ROCKY VISTA UNIVERSITY

Fall Research Week 2024

Nutrition as Medicine

October 2024

Event Program

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Welcome Letter

Welcome to Rocky Vista University Research Week 2024!

Thank you to both our visitors and participants for making Research Week a memorable event as we explore "Nutrition as Medicine" through the research and scholarly works that our students, faculty, and staff have produced.

Research is making a powerful impact at the University, showcasing our unwavering commitment to excellence as we continue to expand our influence on healthcare advancement. Between Research Day in May and Fall Research Week, we have reached another milestone, receiving approximately 230 abstract submissions. In addition, our community has achieved remarkable success, with our students producing roughly 220 peer-reviewed publications and presentations since last October, not including any presentations given during internal research events. These accomplishments highlight the dedication and innovative spirit within our University community.

This year's program includes a unique blend of in-person events celebrating the accomplishments of each campus and remote (Zoom) sessions that unite us as a University. Research Week features oral presentations, poster sessions, panel discussions, and an engaging keynote address. This year we are privileged to have Dr. Richard Johnson provide our keynote address, "Insights into the Cause of Obesity and Diabetes: The Role of Fructose". We hope that you find the week entertaining, informative, and inspiring with interactive events such as "Shark Tank" and discussions on topics like the research gap year, research fellowship opportunities, and strategies for using research to support residency match.

We would like to express our gratitude to all those who have helped, volunteered, and participated in Research Week. Again, thank you for joining us as we come together to celebrate innovation, collaboration, and discovery.

Until May…Happy Researching!

Amanda Brooks, PhD
Vice Provost of Research and Scholarly Activity
Professor of Molecular Biology

Schedule of Events

Saturday, Oct. 5th

9:00 am - 11:00 am	Oral Presentations		Zoom/ Cross-Campus
11:00 am - 1:00 pm	CO Poster Session		In-person: 2nd Floor Hallway

Monday, Oct. 7th

12:00 pm - 1:00 pm	Nutrition as Medicine Discussion Panel		Zoom/ Cross-Campus
7:00 pm - 8:00 pm	Keynote Speaker: Dr. Richard Johnson		Zoom/ Cross-Campus

Tuesday, Oct. 8th

12:00 pm - 1:00 pm	MT Poster Session		In-person: 2nd Floor Loft Area
6:00 pm - 7:30 pm	Shark Tank		Zoom/ Cross-Campus

Schedule of Events

Wednesday, Oct. 9th

6:00 pm - 6:45 pm	Research Gap Year/ Research Fellowship Year		Zoom/ Cross-Campus
6:45 pm - 7:30 pm	Using Your Research to Support Your Residency Match Strategy		Zoom/ Cross-Campus

Saturday, Oct. 12th

9:00 am - 11:00 am	UT Poster Session		In-person: 1st Floor Hallway

Keynote Speaker - Dr. Richard Johnson

Insights into the Cause of Obesity and Diabetes: The Role of Fructose

Dr. Richard Johnson

Today there continues to be a Marked Rise in Metabolic Disease, including obesity, diabetes, fatty liver, high blood pressure, and even conditions such as cancer and dementia. While there are many breakthroughs in the treatment of these conditions, the underlying mechanisms are still poorly understood. Here we will review the evidence that one particular nutrient, fructose, may have a unique role in these conditions. Interestingly, the fructose pathway appears to be important in nature and evolution as a means to protect the animal from starvation, but when activated chronically may be driving a lot of metabolic disease. Here we will discuss the evidence and potential solutions.

Oral Presentations Schedule

9:00 am	*Quantitative Ultrasound to Assess Upper Trapezius Muscle in Patients with Chronic Neck Pain* Eliaz Lynch* OMS IV, Mischa Coleman DO, Jing Gao MD	MT
9:12 am	*Changes in Attitude Towards Sun Protection after a UV Photoaging Educational Intervention* Patrick McClain, OMS II, MS, Sophia Nem, OMS II, MS*, Mira Gill, OMS II, BS, Rebecca Bolen OMS III, BA, Marissa DeVogelaere, OMS III, BS, Jordanne Kirschke OMS III, MS, Robert McFarling OMS III, MS, Alexa Carboni OMS IV, BS, Leslie Torgerson, MD	CO
9:24 am	*Complete Elimination of Hip Precautions Following Posterior Approach THA: Real World Results Based on Level 1 Evidence* Aguilar M, Jackson M, Neguse S, Foran J	CO - PA
9:36 am	*Glutaredoxin-1: A Potential Therapeutic Target for Inhibiting Liver Fibrosis and NASH Progression* Brian S. H. Chong*, Yuko Tsukahara, Beatriz Ferran, Erika T. Minetti, Adam C. Gower, Markus M. Bachschmid, Reiko Matsui	UT
9:48 am	*Developing a Low-Cost Model for Training Resuscitative Thoracotomy* Alexandra Taylor, OMS II*, Anatalia J. Kerstan, OMS II, Ethan Kromberg, OMS III Harrison Steins MS OMS III, Sarah Boulos, D.O.	CO
10:00 am	*COVID-19 Health and Media Literacy Practices among a National Sample of Information Advocates* Jonathan Irby, OMS III, MS*, Alexis M. Koskan, PhD, Kristy Roschke, PhD, Brad Doebbeling, MD, Shalini Sivandam, MS, Deborah Helitzer, ScD, Benjamin Brooks, PhD, MBA	CO
10:12 am	*The Effects of Extended Reality on Intraocular Pressure: A Literature Review* Mckay Berges*, Jacob Wagner, Shandon Paulsen, Aaron Peatross, Inder Sehgal	UT
10:24 am	*Benchmark Breakdown: Charting the True Course of Medical Competency in a Physician Assistant Training Program* Ellery Roberts, Darcy Solanyk*, Jennifer L. Hellier, Cathy Ruff	CO - PA
10:36 am	*Comparing Patient Reported and Clinical Outcomes in Minimally Invasive vs. Open Metatarsophalangeal Joint Cheilectomy* Samuel D. Stark*, BS, Nate Zona BS, Eric Villarreal, MD, Kenneth Hunt, MD	CO
10:48 am	*Improved Resolution and Patient Throughput Following Implementation of Deep Learning Reconstruction in a Clinical Setting* Jocelyn Selan, MS*, Theodore Kryzer, R.T(R)(MR)(CT), Hochun Hu, PhD, Grace Bosma, MS, and Alexander Merkle, MD	CO

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#	Campus	Title	Authors
1	MT	Quantitative ultrasound to assess upper trapezius muscle in patients with chronic neck pain	Eliaz Lynch* OMS IV, Mischa Coleman DO, Jing Gao MD
2	CO	Changes in Attitude Towards Sun Protection after a UV Photoaging Educational Intervention	Patrick McClain, OMS II, MS, Sophia Nem, OMS II, MS*, Mira Gill, OMS II, BS, Rebecca Bolen OMS III, BA, Marissa DeVogelaere, OMS III, BS, Jordanne Kirschke OMS III, MS, Robert McFarling OMS III, MS, Alexa Carboni OMS IV, BS, Leslie Torgerson, MD
3	CO-PA	Complete Elimination of Hip Precautions Following Posterior Approach THA: Real World Results Based on Level 1 Evidence.	Aguilar M, Jackson M, Neguse S, Foran J
4	UT	Glutaredoxin-1: A Potential Therapeutic Target for Inhibiting Liver Fibrosis and NASH Progression	Brian S. H. Chong*, Yuko Tsukahara, Beatriz Ferran, Erika T. Minetti, Adam C. Gower, Markus M. Bachschmid, Reiko Matsui
5	CO	Developing a Low-Cost Model for Training Resuscitative Thoracotomy	Alexandra Taylor, OMS II*, Anatalia J. Kerstan, OMS II, Ethan Kromberg, OMS III Harrison Steins MS OMS III, Sarah Boulos, D.O.
6	CO	COVID-19 Health and Media Literacy Practices among a National Sample of Information Advocates	Jonathan Irby, OMS III, MS*, Alexis M. Koskan, PhD, Kristy Roschke, PhD, Brad Doebbeling, MD, Shalini Sivandam, MS, Deborah Helitzer, ScD, Benjamin Brooks, PhD, MBA
7	UT	The Effects of Extended Reality on Intraocular Pressure: A Literature Review	Mckay Berges*, Jacob Wagner, Shandon Paulsen, Aaron Peatross, Inder Sehgal
8	CO-PA	Benchmark Breakdown: Charting the True Course of Medical Competency in a Physician Assistant Training Program	Ellery Roberts, Darcy Solanyk*, Jennifer L. Hellier, Cathy Ruff
9	CO	Comparing Patient Reported and Clinical Outcomes in Minimally Invasive vs. Open Metatarsophalangeal Joint Cheilectomy	Samuel D. Stark*, BS, Nate Zona BS, Eric Villarreal, MD, Kenneth Hunt, MD
10	CO	Improved Resolution and Patient Throughput Following Implementation of Deep Learning Reconstruction in a Clinical Setting	Jocelyn Selan, MS*, Theodore Kryzer, R.T(R)(MR)(CT), Hochun Hu, PhD, Grace Bosma, MS, and Alexander Merkle, MD

Oral Presentations Rubric

Assessment/Scoring Rubric for Oral Presentations:

Provide a rank for each criterion on a Likert scale of 1-5

Below are examples of what would classify as excellent, very good, good, ok, and poor

5-Excellent	Maintains eye contact, invites discussion, summaries key points, appropriate use of figures and references, slides are well designed and readable, potential limitations are identified, builds logical arguments based on evidence
4-Very Good	Clear summary, well-rehearsed, some filler words, images are used but may not always be well explained, makes limited jumps in logic
3-Good	Some use of scientific jargon, too many words and not enough images, images used did not support the audience learning, no clear summary, difficult to follow logic at times
2-Ok	Not engaging, too much jargon, did not lead a discussion well, difficult to hear, significant background missing
1-Poor	Unclear and hard to follow, not well practiced, did not stay within time limits, defensive during questioning, not well referenced, take home points unclear, limited background provided

Content and Scientific Merit

Introduction:

- Defines background and importance of research.
- States objective, and is able to identify relevant questions.

Body:

- Presenter has a scientifically valid argument.
- Addresses audience at an appropriate level (rigorous, but generally understandable to a scientifically-minded group).
- Offers evidence of proof/disproof.
- Describes methodology.
- The talk is logical.

Conclusion:

- Summarizes major points of talk.
- Summarizes potential weaknesses (if any) in findings.
- Provides you with a “take-home” message.

Oral Presentations Rubric Cont.

Speaking Style/Delivery

- Speaks clearly and at an understandable pace.
- Maintains eye contact with audience.
- Well rehearsed (either extemporaneous or scripted presentation).
- Limited use of filler words (“umm,” “like,” etc.).
- Speaker uses body language appropriately.
- Speaker is within time limits.
- Speaker is able to answer questions professionally.
- Speaker is dressed appropriately.

Audio/Visual

- Graphs/figures are clear and understandable.
- The text is readable and clear.
- Audio/Visual components support the main points of the talk.
- Appropriate referencing of data that is/was not generated by presenter

Constructive Criticisms (2 required):

QUANTITATIVE ULTRASOUND TO ASSESS UPPER TRAPEZIUS MUSCLE IN PATIENTS WITH CHRONIC NECK PAIN

Eliaz Lynch*[1], OMS IV, Mischa Coleman[2], DO, Jing Gao[3], MD

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The correlation between ageing and skeletal muscle changes has been previously established, however providing a quantitative assessment of these is not common practice. Shear wave elastography (SWE) is an ultrasound technique that can be used to quantify muscle stiffness which can then be correlated with skeletal muscle biomechanics. This study aims to investigate the relationship between SWV and muscle stiffness, and its correlation with age in healthy adults. Our hypothesis is that SWE can quantify muscle stiffness and thus be used to describe age related changes in skeletal muscle. IRB approval and informed consent were obtained. Inclusion criteria for healthy adults included age >18 years, pain score <2, no history of neck surgery or trauma, and a TART score <12. Subjects were imaged in the prone position with relaxed neck and shoulder muscles using a linear array transducer (bandwidth 4-10 MHz, Siemens Medical Solutions) to acquire B-mode and SWV of the upper trapezius muscle. SWV was measured in the transverse and longitudinal planes in 16 young (18-44 years), 11 middle-aged (45-64 years), and 15 elderly participants (≥65 years). A one-way ANOVA was used to assess muscle stiffness between groups. The results showed that muscle shear wave velocity (SWV) decreased significantly with age ($p<0.01$), with mean ages of 27, 54, and 74 years in the young, middle-aged, and elderly groups, respectively. There was significant SWV difference in the transverse plane across all age groups, but no significant difference in the longitudinal plane ($p>0.05$). It was concluded that an inverse relationship between age and SWV was observed, suggesting that SWV decreases with age and may contribute to reduced muscle strength.

CHANGES IN ATTITUDES TOWARDS SUN PROTECTION AFTER A UV PHOTOAGING EDUCATION INTERVENTION

Patrick McClain, OMS II, MS[1], Sophia Nem, OMS II, MS[*1], Mira Gill, OMS II, BS[1], Rebecca Bolen OMS III, BA[1], Marissa DeVogelaere, OMS III, BS[1], Jordanne Kirschke OMS III, MS[1], Robert McFarling OMS III, MS[1], Alexa Carboni OMS IV, BS[1], Leslie Torgerson, MD[2]

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Excessive exposure to ultraviolet (UV) radiation from the sun is linked to negative health outcomes such as skin cancer, premature aging, and eye damage (Flament et al). Sun protection practices, including sunscreen use, protective clothing, seeking shade, and avoiding midday sun, are effective in preventing UV damage. However, gaps in patient knowledge regarding the correlation between sun exposure and photoaging or skin cancer risk may hinder the adoption of these methods. Our study aimed to investigate participants' perception of their personal sun protection methods using the Canfield Reveal Imager. A convenience sample of participants aged ≥18 years was obtained from RVUCOM's Friends and Family events (n = 67). This cross-sectional study involved a pre-survey, Canfield Imager photo, and post-survey on sun protection and skin cancer views. Participants were asked to complete the pre-survey prior to their photo being taken and thereafter, results of the image were explained to the participant and a post-survey was completed. Results showed that 54% of participants intended to modify their sun protection behaviors after viewing their Canfield image, with increased sunscreen use being the most popular method (46%). Pre-survey responses indicated that 58% of participants had not seen a dermatologist in the past year, while post-survey responses showed that 46% were more likely to seek dermatological advice in the future. These findings suggest that insufficient awareness of personal photoaging severity may contribute to poor sun protection. Photo intervention methods like the Canfield Reveal Imager may effectively educate patients and modify sun protection behaviors suggesting the benefit for use in clinical practice. Future research should consider larger sample sizes, increased population diversity, and newer technologies to address study limitations.

COMPLETE ELIMINATION OF HIP PRECAUTIONS FOLLOWING POSTERIOR APPROACH THA: REAL WORLD RESULTS BASED ON LEVEL 1 EVIDENCE

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[3]Panorama Orthopedic and Spine, Golden, CO

This retrospective cohort study evaluates the safety of eliminating posterior hip precautions in patients undergoing primary total hip arthroplasty (THA) via the posterior approach. Posterior hip precautions have traditionally been used to reduce dislocation risk, but recent studies question their necessity. Real-world data supporting the removal of these precautions are scarce. To address this gap, we assessed the dislocation rate in a cohort of 604 hips in 562 patients, with a mean follow-up of 54 weeks (range 6 to 194 weeks). The study found a low dislocation rate of 0.17%, with only one dislocation occurring in a patient with known abductor deficiency at approximately 136 weeks postoperatively. There was a significant decrease in rates of dislocation between the cohort in this study and a previous study's cohort who received hip precautions (P =0.011), suggesting that posterior hip precautions may not be necessary for most patients. The cohort's diversity, with a mean age of 64 years and nearly equal gender distribution, enhances the generalizability of the findings. The study challenges the traditional belief that hip precautions are essential, indicating that patient-specific factors may play a more critical role in dislocation risk. Eliminating precautions may offer benefits, including a quicker return to normal activities and improved quality of life. However, the study's limitations, include involvement of a single surgeon and limited follow-up, should be considered. This study contributes to the debate on postoperative care protocols, indicating that removing posterior hip precautions in a real-world clinical setting does not significantly increase dislocation risk.

GLUTAREDOXIN-1: A POTENTIAL THERAPEUTIC TARGET FOR INHIBITING LIVER FIBROSIS AND NASH PROGRESSION

Brian S. H. Chong*[1,2], Yuko Tsukahara[2], Beatriz Ferran[2], Erika T. Minetti[2], Adam C. Gower[3], Markus M. Bachschmid[2], Reiko Matsui[2]

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Abstract: Liver fibrosis is a hallmark of non-alcoholic fatty liver disease (NAFLD) progression toward non-alcoholic steatohepatitis (NASH) and cirrhosis, a process accelerated by aging. Glutaredoxin-1 (Glrx) regulates redox signaling by reversing protein S-glutathionylation induced by oxidative stress, and its deletion leads to fatty liver in mice. Although Glrx regulates various pathways, including metabolism and apoptosis, its role in liver fibrosis remains unexplored. In this study, we investigated the impact of Glrx on liver fibrosis induced by aging or a high-fat, high-fructose diet. Our findings revealed that: (1) Upregulation of Glrx expression inhibits age-induced hepatic apoptosis and liver fibrosis *in vivo*, with *in vitro* studies showing Glrx's regulation of Fas-induced apoptosis in hepatocytes; (2) Diet-induced NASH leads to reduced Glrx expression and increased levels of S-glutathionylated proteins in the liver. Hepatocyte-specific adeno-associated virus-mediated Glrx overexpression (AAV-Hep-Glrx) in the NASH model suppresses fibrosis and apoptosis while enhancing liver function; (3) AAV-Hep-Glrx significantly downregulates Zbtb16 transcription and negatively modulates immune pathways in the NASH liver. In conclusion, upregulating Glrx presents a promising therapeutic strategy for reversing NASH progression through attenuating inflammatory and fibrotic processes.

Keywords: liver fibrosis; aging; non-alcoholic steatohepatitis; glutaredoxin-1; immune cells

Oral Presentations

Developing a Low-Cost Model for Training Resuscitative Thoracotomy

Alexandra Taylor, OMS II*[1], Anatalia J. Kerstan, OMS II[1], Ethan Kromberg, OMS III[1] Harrison Steins MS OMS III[1], Sarah Boulos, D.O. [2]

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Traditional teaching methods for emergency department (ED) resuscitative thoracotomy often rely on lectures and readings, which lack the hands-on training necessary for effective learning and confidence-building. While high-fidelity simulation models enhance procedural teaching, their high cost can limit accessibility. To address this gap, we developed and tested a low-cost, low-fidelity simulation model aimed at improving procedural training. Our primary objective was to create an affordable and functional simulation model for resuscitative thoracotomy for emergency medicine residents, while our secondary objective was to assess proficiency using this model compared to lecture-only instruction among Rocky Vista Medical Students. We divided first and second-year medical students into two groups; both groups received a lecture from an experienced emergency physician and completed pre- and post-lecture knowledge tests. The experimental group had additional hands-on practice with the simulation model, whereas the control group did not. One week later, all students performed the procedure on the model and were evaluated with a 24-point checklist. Analysis revealed no significant difference in pre- and post-test scores between groups; however, the experimental group significantly outperformed the control group, achieving an average score of 20.55 compared to 7.95 out of 24 ($p < 0.0005$). These findings indicate that hands-on practice with the simulation model significantly improved procedural performance, highlighting the effectiveness of practical training in mastering high-acuity, low-occurrence procedures. This low-cost model effectively enhanced procedural skills and anatomical understanding, contributing to better long-term competency in resuscitative thoracotomy.

COVID-19 HEALTH AND MEDIA LITERACY PRACTICES AMONG A NATIONAL SAMPLE OF INFORMATION ADVOCATES

Jonathan Irby, OMS III, MS*[1], Alexis M. Koskan, PhD[2], Kristy Roschke, PhD[3], Brad Doebbeling, MD[2], Shalini Sivandam, MS[2], Deborah Helitzer, ScD[2], Benjamin Brooks, PhD, MBA[1]

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(3) Arizona State University, Walter Cronkite School of Journalism and Mass Communication, Phoenix, AZ

The COVID-19 pandemic has been a significant misinformation event. Identifying practices that individuals skilled in media and health literacy have used to identify accurate COVID-19 information to combat misinformation is critical. Guided by a Positive Deviance framework, our mixed-methods study used survey research to identify 30 individuals with accurate COVID-19 knowledge who reported acting as information advocates. We conducted semi-structured interviews to explore their information practices and are conducting a thematic analysis (complete by January 2023). Our initial findings illustrate that most participants actively searched for information on reputable websites (e.g., Mayo Clinic, CDC). They also reported watching the local news and searching for data-driven information about COVID-19 in their communities on city/county government websites. In addition, participants actively sought and passively received information on social media platforms (Reddit and Twitter), but all reported ignoring information shared on Facebook. They described the importance of identifying who was reporting or sharing information, their credentials, biases, and potential conflicts of interest. Most discussed the need to examine multiple information sources and cross-reference information. When asked how they served as information advocates, more participants reported sharing information interpersonally, with close ties in their social networks. Few described flagging misinformation online and correcting misinformation posts they saw on social media. More individuals preferred sharing accurate information than countering misinformation online, with many describing how they avoided online debates. Information from our interviews can be used for upcoming media literacy and health information advocacy training.

