Burg, Jaimie, M-2 M.D. Candidate, Tabor, Kathryn, Resident M.D.

Category: Quality Improvement/Medical Education Mentor: Kathryn Tabor, Resident M.D.

Abstract:

Background

Historically, public school systems in Michigan have primarily employed an abstinence-only approach to sexual health education, focusing on abstinence while excluding comprehensive information about contraception or condoms' effectiveness in preventing unintended pregnancies or sexually transmitted infections (STIs). In 2016, many schools adopted a new curricular model known as “The Michigan Model for Health: Healthy and Responsible Relationships,” which provides a comprehensive sexual health education. However, since adherence to this updated curriculum was not mandatory, schools developed three distinct models: (1) Abstinence-only, (2) Abstinence-based with condom education, and (3) Abstinence-based with comprehensive contraception education, including condoms. The Grand Rapids Public School system (GRPS) adopted the most comprehensive model (3) in 2016.

Objective

This project aims to evaluate the effectiveness of the newly implemented comprehensive sexual health education curriculum in the Grand Rapids Public School system.

Methods

A comparative analysis was conducted to assess STI and pregnancy rates among adolescents before and after the implementation of the new curriculum. The study population was comprised of adolescents aged 13 to 19 years residing in the Grand Rapids area as identified by Grand Rapids zip codes. Information was extracted from electronic medical records (EMR) using diagnosis codes and problem list entries related to teen pregnancy and STIs. Data from 2011 to 2016 was compared to data from 2017 to 2022.

Rates were calculated based on the total number of adolescents within the specified age range in the EMR. Average rates for the periods 2011-2016 and 2017-2022 were compared.

Results

Trends indicate that from 2011 to 2016, the average pregnancy rate was 4.6%, which decreased to 3.1% between 2017 and 2022. Conversely, STI rates increased during the same periods, with average rates rising from 3.5% in 2011-2016 to 6.1% in 2017-2022.

Conclusions

Results reveal a decrease in adolescent pregnancy rates in Grand Rapids following the implementation of the comprehensive sexual health curriculum. However, there was an observed increase in STI rates during the same period. These findings suggest that while the new curriculum may be effective in educating students on pregnancy prevention, there remains a need to enhance the curriculum's focus on STI education.

Significance

This study provides critical insights into the effectiveness of comprehensive sexual education curricula. As Michigan legislators consider measures such as House Resolution 349 and House Bill 6452, which aim to limit sexual education to abstinence-only models, these findings underscore the importance of informed decision-making. Understanding the impact of various educational approaches can guide policymakers in allocating resources and funding for school-based sexual health programs.

Presentation: Submitter: Erin Williams, M-2

Abstract Title: **Role of Cadaveric Dissection in Highlighting Anatomical Abnormalities and Maximizing its Utility in Medical Education**

Authors: Williams, Erin, M-2 M.D. Candidate, Hock, Emily, M-2 M.D. Candidate, Osborn, Sid, M-2 M.D. Candidate, Chaudhuri, Joydeep, M.D., Luckett, M.S. Brittany, Other

Category: Quality Improvement/Medical Education Mentor: Brittany Luckett, M.S., Other

Abstract:

BACKGROUND: Cadaveric dissection is a cornerstone of medical education, offering hands-on experience in anatomy and surgical techniques. It provides students with their first exposure to human anatomy, establishing a foundation for recognizing normal and pathological structures. However, rising costs and a nationwide cadaver shortage have led many schools to adopt virtual anatomy labs. While cost-effective, this shift deprives students of essential skills like motor development, surgical practice, and tactile understanding of human tissue. Despite financial challenges, cadaveric dissection remains irreplaceable. Strategic improvements are needed to sustain these programs, enhance effectiveness, and prevent resource waste.

OBJECTIVE: To highlight the vital role of cadaveric dissection in medical education and propose a standardized approach to optimize its effectiveness and address existing shortcomings.

METHODS: We illustrate these issues with the collective experiences of M1-M2 medical students at Central Michigan University (CMU) College of Medicine enrolled in a summer dissection program. The expectation of this course was to dissect a human donor, while being provided with limited clinical information. The specific findings referenced are from a 66-year-old anatomical female donor, ethically obtained through CMU's Anatomy Department. There was no cause of death reported, and medical records were not disclosed at the time of dissection.

FINDINGS: The first abnormality identified was a neurovascular variation of the brachial plexus. Further dissection revealed dextrocardia, with the heart's apex, pulmonary trunk, and aortic arch deviated to the right. Deeper inspection confirmed situs inversus totalis (SIT) of the thoracic and abdominal organs. After these findings, students were provided with the cadaver's medical history, which did not mention dextrocardia or SIT. Throughout the dissection, students discovered additional vascular positional abnormalities likely linked to SIT, as well as other anatomical variations, such as an absent thyroid and gallbladder, which were also unrecorded in the medical history.