THE EFFECTS OF EXTENDED REALITY ON INTRAOCULAR PRESSURE: A LITERATURE REVIEW

Mckay Berges*[1], Jacob Wagner[1], Shandon Paulsen[1], Aaron Peatross[1], Inder Sehgal[2]

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Glaucoma is a leading cause of irreversible blindness worldwide, second only to cataracts. Elevated intraocular pressure (IOP) plays a crucial role in glaucoma pathogenesis. Evidence indicates that both smartphones and computer screens can transiently elevate IOP. As the use of extended reality (XR) devices—such as virtual reality (VR) and mixed reality (MR)—increases, understanding their impact on IOP is essential for effective glaucoma management and prevention. Investigating whether prolonged screen and XR use elevates IOP helps clarify their potential as risk factors for glaucoma progression. A comprehensive literature search was conducted using PubMed, Cochrane, Scopus, and Google Scholar. We focused on key terms such as Intraocular Pressure, Ocular Hypertension, Computer Vision Syndrome, and Extended Reality. Relevant studies from 2019 onwards were included in the review. Both healthy individuals and those with glaucoma exhibit increased IOP during computer and smartphone use. For example, IOP measurements before and after 25 minutes of cell phone use increased significantly from 13.7 ± 1.8 mmHg to 17.0 ± 1.7 mmHg. Interestingly, VR appears to have a different effect; studies suggest it may even reduce IOP, with measurements showing a statistically significant decrease after using VR glasses. The consistent evidence of elevated IOP during traditional screen use, contrasted with the nuanced effects of XR devices, underscores the need for further research. Understanding these mechanisms will be crucial for developing strategies to mitigate risks associated with prolonged screen and XR device usage, particularly for those at risk of or living with glaucoma.

BENCHMARK BREAKDOWN: CHARTING THE TRUE COURSE OF MEDICAL COMPETENCY IN A PHYSICIAN ASSISTANT TRAINING PROGRAM

Ellery Roberts[1], Darcy Solanyk[1*], Jennifer L. Hellier[1], Cathy Ruff[1]

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Assessments in medical education attempt to ensure the production of competent professionals. Historically, if students completed the scheduled time in school, they were expected to progress and practice. However, a lack of competency at graduation is one factor that can lead to medical errors. Thus, a shift was created to assess the growth of medical students within professional attributes with the utilization of criterion-based rubrics to provide feedback to learners. This became competency-based medical education (CBME). This report evaluates the accuracy of CBME benchmarks used by Rocky Vista University's Physician Assistant program in predicting student progression in patient care competencies during the didactic phase. We analyzed the academic milestone achievements of three cohorts to compare observed progression with program-defined expectations. Descriptive statistics were used to assess milestone progression in five patient care competencies.

Our findings indicate that the program's benchmarks are conservative, with students reaching expected milestones earlier than predicted. For example, 80 percent of Patient Care Competency 2 assessments reached Milestone Level 2 by the second month, far ahead of the expected tenth month. Similar trends were observed in other competencies, suggesting that students progress faster than anticipated.

These results imply that the curriculum effectively fosters rapid competency development, necessitating a reevaluation of educational benchmarks to better reflect student performance. This is critical for ensuring that students are adequately challenged and prepared for the clinical phase and professional practice. These findings will also act as a stepping-stone for further evaluation of the implementation of CBME in physician assistant programs.

COMPARING PATIENT REPORTED AND CLINICAL OUTCOMES IN MINIMALLY INVASIVE VS. OPEN METATARSOPHALANGEAL JOINT CHEILECTOMY

Samuel D. Stark*, BS[1,2], Nate Zona BS[2], Eric Villarreal, MD[2], Kenneth Hunt, MD[2]

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Arthroscopic and minimally invasive (MIS) surgical techniques and instrumentation have made it increasingly easier to perform small-joint diagnostic arthroscopy — procedures that have generally been performed in an open fashion. Our study sought to determine whether there is a difference in patient-reported outcomes between MIS and open hallux cheilectomy.

A retrospective chart review of all hallux MTP cheilectomies between 2015 and 2023 was performed. Patients with a completed measure of PROMIS Physical Function (PF) or Pain Interference (PI) at baseline, 3, 6, 12, and/or 24-month post-operative timepoints were included in analysis. Differences in PROs at each timepoint, both within and between cheilectomy type, were determined using Wilcoxon signed rank tests. Differences in improvement from baseline between surgery type were compared using an unpaired t-test. All patients were surveyed to address satisfaction, likelihood of redoing the surgery, and return to sport. Differences in response rates between groups were determined using a chi-squared test of independence.

In total, 102 patients had arthroscopic surgery and 217 had open surgery. There were no differences in patient age (51.9 vs 52.9 years) gender (64% vs 66% female) BMI (25.8 vs 26.8 kg/m2), or total operative time (55.8 vs 55.2 minutes). PRO data at one or more timepoints were available for 232 patients, and 131 patients completed the survey. Arthroscopic and open approaches demonstrated similar PROs at each time point, and both techniques reached statistically significant improvement by two years postop. There was no difference in overall improvement by procedure type for PF (3.2 ± 7.3 vs 4.6 ± 9.0; p=0.311) or PI (-6.0 ± 7.5 vs -5.7 ± 8.3; p=0.827). Rates of return to sport did not differ (p=0.413). Satisfaction rates were 11% higher (p=0.168) and likelihood of redoing the operation was 17% higher (p=0.042) among arthroscopic patients.

Arthroscopic and open approaches to hallux MTP cheilectomies have comparable PRO improvements, and both techniques ultimately result in significant improvement. The likelihood of redoing surgery following arthroscopic approach was significantly greater in our sample. Thus, arthroscopic approaches are non-inferior to the traditional open approach and may be preferred by patients. Current work is being done to assess how functional, clinical, and radiographic outcomes align with PROs following MIS or open cheilectomy.

Improved Resolution and Patient Throughput Following Implementation of Deep Learning Reconstruction in a Clinical Setting

Jocelyn Selan, MS*[1], Theodore Kryzer, R.T(R)(MR)(CT)[2,3], Hochun Hu, PhD[2,3], Grace Bosma, MS[4] and Alexander Merkle, MD[2,3]

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(4) Department of Biostatistics and Informatics, Colorado School of Public Health, University of Colorado Anschutz, Aurora, CO

Magnetic resonance imaging (MRI) is the gold standard in musculoskeletal soft tissue pathology detection and characterization but incurs slower imaging speed and longer exam times compared to other modalities. Artificial intelligence and deep learning algorithms have been shown to mitigate this limitation while maintaining or even improving image resolution in many applications of MRI. In this study, we hypothesized that image quality can be maintained or improved following clinical implementation of a commercial deep learning reconstruction (DLR) algorithm while increasing patient throughput. This was evaluated through standard knee MRI exams at 3 Tesla using commercially Deep Resolve Sharp Gain (Siemens Healthineers, Erlangen, Germany) deep learning reconstruction software from Siemens Healthineers compared to conventional imaging performed prior to implementation of the algorithms. Fifty consecutive patients underwent examinations without DLR from January 24th to 31st, 2023, before the installation of DLR on February 1st, 2023. Image quality was judged by blinded review of two musculoskeletal fellowship trained attending radiologists and throughput was measured by retrospectively utilizing Siemens Teamplay. Imaging time per examination was also recorded. A total of 100 patients were evaluated, 50 prior to and 50 following DRSG implementation. A significant reduction in knee scan times was observed, decreasing overall times from 21.4 to 16.3 minutes. In addition, patient throughput increased by 2000+ scans in 2023. Blinded review of the images by fellowship trained musculoskeletal radiologists showed a slight preference for 3T images with DRSG reconstruction, suggesting that image resolution was maintained. Implementation of deep learning technology in our clinical setting reduced scan times by ~20% and improved patient throughput while maintaining image resolution. These observed differences with DRSG further support the advantages this technology and feasibility of usage in a clinical setting.

Index of Posters - Colorado

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Abstract Rubric

Research Abstract	0	1	2	3
	Missing	**Poor**	**Good**	**Excellent**
Introduction	Missing	Unclear; Does not connect to the literature	Clear but not engaging; Attempts to connect to the literature	Clear, concise, engaging; Connects the topic to the literature and purpose of the work
Research Question/Purpose	Missing	Unclear; Includes irrelevant or unimportant information	Clear but not concise; Might contain irrelevant or unimportant information; lacks specifics	Clear, concise, relevant and assessable; Logical based on introduction
Methodology/Approach	Missing	Not mentioned but implied; Not appropriate for the purpose; Not good scientific practice	Unclear; Not appropriate detail; Unconnected to the purpose	Connected to the purpose; Clearly identifies methods used; Described in appropriate level of detail
Results (Findings)	Missing	Unclear; Not related to the purpose; Misinterpretation of the results	Presents findings, but may not be clear; some information missing	Clear, Connected to the purpose; Provides explanations of what was expected, found, accomplished, etc.; Clearly identifies the limitations of the study
Contribution to the Field	Missing	Unclear and lacks detail about contribution	Attempts to connect work to the field, but it is unclear	Clearly states how the work advances knowledge in the field or fills an important gap; States why it is important and where it can go
Professional Writing	Grammatical errors, typos impede understanding, inappropriate verb tense; Non-compliant with template	Many grammatical errors and typos but it does not impede understanding; inappropriate verb tense; Writing is unfocused or not engaging; Too much jargon	Few grammatical errors and typos; mixed verb tense; Writing is somewhat engaging	Writing is appropriate for the profession; Acronyms are defined at first use; Appropriate verb tense; Writing is engaging

Case Report Rubric

	0	1	2	3
	Absent	Poor	Good	Excellent
Case Report				
Case Description		Limited background and details of examination	Adequate	Comprehensive and clear detail including history and examination
Uniqueness	Not unique	Unclear uniqueness	Moderately unique	Clear description of uniqueness and is instructive.
Importance in the field	Not discussed	No clear importance in the field	Limited impact in the field	Clear description of importance. Could have significant impact on the field
Diagnosis/Treatment	Not described	Unclear diagnostic strategy, no justification of treatment	Adequately described diagnostics and treatment regimen	Clearly described diagnostics and justified treatment
Discussion	Missing	Case is not discussed in the context of the literature	Case is summarized but not connected to the current literature	Case is summarized and placed in the context of the literature and the field with clear impacts identified
Overall				
Format	Did not use correct format	Many formatting errors	Generally followed formatting guidelines	All formatting guidelines are carefully followed
Clarity	Unable to follow, typos impede understanding	Difficult to read		Clear and easy to read
Professional Communication	Too much jargon and poor communication	Many grammatical errors, but they do not impede understanding	Few grammatical errors and little jargon to impede understanding	Writing is appropriate to profession, all acronyms are defined, appropriate verb tense

Poster Rubric

	Very Poor (1)	Poor (2)	Average (3)	Good (4)	Excellent (5)
Content					
Legibility	The poster is too small to read.	There is too much text and it is difficult to focus.	There are different sizes and font styles throughout the poster.	Figure captions/legend are difficult to read, but everything else is readable.	Poster can be read from 3 feet away and the size and style of the font are consistent. (Exception for references and acknowledgements)
Grammar	Grammatical mistakes are distracting and make it difficult to understand the writing.	Grammatical mistakes are abundant but the text is still understandable	Grammatical mistakes are minimal, but the jargon and sentence structure make it difficult to understand.	The definition of some acronyms are missing, but the jargon used is minimal and the test is understandable	No errors in spelling, punctuation, and grammar. It is easy to read.
Title	The title is misleading	The title does not reflect the work being done	The title is confusing but accurately describes the work. Title is Inappropriately broken onto 2 lines.	The title is overly wordy but accurate	Effectively Highlights the subject matter and accurately represents the content of the poster
Background	No background is provided.	Not all the relevant background is provided.	Background is relevant but not well referenced.	Background is relevant and mostly referenced, but some key concepts that provide justification for the work are missing.	Relevant previous work is referenced, acronyms and jargon are well explained and all important information is included.
Hypothesis or Research Question	No hypothesis/research question is provided	Hypothesis/research question is unclear or inferred. Hypothesis/research question may not be able to be measured/answered	Hypothesis/research question is leading or not well written	The hypothesis/research question is well written but the scientific premise supporting it is not clear.	The purpose of the study is clearly stated and supported by a solid scientific premise as established in the background.
Methods	Missing	Methods used are not appropriate to address the hypothesis/research question	Methods not complete (usually the analysis method is missing)	Methods are completed but either too much or too little detail is provided.	All procedures, including literature searches, and analysis are described in appropriate detail. A figure is used
Results	Results/expected results are not provided or discussed	Results/expected results are not provided but are contemplated briefly.	Results/expected are buried in the text of the poster	Results/expected results are provided as bullet points.	Results are easy to identify on the poster and provide an adequate summary of findings. Analysis is provided as figures
Figures and Figure captions	There are no figures or tables or figures are not referenced or used with permission.	Figure captions are missing and figures are not referenced in the text of the poster.	Figures do not support the story of the poster	The text of the poster does not reference the figures, but the captions are clear	Communicates facts and findings with a clear description to interpret the main take home messages.

Discussion/ Conclusions	Missing	Results/expected results do not (will not) support the discussion/conclusion	Results are over interpreted in the discussion/conclusions.	Discussion/conclusions are supported by the results but not placed in the context of the field.	Evidence of critical thinking and ability to place findings I the context of the literature. Conclusions are supported by the data.
Future Directions	Missing	Vague and not specific to a field.	Future directions are suggested but may not be supported by the current study.	Future Directions are suggested and supported by the findings. The Impact on the field is considered	Future Directions are suggested and supported by the findings. The Impact on the field is considered and specific
Acknowledgements and References	Missing	References are provided but they are not complete or use many different citation styles.	Acknowledgements are not provided.	All figures and content are appropriately referenced and permissions obtained when necessary. Any contributions not rising to the level of authorship are acknowledged.	All figures and content are appropriately referenced and permissions obtained when necessary. Any contributions not rising to the level of authorship are acknowledged. Funding is acknowledged where appropriate and conflict of interest is mentioned.
Presentation					
Presentation of Material	No presenter present	Presenter did not practice and is not confident in what they are saying	Presenter stubbles over their words.	Presenter is well-rehearsed but not confident	Well-rehearsed, clear and confident
Understanding	No understanding of the material.	Significant gaps in understanding that prevent discussion.	Presenter can answer questions that were prepared but cannot have an in-depth conversation about the work.	Presenter has a relatively good understanding of the work they did but cannot extend it to the context of the field.	Understands the material well enough to answer questions and have an in-depth discussion, including implications to the field.
Enthusiasm and Engagement	Presenter is openly hostile toward the topic or the research team.	Presenter is not engaged in the topic and not happy to be there presenting.	Presenter is happy to be there but not necessarily excited about the topic and does not engage with the audience and allow time for questions.	Presenter is so excited about the topic that they do not allow the audience to ask any questions.	Excited/Passionate about the topic. Ability to engage the audience and get them to ask questions
Role on the project	There is no mentor 4listed on the project.	Presenter had no role on the project and does not understand the work	The presenter did not help carry out the work but understand it.	Everyone, including the presenter, had a clear role on the project.	Presenter acknowledges and makes clear everyone's individual contributions during their presentation.

Poster Abstracts

Abstract # 1

Proposed Etiology of Idiopathic CVST

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Background: Cerebral venous sinus thrombosis (CVST) is a rare type of stroke predominantly affecting younger individuals, with a potentially poor prognosis if left untreated. This review aims to provide a comprehensive overview of the epidemiology, risk factors, clinical presentation, diagnostic methods, treatment options, and outcomes associated with CVST, with a specific focus on idiopathic pathophysiology.

Objective: The pathophysiology of idiopathic CVST remains unclear. However, by applying Virchow's Triad, we hypothesize that a combination of transient and permanent risk factors manifesting either clinically, sub-clinically, or delayed clinical presentation contribute to the development of CVST.

Methods: A systematic review identified studies on idiopathic CVST from PubMed, ClinicalKey, and UpToDate, focusing on English-language articles published within the last decade. Inclusion criteria were peer reviewed studies on etiology and diagnosis; exclusion criteria included non-English texts and those with incomplete data. MeSH terms 'Cerebral Venous Thrombosis,' 'Idiopathic,' and 'Sinus Thrombosis' were used.

Results/Conclusion: Virchow's Triad—encompassing endothelial damage, hypercoagulability, and altered blood flow—frames our understanding of CVST risk factors. Inherited thrombophilia, cancer, and lupus are identified as high-risk factors, while transient factors like infections and acute inflammation can temporarily elevate CVST risk. These findings highlight the complex interplay of risk factors, some of which may resolve independently, leading to idiopathic cases. This review discusses both established and hypothesized mechanisms of CVST, providing insights that support further investigation to enhance understanding and guide future research in this and related thrombotic conditions.

Abstract # 2

A NOVEL AND COST-EFFECTIVE MODEL TO SCREEN AND TREAT CERVICAL CANCER AND PRE-CANCERS AT THE POINT OF CARE IN RESOURCE CONSTRAINED COUNTRIES AND COMMUNITIES

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Cervical cancer is a slow growing, preventable cancer, though nearly half of women will die from cervical cancer once diagnosed. The World Health Organization (WHO) created the 90-70-90 policy to reduce the number of deaths from cervical cancer: 90% vaccination against human papilloma virus (HPV), 70% screened twice in their lifetime, and 90% treated for precancerous and cancerous lesions of the cervix. However, resource constrained countries/communities (RCCs) face many obstacles in adoption of this policy, such as access to care and costs. This project offers a unique model to address the obstacles faced by RCCs while working within the WHO goals. The model includes the Bouquet Speculum™, screening with visual inspection and acetic acid (VIA) and automated visual evaluation (AVE), and point of care treatment with cannister based cryoablation. Each piece of the Cervical Cancer Cure Kit is evaluated using literature on epidemiological effectiveness and cost comparisons to support use of the kits in RCCs. The Bouquet Speculum™ provides user-friendly design, improved cervix visualization, and decreased discomfort for the patient. In comparison to various screening methods including pap smear, HPV testing, and more, VIA with AVE proves the most cost-effective and realistic for screening in RCCs at $7 per person. Cannister based cryotherapy is the most cost-effective treatment at $3. Though further studies are needed to evaluate effectiveness and reliability of the kit in practice, this model presents a novel, practical, accurate, and sustainable way to screen and treat cervical cancer and precancers at the point of care in RCCs.

Abstract # 3

A REVIEW OF OPTIMIZING PERIOPERATIVE MEDICATION MANAGEMENT TO REDUCE POSTOPERATIVE INFECTIONS IN PATIENT WITH RHEUMATIC DISEASES.

Hugh Zhang, OMS3, MS[1], Rebecca Bolen, OMS3, BA[1], Jazmin Butzin, OMS3, BS[1], Gregory Rauch, OMS3, BS[1], Tiffany Nguyen, OMS3, MS[1], Johnny Cheng, DO[1]

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ABSTRACT

Perioperative medication management is crucial for patients with rheumatic diseases undergoing surgical interventions like joint replacements. This review examines how such management impacts postoperative complications, particularly infections. Effective management is vital due to the high morbidity and mortality associated with postoperative infections, exacerbated in rheumatic disease patients by their immunocompromised state from both the disease and immunosuppressive treatments. The review explores whether to continue or discontinue disease-modifying antirheumatic drugs (DMARDs) and biologic agents perioperatively. The evidence is mixed: some studies indicate that continuation increases infection risk, while others show complications from discontinuation. Key studies by Bongartz (2007) and Ravi et al. (2014) highlight elevated infection risks in rheumatoid arthritis (RA) patients compared to those with osteoarthritis (OA). Conversely, Den Broeder et al. (2007) suggests proper management can mitigate infection risk without stopping therapy. Additionally, the review addresses propofol, noting its potential to trigger autoimmune conditions such as systemic lupus erythematosus (SLE) and subacute cutaneous lupus erythematosus (SCLE). Reports by Schoenfeldt et al. (2023) and Yu et al. (2017) emphasize the need for careful evaluation and alternative anesthetics for patients with known autoimmune conditions. Overall, findings suggest improved perioperative medication management leads to better outcomes for RA patients, but conflicting evidence on DMARDs and biologic agents calls for further research to establish clear guidelines. Integrating current evidence and addressing gaps can enhance perioperative care and reduce complications in rheumatic disease patients.

Abstract # 4

AFFECTING ALCOHOL-RELATED MORTALITY: COMPARING GUIDELINES FOR ALCOHOL CONSUMPTION RECOMMENDATIONS IN THE UNITED STATES, CANADA, AND AUSTRALIA OVER TWO DECADES

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Alcohol consumption is embedded in the cultures of the United States (US), Canada, and Australia, each with distinct alcohol consumption guidelines aimed at mitigating health risks. These guidelines vary, influencing public health strategies and alcohol-related mortality rates. This study examined the correlation between alcohol consumption guidelines and alcohol-related mortality rates for these three countries over two decades. We assessed whether changes in alcohol consumption guidelines in Canada and Australia led to a deviation in alcohol-related mortality trajectories compared to the US, which maintained consistent guidelines. A quantitative comparison was conducted using data on alcohol-related deaths from 1999 to 2023. Sources included the CDC WONDER database for the US, StatCan for Canada, and Australian government datasets. Guidelines were analyzed for changes in Canada (2011) and Australia (2019), with mortality rates compared before and after these changes using linear regression analysis. The US served as a control due to its stable guidelines. In 2020, the US had the highest alcohol-related mortality rate (14.9 per 100,000), significantly higher than Canada (11 per 100,000) and Australia (5.3 per 100,000). Regression analyses indicated that despite changes in Canadian and Australian guidelines, alcohol-related mortality rates continued to rise similarly across all three countries. There was no significant deviation in mortality trends attributable to guideline changes, suggesting that other factors beyond guidelines influence alcohol-related deaths. This suggests that guidelines alone may not effectively alter mortality trends. Addressing alcohol-related mortality may require a multifaceted approach, including public awareness, policy changes, and sustained intervention efforts.