CONCLUSIONS: This study highlights the invaluable role of cadaveric dissection in student learning, offering the rare opportunity to uncover exceptional anatomical anomalies like SIT—an experience that cannot be replicated virtually. It also underscores a key limitation: working with an incomplete medical history. Conducting a dissection without prior knowledge of expected variations, such as those indicated in a medical history, can be particularly challenging for students, who may struggle to connect these variations to pathology across multiple organ systems. In the dissection of the cadaver with SIT, the lack of pre-dissection information led to a less efficient approach, doubt among students, and confusion when the medical history was later reviewed, as it did not mention SIT or several other conditions. To maximize the benefits of dissections, a detailed and accurate clinical history is essential. It allows students to adopt a more focused approach, enhancing their ability to identify anatomical variations. This targeted method also minimizes common uncertainties in the learning process, ensuring a more systematic and productive dissection experience.

SIGNIFICANCE: These findings highlight the clinical importance of cadaveric dissection in medical education. Implementing a standardized procedure for reporting and obtaining a complete medical history prior to dissection will maximize resources, improve efficiency, and enhance student learning outcomes.

Presentation: Q/M-13 Submitter: Maria Younan, M-1

Abstract Title: **Involving End-Users in the Design of a Digital Opioid Safety Intervention for Adolescents and Young Adults with Inflammatory Bowel Diseases: A Qualitative Analysis of Patients and Clinicians**

Authors: Younan, Maria, M-1 M.D. Candidate, B.S., Other, Balbale, Salva, Ph.D., Castro, Lauren, Graduate Student, Paniagua-Perez, Deysi, B.S., Hanauer, Stephen, M.D., Holl, Jane, M.D., Raval, Mehul, M.D., Berry, Andrew, Ph.D.

Category: Quality Improvement/Medical Education Mentor: Salva Balbale, Ph.D.

Abstract:

Background: Opioid overdoses are a leading cause of death among adolescents and young adults (AYA), often resulting from chronic opioid use. AYA with inflammatory bowel disease (IBD) are at particularly high risk, with approximately 1 in 5 using opioids chronically. Prior research highlights the necessity of engaging both AYA IBD patients and IBD-focused clinicians in pain management and opioid safety initiatives. This study leverages human-centered design (HCD) principles to explore patient and clinician perspectives to inform the development of the Chronic Opioid Use Assessment & Screening Tool (COAST), a digital opioid safety intervention.

Objective: The goal of this study was to identify AYA patient and clinician needs and expectations for designing a digital opioid safety intervention using a human-centered design approach.

Methods: Following HCD methodology, we focused on the "defining" and "empathizing" phases by conducting semi-structured interviews with AYA IBD patients and IBD-focused clinicians (gastroenterologists, surgeons, and nurses). Interviews explored patient experiences with pain management, opioid use, and transitions to adult care, as well as clinician experiences in monitoring pain and prescribing opioids. Sessions were audio recorded, transcribed, and thematically analyzed using an inductive approach to identify emerging themes.

Results: A total of 17 participants (four AYA patients and 13 clinicians) contributed to the study. Thematic analysis categorized key needs for an opioid safety intervention into three domains: (1) overarching needs, (2) patient-facing needs, and (3) clinician- and system-level needs. Overarching needs included the importance of integrating opioid safety interventions into multidisciplinary chronic care, supporting AYA transitions to independence, and acknowledging individual patient differences. Patient-facing needs highlighted the necessity of routinely assessing lived pain experiences, setting clear expectations about pain management, and connecting patients with safe non-opioid alternatives. Clinician- and system-level needs emphasized accounting for pain management received outside the IBD clinic, addressing information gaps on opioid risk, and coordinating safety efforts across clinical teams. Additionally, clinicians noted time constraints and a need for enhanced training in pain management.

Conclusions: AYA IBD patients and IBD-focused clinicians identified multiple priorities beyond assessing opioid misuse risk, including integrating routine pain assessments, connecting patients with safe pain management strategies, and facilitating smooth AYA transitions to adult care. Incorporating these insights in COAST's development may enhance alignment between patient and clinician expectations regarding safe pain management and opioid use. Findings will guide future intervention design, prototyping, and testing with continued engagement of AYA IBD patients and clinicians.

Significance: Avoiding opioid misuse among AYA with IBD requires interventions that reflect the lived experiences and needs of both patients and their clinicians. This study underscores the value of human-centered design in developing digital opioid safety tools that are practical, patient-focused, and effectively integrated into clinical workflows. The insights gathered will help shape COAST into a meaningful digital resource for improving opioid safety and pain management in this high-risk population.