Abstract # 5

ANTI-DRUG ANTIBODY DEVELOPMENT AGAINST TNF-ALPHA INHIBITORS USED FOR INFLAMMATORY BOWEL DISEASE (CROHN'S AND ULCERATIVE COLITIS)

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Inflammatory bowel disease (IBD), including Crohn's disease and ulcerative colitis, poses a significant challenge within gastroenterology, affecting millions globally and imposing substantial healthcare costs. Despite advancements in treatment, such as the introduction of TNF inhibitors and other biologics, a common issue is the development of anti-drug antibodies (ADAs), which can compromise drug efficacy. Our study aimed to address this gap by exploring the relationship between DA presence and TNF inhibitor efficacy over time in IBD treatment. A survey was conducted collecting data on the duration of drug efficacy, ADA development, patient-reported outcomes, and analyzed blood samples for ADA levels. Preliminary results indicated that a subset of participants on Adalimumab (Humira) and Infliximab (Remicade) experienced reduced drug efficacy correlating with elevated ADA levels. These findings suggest that ADA development is a significant factor in decreased TNF inhibitor efficacy, highlighting the need for proactive ADA monitoring and personalized treatment strategies to enhance long-term outcomes in IBD management.

Abstract # 6

PKU: Assessing Burden on Patients in a Rural Area

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Phenylketonuria (PKU) is a rare metabolic disorder affecting 1 in 23,930 births worldwide. This disease limits the conversion of the amino acid phenylalanine (Phe) to tyrosine, leading to toxic Phe levels. This disrupts mood, learning, attention, and memory if untreated.

To date, patients need a strict diet that includes Phe-free "protein". Additionally, these patients see specialists regarding disease progression. Thus, this rare disorder affects social and financial issues. This literature review aims to exemplify these problems, especially in rural regions.

A systemic literature review was conducted using search terms "PKU", "rural medicine", "barriers to healthcare", "financial burden", and "rare genetic disorders". Sixteen articles were identified and included various rare genetic disorders [PKU, cystic fibrosis (CF), and Dravet syndrome (DS)] with management of disease in rural areas.

Articles delved into care costs for PKU, CF, and DS, which varied by nation and disease process. Still, the average annual cost of PKU care was $5,833 USD, $15,571 for CF, and $27,276 for DS. Socioeconomic burdens differed with each study. However, each disease had longer distances, increased travel expenses, a lack of local resources to manage the disease, and lower confidence in care received by non-specialist providers. For PKU in rural areas, these patients also had difficulty affording Phe-free dietary formulas, accessing registered dieticians and endocrinologists, and assessing regular Phe blood levels. Thus, it is paramount to explore further associations between barriers to care and disease management and patient quality of life to reduce rural burdens and potential disease effects.

Abstract # 7

Assessing the Scientific Validity of Publicly Available Media on Allopathic Vs. Alternative Treatments for Androgenic Alopecia

Avaneesh Ojha[1], Zaakir Hamzavi[2], Rohan Dureja[3], Udayvir Jalf[1], Qamrul Choudhury, PhD[2]

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Androgenic alopecia (AA), commonly referred to as male pattern baldness, is the most prevalent form of hair loss, affecting at least 80% of men and 50% of women by age 70. Oral minoxidil and topical finasteride are the conventional treatments prescribed for AA. However, recently there has been a surge in interest towards non-conventional treatments driven by social media. This raises concerns about the quality and reliability of the information being disseminated. This project aims to address this gap by analyzing the quality and reliability of AA treatment content on YouTube.

The DISCERN scale was used to assess the quality of consumer health information on Youtube related to AA treatments with high viewership. 101 Youtube videos classified as allopathic, experimental, and herbal/alternative were analyzed. These videos were further categorized based on authorship: board certified dermatologists (BCD's), Non-board-certified dermatologists (N-BCD's), and private companies. BCD created videos scored highest on average on the DISCERN scale. Herbal/alternative treatments made by nBCDs and private companies had the lowest scores. Furthermore, herbal videos had the most views, but lower DISCERN scores, showing viewership doesn't always correlate to content quality.

Youtube videos produced on AA treatments vary significantly in quality, with BCDs producing the highest quality content. Enhanced educational outreach by dermatologists and stricter content regulations are recommended to ensure accurate information reaches patients.

Abstract # 8

BARRIERS TO CARE RESULTING FROM A LACK OF SCREENING GUIDELINES FOR ABDOMINAL AORTIC ANEURYSM IN WOMEN

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Abdominal aortic aneurysms (AAAs) are a leading cause of mortality and morbidity, predominantly affecting elderly males, and most existing AAA research has been primarily conducted in males and applied to females. This study investigates the impact of routine AAA screening in women aged 60-75 and addresses gaps in current screening guidelines that may contribute to barriers to care for this demographic. Despite known risk factors such as smoking and cardiovascular disease, there is insufficient data on AAA prevalence, morbidity, and mortality in women, leading to discrepancies in screening recommendations. A comprehensive literature review was conducted using PubMed to analyze clinical trials and meta-analyses focusing on AAAs in females, calculating odds ratios and confidence intervals to assess sex-based differences in AAA prevalence and outcomes. This study found that females show an increased prevalence of AAA with increasing age (OR 24.7, 95% CI 23.4-26.0), female sex is a significant predictor of death from AAA rupture (OR 1.39, 95% CI 1.16-1.66), females are more likely to rupture at smaller diameters (RR 4.0, 95% CI 1.2-13.0), and females display a higher rate of rupture compared to males (OR 1.39, 95% CI 1.16-1.66). These findings suggest that current screening guidelines are insufficient and routine screening for women aged 65-70, especially those with risk factors such as smoking and hypertension, could reduce AAA-related morbidity and mortality. This study further highlights the need for updated, sex-inclusive screening protocols and further research into AAA prevalence among older women to address existing disparities and improve healthcare outcomes.

Poster Abstracts

Abstract # 9

BARRIERS TO CARE IN UTILIZING FERTILITY AWARENESS-BASED METHODS

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Fertility Awareness-Based Methods (FABMs) are defined as a collection of family planning methods that aim to identify the "fertile window" utilizing a combination of different biological observations like cervical mucus, basal body temperatures, urinary hormonal markers, and knowledge from previous menstrual cycles to avoid or achieve pregnancy. When used to prevent pregnancy, women using FABMs are taught to avoid sexual intercourse or use a barrier method of birth control during a woman's individual fertile period. Despite the growing interest of FABMs usage in the patient population, these fertility tracking methods have been mostly left out of contraceptive discussions. This study aims to ascertain the perceived barriers to care in why FABMs are underutilized in patient-provider discussions. A thorough literature search, from 2014-2024, with keywords "Natural Family Planning, Fertility awareness-based methods, provider perceptions of FABMs, and provider education of FABMs," was employed through Google Scholar and PubMed that found eight pertinent articles discussing the limitations on providing FABM counseling. A thematic analysis was conducted, which identified four main themes that proved to limit FABMs presence in clinician-patient dialogue. The most significant factor was providers' lack of knowledge and training gaps on FABMs, as 75% of the papers in this study mentioned this as a reason why FABMs were underutilized in contraceptive counseling across the country. This study suggests that increasing providers' knowledge about the efficacy of FABMs may increase the utilization of these methods by patients, while simultaneously creating a more inclusive environment by offering patient-centered care for diverse patient populations.

Abstract # 10

THE POWER OF EARLY DETECTION: COLON CANCER SCREENING UNDER 45

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Colorectal cancer (CRC) is the third most common cancer worldwide, and the second-leading cause of cancer related deaths. There has been an increase of CRC cases in patients younger than the age of 50 years, known as early-onset CRC (EOCRC). This literature review aims to assess the current state of research on CRC screening among individuals under the age of 45, focusing on the rising incidence rates, risk factors, and outcomes associated with EOCRC. The review utilized a systematic search strategy across three major databases: PubMed, Cochrane Library, and Google Scholar. Studies were selected based on the relevance to CRC screening, diagnostics, and outcomes in individuals younger than 45 years. MeSH terms such as "early-onset colorectal cancer," "colorectal cancer screening," "young adults," "colonoscopy," and "fecal immunochemical test" were employed. The review excluded editorials, letters, and case reports. Out of an initial 23 articles, 20 were ultimately included in this review. Incidence of EOCRC has significantly increased globally, particularly in high-income countries with key risk factors associated with a Western lifestyle characterized by high intake of processed meat, alcohol, smoking, and obesity. The review highlighted that CRC in younger individuals is often diagnosed at a more advanced stage, leading to poorer prognoses. The rising incidence of EOCRC calls for heightened awareness and potentially earlier screening interventions, however there is still further research that needs to be done to identify etiological factors and epidemiological exposures to the recent rise in EOCRC.

Abstract # 11

Brushed Off? Investigating Healthcare Workers Attitudes Towards Their Managements' Response to Safety Issues

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The scientific community lacks knowledge of how effective managerial systems are at addressing patient and employee safety concerns in healthcare settings. By evaluating employee perceptions across various healthcare positions, we aim to gain insight into the efficacy of management practices in ensuring patient and employee safety. The research question is: what are healthcare workers' perceptions of their management's response to safety issues? A 15-question anonymous survey in Qualtrics regarding workplace safety was created and disseminated electronically to students and faculty at Rocky Vista University (RVU), preceptors at RVU rotation sites, former co-workers, and medical internet forums on Reddit. The data were exported, organized, and analyzed with Microsoft Excel, and demographics of the subjects were analyzed as were responses based on a 5-point Likert scale. Respondents were divided into providers (n=49) and support staff (n=39) for comparative statistical analysis. There was statistical significance showing that support staff perceived less access to functional and readily available equipment than providers ($p=0.03$, T-test), as well as support staff perceived enforcement of safety protocols as decreased compared to providers ($p=0.02$, T-test), which could pose threats to patient and employee safety. Limitations of the study included the size (total respondents: n=85) and broad nature of the survey questions; however, the study suggests that healthcare providers and support staff perceived problems regarding safety in their clinics, which may indicate a more significant issue nationwide. Thus, future studies should include investigations into employee training, equipment distribution, and their impact on patient safety.

Poster Abstracts

Abstract # 12

CAPABILITIES OF AI TO READ RADIOGRAPHIC IMAGES

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AI is advancing every day, and its utility in the medical field is continuously evolving. ChatGPT is one of the most publicly used AI programs. Patients and medical students may be tempted to use AI when looking at medical images. The widespread availability of ChatGPT is concerning as the lay public can submit images and get a diagnosis in seconds that has not been medically confirmed by a trained radiologist. This case series examines the accuracy of Chat GPT to interpret extremity fractures. X-ray images with known diagnoses from Radiopaedia were submitted into Chat GPT, asking for medical anomalies and diagnoses. The images selected were chosen based on criteria of single diagnosis, clarity of diagnosis, and age range. ChatGPT was given a normal forearm and wrist, a Colles fracture, a scaphoid fracture, a greenstick fracture, and a complete forearm fracture. It was judged on if it was correct in identifying the diagnosis, incorrect if it mentioned fracture but not the correct one, and very incorrect if no fracture was named. The program was inaccurate in its reading of the radiographs, as it gave normal findings for fractures, and fabricated diagnoses for the normal radiographs, and only diagnosed 6 out of 14 images correctly. For certain fracture types, ChatGPT didn't recognize fractures that were clearly visible. The use of ChatGPT is not recommended for use in viewing radiographs at this time. More studies should be done as ChatGPT is updated to see if its accuracy improves.

Poster Abstracts

Abstract # 13

Impact of Anesthesia Modalities on Opioid Consumption in Knee Surgery: A Systematic Review

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Total knee arthroplasty (TKA) requires effective postoperative pain management to enhance patient recovery. The ongoing opioid crisis underscores the urgency of strategies that minimize opioid use due to risks of addiction and adverse outcomes. This review analyzes the impact of general versus regional anesthesia on postoperative opioid consumption following TKA.

A systematic review was conducted using PubMed and CINAHL databases, focusing on studies from 2000-2024 that addressed anesthesia modalities in TKA and their effects on opioid use. Inclusion criteria included studies published after 2010 on anesthesia techniques and opioid consumption in TKA, while exclusion criteria ruled out non-knee surgeries, non-specific anesthetic methods, or studies lacking direct relevance to opioid outcomes. From 8,743 articles screened, 49 studies were included.

Results demonstrated that spinal anesthesia significantly reduces postoperative opioid consumption by 30-50% compared to general anesthesia (GA). Nerve blocks such as the adductor canal block (ACB) and femoral nerve block further enhanced pain control, with femoral nerve blocks reducing opioid use by 40% and ACB with adjuncts like dexmedetomidine extending analgesia by up to 18.4 hours, cutting opioid needs by 50% within the first 24 hours. Multimodal pain management, including adjuncts like dexamethasone and gabapentin, offered additional reductions of up to 25% in opioid consumption within the first 48 hours.

Optimizing anesthesia modalities in TKA is essential for reducing opioid dependency. This review emphasizes adopting multimodal pain strategies that incorporate regional anesthesia and non-opioid adjuncts, tailored to individual patient needs. While regional anesthesia has shown clear advantages over GA, further large-scale trials are needed to validate these benefits and guide clinical practice, contributing to broader efforts in mitigating the opioid crisis in postoperative care.

Poster Abstracts

Abstract # 14

Anesthetic Management in a Patient with Tethered Spinal Cord Syndrome Undergoing Knee Replacement Surgery

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Tethered Spinal Cord Syndrome (TSCS) is a neurological disorder characterized by tissue attachments that limit spinal cord movement, often resulting in the conus medullaris terminating at a level lower than the typical L1, such as at L5. This abnormality can cause significant complications during spinal anesthesia due to the risk of injury at the traditional puncture sites of L4-L5. This case report discusses the anesthetic management of a 65-year-old female patient with a diagnosed tethered spinal cord, extending to L5-S1, who presented for a right total knee replacement. The patient had a history of successful spinal anesthesia for her previous left knee replacement but was apprehensive about repeating the procedure due to her spinal anatomy and the associated risks.

A thorough preoperative assessment was conducted, including a detailed MRI review by a radiologist and a neurosurgeon, which highlighted the risks associated with spinal anesthesia in this patient. Given the minimal cerebrospinal fluid around critical levels, the risk of injuring the spinal cord during spinal anesthesia was high. After extensive discussions with the patient, focusing on the potential for neurological complications and the benefits of various anesthetic options, the decision was made to proceed with general anesthesia.

General anesthesia was administered successfully with standard intraoperative monitoring and airway management. A preoperative adductor nerve block was also performed to manage postoperative knee pain. The patient emerged from anesthesia without complications, with stable vital signs and good neurovascular function. The interdisciplinary approach and careful preoperative planning were crucial in achieving a positive outcome.

This case highlights the importance of individualized anesthetic planning for patients with complex spinal anatomy, such as those with TSCS. It underscores the need for thorough preoperative assessment and patient-centered care in determining the safest anesthetic approach. Further research is recommended to develop guidelines for anesthetic management in similar cases to enhance patient safety and outcomes.

Abstract # 15

CHALLENGES AND CONSIDERATIONS IN THE MANAGEMENT OF U-SHAPED SACRAL INSUFFICIENCY FRACTURES

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Sacral insufficiency fractures (SIFs), particularly U-shaped fractures, are increasingly common in elderly patients with osteoporosis, representing a significant healthcare burden due to their complexity and the associated costs of diagnosis, treatment, and rehabilitation. U-shaped fractures involve the sacral alae and sacral body, leading to severe pain, impaired mobility, and often prolonged hospitalization. Diagnosing these fractures is challenging due to their subtle clinical presentation and the limitations of standard radiographs, necessitating advanced imaging techniques like MRI or CT scans for accurate identification. Despite the challenges, early and accurate diagnosis is crucial for effective management. Conservative management, including rest, pain control, and physical therapy, is typically the first line of treatment. However, surgical interventions such as percutaneous sacroplasty or internal fixation may be required in cases of unstable fractures or when conservative measures fail, offering significant pain relief and improved mobility, especially in geriatric patients. Recent advances in minimally invasive surgical techniques and early, aggressive pain management have improved patient outcomes, emphasizing the need for individualized treatment plans based on the patient's overall health and fracture characteristics. Early referral and integration of advanced imaging are essential to improving diagnostic accuracy and ensuring timely intervention. Continued research is needed to refine treatment protocols and explore innovative approaches to optimize outcomes further. By prioritizing these tailored, patient-centered strategies, the orthopedic community can enhance care for patients with U-shaped sacral insufficiency fractures, reducing pain, improving mobility, and ultimately improving quality of life.

Abstract # 16

REEVALUATING DISTAL BICEPS REPAIR – UNICORTICAL VS. BICORTICAL TECHNIQUES

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Distal biceps tendon ruptures are significant orthopedic injuries requiring timely surgical intervention to restore arm function and prevent long-term disability. While the traditional bicortical repair method, which involves drilling through both cortices of the radius, has been favored for its perceived biomechanical strength, it carries risks such as posterior interosseous nerve injury. Emerging evidence suggests that unicortical repair, which secures the tendon using only the near cortex of the radius, offers a less invasive alternative with comparable outcomes. Studies demonstrate that unicortical repair provides sufficient fixation strength to withstand physiological forces, with reduced risks of complications like nerve injury and heterotopic ossification. Moreover, patients undergoing unicortical repair exhibit comparable, if not superior, functional outcomes and faster recovery times. Despite initial concerns regarding its strength, unicortical repair has proven to be a viable option, particularly in reducing surgical risks. While patient selection and surgical skill remain critical, the orthopedic community should consider unicortical repair as a superior approach for distal biceps tendon ruptures, with the potential to enhance patient outcomes and minimize complications traditionally associated with bicortical techniques.

Abstract # 17

USE OF CONTEXTUAL DESIGN TO ASSESS WORKFLOWS AND REDESIGN OPPORTUNITIES AFTER EHR CONVERSION

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Contextual Design (CD) is a process that aggregates user data to directly inform software design. Given its capabilities, CD is uniquely suited to evaluate complex workflows. In this study, methods from CD were applied to assess clinical workflow after a major multi-site electronic health record (EHR) conversion. 46 semi-structured interviews were conducted to gather post-conversion data on the use of the new EHR, its relationship to other information systems, and opportunities for improvement. We identified eight themes derived from a total of 272 quotes gathered from interviews. Themes and corresponding quotes were represented in a consolidated affinity diagram with varying frequency of themes. Individual stories revealed representations of the population of EHR users. Some gaps in user understanding of the EHR software were identified. Several themes indicated an interest in standardizing EHR and streamlining workflow processes. This study provides a proof-of-concept for CD as an approach for evaluating clinical workflows post software implementation. These findings can be used to address workflow and suggest potential redesigns, which ultimately improve health system performance.

Abstract # 18

COMPARATIVE ANALYSIS OF CONTRIBUTING FACTORS FOR DEPRESSION AND SUICIDAL IDEATION AMONG ADOLESCENTS IN RURAL VS URBAN POPULATIONS

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Depression and anxiety are significant concerns among adolescents, particularly in rural areas with limited access to mental health services. A study found that rural areas have only 16 psychologists per 100,000 residents, compared to 30 psychologists in urban areas[4]. This study investigates the differences in contributing factors for depression and suicidal ideation among adolescents in rural versus urban populations in the United States. Additionally, the study highlights the importance of early screening for adverse childhood experiences (ACE) to facilitate timely interventions. An anonymous survey was distributed to healthcare providers and students nationwide, focusing on youth mental health in both rural and urban settings. The collected data were analyzed using chi-square tests to identify common risk factors and compare the prevalence of depression and suicidal ideation between these populations. Despite a small sample size (n=12), the findings reveal common and distinct themes: abuse, substance use, and family discord were prevalent across both settings, while urban adolescents faced additional challenges related to education and social identity. In contrast, rural adolescents reported a lack of opportunities and access to mental health services as major concerns. There were no significant results, but our findings warrant further investigation into the need for tailored interventions, including enhanced access to mental health services in rural areas and the regulation of social media in urban areas. While the study's limited scope suggests the need for further research, particularly longitudinal studies, it provides crucial insights into addressing adolescent mental health disparities in different geographical settings.

Abstract # 19

COMPARATIVE ANALYSIS OF COLLAGEN-BASED BIOINKS AND CONVENTIONAL TREATMENTS FOR ANGIOGENESIS IN ISCHEMIC LIMB CONDITIONS

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Ischemic limb conditions, characterized by reduced blood flow and tissue damage, require effective treatments that promote angiogenesis and tissue regeneration. Current therapies, such as Vascular Endothelial Growth Factor (VEGF) therapy is a widely used method that stimulates new blood vessel formation. However, limitations such as short half-life and increased risk of adverse events may reduce its long-term efficacy. Recent advances in regenerative medicine have introduced collagen-based bioinks as a potential alternative to enhance angiogenesis with fewer complications.

This study aims to compare the efficacy and safety of VEGF therapy and collagen-based bioinks for treating ischemic limb conditions. The hypothesis is that while VEGF therapy remains a viable method, collagen-based bioinks may provide sustained angiogenic support with a lower rate of adverse events.

To investigate this, a systematic literature review was conducted using databases such as PubMed and Google Scholar, focusing on peer-reviewed articles published from 2000 to 2024. Search includes terms such as “VEGF therapy”, “collagen-based bioinks”, “angiogenesis”, and “ischemic limb conditions”. Articles were selected based on their relevance and quality using standardized assessment tools.

Analysis of the literature reveals that collagen-based bioinks achieve higher blood flow improvement (85-90% over 12 weeks) compared to VEGF therapy, which declines from 70% to 35% during the same period. Additionally, collagen-based bioinks (10-18 per 100 patients) versus VEF therapy (40-50 per 100 patients). These findings suggest that collagen-based bioinks offer a promising and potentially more effective treatment for ischemic conditions.

The findings underscore the need for further research into collagen-based bioinks as a next-generation treatment. While VEGF therapy continues to have clinical value, collagen-based bioinks may offer a more effective and safer option. As clinical trials advance, these bioinks have the potential to enhance and sustain angiogenesis in ischemic limb conditions.

Abstract # 20

CONDITIONING FALSE PERCEPTIONS IN SCHIZOPHRENIA USING MATLAB

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Introduction: Auditory verbal hallucinations (AVH) are prevalent in patients suffering from schizophrenia (SZ) and are associated with aberrant activity in the auditory cortex. Though most patients respond well to antipsychotics, relapse and treatment resistance remain significant challenges. The P50, an auditory-evoked potential occurring approximately 50 ms after a stimulus, can be used to assess sensory gating in auditory pathways. Abnormal P50 responses have been observed in patients with SZ. This study aims to develop a MATLAB program that integrates provoked AVH with aberrant P50 responses in patients with SZ.

Materials and Methods: Patients participate in a paired click task designed to condition and provoke AVH. Electroencephalography (EEG) data from the auditory cortex are gathered concurrently. The program will couple EEG data with visual cues from the paired click task to correlate aberrant P50 responses with provoked AVH. Limitations include the large number of responses necessary for high power results and patient compliance.

Results: The program is already capable of detecting aberrant P50 responses from EEG data, but modifications to correlate these responses with AVH produced by the paired click paradigm are still in progress. A significant correlation is anticipated between conditioned AVH frequency and abnormal P50 responses. Also, both these parameters are expected to be increased in patients with more severe AVH.

Conclusion: This program could significantly advance our understanding of the electrophysiological mechanisms of AVH and provide non-invasive means of assessing AVH severity. These could help guide the discovery and implementation of new treatment modalities in this patient population.

Abstract # 21

COST OF SEPSIS CARE IN WESTERN UNITED STATES LEVEL I AND LEVEL II TRAUMA EMERGENCY DEPARTMENTS

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Sepsis care is among the most expensive hospital admissions in the US, with average costs of $28,000. US trauma centers are categorized by level based on resources and patient volume. Still, little research has examined the cost differences for sepsis care between Level I and Level II trauma centers. We compared emergency department (ED) charges for sepsis care in the Western US to average incomes of patients associated with these charges.

Utilizing the 2021 Healthcare Cost and Utilization Project (HCUP) Nationwide Emergency Department Sample (NEDS) database, we assessed sepsis costs. Discharged cases from Level I and Level II trauma centers were compared to the median household income of patients' zip codes. Data analysis was performed using SPSS, with descriptive statistics and ANOVA (Analysis of Variance), followed by post-hoc Tukey HSD tests.

An increasing number of sepsis ICD-10 diagnoses correlated with higher median household incomes. ANOVA revealed significant differences in ED costs across income quartiles, with the highest income quartile (Q4) being significantly higher ($p<0.05$). Notably, patients from higher-income zip codes paid >$7,544 for sepsis care at Level II trauma centers compared to Level I centers. However, >70% of patient cost data were missing.

The HCUP-NEDS database aims to analyze healthcare costs and utilization across the US, but most patient costs were missing, and the database lacked vital signs and laboratory data, limiting conclusions on the reasons for sepsis care cost differences. Future research should explore correlations between sepsis diagnoses and clinical data to understand cost disparities better.

Abstract # 22

DERMATOLOGICAL SAFETY OF COSMETIC PRODUCTS MARKETED TO CHILDREN: INSIGHTS ON THE SEPHORA KIDS PHENOMENON

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The “Sephora Kids” trend, where children, especially tweens and teens, are increasingly using makeup and skincare products marketed by beauty retailers, presents notable dermatological challenges. Although these products can facilitate self-expression and teach self-care, their safety and efficacy for young users are largely unverified. This review examines four key ingredients commonly found in these products—retinol, exfoliating acids (AHA and BHA), and vitamin C—to assess their implications for pediatric skincare. Current literature and FDA-approved guidelines indicate that these ingredients have not been thoroughly tested in children. Consequently, using these products without medical supervision can pose risks such as skin redness, irritation, heightened sun sensitivity, dermatitis, and other potential adverse effects. This review underscores the importance of cautious use and highlights the need for further research to ensure the safety of these ingredients in young populations. By informing healthcare providers and consumers of these risks, we aim to promote safer skincare practices among children.

Abstract # 23

DIAGNOSTIC CODES ASSOCIATED WITH FALLS, A FOCUS ON PSYCHIATRIC AND NEURAL DIAGNOSES IN THE ELDERLY IN-PATIENT SAMPLE

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Body of the abstract written in paragraph form. (Font – Times New Roman, Calibri or Arial, size 12, 1" margins, fully justified).

- The WHO reports that elderly people have the highest risk of death or serious injury arising from a fall (WHO, 2021).
- This study utilized the 2020 National Inpatient Sample (NIS) database from the Healthcare Cost and Utilization Project to determine which diagnostic conditions were most likely to be seen in elderly fall patients.
- The 2020 NIS database was used to identify the ICD-10 diagnostic codes that were associated with a fall code in elderly patients. Analyses used the first 3 digits of the diagnostic code.
- As expected, Circulatory codes were common in the FPs >50 YOA, as the incidence of these diagnoses increase dramatically with age. It was, however, surprising to see the high incidence (73.1%) of Psychiatric and Neural codes in the FPs >50 YOA, particularly codes relating to dementias.
- We presume that most falls occurred outside of the hospital and may have been associated with hospital admission. Studies like this may help to develop fall prevention strategies by isolating specific diagnostic patient profiles in the elderly.

Poster Abstracts

Abstract # 24

DIAGNOSTIC UTILITY OF ULTRASOUND FOR WRIST PAIN

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The complex etiology of chronic wrist pain is inherently related to the anatomic structures that comprise the wrist as well as the biomechanical forces that may contribute to developing chronic pain. Though not as widely used as physical exam testing, current literature suggests that ultrasound of the wrist compartments can be useful in diagnosing wrist pain etiologies. Assessment of patient history alongside visualization of anatomy should be crucial in the assessment of chronic wrist pain as it is efficient and objective. A 25-year-old right-handed female presented with chronic right radial wrist pain for one year with insidious onset. The pain presented in sporadic episodes with occasional "catching" symptoms after certain movements. Ultrasound imaging of the first compartment illustrated notable fluid collection with septal inflammation surrounding the abductor pollicis longus (APL) and extensor pollicis brevis (EPB) tendons. Both physical exam testing and ultrasound imaging proffered a diagnosis of severe DeQuervain's tenosynovitis (DQT). After four months of conservative management, her symptoms have almost completely resolved and repeat ultrasound was recommended. In addition to ultrasound utilization in diagnostics, it can also be used to differentiate anatomic variation prior to invasive surgical treatments, leading to an overall decrease in post-operative complications. This is particularly important for our patient, as existing literature notes a septum between the APL and EPB is only present in about 10% of the population. Should our patient have required surgical release of the tendon sheath, this anatomic variation would have been missed if not for the diagnostic utility of ultrasound. This case report illustrates the importance of ultrasound imaging to diagnose complex musculoskeletal complaints and suggests the bypass of uncomfortable and subjective physical exam testing.

Abstract # 25

INTO THE THROES OF HYPEREMESIS GRAVIDARUM: A CALL FOR GREATER AWARENESS AND SUPPORT

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Pregnancy-associated morbidities exhibit a wide range of presentations and severities, with Hyperemesis Gravidarum (HG) being a particularly severe and poorly understood condition. HG is characterized by extreme nausea and vomiting that can significantly impair a woman's quality of life (QoL) and, in severe cases, persists throughout the entire pregnancy or even recurs with increasing severity in subsequent pregnancies. Despite the development of various treatment options, many women with HG continue to suffer until delivery, unless an early delivery is medically necessary. Current research efforts are focused on identifying molecular targets and developing new therapeutic interventions, but advancements in this area are still lacking. As a result, the clinical management of HG remains challenging, and the need for improved awareness among clinicians, patients, educators, and researchers is crucial. This study contextualizes the myriad experiences of HG and women's QoL and it highlights the necessity for increased vigilance and resource allocation in the care of HG patients. It calls for enhanced education and support for clinicians and caregivers to better address the complexities of HG. By improving understanding and resources, we can work towards more effective treatments and improved outcomes for those affected by this debilitating condition. A survey was conducted of 1002 pregnancies, during which the patient experienced nausea and vomiting of pregnancy or was formally diagnosed with HG. The survey analyzed correlations between factors such as support system strength, HG severity, geographic region, symptom duration, and pregnancy enjoyment.

Keywords: hyperemesis gravidarum, quality of life, pregnancy morbidity

Poster Abstracts

Abstract # 26

INVESTIGATING THE EFFECTIVNESS OF VIRTUAL REALITY TO CADAVER-BASED TUTORING

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Virtual Reality (VR) is an emerging technology that offers potential applications in medical education. The comparative effectiveness between VR and cadaver tutoring methods is poorly understood. This study aims to gain an understanding of anatomical knowledge acquisition and perceptions of anatomical knowledge by pre- medical graduate students utilizing VR versus cadaver-based tutoring. We hypothesized that students who participated in VR tutoring sessions would not experience diminished performance on cadaver anatomy lab practical or written exams as compared to students who participated in cadaver lab sessions. Two groups of 18 pre-medical post baccalaureate master-level students enrolled in two sequential sections of anatomy content (head and neuroanatomy). Sessions were randomly assigned to VR or cadaver tutoring. At the conclusion of the four weeks, student cohorts switched tutoring methods. Three surveys were administered: pre, at the end of initial four weeks, and the end of second four weeks. At the completion of each four-week period, students took anatomy practical and written examinations as part of their enrolled coursework. Preliminary data indicate that more students believed their anatomy learning experience was enhanced through cadaver lab tutoring as compared to VR. Data is currently being analyzed. Actionable data outcomes would be indicated by enhancements in memory retention, improved examination grades, improved economic feasibility, and students' learning satisfaction. Future directions may include exploring a system-based anatomical approach and potential effectiveness of VR based-learning as well as VR learning as a prelude to cadaver lab learning.

Abstract # 27

DUAL INHIBITION OF AMYLOID AGGREGATION: A PROMISING THERAPEUTIC STRATEGY FOR ALZHEIMER'S DISEASE IN THE CONTEXT OF TYPE 2 DIABETES MELLITUS

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Alzheimer's Disease (AD) and Type 2 Diabetes Mellitus (T2DM) are interconnected conditions, both marked by the aggregation of amyloidogenic proteins: amyloid-β 42 (Aβ42) in AD and islet amyloid polypeptide (IAPP) in T2DM. IAPP, when overproduced in T2DM, can cross the blood-brain barrier and interact with Aβ42. Their cross-seeding enhances amyloid plaque formation and neurotoxicity while reducing their clearance from the brain, thereby worsening neurodegeneration in AD. Current treatments for AD in patients with T2DM, including traditional AD therapies and specific diabetes management strategies, do not effectively address the role of IAPP, limiting their ability to slow the progression of AD in this population. This review explores dual inhibitors that target Aβ42 and IAPP, offering a promising approach to treat AD in T2DM patients. Literature was gathered from PubMed and Google Scholar, focusing on studies within the last 10 years for treatments, with no date restrictions for background. Both animal and human studies were included. Studies were analyzed for common mechanisms of action, effectiveness in reducing amyloid aggregation, and potential clinical applications. We discuss various classes of dual inhibitors such as structure-based inhibitors that bind to specific protein segments in IAPP and Aβ42; aromatic interaction-based inhibitors that leverage π-π stacking with these proteins; catechol-based inhibitors that utilize catechol moieties for effective binding; and chaperone-based inhibitors that stabilize amyloidogenic proteins. Studies indicate these inhibitors effectively reduce the formation of toxic aggregates and significantly improve neuronal viability. However, these drugs are still in the preclinical phase, and significant research gaps remain, particularly in understanding the detailed mechanisms of these drugs and their clinical efficacy. Further research into these pharmacological agents, which address the complex interplay between these diseases, could lead to effective treatments for AD in the presence of T2DM.

Abstract # 28

DYSHIDROTIC ECZEMA: IDENTIFICATION, DIFFERENTIATION, AND CURRENT TREATMENTS

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Dyshidrotic eczema is a multifactorial and chronic contact dermatitis and is characterized by eruption of deep-seated and pruritic blisters mainly on the hands. The pathology is unknown, making the condition challenging to diagnose and treat, even though dyshidrotic eczema encompasses 5-20% of hand eczema cases. The purpose of this paper is to condense significant research to make it easily accessible to primary care providers to assist in identifying, diagnosing, and treating dyshidrotic eczema. A systematic search was conducted using PubMed, MEDLINE, and the Cochrane Library. Search terms included “dyshidrotic eczema,” “pompholyx,” “treatment,” “diagnosis,” “vestibular palmar dermatitis” and “contact dermatitis.” The initial search yielded 150 articles; after screening for relevance, 30 articles were reviewed in detail. Diagnosis can be conducted through evaluating risk factors, such as occupational exposure, and through allergy testing and skin biopsy to differentiate it from similar conditions. For treatment, tacrolimus, Adjuvant botulinum A, ultraviolet A1, and Dupilumab are the most researched treatment options that show significant improvement in severity and chronicity. Other emerging therapies show promise but require further study. This review highlights the need for increased awareness and research on dyshidrotic eczema to improve patient outcomes. By providing primary care providers with a clear synthesis of the available literature, this paper aims to facilitate earlier diagnosis, prevent misdiagnosis, and provide more effective treatment, reducing the need for specialist referral.

Abstract # 29

Stem Cell Therapy in Achilles Tendon Injuries: A Comprehensive Review

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Achilles tendon injuries (ATIs) are prevalent injuries resulting from repetitive physical activity, ranging from tendinopathies to full ruptures. These injuries often lead to chronic pain and weakness in the Achilles tendon, with recovery and rehabilitation posing significant challenges. Standard treatments include exercise therapy, nonsteroidal anti-inflammatory drugs, and injection therapies such as corticosteroids or autologous blood products. In severe or chronic cases, surgery may be required. However, many patients continue to experience persistent pain and diminished tendon function, even after treatment. Recent research suggests that stem cell therapies, particularly those utilizing bone marrow, mesenchymal, and tendon progenitor cells, may offer promising alternatives by enhancing the restoration of tenocyte cells and other non-regenerative molecules within the tendon. These stem cells have shown potential in restoring the tendon's original biomechanical properties, offering hope for more effective healing. A comprehensive literature review was conducted using key terms like "Achilles tendinopathy," "stem cell," and "tendon repair" across databases such as PUBMED, NCBI, and Google Scholar. Studies in both animal and human models were analyzed to assess the efficacy of stem cell therapy in treating ATIs. Findings indicate that stem cell therapy could significantly reduce pain and improve the restoration of tendon function, presenting a transformative option for patients who have long struggled with chronic pain and ineffective treatments. This review aims to further explore the potential of stem cell therapy to revolutionize the management of ATIs, offering a new avenue for effective tendon healing.

Abstract # 30

ENDOCRINE AUTOIMMUNITY: HLA INSIGHTS AND POTENTIAL CLINICAL IMPACT FROM THE LAST 5 YEARS

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The immune system protects against pathogens by recognizing non-self proteins, a process largely involving the Human Leukocyte Antigens (HLA) gene complex. However, if these functions go awry through genetics or environmental triggers, it can lead to autoimmune diseases in which a self-tissue becomes targeted and inflamed by immune cells. In this literature review, we examine a comprehensive list of autoimmune diseases that impact the endocrine system and their HLA associations. This review will discuss the overlapping HLAs in endocrine diseases. Our goal is to provide an up-to-date endocrine autoimmune review that focuses on HLA, addressing a gap left by existing reviews that are over 15 years old. Limiting to a 5-year timeframe and peer-reviewed papers, we performed a literature search on PubMed, DynaMed, and UpToDate on all the glands of the endocrine system. We then searched for autoimmune diseases of those glands and made a comprehensive list. Our search included the name of the gland, the MeSH terms “autoimmune diseases,” “autoimmunity,” “autoimmune,” and “HLA associations,” excluding any papers that were more than 5 years old. We included papers that summarized these diseases in terms of clinical presentation, pathogenesis, management, complications, and their genetic contributions, with an emphasis on HLA involvement and were peer-reviewed. We hypothesize and expect our research will reinforce that specific HLA subtype mutations will be present in all the endocrine diseases, specifically, on HLA-DRB. Our paper will include a comprehensive table offering a valuable reference for various fields including clinical research, personalized medicine, immunology, genetics, and more.

Abstract # 31

ENDOMETRIAL THICKNESS IMPACTS GOOD BIRTH OUTCOMES IN MODIFIED NATURAL EMBRYO TRANSFER CYCLES

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Frozen embryo transfer (FET) is a mainstay of treatment for patients undergoing fertility treatment. While previous studies have shown decreased maternal and fetal risk is associated with natural FETs when compared to hormone replacement cycles, there are very few studies that have looked specifically at subcategories of natural cycles, such as modified natural cycles, and factors that may influence the outcome. The present retrospective cohort study looks at 1,059 modified natural cycle frozen embryo transfers (mNC-FETS) and evaluates the impact of endometrial thickness (EMT) on birth outcomes. The primary outcome of this study is Good Birth Outcome (GBO), defined as "singleton birth at 37 weeks gestational age or greater with an appropriate for gestational age weight of 2500-3999g" (Roeca, C, et al., 2020). Statistical analysis was performed, risk ratios were calculated, and findings demonstrate a positive correlation between the thickest EMT group (>10.3mm) and GBO (RR 1.48; 95% CI 1.16, 1.90; p= 0.005). Increased EMT is also associated with increased rates of live birth (RR 1.33; 95% CI 1.11, 1.58; p= 0.008). This information is vital to the reproductive endocrinology community when looking to reduce risk and maximize positive outcomes for patients undergoing treatment.

Abstract # 32

EOSINOPHILIC ESOPHAGITIS: A CASE REVIEW WITH THROAT CLEARING AS THE ONLY CLINICAL SYMPTOM

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Eosinophilic esophagitis is the presentation of greater than or equal to 15 eosinophils per high-power field on light microscopy. It is a T_H2 antigen-mediated response. Typical patient presentation of symptoms is dysphagia, emesis, abdominal pain, regurgitation, followed by failure to thrive or weight loss [1]. In August of 2022, a 9-year-old girl presented with chronic throat clearing for approximately six months that interrupted her speech and flow of conversation yet no additional symptoms. In September 2022, the patient underwent an esophagogastroduodenoscopy with biopsies. The esophageal biopsy yielded squamous mucosa with basal cell hyperplasia and approximately 30 eosinophils per high-powered field. Foci containing degranulated eosinophils and eosinophilic collections within the superficial mucosa were also seen. The patient was started on budesonide and fluconazole[2], typical treatments of eosinophilic esophagitis, and her chronic throat clearing resolved. In September 2023, the patient underwent a second esophagogastroduodenoscopy and the results yielded squamous mucosa with significant findings with no histological evidence of increased intraepithelial eosinophils, intestinal metaplasia, or dysplasia.

1. Gonsalves, Nirmala. “Diagnosis and Treatment of Eosinophilic Esophagitis.” *The Journal of Allergy and Clinical Immunology*, U.S. National Library of Medicine, pubmed.ncbi.nlm.nih.gov/31910983/. Accessed 15 Aug. 2024.

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Abstract # 33

EXPLORING EQUITY IN AUTISM SPECTRUM DISORDER DIAGNOSIS: VIRTUAL SCREENING TOOLS FOR TRADITIONALLY UNDERSERVED POPULATIONS

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Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition that affects approximately 1 in 36 children in the United States. Early detection is critical for improving developmental outcomes, yet significant racial and ethnic disparities persist in the diagnosis of ASD. This study explores these disparities, focusing on the potential of virtual and online screening tools to enhance early detection in traditionally underserved populations, including racial and ethnic minorities. A comprehensive literature review and thematic analysis identified key barriers to care contributing to delayed or missed ASD diagnoses, including limited access to primary and preventative healthcare, low healthcare literacy, cultural stigma, language barriers, and implicit bias among providers. The study examined the effectiveness of emerging virtual screening tools, with themes identified including telehealth platforms, artificial intelligence (AI)-driven assessments, and digital observation methods, in mitigating these barriers to care. These tools potentially offer several advantages when compared to traditional screening methods. Advantages identified include improved accessibility, scalability, and ease of use, particularly for low-literacy and non-English-speaking populations. However, challenges remain in validating these tools, integrating them into existing healthcare systems, and addressing the digital divide. Despite these challenges, the study suggests that virtual screening tools hold significant promise for reducing disparities in ASD diagnosis and improving outcomes for underserved communities. The findings underscore the need for continued research and the potential for integrating these tools into clinical practice to create a more equitable healthcare landscape.

Abstract # 34

EXPLORING HORMONAL AND CYTOKINE FLUCTUATIONS DURING REPEATED STRESS: A COMPARATIVE ANALYSIS OF TRUTHFUL AND DECEPTIVE RESPONSES

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Elevated levels of cytokines and hormones are often observed during physiological and mental stress. This study investigates how cortisol and immune cytokines fluctuate throughout a week of repeated stress and their correlation with emotional responses in participants. Specifically, we aimed to determine whether there are significant differences in the concentrations of specific hormones and cytokines between participants who were lying versus those who were truthful, as identified by the TouchScreener™ system. Saliva samples were collected from participants twice daily for four days during Cut Suit Week. The samples were analyzed by Eve Technologies to measure the concentrations of 2 hormones and 21 cytokines. Participants were divided into two groups (lying vs. truthful) based on TouchScreener™ data. A one-tailed T-test with a P-value of 0.05 was conducted to assess significant differences in hormone and cytokine levels between the groups. Significant differences were found in the concentrations of Cortisol, EGF, G-CSF, IFNγ, IL-1α, IL-1β, IL-6, IL-10, IL-18, and MCP-1 between the two groups Preliminary findings suggest that specific cytokines and hormones significantly differ in individuals who were lying, as detected by the TouchScreener™ system. These biomarker changes highlight the potential inaccuracies in surveys relying solely on self-reported metrics, as physiological stress responses can undermine the reliability of self-reported data. Further analysis may provide insights that challenge the validity of traditional survey methods and emphasize the need for incorporating objective physiological measurements in research that depends on self-reporting.

Abstract # 35

EXPLORING THE IMPACT OF SOCIAL DETERMINANTS OF HEALTH ON FOLLOW-UP MEDICAL CARE FOR SEXUAL ASSAULT SURVIVORS POST-INITIAL EMERGENT EVALUATION: A LITERATURE REVIEW

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Each year, approximately 400,000 women in the United States experience sexual assault. Of these, less than 21% receive emergent care, and of those, only 40% follow up with a primary care provider due to obstacles facing sexual assault survivors. Following sexual assault, it is crucial for survivors to continue seeking healthcare, as they are at higher risk of developing medical and psychiatric conditions. While current literature extensively addresses the initial emergency treatment of sexual assault survivors, there is limited cohesive research on their follow-up care and the factors contributing to successful or unsuccessful follow-up.

The authors of this review combed the literature for sources discussing social or economic barriers to sexual assault survivors seeking healthcare. Using PubMed, Embase, Cochrane, and Google Scholar, searches for articles containing relevant keywords, MeSH, and entry terms, such as “sex offenses,” “survivors,” “healthcare utilization,” “delivery of healthcare,” “resource-limited areas,” and “social determinants of health” were conducted. Key factors significantly impacting individuals seeking care were ethnicity, social support, language, residence, and income. Minor factors included age, education, substance use, and disability.

Current research only scratches the surface by addressing specific barriers and needs to provide the comprehensive data required to initiate more positive outcomes. Focusing on these key barriers will allow for responses tailored to patients seeking care while fostering awareness. By exploring the predominant factors affecting individuals who did not seek follow-up care, this literature review aims to furnish survivors, healthcare providers, and community organizations with the information needed to improve the standard of care.

Abstract # 36

EXPLORING THE INFLUENCE OF ANIMAL COMPANIONSHIP ON CORTISOL LEVELS: A REVIEW ON STRESS REDUCTION AND WELL-BEING

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The negative impact of stress on biopsychosocial parameters of wellbeing have been thoroughly documented and continue to be a priority in the field of preventative medicine. Awareness of mental health conditions and subsequent intervention continues to capture the zeitgeist of the post-pandemic era. This review aims to analyze the available data regarding cortisol levels in response to interactions with companion animals. A comprehensive literature review was completed to analyze the influence of companion animals on cortisol levels. Articles were aggregated that met the following inclusion criteria: 1) studies in the United States (U.S)., 2) ownership of companion animals, 3) quantitative measurements of cortisol levels. Using a reproducible strategy on PubMed, 14 articles were identified, and 7 were reviewed. These identified that owning a companion animal had resulted in reduced cortisol level. Results indicated an average 20% decrease in salivary cortisol levels, which were analyzed and averaged pre and post companion animal partnership. In the United States, more households have pets than children, making this a relevant topic of study. These findings aim to advance the understanding of the physiological benefits of pet ownership, specifically cortisol reduction and management. This study underscores the stress-reducing effects on animal companionship and can help dismantle barriers to companion animal ownership. It has the potential to influence mental health interventions and funding.

Abstract # 37

EXPLORING THE RELATIONSHIP BETWEEN BODY MASS INDEXAND PROSTATE CANCER INCIDENCE: A COMPREHENSIVE SYSTEMATIC LITERATRE REVIEW

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Prostate cancer is the second leading cause of male cancer-related mortality in the United States, with an estimated 299,010 new cases and 35,250 deaths expected in 2024. This systematic literature review aims to explore the relationship between body mass index (BMI) and prostate cancer incidence, focusing on existing evidence, potential modifiers, geographical disparities, and underlying biological mechanisms. The keywords used were "BMI" and "prostate cancer screening". The inclusion criteria were studies involving prostate cancer patients and BMI metrics. Out of 22,705 articles initially identified with "BMI" (19,589) and "prostate cancer screening" (3116). 58 studies met the inclusion criteria, yet only 22 were used based on inclusion of specific BMI metrics. 17 additional articles were used to support the analysis. Studies before 2004 were excluded. Some studies indicated a positive correlation between higher BMI and increased risk of advanced prostate cancer, while others reported no significant association or even an inverse relationship. Potential biological mechanisms linking BMI to prostate cancer include metabolic dysregulation, hormonal influences, and genetic pathways. The relationship between BMI and prostate cancer incidence is influenced by age, race/ethnicity, and socioeconomic status. While higher BMI is generally associated with increased risks and poorer outcomes in prostate cancer patients, contradictory findings highlight the need for further research. Some limitations include high heterogeneity in study designs and outcome measures, potential publication bias, selective reporting of positive outcomes, and short follow-up periods limiting long-term outcome assessment**.** Overall, understanding the underlying mechanisms and modifiers is crucial for developing targeted interventions to reduce the burden of prostate cancer.

Poster Abstracts

Abstract # 38

FUTURE HEALTHCARE PROVIDERS' CONCEPTUALIZATION OF RACE AND INFLUENCE ON CLINICAL DECISION-MAKING

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Despite the large body of evidence demonstrating there is no genetic basis for racial categories, medical education and healthcare practices continue to reinforce these ideologies by oversimplifying and pathologizing the relationship between race and genetics. This misinformed approach poorly addresses the underlying factors contributing to disease states and negatively impacts vulnerable populations. Examining healthcare students' conceptualization of race and its impact on clinical decisions can inform curriculum reform, and best healthcare practices. This study aimed to understand future healthcare providers' conceptualization of race, how it is discussed in curriculum, and how that may impact clinical decision-making. An 11-question electronic survey was administered to Doctor of Osteopathic Medicine and Master of Physician Assistant Studies students at Rocky Vista University. The survey asked how participants define race, differentiate races, and how race is discussed in curriculum. A Likert scale questionnaire asked participants their degree of agreeableness with statements about the relationship between race, genetics, and clinical decisions. Of 48 responses, 36 completed responses were analyzed to recognize themes (where greater than 10 percent of participants provided similar responses). Modal responses were identified from the Likert scale answers. Participants defined and differentiated racial categories based on physical attributes, shared culture, ancestry, genetics/DNA, ethnicity, and as a social construct. Many participants reported race as a social construct, then later indicated a biological basis for race, demonstrating a complex, and dynamic understanding of race. Most participants endorsed that there are genetic differences between races that affect health, and supported race's relevance in clinical decisions such as genetic risk assessment and medication prescribing. The findings highlight the gap in understanding of the relationship between race and genetics among future healthcare providers and underscore the need for educational reform that challenges ingrained ideologies. Further studies are needed to validate findings across multiple institutions, and a more representative population.

Abstract # 39

GROWTH DIFFERENTIATION FACTOR 15 IN HYPEREMESIS GRAVIDARUM: EXPLORING THE PATHOPHYSIOLOGY AND THERAPEUTIC POTENTIAL OF GDF-15/GFRAL INHIBITORS

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Hyperemesis gravidarum (HG) is the most severe form of nausea and vomiting during pregnancy, affecting approximately 2% of pregnant women in the U.S. Current treatments, including antiemetics, antihistamines, and vitamins/supplements, are largely ineffective and often have adverse effects, highlighting the need for better therapeutic options. Recent studies have identified Growth Differentiation Factor (GDF15) as a significant contributor to the etiology of HG.

This literature review aims to explore the biochemical structure and signaling pathways of GDF15 to identify potential pharmaceutical targets for managing HG. Keywords related to GDF15, HG, nausea and vomiting in pregnancy (NVP), and drug therapy were used in a search with DistillerSR, yielding 345 articles. Investigators reviewed these articles for relevance to GDF15 in pregnancy, HG mechanisms, and potential drug therapies, narrowing the selection to 86 relevant articles. These articles were subsequently categorized by study type, specificity to HG or NVP, relevance to GDF15 or GFRAL, and drug type. After categorization, 56 more articles were excluded, leaving a total of 30 papers.

The findings indicate a strong association between elevated GDF-15 levels and the severity of HG/NVP, with the C211G mutation being identified as a contributing factor in this process. Several GDF-15-targeting drugs, including monoclonal antibodies, GFRAL antagonists, and small molecules are currently in development that may offer therapeutic options for pregnant women suffering from NVP/HG. However, thorough safety testing is crucial to ensure maternal and fetal well-being.

Abstract # 40

A BENIGN FINDING OF HEMORRHAGIC PANCREATITIS

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Hemorrhagic pancreatitis is a rare cause of hypovolemic shock. This condition is typically a complication of acute pancreatitis. As such, causes of this condition mirror those of acute pancreatitis (chronic alcohol abuse, gallstones, infection, hypertriglyceridemia, etc.) with the addition of predisposing factors for pseudoaneurysm or pseudocyst formation such as chronic pancreatitis, trauma and biliopancreatic surgery. Hemorrhagic pancreatitis presents as silent bleeding, with signs of hypovolemic shock and abdominal pain eventually culminating in life-threatening bleeding. This case report delves into a case of hemorrhagic pancreatitis in a 49-year-old male. Notably, he has a history of recurrent lower extremity deep vein thrombosis and atrial fibrillation managed with Coumadin. He presented to the emergency department with shortness of breath and was admitted for acute hypoxic respiratory failure secondary to Influenza A. A few days into admission, the patient developed acute cardiogenic shock, septic shock, and acute respiratory distress syndrome, requiring intubation and sedation. The patient developed rectal bleeding, and CT of the chest, abdomen, and pelvis without contrast showed hemorrhagic pancreatitis in the head and tail regions. GI was consulted, and no interventions were pursued. Hemorrhagic pancreatitis carries a high mortality rate, making this patient's recovery unique. In this case, the hemorrhagic pancreatitis had an insidious onset with self-resolution. Here we discuss the most common etiologies of hemorrhagic pancreatitis, evaluation and management of this high-mortality condition, and an incredibly rare case where hemorrhagic pancreatitis resolved without treatment.

Abstract # 41

WOHLFAHRTIIMONAS CHITINICLASTICA BACTEREMIA IN MAGGOT-INFESTED WOUND

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The bacteria Wohlfahrtiimonas chitiniclastica, is a gram-negative rod which can cause bacteremia and sepsis in humans. The bacteria was isolated from Wohfahrtia magnifica, an obligate parasitic fly that often lives off livestock in Eastern Europe, the Mediterranean, and Middle Asia. As of March 2023, 43 case reports have described infection with W. chitiniclastica worldwide, with 3 of those cases occurring in the Northeastern United States. In this case report, we discuss a rare incidence of maggot-induced bacteremia in a 54-year-old female patient. The patient presented to the Emergency Department with altered mentation and a shock state. The patient has schizophrenia and had been refusing to shower. She was found to have bilateral ankle ulcerations infested with maggots. In addition to removal of the maggots, the patient was started on empiric coverage IV antibiotics with piperacillin/tazobactam IV and vancomycin IV. Blood cultures were drawn, resulting in Wohlfahrtiimonas chitiniclastica. Antibiotics were transitioned to piperacillin/tazobactam IV. Repeated blood cultures were drawn two days after the original blood cultures and showed no growth. W. chitiniclastica transmission occurs through the deposition of larvae into a chronic or necrotic wound, leading to myiasis and subsequent bacteremia. Risk factors for infection include poor hygiene, homelessness, and presence of chronic or necrotic wounds. Most cases of W. chitiniclastica have been reported in the setting of polymicrobial infection which underscores the need for first line broad spectrum antibiotic use with gram negative coverage.

Abstract # 42

HEPATIC ADENOMATOSIS IN A 24 YO FEMALE

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A 24-year-old female presented with a 7-hour history of severe right upper quadrant (RUQ) pain, nausea, and vomiting with a history notable for OCP use for 11 years. On examination, she was in moderate distress due to pain, tachycardic, tachypneic, and tender to palpation in the RUQ with guarding present and active vomiting. After abdominal US, a ruptured adenoma was suspected and transarterial embolization (TAE) was performed. With further imaging of CT and MRI, the patient was found to have hepatic adenomatosis which is defined by the presence of 10 or more adenomas in an otherwise normal liver. The uniqueness of this case lies in the number and size of adenomas, with the largest exceeding 8 cm, and the presentation with hemorrhage due to a ruptured adenoma. Hepatic adenomatosis is a rare condition, often asymptomatic, and usually diagnosed incidentally. However, large adenomas may rupture, leading to complications like hemorrhage. This case highlights the diagnostic challenges, including the role of ultrasound, CT, and MRI in diagnosis, and emphasizes the importance of discontinuing hormone therapies like oral contraceptives in management. Treatment options vary from nonsurgical approaches such as TAE for active bleeding, to surgical options like partial hepatectomy or liver transplant in severe case. This case, classified as an inflammatory subtype of adenomas and found to be β-catenin negative, provides valuable insights for future research and emphasizes the need for improved diagnostic accuracy and standardized care protocols for benign liver neoplasms.

Abstract # 43

INVESTIGATION OF HUMAN PAPILLOMAVIRUS VACCINATION DISPARITIES IN MISSISSIPPI AND RHODE ISLAND

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Human papillomavirus (HPV) is a common sexually transmitted infection and the primary cause of cervical cancer, with 99.7% of cervical cancers attributable to HPV infection. Ninety percent of these cervical cancer cases are preventable, as they are caused by HPV strains for which we currently have a vaccine. In May 2018, the Director-General of the World Health Organization announced a global call to action to eliminate cervical cancer by setting targets for HPV vaccination, cervical cancer screening, and cervical cancer treatment to be reached by 2030. This study assesses the HPV vaccination rates of two representative states, Mississippi and Rhode Island, to discuss factors that contribute to vaccination disparities and to identify potential targets for public health strategies to increase vaccination rates. Vaccination rates were obtained from TeenVaxView on the Centers for Disease Control and Prevention (CDC) website. An ANOVA test was used to compare the average vaccination rates in the United States (U.S.) across different demographics. A two-sample t-test was used to compare the average vaccination rates in the U.S. across Metropolitan Statistical Areas (MSA) and non-MSA regions. Between 2018 and 2022, Mississippi and Rhode Island had average HPV vaccination rates of 33.3% and 81.7%, respectively, thus they were selected to investigate factors contributing to vaccination disparities because of their representation of low and high vaccination rates. Between 2018 and 2022, Black and Hispanic populations had significantly higher vaccination rates than the White population in the U.S.: 61.62/61.66% vs. 56.18% ($p = 0.006696$), and MSA principal cities had a significantly higher vaccination rate than non-MSA locations in the U.S.: 62.59% vs. 52.53% ($p = 0.0000007$). This study identifies White populations and non-MSA locations as potential targets for increasing HPV vaccination rates and recommends that public health strategies target the following factors to increase vaccination rates: require HPV vaccination for school entry, improve sexual health education in schools, increase vaccine availability, and eliminate political stigma associated with vaccination.

Abstract # 44

IMAGING PREGNANCY ASSOCIATED BREAST CANCER

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Pregnancy-associated breast cancer (PABC) is a distinct diagnosis defined as breast cancer identified during pregnancy or within one year postpartum. This condition presents unique diagnostic and treatment challenges due to its timing, presentation, and associated risk factors. Despite its rarity, PABC often results in a delayed diagnosis, leading to a poorer prognosis. These delays are primarily due to the difficulty in interpreting changes in the gravid breast and clinicians' reluctance to perform imaging and treatment during pregnancy. With the increasing trend of delayed childbearing, the incidence of PABC is expected to rise, underscoring the need for a deeper understanding of its diagnosis and management. This review thoroughly examines the epidemiology, risk factors, clinical presentation, and imaging evaluation of PABC. It emphasizes the crucial role of imaging, with ultrasound as the first-line modality, and discusses the use of mammography and MRI for further assessment. The findings highlight the importance of timely and accurate diagnosis to improve outcomes for both mother and fetus. This study aims to address the critical need for heightened awareness and refined diagnostic strategies in managing PABC, ultimately striving to enhance clinical outcomes.

Abstract # 45

Pre-surgical Breast Lesion Localization with Non-wire Devices: Information, Benefits, and Limitations

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Radiologists' role in managing breast cancer has traditionally involved wire-guided localization (WGL) for the pre-surgical identification of non-palpable lesions. WGL is currently the gold standard, however, it has several drawbacks, including discomfort from the protruding wire, risk of displacement before resection, and same-day surgery necessitation. This review examines non-wire localization (NWL) devices, which have emerged as alternatives to WGL. Included in this review are some of the most widely used NWL techniques; radioactive seed localization (RSL), radar reflector localization (RRL), magnetic seed localization (MSL), Sirius Pintuition, radio-frequency identification (RFID), and intra-operative ultrasound (IOUS). These techniques enhance patient comfort, minimize displacement, and improve scheduling flexibility (RSL can be placed up to 60 days before surgery). RSL, RRL, MSL, and RFID have lower positive margin rates (5-32%, 0-16.8%, 9-22%, and 0-27%, respectively) compared to 5.5-57% with WGL. While not statistically significant, clinically NWL is more precise and preferred among patients and providers. Higher costs, regulatory requirements, and limitations in repositioning are challenges of NWL. All NWL options cost more than WGL, with RSL being the cheapest and RFID the most expensive. RSL uses radiation, mandating regulatory precautions. NWL devices can cause imaging artifact, limiting the radiologist's ability to assess residual disease. This review emphasizes the importance of a multidisciplinary approach when choosing the most appropriate technique, considering patient needs, provider preferences, and institutional capabilities. Review of the current literature found no significant difference in surgical outcomes between WGL and NWL; however, over the past decade, use of NWL has increased, necessitating continued research into their clinical utility for optimizing breast cancer management.

Abstract # 46

Increasing Incidence of Ulnar Collateral Ligament Injuries in Pediatric Baseball Pitchers: Case Reports of Surgical Repair in Two Young Athletes

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Youth athletes are increasingly specializing in sports, leading to a rise in overhead throwing injuries, particularly ulnar collateral ligament (UCL) injuries in baseball pitchers. While UCL injuries are common in adults, they are less frequently seen in children, where surgical repair is complicated by the presence of a growing skeleton. This case report presents two pediatric patients, aged 12 and 13, who sustained acute proximal bony avulsion of the anterior bundle of the UCL while pitching. Both cases highlight the unique challenges of managing UCL injuries in youth athletes, where valgus stress during throwing exceeds the physiological limits of the UCL, leading to microtrauma and, ultimately, acute failure.

Both patients were treated with open surgical repair to restore UCL continuity and prevent long-term complications, including elbow instability and limitations in sports participation. The surgical technique involved a limited incision, preservation of the ulnar nerve, and a suture repair method designed to reattach the avulsed UCL to the medial epicondyle. Postoperatively, both patients underwent physical therapy (PT) to restore range of motion and strength, with the goal of returning to sport.

At 4.5 months postoperatively, the patients reported significant improvements, with one patient beginning a throwing program and the other progressing well in PT. However, at 12.5 months follow-up, one patient experienced persistent pain on the lateral epicondyle, highlighting the need for ongoing monitoring and individualized rehabilitation.

This case series underscores the importance of early and accurate diagnosis, tailored surgical intervention, and structured rehabilitation in managing pediatric UCL injuries. Historically, UCL surgery was reserved for elite athletes, but recent literature supports its use in adolescent athletes, demonstrating high return-to-sport rates and favorable outcomes with surgical repair, particularly in cases of acute injury with proximal or distal UCL damage. The trend toward more frequent UCL repair in younger athletes reflects an evolving understanding of the importance of early intervention to preserve elbow function and enable a timely return to sports. This report contributes to the growing body of evidence supporting UCL repair as a viable and effective treatment option for young athletes.

Abstract # 47

INNOVATIVE APPROACHES TO GLIOBLASTOMA TREATMENT: INTEGRATING RNA INTERFERENCE & EPIGENETICS

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Glioblastoma multiforme (GBM) is an aggressive and fatal brain tumor with limited treatment options and is often associated with poor prognosis. Continued discoveries are being made in miRNAs which can eventually lead to new and improved ways of managing GBM. This literature review examines the possible miRNA-based approaches that can target some epigenetic changes and molecular pathways involved in the development and progression of GBM. In this review, studies published within the last 15 years were included, and a systematic search of databases such as PubMed, Google Scholar, and Web of Science was conducted using key terms like “glioblastoma,” “miRNA,” “tumorigenesis,” and “epigenetics.” Through a comprehensive analysis of the literature, key miRNAs including miR-7, miR-21, and miR-26a, which modulate pathways such as EGFR/Akt signaling and PTEN regulation, can be identified in controlling apoptosis and tumor growth. Moreover, miR-221/222 among others were shown to be involved in angiogenesis and cell cycle progression which are necessary for increased proliferation as well as resistance of the affected cells against conventional therapies like chemotherapy. The dysregulation of these miRNAs contributes to GBM’s aggressive nature and targeting them can influence these pathways. The findings suggest that use of miRNA therapies could even involve combining them into current treatment regimens thereby enhancing existing therapies while making GBM care more personalized. This shift towards miRNA-based interventions shows a promising avenue for developing more effective and targeted treatments for patients suffering from this disease.

Abstract # 48

INVESTIGATING THE LINK BETWEEN SALIVARY NEUROTENSIN & OXYTOCIN AND EMOTIONAL VALENCE FOLLOWING STRESS INOCULATION

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Neuropeptides represent a vast group of chemicals that elicit effects at various sites, having direct effects on tissues as well as modulatory functions; however, neuropeptide action in stress responses is not well understood. The study objective was to investigate the relationship between salivary neuropeptides and emotional valence with acute stress inoculation. Salivary samples for oxytocin and neurotensin were collected from osteopathic medical students pre- and post-simulation. Samples were measured using the Eve Technologies Human Neuropeptide Panel 2-Plex Assay. Participants were given the Adverse Childhood Events (ACE) questionnaire pre-simulation and a Scale of Positive and Negative Emotions (SPANE) questionnaire pre- and post-simulation. Pearson Correlation Coefficient Analysis revealed positive correlations >0.9 for neurotensin pre-simulation and oxytocin pre-simulation in addition to neurotensin post-simulation and oxytocin post-simulation. These correlations suggest that oxytocin and neurotensin release may be related. Further analysis investigated the relation between neuropeptides and SPANE scores. Neurotensin and oxytocin post-simulation showed inverse relationships with pre-SPANE positive emotion scores. Cohorts of increased or decreased neuropeptides over the week were developed for additional analysis. Inverse correlations existed between oxytocin post-simulation and post-SPANE positive emotions in the increased oxytocin group, as well as between pre-simulation oxytocin and pre-SPANE positive emotions in the decreased oxytocin group. These inverse relationships suggest high levels of neuropeptides correlate with lower positive emotion scores following repeated stress exposures. Implications can postulate that oxytocin may play an adaptive role in dampening positive emotions in stress-related conditions. Further research is required to assess the relationship and interaction between oxytocin and neurotensin.

Abstract # 49

Investigating the Role of Headaches as a Clinical Precursor to Endometrial Cancer: Assessing the Predictive Value of Headache Prevalence for Secondary Brain Metastases and the Involvement of TNFSF10 in Immune Modulation

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Headaches are frequently reported in patients with endometrial cancer (EC), and they may serve as an early indicator of disease progression, including the rare occurrence of brain metastases. The prognosis for EC with brain metastases is poor, emphasizing the importance of preventative measures. Protein TNFSF10 up-regulates Death Receptor 5, inducing tumor cell motility and directly allowing metastases.

A literature review was conducted to investigate the incidence of headaches in patients with primary EC and brain metastasis. Previous literature has suggested that headaches may precede the discovery of brain lesions. Results indicated that 0.84% of patients with EC have brain metastases. However, 29% of these patients experienced headaches as a symptom. The median prognosis for patients with endometrial carcinoma with brain metastases was 6.2 months post diagnosis, significantly lower than those without. Headaches and other neurologic symptoms are prevalent among patients with brain metastases, however the timeline between post operative EC and diagnosis of brain metastases may be too short to improve patient outcomes.

The available data supports the notion that headaches may precede the development of brain metastases in EC, however preventative measures should be taken to ensure that outcomes can be improved despite metastases. There is a lack of direct evidence connecting the mechanism of TNSFS10 and induction of tumor motility in EC metastasis.

Future research should focus on the feasibility of implementing neurological imaging in guidelines for post-operative endometrial carcinoma, and investigating the specific role of TNFSF10 in the metastatic process of EC.

Abstract # 50

METFORMIN USE IN YOUNG PATIENTS WITH TYPE 1 DIABETES IN THE CLINICAL SETTING

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Overweight/obesity (OW/OB) in young people with type 1 diabetes (T1D) increases long-term complication risks. Metformin, primarily used for type 2 diabetes, has shown reductions in insulin use and BMI in OW/OB T1D patients in trials. We hypothesize that metformin improves A1c, BMI percentile, cholesterol, and insulin needs in youth with T1D.

We conducted a retrospective chart review of T1D patients at the Barbara Davis Center initiated on metformin between January 2017 and December 2022. Data on insulin use (units/kg/day), A1c, cholesterol (mg/dL), LDL (mg/dL), and BMI percentile were recorded before and 12 months after metformin initiation.

Of 150 patients, 83 remained on metformin for 12 months: 36 used an insulin pump, and 47 used multiple daily injections (MDI). The average age was 15.3 years, with a diabetes duration of 4.99 years. Among MDI users, mean A1c decreased (baseline: 9.23% vs. 12 months: 9.04%, p=0.0045). There was no change in mean BMI percentile (baseline: 88.85% vs. 12 months: 92.16%, p=0.78) or insulin dose (baseline: 0.81 vs. 12 months: 1.003, p=0.40).
Among insulin pump users, there was no difference in mean A1c (baseline: 8.75% vs. 12 months: 8.78%, p=0.85), BMI percentile (baseline: 96.64% vs. 12 months: 96.42%, p=0.82), or insulin dose (baseline: 1.18 vs. 12 months: 1.14, p=0.35). There was no difference in total cholesterol or LDL for either MDI or insulin pump users.
Forty-two patients stopped metformin due to side effects (11), hospital admissions (5), a lack of motivation (8), or other unspecified reasons (18). Four patients who stopped Metformin within 1 year were prescribed a second obesity treatment.

Metformin did not significantly improve BMI, insulin sensitivity, total cholesterol, or LDL in youth with T1D. A1c improved in MDI users but not in pump users which could be due to changes in technology use. Nearly half of the patients discontinued metformin within a year, while few were prescribed alternative obesity treatments. Further research is needed to explore effective obesity treatments in T1D and raise awareness of these options.

Abstract # 51

INVESTIGATING THE THERAPEUTIC EFFECTS OF RADON IN DIFFERENT COUNTRIES AND AVERAGE EXPOSURE LEVELS IN THE GENERAL POPULATION OF THE UNITED STATES

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Radon, a naturally occurring decay product of uranium, is found in soil, water, and air, and can enter the body as a colorless, odorless gas via inhalation, ingestion, or skin contact. In the United States, radon is primarily recognized for its carcinogenic risks. However, in Europe and Asia, high-dose, short-interval radon exposure has been employed as a therapeutic treatment for various conditions, including cancer. This review examines existing radon therapy protocols in these regions to evaluate their potential therapeutic effects and assess whether environmental radon exposure levels in the United States might offer any protective benefits. A comprehensive search of PubMed and Google Scholar databases was conducted using keywords such as “radon therapy,” “radon spa,” and “radon cancer treatment.” The selection of articles focused on those describing the underlying physiological mechanisms of radon therapy. Preliminary results suggest that therapeutic effects are achieved only through high-dose, short-interval radon exposure, whereas the low-dose, continuous exposure levels common in the United States do not yield such benefits. The treatment options for radon previously investigated had dosages ranging from 1 to 6 MBq/M. The findings call for future research to quantify the minimum radon doses required to achieve therapeutic outcomes in short-term exposures. Should these preliminary findings be confirmed, access to radon-rich environments, such as radon spas, could offer potential health benefits if used in controlled, short-duration treatments. These insights could have significant implications for expanding therapeutic practices involving radon, warranting further investigation.

Abstract # 52

THE THERAPEUTIC POTENTIAL OF BETA-HYDROXYBUTYRATE: A PROMISING APPROACH FOR MITIGATING GASTROINTESTINAL CELL DAMAGE AND ASSOCIATED PATHOLOGIES

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Inflammatory gastrointestinal diseases and sensitivities have garnered significant research interest due to rising diagnoses and the associated increased risk of colorectal cancer. Beta-hydroxybutyrate (BHB), a metabolite produced during ketosis, has emerged as a potential protective agent against cellular damage linked to aberrant immune responses, such as prolonged NLRP3 inflammasome activation, release of the pro-inflammatory cytokines IL-1β and IL-18 in macrophages, and reducing reactive oxygen species (ROS). Given the increasing prevalence of gastrointestinal disorders, from sensitivities to cancer, exploring strategies to mitigate gastrointestinal cell damage is urgent. BHB's capacity to modulate abnormal immune responses and act as an antioxidant offers promise, although studies specifically addressing its role in colorectal cancer and IBD are limited. This review aims to evaluate BHB's potential in protecting against gastrointestinal cellular damage and its implications for disease prevention. We hypothesize that ketogenic byproducts, particularly BHB, serve as modulators of the innate immune system and antioxidants, potentially preventing gastrointestinal damage that leads to harmful pathologies. To explore this, we conducted a literature review focusing on the therapeutic role of ketogenic metabolites in gastrointestinal pathologies. Databases such as PubMed and Google Scholar were searched using terms "Beta-hydroxybutyrate innate immune system," "Beta-hydroxybutyrate and ROS," "colorectal cancer and Beta-hydroxybutyrate," and "Beta-hydroxybutyrate IBD." Our review anticipates finding a significant connection between BHB and its protective effects on gastrointestinal cells, highlighting its potential as a therapeutic agent. Future research should examine whether BHB's benefits are independent of dietary factors or if factors such as lifestyle changes contribute to the observed effects.

Abstract # 53

Management Challenges in a Patient with Evans Syndrome: Navigating Anticoagulation Amidst Concurrent Pectoral Hematoma and Gastrointestinal Bleed

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This case involves a 54-year-old female with sepsis from a *Staphylococcus aureus* wound infection, complicated by Evans Syndrome (AIHA and ITP), antiphospholipid syndrome (APLS), mechanical mitral valve replacement, and atrial fibrillation. Key challenges included balancing the need for anticoagulation to prevent stroke and thromboembolism with the high risk of bleeding due to thrombocytopenia and anemia. The patient required 16 pRBC and 6 FFP transfusions for anemia and thrombocytopenia. Prednisone was used for Evans Syndrome but initially delayed due to bacteremia. Anticoagulation for APLS and the mechanical valve was critical but complicated by recurrent bleeding, even though platelet counts did not fall below the current guideline threshold of 50,000. This case highlights the need for a multidisciplinary approach and suggests reconsidering thromboprophylaxis guidelines in Evans Syndrome patients with complex comorbidities. Raising the platelet threshold for withholding anticoagulation to 75,000 could reduce bleeding risks and the need for transfusions.

Abstract # 54

MANAGEMENT OF GENDER DYSPHORIA IN ADOLESCENTS

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With attacks against gender affirming care becoming a focal point among state legislation and policy, there is a need for clear understanding in how primary care providers can educate and support patients and families of transgender youth. By synthesizing current guidelines and recommendations from specialty organizations, this review evaluates treatment approaches for prepubertal and pubertal individuals with gender dysphoria (GD), analyzing diagnostic criteria, assessing medical decision-making competence, and tailored treatments for diverse patient subgroups. A comprehensive review of recent literature and guidelines from major medical associations was conducted, including the DSM-5-TR criteria, and recommendations from the American Academy of Pediatrics, the Endocrine Society, and the World Professional Association for Transgender Health. The review identified distinct treatment recommendations between prepubertal and pubertal patients. In the prepubertal population, treatment focused on affirming care that allows for exploration of gender identity. A comprehensive biopsychosocial assessment and evaluation of pubertal patient's competence prior to medication intervention is advised. Discussions between partially reversible vs completely reversible interventions can begin as early as Tanner Stage 2, defined by thelarche for biological females and gonadarche for biological males. The review highlights the need for individualized care with the use of multidisciplinary teams, particularly for youth with coexisting conditions such as autism spectrum disorder. Gender dysphoria that is persistent into puberty is unlikely to subside. Current best practices emphasize an affirming, patient-centered approach to care for gender-diverse youth. Treatment recommendations differ between prepubertal and pubertal individuals, with medical interventions typically reserved for adolescents who meet specific criteria. Patients with autism spectrum disorder are four times more likely to be diagnosed with GD and should receive the same evidence-based practices as their peers. Further research is needed to assess long-term outcomes of various treatment approaches and to refine guidelines for special populations, such as neurodiverse youth.

Abstract # 55

MEDICAL STUDENT PERCEPTIONS OF USING STANDARDIZED PATIENTS TO ADD CLINICAL INTEGRATION COMPONENTS OF POINT OF CARE ULTRASOUND EDUCATION

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Point of Care Ultrasound (POCUS) is a relatively new component of medical student education. This study fills a gap in the literature as no studies have specifically looked at ultrasound use in standardized patients (SP). SPs provide an opportunity for students to use hands-on skills before rotations. Rocky Vista University (RVU) developed a system for adding ultrasound skills into their current SP assessments so students could experience the clinical utility of ultrasound. This is a survey study evaluating students' perception of their comfort level of ultrasound in SPs as well as their perceptions of clinical integration into SPs. Qualtrics surveys were sent to second year medical students with 51 responses. A Likert scale was used to measure perception of comfort level with skills including vascular, musculoskeletal, cardiac, abdomen and emergency ultrasound. Likert scales were also used to measure comfort with clinical integration of ultrasound during their SP encounters. The majority of responses valued the addition of ultrasound in the medical school curriculum and answered this experience will help them improve their ultrasound skills and comfort level with ultrasound, which will also be helpful during their clinical rotations. Most respondents felt the experience will help them in their future practice and provide more training in dealing with patients in a simulated situation. Overall respondents overwhelmingly felt using ultrasound with SPs helped their comfort level with skills and aided them in integrating ultrasound into their exam skills which will prove useful for their future.

Abstract # 56

NAVIGATING THE WORK-HEALTH BALANCE: A QUALITATIVE EXPLORATION OF ULCERATIVE COLITIS PATIENTS' PERSPECTIVES

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Introduction: Ulcerative Colitis (UC) is a chronic inflammatory bowel disease with a significant economic impact due to frequent healthcare utilization and lost work productivity. Despite research on the economic impact of UC, there has been limited exploration into how UC specifically affects patients' professional lives and their strategies for managing work. This study investigated how UC affects patients' professional lives, focusing on work-life balance, coping strategies, and the impact of workplace accommodations.

Materials/Methods: An online survey was conducted from October 2023 to July 2024, targeting UC patients via social media platforms and using the Work Productivity and Activity Impairment Questionnaire to gather data on work productivity, workplace disclosure, support, and accommodations. Thematic and statistical analysis was employed to analyze survey data.

Results: Among 21 respondents, UC symptoms resulted in an average of 10.6 hours of missed work per week and a 44.6% impairment while working, leading to an overall work impairment rate of 58.6%. UC-related absenteeism was significantly higher than national averages ($p=0.04$). Although most respondents who disclosed their UC received moderate support, they struggled with taking time off during flare-ups ($p=0.04$). While workplace accommodations were frequently utilized, advice from healthcare providers on UC challenges was rated poorly.

Conclusion: UC significantly affects work productivity and presents substantial challenges in managing work-life balance. Despite some workplace accommodations, we found a gap in effective support and advice from healthcare providers, underscoring the need for improved interventions and education for managing UC in professional settings.

Abstract # 57

PATIENT'S PROVIDER SATISFACTION WITH NON-PHARMACOLOGICAL INTERVENTION FOR UPPER RESPIRATORY INFECTION

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Compensating urgent care providers presents challenges that can affect provider culture, interrelationships, and recruitment. Bonus-based compensation models, which reward providers for patient satisfaction, may inadvertently encourage unnecessary antibiotic prescriptions for viral upper respiratory infections (URIs). This study examines whether patient attitudes towards their healthcare providers vary based on the prescription of antibiotics for URIs. A retrospective review of patient surveys from five urgent care clinics was conducted, focusing on responses from patients who either received antibiotics or did not. The survey assessed overall experience, provider interaction, timeliness of treatment, and staff professionalism. Analysis of 533 de-identified surveys, separated into two groups (214 patients receiving antibiotics and 46 not), utilized Wilcoxon signed-rank tests to determine differences in satisfaction. Results revealed no statistically significant differences in patient satisfaction between the two groups, with all p-values exceeding 0.05. These findings suggest that patients' perceptions of their providers are not influenced by whether they receive antibiotics for URIs. Therefore, urgent care providers operating under bonus-based compensation models should not alter treatment practices based on perceived patient expectations regarding antibiotics. Limitations of this study include the relatively small sample size of patient's not receiving antibiotics and lack of geographical diversity among the patient population. The study highlights the need for further research to explore patient attitudes across a broader range of urgent care conditions and to assess the generalizability of these findings. Future investigations should aim to clarify misconceptions about patient preferences and their impact on clinical decision-making.

Abstract # 58

PEDIATRIC DEPRESSION: UNRAVELING A COMPLEX CASE THROUGH A BIO-PSYCHOSOCIAL LENS

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Pediatric depression is a challenging condition, often influenced by a mix of biological, psychological, and social factors. When a child presents with depression alongside other medical conditions, like Cushing's Syndrome, the complexity of diagnosis and treatment can increase significantly. This case study explores the value of using a comprehensive biopsychosocial approach in understanding and managing pediatric depression.

We present the case of an 11-year-old girl admitted to a psychiatric unit with persistent sadness and suicidal thoughts. Her background revealed significant trauma from early childhood, exacerbated by a turbulent foster care situation. In addition to her depressive symptoms, she exhibited physical signs that suggested an underlying endocrine disorder. Further evaluation confirmed elevated cortisol levels and a pituitary microadenoma, leading to a diagnosis of Cushing's Disease.

This case highlights the importance of a multidisciplinary approach in child psychiatry, where mental health care is integrated with medical investigation. The co-occurrence of major depressive disorder and Cushing's Syndrome in this young patient underscores the need to consider underlying medical conditions that might worsen psychiatric symptoms. Early diagnosis and targeted treatment of these conditions can profoundly influence the management and outcomes of pediatric depression.

This case emphasizes the need for a biopsychosocial approach in child psychiatry, advocating for a thorough and collaborative assessment across specialties to enhance patient outcomes, especially in complex cases like this one.

Abstract # 59

PELVIC ORGAN PROLAPSE: PATIENT TIME TO DIAGNOSIS AND TREATMENT SATISFACTION

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Pelvic organ prolapse (POP) is a prevalent condition that affects nearly half of all women, yet it often goes undiagnosed until symptoms become severe, leading to delays in care and treatment. Despite the availability of both surgical and non-surgical treatment options, research is limited regarding the progression of POP symptoms, patient satisfaction with various treatments, and the efficacy of non-surgical approaches. This study was conducted to evaluate symptom progression from onset to diagnosis and assess patient satisfaction to uncover which treatment modalities offer the most symptom relief, particularly for persistent symptoms like pelvic pain and urinary retention.

To investigate this, we conducted a cross-sectional survey among 158 women with a confirmed POP diagnosis. The survey, distributed via a support group, gathered data on symptom severity at onset, at diagnosis, and post-treatment, as well as patient satisfaction with both surgical and non-surgical interventions. Data was also collected on the time it took for patients to seek care, and demographic factors like age, number of pregnancies, and method of delivery were analyzed. Symptom severity was compared across different treatment modalities to identify trends in symptom resolution.

Our findings indicate that surgical treatments, particularly posterior rectum repair and anterior bladder repair, resulted in significantly greater symptom improvement and higher patient satisfaction than non-surgical treatments such as pessary use and physical therapy. Symptoms such as the feeling of a vaginal bulge and back pain showed marked improvement, while dyspareunia and pelvic pain remained persistent.

These results highlight the critical need for early diagnosis and intervention, as well as the importance of more individualized treatment strategies. Addressing the gaps in symptom management could lead to better outcomes for POP patients, especially for those experiencing symptoms that are not adequately resolved through standard treatments.

Abstract # 60

RAPID-ONSET DRESS SYNDROME FOLLOWING TMP-SMX THERAPY: A CASE STUDY

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Drug reaction with eosinophilia and systemic symptoms (DRESS) is a rare but severe hypersensitivity reaction, often triggered by medications like sulfonamides. While DRESS is well-documented, rapid-onset cases are less understood, leading to challenges in diagnosis and management. DRESS is often compared with Stevens-Johnson Syndrome (SJS) and Toxic Epidermal Necrolysis (TEN) due to overlapping symptoms. SJS and TEN differ from DRESS in that DRESS involves systemic organ dysfunction and eosinophilia rather than extensive skin detachment seen in SJS/TEN. This case study aims to explore the clinical course, challenges, and management strategies in a patient with early-onset DRESS following TMP-SMX administration.

Our hypothesis is that early identification and prompt discontinuation of the offending agent can significantly improve patient outcomes in cases of rapid-onset DRESS. We gathered a comprehensive medical history and analyzed the patient's presentation and diagnostic testing. Differential diagnoses, such as sepsis and SJS/TEN, were ruled out before confirming DRESS. Once diagnosed, corticosteroid therapy was initiated with close monitoring of vitals and symptom progression.

Our findings revealed that despite the unusually early onset of DRESS (within five days of TMP-SMX administration), the patient experienced significant recovery following rapid drug discontinuation and corticosteroid treatment. Fever and rash resolved within days of discharge, with no recurrence of symptoms six months post-follow-up. Unlike SJS/TEN, the patient's condition involved systemic organ abnormalities, but no skin detachment.

This case underscores the complexities associated with diagnosing and managing rapid-onset DRESS, particularly when its presentation overlaps with conditions like SJS/TEN. By focusing on early recognition and prompt intervention, this case highlights the need for heightened clinical awareness in distinguishing DRESS from other severe drug reactions. Our findings suggest that timely withdrawal of the offending drug and the use of corticosteroids can lead to a favorable outcome, even in cases with significant systemic involvement. This contributes to the growing body of evidence advocating for individualized management strategies in cases of rapid-onset DRESS.

Abstract # 61

PLANT BASED DIETS IN THE FIGHT AGAINST INSULIN RESISTANCE, A REVIEW.

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Treatment of diabetes mellitus is complicated by insulin resistance (IR), causing a reduction in the efficacy of exogenous insulin, and thus requiring higher doses to maintain glycemic control. This increases the risk of weight gain, cardiovascular disease, and metabolic dysregulation. Current treatment guidelines emphasize the importance of lifestyle modifications, particularly controlling carbohydrate intake, to manage weight, but patient populations are often unresponsive to these interventions, and this does not ultimately aid in progressive IR. Adjuvant recommended therapies like metformin enhance the effect of insulin by amplifying post-receptor insulin signaling pathways but come with the risk of gastrointestinal side effects and, in rare cases, lactic acidosis. Thiazolidinediones work to insulin-dependent glucose disposal but are associated with an increased risk of heart failure, weight gain, and osteoporosis. Emerging evidence suggests that noninvasive plant-based dietary changes, such as limiting the ingestion of animal products, lead to decreased levels of branched-chain amino acids, reduced lipotoxicity, and lower glucotoxicity, which are known to exacerbate insulin resistance. This review compares changes in the homeostasis model assessment of insulin resistance (HOMA-IR) in nine studies of plant-based dietary modifications with those seen in established adjuvant therapies like metformin and thiazolidinediones over a short timeframe. The results demonstrated significant similarities between them in reducing insulin resistance, as measured by HOMA-IR, suggesting that long-term management of IR may benefit from a plant-based dietary approach. However, further studies are needed to compare the long-term clinical outcomes of plant-based diets.

Abstract # 62

ANALYSIS OF CUSTOM AND PREFABRICATED FOOT ORTHOSIS PRESCRIPTION PATTERNS AT A SINGLE INSTITUTION

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Foot Orthoses (FOs) are a noninvasive treatment modality for a wide range of foot and ankle conditions. The two most common subgroups of FOs are custom and prefabricated. There is a lack of data depicting prescription patterns of these two orthosis types. This study aims to analyze prescription patterns of these two FO types at a single institution to better understand current trends.

A retrospective review of all dispensed custom and prefabricated FOs at a single institution between December 2017 and July 2024 was conducted. Due to changes in the system for tracking this data, additional information such as individual prescribing provider were available for analysis from 4/2023 – 7/2024.

In total, 11,765 total FOs were prescribed with 6,565 being custom and 5,200 being prefabricated. Prescription totals for both types increased year after year from 2017 – 2021, with custom continuing this trend. Prefabricated FOs have declined in prescriptions since 2021. The custom/prefabricated prescription ratio has increased from 0.76 in 2021 to 2.16 in 2023. Analysis of provider-specific prescriptions shows a large variety in prescription patterns between providers. The percentage of total FOs prescribed as custom by each provider ranged from 35% to 95%.

There is a lack of robust literature to support the claim that custom FOs are better than prefabricated FOs, yet we see a rapid trend favoring custom orthosis prescriptions. This represents an increased price burden on patients and should be thoroughly studied before continuing the trend depicted.

Abstract # 63

NOVEL CLASSIFICATION OF PERONEAL TENDON DISEASE REVEALS DISTINCT MOLECULAR PHENOTYPES OF THE TENOSVNOVIUM

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Peroneal tendon disease (PTD) is a significant source of lateral ankle pain. The lack of a standardized classification system for PTD complicates accurate diagnosis and targeted treatment. Understanding expression changes in the tenosynovium (TS) across PTD stages could improve therapeutic strategies. This study aimed to establish a clinically meaningful PTD classification system, incorporating detailed analyses of transcriptomic tissue changes within the TS. The purpose of this study is to develop a PTD classification system, incorporating detailed analyses of molecular tissue data.

We developed a 5-stage PTD classification for patients undergoing surgery for peroneal tenosynovitis, tendinosis, tendon tears, instability: non-inflamed TS, normal tendons (Type 0; n=9); inflammatory TS, normal tendons (Type 1; n=16); inflammatory/degenerative TS with tendinosis or tendon tear (<50% substance, Type 2, n=6; >50% substance, Type 3, n=6); near-complete/complete degenerative rupture (Type 4; n=3). Bulk RNAseq was performed on TS samples to analyze transcriptomic differences (compared to PTD 0), with Gene Ontology (GO) terms used for comparative analysis between PTD types.

Based on our PTD classification, the tenosynovial molecular signature was unique between PTD stages. Distinct sets of GO-genes were identified between stages 1 to 4. While early PTD stages (1/2) are characterized by inflammation and tissue growth factor expression, advanced PTD shows signs of increased mitochondrial gene expression, altered fatty acid oxidation, and a strong increase in hemoglobin. Total tendon rupture showed a decrease in differentially expressed genes related to Th2 immunity (GATA3, IL4, IL13).

Our classification identifies key transcriptomic differences between PTD types, including increased tenosynovial hemoglobin, which may protect against oxidative damage, and altered energy metabolism pathways. An imbalanced Th1/Th2 immune response in PTD 4 may hinder the post-inflammatory reparative healing phase, possibly allowing for degenerative progress and tendon rupture. Understanding these pathways will help optimize surgical strategies and therapeutic targets for PTD.

The development of a new PTD classification system shows significant molecular differences in various stages of peroneal tendon disease. Better characterization of PTD subtypes and biological pathways will help identify appropriate surgical treatments and therapeutic targets.

Abstract # 64

PROGRESSION OF ANKLE OSTEOARTHRITIS IS ASSOCIATED WITH DISTINCT SYNOVIAL TRANSCRIPTOMIC PHENOTYPES

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Ankle osteoarthritis (AOA) is a common condition characterized by progressive loss of articular cartilage. Little is known about the molecular mechanisms driving AOA, nor the contributing role of the joint synovium despite its proximity to cartilage. Thus, this study defines the transcriptomic landscape of ankle synovium in progressive stages of AOA using bulk RNA-sequencing. The purpose of this study is to identify the transcriptomic phenotypes of ankle synovium in progressive stages of ankle OA using bulk RNA-sequencing

Synovium from patients with varying degrees of AOA was harvested for bulk RNA sequencing (RNA-seq). Synovium was assigned to an AOA severity group based on Outerbridge grade (OB) as either minimal (OB-0/1, n=8), advanced (OB-3/4, not requiring ankle replacement, n=6), and end-stage (OB-4, requiring ankle replacement, n=29) OA. Gene Ontology (GO) terms that describe the transcriptomic environment were derived from RNA-seq data and were used for two comparisons of AOA: advanced vs. minimal, and end-stage vs. advanced.

The synovial transcriptomic signature was different based on AOA severity, with unique sets of GO-genes identified between the two group comparisons. Advanced AOA was characterized by upregulation of tissue remodeling and morphogenesis (GO terms related to endothelial chemotaxis, vascular growth factor binding and PI3K signaling) compared to minimal disease. End-stage AOA highlighted the upregulation of inflammation with downregulation of protein synthesis compared to advanced disease. Specifically, several immunoglobulin and ribosomal components were among the top upregulated genes.

Synovial transcriptomic phenotypes were distinct with the progression of AOA. While early disease was characterized by upregulation of tissue remodeling, inflammatory processes were increased at end-stage disease. Furthermore, end-stage AOA showed a reduction of transcripts involved in the production of proteins, the building blocks of inflammatory mediators, growth factors, and tissue structure.

Our data show clear synovial transcriptomic signatures throughout AOA progress. A clear understanding of the transcriptional dynamics of the synovium during the early and late osteoarthritic disease process is important guide the development of stage-specific targeted treatment and prevention strategies for AOA.

Abstract # 65

PROMISING IMMUNOLOGICAL THERAPUETICS AS TREATMENT FOR RECURRENT PREGNANCY LOSS

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This case report presents a novel therapeutic approach for treating recurrent pregnancy loss (RPL) in a 40-year-old woman with a history of failed in-vitro fertilization attempts. RPL, affecting about 5% of patients with pregnancy loss, remains unexplained in up to 50% of cases, emphasizing the need for innovative treatments. The patient experienced three pregnancy losses after frozen embryo transfers (FETs) and her condition was complicated by eczema flares triggered by exogenous hormones.

A fourth FET incorporated an immune protocol consisting of prednisone, famotidine, and loratadine, resulting in a successful pregnancy and live birth. This approach uniquely combined glucocorticoids and antihistamines to modulate the immune response in RPL treatment. The patient experienced a milder eczema flare with this protocol, which subsided within days of the transfer. While glucocorticoids are not typically recommended for RPL due to potential side effects, and antihistamines lack rigorous evidence supporting their efficacy, this case aligns with recent literature suggesting potential benefits of immunosuppressants in RPL treatment. A meta-analysis by Ma et al. (2022) reported increased live birth rates with oral immunosuppressants in RPL patients.

This successful outcome, contextualized within emerging research, underscores the potential for immune-modulating approaches to significantly improve outcomes in previously resistant RPL cases, particularly those with concurrent inflammatory conditions. However, as a single case report, it also highlights the need for larger, well-designed clinical trials to establish the efficacy and safety of this approach, optimize treatment strategies, and determine the specific contributions of different immunomodulatory agents in RPL treatment.

Abstract # 66

QUANTITATIVE ULTRASOUND TO ASSESS UPPER TRAPEZIUS MUSCLE IN PATIENTS WITH CHRONIC NECK PAIN

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The correlation between ageing and skeletal muscle changes has been previously established, however providing a quantitative assessment of these is not common practice. Shear wave elastography (SWE) is an ultrasound technique that can be used to quantify muscle stiffness which can then be correlated with skeletal muscle biomechanics. This study aims to investigate the relationship between SWV and muscle stiffness, and its correlation with age in healthy adults. Our hypothesis is that SWE can quantify muscle stiffness and thus be used to describe age related changes in skeletal muscle. IRB approval and informed consent were obtained. Inclusion criteria for healthy adults included age >18 years, pain score <2, no history of neck surgery or trauma, and a TART score <12. Subjects were imaged in the prone position with relaxed neck and shoulder muscles using a linear array transducer (bandwidth 4-10 MHz, Siemens Medical Solutions) to acquire B-mode and SWV of the upper trapezius muscle. SWV was measured in the transverse and longitudinal planes in 16 young (18-44 years), 11 middle-aged (45-64 years), and 15 elderly participants (≥65 years). A one-way ANOVA was used to assess muscle stiffness between groups. The results showed that muscle shear wave velocity (SWV) decreased significantly with age ($p<0.01$), with mean ages of 27, 54, and 74 years in the young, middle-aged, and elderly groups, respectively. There was significant SWV difference in the transverse plane across all age groups, but no significant difference in the longitudinal plane ($p>0.05$). It was concluded that an inverse relationship between age and SWV was observed, suggesting that SWV decreases with age and may contribute to reduced muscle strength.

Abstract # 67

Improved Diagnostic Testing for Field Assessment of Traumatic Brain Injuries in Military Combat Environments

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Traumatic brain injuries (TBI) are a leading cause of morbidity amongst military personnel in combat environments. Rapid and accurate diagnosis is critical for effective management and prevention of long-term neurological damage. Traditional diagnostic methods, such as MRI and CT, are limited in combat environments, necessitating advanced tools for field assessment of TBI.

A structured literature review was conducted between 2015 to 2024 to evaluate diagnostic technologies for TBI, including portable imaging devices, blood-based biomarkers, and advanced neurological assessment tools. This review intended to analyze a correlation between diagnostic accuracy of blood-based biomarkers and their application to military medicine, specifically accessibility to testing and rapid field assessment of TBI.

The analysis demonstrated promising advancements in TBI diagnostics. Blood-based biomarkers, GFAP and UCH-L1, offer a minimally invasive method for early detection of TBI, as these biomarkers increase rapidly after injury. With some studies reporting diagnostic accuracy comparable to traditional imaging, the utilization of these biomarkers in evaluation of suspected brain injuries can enhance decision-making and management in combat environments.

Recent advancements in diagnostics for field assessment of TBI show potential for improving early detection and treatment. The use of GFAP and UCH-L1 facilitates quicker and accurate diagnoses in the field which can impact medical evaluation efforts, reduce the time to treatment, and improve long-term clinical outcomes for suspected TBI. Continued research and field testing is essential to refine the use of biomarker analyses and integration into military medical practice, focusing on effectiveness, portability, and impact on clinical management.

Abstract # 68

Regional vs. General Anesthesia in Arthroscopic Shoulder Surgery: A Comparative Analysis

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Deciding between regional, general, or combined anesthesia techniques in arthroscopic shoulder surgery can influence clinical outcomes. Regional anesthesia provides targeted pain relief with minimal systemic effects, whereas general ensures global muscle relaxation. This analysis compares the efficacy and risks of these techniques, focusing on pain management, complications, and recovery.

A literature review was performed on PubMed using "regional + general + anesthesia + arthroscopic + shoulder." It yielded 11 randomized-controlled trials. Inclusion criteria included adult patients undergoing arthroscopic shoulder procedures using regional, general, or combined techniques between 2016 and 2024. Exclusion criteria included non-shoulder procedures and pediatric patients.

Regional anesthesia has fewer systemic complications, with respiratory issues in less than 5% of cases. However, there is risk for hemi-diaphragmatic paralysis and rebound pain. General anesthesia had higher rates of postoperative nausea, vomiting, and cognitive dysfunction. Combining both improved pain control and reduced post-operative opioid use by almost 40% but introduced greater risks, such as respiratory issues, cardiovascular instability, and prolonged recovery.

The analysis demonstrates that regional anesthesia has its associated risks but minimizes systemic complications and post-operative opioid use. General anesthesia correlates with increased postoperative nausea, vomiting, and cognitive issues. Limitations include the small number of studies and excluding non-shoulder and pediatric cases. Anesthesia technique adjustment could enhance clinical outcomes, with future research focusing on diverse populations and pain management strategies.

Based on assessment of the efficacy and risks associated with regional, general, and combined anesthesia, the recommendation is to provide anesthetic techniques tailored to the patient and surgical complexity.

Abstract # 69

Shouldering the Load: Evaluating How an Athletic Background Affects Frequency of Shoulder Injuries in Weightlifters

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Safety in weightlifting is a critical concern. Previous research indicates shoulder injuries are the most prevalent musculoskeletal injuries amongst weightlifters, particularly within Olympic Weightlifting. While there has been ample research on how age, weight and sex affect injury risk in weightlifters, the influence of prior competitive athletic experience on shoulder injury rates in this population remains unclear. This study aimed to determine if a competitive athletic background affects the frequency of shoulder injuries in weightlifters aged 25-32. Specifically, we hypothesized that a history of instructor-led athletic training might promote safer lifting practices and reduce shoulder injury risk. An anonymous Qualtrics survey was distributed to individuals greater than 25 years old who either have or have not experienced a shoulder injury while participating in weightlifting between the ages of 25-32. Responses were analyzed using descriptive statistics and chi-square tests to compare shoulder injury rates between weightlifters with and without a competitive background. Our results found that the frequency of shoulder injuries did not significantly differ between weightlifters with (56%, n=27 of 48) and without (44%, n=21 of 48) a competitive athletic background (P=0.94, chi-square.) Limitations of this study include a limited survey population, therefore future studies should aim to distribute to a more diverse sampling of participants. This study shows that the presence of a competitive athletic background may not directly reduce the risk of shoulder injury in weightlifters; however, athletic history should still be considered when shoulder injury prevention in weightlifting is discussed with patients by healthcare providers.

Abstract # 70

SEMAGLUTIDE INDUCED DELAYED GASTRIC EMPTING AND ANESTHESIA FASTING TIMES

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The increasing use of semaglutide, a glucagon-like peptide-1 (GLP-1) receptor agonist, has significantly advanced the treatment of type 2 diabetes mellitus (T2DM) and obesity. However, semaglutide-induced delayed gastric emptying presents a major challenge in anesthesia-related care due to the heightened risk of pulmonary aspiration, creating a gap in current fasting protocols for patients undergoing surgery. We hypothesize that individualized preoperative fasting protocols are necessary to mitigate anesthesia risks for patients on semaglutide. To test this, we conducted a literature review, analyzing clinical studies and case reports on the impact of semaglutide on residual gastric contents (RGC) in patients under deep sedation or general anesthesia. Our findings revealed that despite adhering to standard fasting guidelines, patients on semaglutide often exhibited increased RGC, resulting in a higher incidence of regurgitation and broncho-aspiration during procedures. These results indicate that current fasting protocols are insufficient for semaglutide patients, underscoring the need for revised guidelines tailored to address delayed gastric emptying. This research suggests that more precise preoperative fasting strategies are essential to ensure patient safety and reduce anesthesia-related risks in this population.

Abstract # 71

SEROTONIN SYNDROME CAUSED BY KETAMINE, SERTRALINE, AND OPIOIDS

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Serotonin syndrome is potentially life-threatening and is caused by increased serotonin levels in the central nervous system. Commonly used antidepressants and intraoperative medications can interact to cause this dangerous syndrome. We describe a case report involving a 33-year-old male who underwent dissection of retroperitoneal lymph nodes and right orchiectomy for testicular cancer. He had a history of smoking and vaping for 5 years, depression, difficult pain control and prolonged hiccups following previous surgeries, L5-S1 lumbar fusion, and polyneuropathy due to chemotherapy. The patient also consumed 10 servings of alcohol weekly. This was accompanied by a 13-year-long THC/CBD substance usage history. He reported daily use of marijuana in both the smokable and edibles forms (5-10 mg each and 5-10 doses). He was instructed to abstain from marijuana in any form prior to surgery. However, a friend noted that the patient had taken some edible gummies on the morning of the surgery. The patient's sertraline dose, additionally, had been recently increased from 100 mg to 150 mg daily for depression. He also took gabapentin 300 mg three times daily for neuropathic pain.

General anesthesia was induced with 250mg propofol and 200mg rocuronium. Anesthesia was maintained with Sevoflurane via endotracheal tube and intravenous propofol. Ketamine infusion was started at 0.1mg/kg/hr for additional analgesia, along with 200 mcg fentanyl and 2.5 mg hydromorphone IV during the operation. A temperature rise was noted, gradually escalating to 38.4 degrees Celsius. Icepacks were applied to the head and neck, the warm air blanket was turned off, and IV acetaminophen was administered without decreasing the patient's temperature. Increased mechanical ventilation requirements were also noted to maintain normocarbia, 14 L/minute (RR 20/min, tidal volume 700 cc). No dysrhythmias, tachycardia, discolored urine, or hyperkalemia were observed intraoperatively. The differential diagnosis included serotonin syndrome, malignant hyperthermia, or withdrawal from marijuana. Expert opinion was sought from the malignant hyperthermia hotline, and the diagnosis of serotonin syndrome remained favored based on interactions between several serotonergic medications.

The patient was transported to the ICU on a propofol infusion. Upon arrival, myoclonus at both ankles was observed, as well as lower extremity hyperreflexia and rigidity. 4mg of Cyproheptadine three times daily was started. The fever and hyperreflexia improved. Clonus and rigidity resolved. Ketamine and sertraline were discontinued due to their serotonergic properties; however, opioids (hydromorphone and oxycodone) were provided for postoperative analgesia. He recovered from surgery and was discharged on a decreased dose of sertraline.

Serotonin syndrome is a result of excess serotonergic activity in the central nervous system. Several medication interactions produced this dangerous condition, including sertraline, ketamine, fentanyl and hydromorphone. Clinician vigilance is necessary to prevent, detect and treat this syndrome. Treatment includes supportive care, serotonin antagonists, benzodiazepines, and discontinuing serotonergic medications.

Abstract # 72

SICK OF SICKING: USING DESIGN THINKING TO CRAFT MEANINGFUL CARE PLANS

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The average length of stay (LOS) for patients with sickle cell disease (SCD) admitted for vaso-occlusive crisis is approximately 5.0 days. At Anschutz Medical Center (AMC), SCD patients often experience extended LOS in the emergency department, observation, and inpatient units, along with high readmission rates shortly after discharge. These challenges place AMC in the 95th percentile for poor performance among academic medical centers. Individualized care plans have been shown to reduce admission rates and alleviate financial burden for this population. This study describes using design thinking to integrate patient perspectives into individualized care plans for SCD management. Design thinking, an iterative five-phases process - empathize, define, ideate, prototype and test – was employed. Seven patients participated, providing insights through in-depth interviews. These interviews were analyzed using empathy and journey mapping to create, highlighting themes such as control and stigma. The define phase used “why-how laddering” and “how might we” statements to identify issues related to personhood and trust. Affinity mapping in the ideate phase generated potential solutions. The final prototype, a daily collaboration tool, features a pain log, a goal-oriented activity meter, and a tiered pain management plan. Limitations include the small number of patient interactions and provider feedback. Analyzing the prototype’s effectiveness is planned for future research. Design thinking enabled development of a tool that fosters collaboration, connection, and consistency between providers and patients.

Abstract # 73

SPINDLE CELL LIPOMA OF THE FOREHEAD OVERLYING SUPRAORBITAL NERVE ASSOCIATED WITH CHRONIC CLUSTER-LIKE HEADACHES: A CASE REPORT

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Here we describe a unique case involving a spindle cell lipoma (SCL) associated with chronic cluster-like headaches in a patient that does not align with the typical disease demographics. A 31-year-old female with a history of hyperlipidemia and acne vulgaris was evaluated for a right subcutaneous forehead mass located above the right eyebrow. The mass appeared suddenly and unexpectedly, and she felt it was associated with newly presenting right ipsilateral headaches. The lesion was measured at 1.0 cm and differential diagnoses included cyst vs lipoma. The patient had inquired about removal but was recommended to wait for the mass to enlarge before considering excision with a plastic surgeon due to location and risk of scarring. Two months later, the patient scheduled a consultation with plastic surgery due to worsening of the headaches and their impact on her quality of life. Concurrently, there was enlargement of the subcutaneous forehead mass (measured at 1.5cm x 1.0 cm). Ultrasound of the mass revealed a possible cyst, lipoma, or soft tissue neoplasm. Subsequent surgical excision four months later identified the mass to be overlying the right supraorbital nerve. Pathologic analysis identified the mass as a SCL. After removal of the mass, the patient's headaches resolved, implicating the SCL compression of the supraorbital nerve as the etiology of the headaches. To date, there have been no reports that describe SCL causing headaches. This case sheds light on the implication that rare entities such as SCL impose regarding misdiagnosis, overdiagnosis, delayed diagnosis, and appropriate treatment due to clinical similarities with lipomas and soft tissue neoplasms. When adjacent to cellular areas, SCL can be mistaken for dedifferentiated liposarcomas warranting aggressive and unnecessary treatment.[1] Additionally, if advised to monitor the lesion for change, delayed diagnosis becomes gravely problematic in the event that the lesion turns out to be malignant. For this reason, detailed patient history, physical exam and diagnostics are essential to ensure accurate diagnosis and subsequently, appropriate treatment. This case report underscores the importance of clinician adaptability when assessing and diagnosing atypically presenting patients.

Abstract # 74

RETHINKING SHADE: FLORIDA'S BEACH LAWS AND THE RISK OF UV EXPOSURE

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Chronic exposure to ultraviolet (UV) radiation is notorious for its role in sun damage and development of skin cancer. Florida, a state already grappling with one of the highest rates of UV-induced skin cancer in the nation, is seeing stricter enforcement of recent legislative changes restricting the use of shade structures on private beaches. This study examines the implications of these regulations with a focus on the potential public health risks associated with increased UV exposure. Using the Google search engine and inclusion criteria of counties bordering the coasts of Florida, 35 coastal counties were identified. Shade structure ordinances were then sourced from Florida Municode Library online access and compared against 2021 national and Florida melanoma incidence rates (per 100,000). Our analysis showed that of the 35 coastal counties, only four had shade structure-specific regulations. There was no correlation identified between shade structure ordinances and melanoma rates by county; however, there was a noted increase in Florida melanoma rates in comparison to the national average (26.0 vs. 23.0 per 100,000). Additionally, private beaches and resort regulations are independent of the county and subject to variations in regulatory laws. Thus, restrictions seen on private beach areas pose probable obstacles for beachgoers. Discrepancies amongst ordinance statements could lead to confusion amongst the public, potentially causing beachgoers to trade in shade structure use for increased UV exposure. Therefore, future longitudinal studies must assess the risk of melanoma in shade-structure-prohibited beach populations to evaluate the impact of these regulatory actions.

Abstract # 75

STRESS AND MIGRAINES: THE IMPACT OF SPECIFIC STRESSORS ON MIGRAINE PREVALENCE, SEVERITY, AND DURATION

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Migraines, with an estimated 12 percent prevalence, are amongst the most common medical complaints worldwide and also contribute to disability, economic healthcare burden, and decreased quality of life. There is an established correlation between migraines and stress, whereas stress can not only cause migraines but exacerbate them, leading to increased frequency, severity, and duration. This study aims to identify how specific stressors contribute to migraine prevalence, duration, and severity. Although previous studies have identified stress as a trigger for migraine, it is still unclear if or what specific circumstances resulting in psychological stress trigger migraines. To better address this question, we conducted an online survey administered to individuals who recognize stress as a trigger for their migraines. This survey collected responses from 86 participants, with 72 meeting inclusion criteria. Descriptive statistics and chi-square tests were utilized for data analysis, and a p-value of <0.05 was accepted as significant. Analysis revealed that the majority of participants acknowledged stress as a trigger for their migraines, with occupational and school being the most frequently cited stressors. However, statistical analysis showed no significant relationship between the type of stressor and migraine prevalence, severity, or duration. This study supports the existing research, recognizing stress as a trigger for migraines; however, it suggests that specific stressors may not universally predict migraine outcomes while also highlighting the need for practical stress screening tools in clinical practice for early intervention and prevention of migraines.

Abstract # 76

TALAR EXTRUSION AND SUCCESSFUL REPAIR: A CASE REPORT

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1. ABSTRACT

Talar extrusion injuries represent a highly uncommon yet critical subset of traumatic orthopedic injuries, typically resulting from a high-energy trauma to the ankle joint. Its true incidence is not known but is estimated at 0.06 percent of all dislocations and 2 percent of all talar injuries.[1] These injuries involve the displacement of the talus bone from its normal position within the ankle, often leading to severe complications such as vascular compromise, nerve injury, and potential loss of limb function or amputation if not promptly managed.[2,3]

Our case involves a 49-year-old male who experienced a talar extrusion injury following a fall from a ladder. Upon presentation to the Emergency Room, the urgency of his condition was recognized, prompting immediate intervention to reduce the displaced talus back into its anatomical position. Such swift action by the attending orthopedic surgeon is unusual in cases of talar extrusion, where delays in reduction commonly result in devastating consequences, including the need for amputation or permanent disability.

Timely surgical intervention proved crucial in this instance, as the patient's prompt treatment prevented the anticipated outcomes of severe complications and irreversible damage to the foot's vital structures. Despite the rarity of successful outcomes reported in similar cases, our patient has achieved full functional recovery of his foot, with no discernible neurological deficits or compromise to adjacent tissues.

This case study highlights the importance of rapid diagnosis, timely reduction (occurring within less than 24 hours of injury), and expert surgical management in mitigating the severe sequelae associated with talar extrusion injuries.[4] By highlighting the successful treatment and favorable outcome achieved in this rare clinical scenario, our report aims to emphasize the critical role of early intervention strategies in optimizing patient prognosis and preserving limb function following traumatic orthopedic emergencies.

Abstract # 77

THE SIGNIFICANCE OF KEEPING A BROAD DIFFERENTIAL: AN INITIAL EPISODE OF SYSTEMIC CAPILLARY LEAK SYNDROME (CLARKSON DISEASE) LEADING TO MORTALITY

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Systemic capillary leak syndrome (Clarkson Disease) is a rare condition that consists of a triad of hypotension, hemoconcentration, and hypoalbuminemia. Here, we present a 52-year-old female treated in the emergency department for abdominal pain in which treatment course was complicated by Clarkson Disease. On initial presentation, a cecal volvulus was diagnosed, which was treated with a hemicolectomy. She was stable and discharged but returned on post-op day 12 with recurrent abdominal pain. Repeat imaging identified free fluid in the abdomen, and the patient was taken to the operating room for suspected anastomotic leak. No leak was identified, but the anastomosis appeared to be ischemic, so additional colon was resected. Postoperatively, she developed hypotension, poor urinary output, and worsening mental status. Labs showed polycythemia and leukocytosis, leading to a suspected diagnosis of severe septic shock. Despite aggressive fluid resuscitation, intravascular volume could not be maintained, and she developed acute renal failure secondary to hypoperfusion. Severe hypoalbuminemia was identified leading to the diagnosis of Clarkson disease. She later developed abdominal compartment syndrome secondary to third spacing of administered fluids resulting in the need for a decompressive laparotomy. She remained hypotensive postoperatively despite pressors, albumin, and IV immunoglobulin administration. Shortly after surgery, she went into cardiac arrest and could not be resuscitated. To date, there are fewer than 500 reported cases of Clarkson disease worldwide, likely due to misdiagnosis and lack of awareness of this rare disorder. This report aims to raise awareness and allow for earlier identification and treatment to reduce mortality.

Abstract # 78

TRIAL OF LABOR AFTER CESAREAN AND UTERINE RUPTURE: WHAT IS THE RISK?

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Today, approximately 33 percent of births are by cesarean, making the procedure the most common major surgery worldwide. There is a risk of uterine rupture associated with TOLAC (trial of labor after cesarean); however, the risk associated with following specific guidelines is unknown. We focused on comparing the American College of Gynecologists (ACOG), American Academy of Family Physicians (AAFP), and Society of Obstetricians and Gynecologists of Canada (SOGC) guidelines to determine which recommendation has the most risk of uterine rupture associated with previous incision type. The analysis showed that TOLAC after previous vertical cesarean incision vs previous low transverse incision is associated with increased risk of uterine rupture, odds ratio (OR) = 3.46 95% CI, 1.73-8.46. The guideline that has the most ambiguity surrounding scar type and TOLAC are the AAFP guidelines as shown in the guideline comparison table. The study also showed that women with previous vertical uterine incisions were more likely to have other comorbidities contributing to the overall risk of uterine rupture. This information can help guide the conversation around the risks and benefits of TOLAC and repeat cesarean delivery, empower women to make the right decision based on evidence and not opinion-based culture, aid in decreasing the number of women undergoing major abdominal surgery, and lower expenses surrounding childbirth.

Abstract # 79

UNDERSTANDING DEPRESSION AMONG PA STUDENTS DURING DIDACTIC VS. CLINICAL ROTATIONS

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Ample research exists regarding the mental health of college students. Less is known about physician assistant (PA) students, who may similarly experience significant stress during their education. We investigated depression levels among PA students between the didactic and clinical rotation phases.

An online survey was conducted among PA students and alumni at Rocky Vista University (RVU), using questions from the Patient Health Questionnaire-9 and original queries. The survey was distributed using a snowball sampling method, and data were analyzed using descriptive statistics and paired t-tests to compare depression severity between didactic and clinical phases. Statistical significance was determined at $p<0.05$.

Out of 39 respondents, 37 were included in the analysis. During the didactic phase, 54% of students reported moderate to severe depression. This decreased to 13.5% during the clinical phase. The mean depression score was significantly higher during the didactic phase ($M = 10.54$, $SD = 5.24$) compared to the clinical phase ($M = 5.74$, $SD = 4.59$; $p<0.05$). Awareness of mental health resources was universal during the didactic phase but was less prevalent during clinical rotations.

The results suggest that PA students experience higher depression levels during the didactic phase, possibly due to its demanding nature. The drop in depression during clinical rotations could be linked to reduced academic pressure, though decreased awareness of mental health resources during this time highlights a support gap.

This study underscores the mental health challenges faced by PA students. Further research is needed to validate these findings across different institutions and PA programs.

Abstract # 80

VETERAN PERCEPTIONS OF CIVILIAN HEALTHCARE IN COLORADO

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Colorado has a significant veteran population, yet less than half are enrolled in VA services, leading many to seek care from civilian primary care providers (PCPs). This study examines veterans' perceptions of civilian healthcare to identify strengths and areas for improvement. A cross-sectional survey of Colorado veterans explored their experiences with civilian PCPs and values of their healthcare, focusing on military status awareness and understanding of military culture. While some veterans were satisfied with their PCPs, most reported that their providers did not inquire about their military status. Veterans emphasized the importance of providers being knowledgeable about military-related health issues. The findings suggest that incorporating veteran-specific knowledge could improve care. However, the small and homogenous sample limits the conclusions. Further research with a larger, more diverse veteran population is needed.

Poster Abstracts

Abstract # 81

WHAT ARE THE REASONS PEOPLE MAY NOT SIGN ORGAN DONATION CARDS?

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Organ transplantation remains a critical solution for individuals with organ failure, yet a significant number of people do not register as organ donors, exacerbating the shortage of available organs. This study investigates the reasons behind the reluctance to sign organ donation cards, focusing on educational influences, demographic factors, and perceived urgency. Utilizing a Qualtrics-based survey, this research collected data from 325 respondents between July 2023 and July 2024. The survey included 10 questions asking different demographic questions and gauging understanding of organ donation. The survey assessed donor attitudes and identified key reasons for not registering, including misconceptions about medical care (31%), lack of understanding (28%), and familial influence (15%). Results revealed that donor registration rates were higher among individuals with college degrees (89.13%) compared to those without (75.51%), suggesting that educational attainment significantly impacts donation decisions ($p < 0.0001$). These studies limitations include a majority response rate from Colorado and Texas, which may not represent other regions and could skew results. The online survey format may exclude individuals without internet access, affecting sample diversity. These factors should be considered when interpreting the findings.

Additionally, state-level variations in donor registration rates were observed, with states like Colorado showing higher registration rates (90%) compared to others like Michigan (60%). The study highlights the need for targeted educational campaigns and further research to explore regional differences and improve donor registration rates. Understanding these barriers and addressing educational gaps could play a crucial role in alleviating the organ shortage crisis and saving lives.

Abstract # 82

WHICH SELF-CARE STRATEGIES ARE THE MOST EFFECTIVE IN MITIGATING THE EFFECTS OF STRESS ON PA STUDENTS DURING THEIR EDUCATION?

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INTRODUCTION

Burnout is a critical issue in healthcare, often manifesting during training. Physician Assistant (PA) students face high rates of stress, burnout, and emotional exhaustion due to the accelerated nature of their programs. Addressing these stressors through effective self-care strategies is essential to prevent long-term adverse outcomes.

METHODS

This study identified self-care strategies for stress reduction among PA students at Rocky Vista University (RVU). Students were distributed a survey assessing perceived stress levels before and during PA school and their self-care practices throughout their training. The survey yielded 73 responses. Correlation and regression analyses examined the relationship between self-care activities and stress changes. Additionally, access to institutional resources was analyzed for its impact on stress levels.

RESULTS

The average stress level increased from 3.85 before PA school to 7.64 during PA school. Correlation analysis showed that communication with family and friends ($r = -0.37$), spending time outside ($r = -0.35$), and physical activity ($r = -0.33$) were associated with significant stress reduction ($p<0.05$). However, regression analysis did not identify statistically significant predictors of stress change. Trends showed students with higher stress levels were more likely to access institutional resources such as therapy ($r = 0.24$) and academic advising ($r = 0.18$). In comparison, participation in the PAL program was linked to lower stress levels ($r = -0.12$).

CONCLUSIONS

The findings suggest that promoting physical activity, outdoor time, and social connections, along with providing institutional support, may help mitigate stress in PA students. Further research is needed to develop targeted interventions and explore the long-term effects of these strategies.

Abstract # 83

ADAPTING SIDS PREVENTION: EVALUATING THE GLOBAL IMPACT OF SAFE SLEEP GUIDELINES ACROSS DIVERSE CONTEXTS

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Introduction

Sudden Infant Death Syndrome (SIDS) remains a leading cause of infant mortality worldwide, particularly in high-income countries. Despite significant declines in SIDS rates since 1990s, burden remains uneven across-regions and socio-demographic indices (SDIs). [1-4] Triple risk model posits that SIDS results from an interaction between an infant's vulnerabilities and external triggers such as unsafe sleep environments. Current guidelines advocate for safe sleep practices, including supine positioning, firm sleep surfaces, room sharing without bed sharing, and avoidance of soft bedding. [4] Additional recommendations include human milk feeding, avoiding harmful substances, routine immunization, and pacifier use. [5] This review evaluates these guidelines effectiveness and their adaptability across diverse ethnic contexts, considering global burden trends and socio-demographic disparities.

Methods/Results

A literature review examined SIDS prevention guidelines across various regions and socio-economic contexts. It evaluated the effectiveness of these guidelines in reducing SIDS rates and their adaptation to different cultural and socio-economic settings. Key findings revealed ongoing disparities in SIDS rates among ethnic groups and regions, with significant variations in guideline adherence and impact. [1-5] Although global burden of SIDS has decreased, differences persist based on SDIs. The review highlighted new recommendations, such as noninclined sleep surfaces and short-term emergency sleep locations. It recommended for tailored strategies to address specific cultural, socioeconomic, and environmental factors in SIDS prevention.

Conclusion

While global SIDS rates have decreased, disparities persist. Adapting guidelines to address cultural and socioeconomic differences is crucial for improving effectiveness and reducing disparities. Future research should refine strategies and address socio-environmental impacts to enhance global infant health outcomes.

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Abstract # 84

ADVANCEMENTS IN ARTIFICAL INTELLIGENCE IN EMERGENCY MEDICINE: DIAGNOSTIC AND OPERATIONAL BENEFITS

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Introduction

In recent decades, artificial intelligence (AI) has seen unprecedented growth and adoption across various sectors globally. Introduced in 1956 as the "science and engineering of making intelligent machines," AI, or augmented intelligence as termed by the American Medical Association, has evolved significantly. [1] The 2000s marked a turning point, with technological advancements driving broader acceptance and application of AI. [2] This surge is correlated with an increase in labor productivity within the service industry, highlighting AI's transformative potential. In the realm of emergency medicine, the integration of AI holds promise for enhancing diagnostic accuracy and operational efficiency. [2] This review evaluates the current state of AI applications in emergency medicine, examining its impact on diagnostics, efficiency, and triage processes, and identifying areas for further development.

Methods/Results

A comprehensive literature review was performed to explore the application of AI in emergency medicine. Key areas of focus included diagnostic support, operational efficiency, and triage enhancement. In radiology, AI has demonstrated remarkable performance, with solutions achieving near-perfect sensitivity (98.9%) and strong agreement with reference standards for diagnostic imaging. [3] AI-enhanced diagnostic tools have also improved sensitivity for detecting fractures, from 82.7% unaided to 92.5% aided by AI, and reduced misinterpretations by 47%. [4] In terms of operational efficiency, AI software such as CardioAI has shown the capability to analyze cardiac magnetic resonance images rapidly, providing critical metrics like cardiac ejection fraction in seconds. [1] Additionally, AI-based triage systems, exemplified by ChatGPT, have outperformed traditional triage teams in identifying moderate ("yellow zone") and severe ("red zone") emergencies, though not for non-urgent cases. Sensitivity comparisons indicated superior performance by AI in urgent scenarios, with 94.78% accuracy versus 98.34% for the most severe cases. [5]

Conclusion

AI has rapidly become an influential tool in emergency medicine, demonstrating significant improvements in diagnostic accuracy and operational efficiency. [1-3] The application of AI in radiology has already proven beneficial, enhancing diagnostic capabilities and reducing misinterpretations. AI's role in triage also shows potential to streamline emergency department operations by optimizing patient sorting and reducing wait times, which can lead to better outcomes, particularly for cardiovascular patients. [6] Despite these advancements, AI should complement rather than replace human expertise, with careful consideration given to its limitations. Future guidelines are needed to address accountability for AI-generated errors and to establish best practices for integrating AI into emergency care. Ongoing research and development will be crucial in refining AI applications and maximizing their benefits for emergency medicine.

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Abstract # 85

VA ECMO AS A BRIDGE FOR SEPTIC CARDIOMYOPATHY IN GROUP A STREP NECROTIZING SOFT TISSURE INFECTION

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Introduction

Necrotizing soft tissue infections (NSTIs), primarily caused by Group A beta-hemolytic Streptococcus (GAS), are rare yet life-threatening, characterized by rapid tissue necrosis and severe septic shock. Streptococcal toxic shock syndrome has a mortality rate of up to 40%, necessitating prompt recognition and aggressive surgical intervention. Venoarterial extracorporeal membrane oxygenation (VA-ECMO) has emerged as a potential lifesaving intervention in severe cases, though its efficacy remains uncertain. Case Description A 34-year-old male with alcohol use disorder presented with symptoms of NSTI in the right lower extremity following trauma. Initially presenting with bruising and swelling after a heavy cast iron chair fell on his foot, his condition rapidly deteriorated. He exhibited extreme tachycardia, tachypnea, marked tenderness, and escalating leg swelling with bullae. Laboratory findings indicated significant hyponatremia, hypocalcemia, hypochloremia, and a high LRINEC score, prompting urgent surgical exploration and below-the-knee amputation due to extensive necrosis. Despite surgery and targeted antibiotic therapy, including clindamycin after GAS confirmation, the patient developed severe septic cardiomyopathy with an echocardiogram showing global hypokinesis of the left ventricle with an ejection fraction of 11%, requiring VA-ECMO. VA-ECMO supported cardiac function and stabilized hemodynamics amidst complications like disseminated intravascular coagulation and cardiogenic shock, necessitating continuous renal replacement therapy.

Discussion

This case underscores the critical role of VA-ECMO in managing severe GAS-induced NSTI complicated by septic cardiomyopathy and systemic complications in an alcohol use disorder patient. VA-ECMO effectively bridged cardiac recovery despite challenges like progressive NSTI and associated complications. Optimizing VA-ECMO protocols and integrating adjunct therapies like continuous renal replacement therapy are essential to improving outcomes in such complex cases.

Abstract # 86

THE ROLE OF COLLECTIVE HANDGRIP STRENGTH WEAKNESS IN PREDICTING FUNCTIONAL DECLINE, CHRONIC DISEASE, AND MORTALITY IN AGING ADULTS: A COMPREHENSIVE REVIEW

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Introduction

Handgrip strength, a simple and non-invasive measure of upper extremity muscle function, has become a significant prognostic marker in clinical and epidemiological contexts. [1-8] Skeletal muscle is essential for body movement, glucose disposal, and protein storage, and its role extends to providing gluconeogenic precursors in chronic conditions such as cancer, respiratory disease, and chronic kidney disease. Decreased muscle mass and function are associated with increased morbidity and mortality. This review evaluates the predictive power of handgrip strength for functional decline, chronic disease onset, and early mortality, and compares its clinical utility to other risk factors.

Methods/Results

A literature review evaluated the association between handgrip strength and health outcomes, including chronic diseases and mortality. [1-8] A meta-analysis of 53,476 participants found a 16% increase in all-cause mortality for every 5 kg decrease in handgrip strength. [1] UK Biobank data (502,293 participants) showed grip strength inversely related to cardiovascular disease mortality (HR 1.19 for men, 1.24 for women) and cancer mortality (HR 1.17 for men, 1.10 for women). [2] Hazard ratios (HRs) indicate the likelihood of an event, like mortality, in lower grip strength groups versus a reference group, with HRs above 1 indicating higher risk. [2] Further studies confirmed handgrip strength as a more robust predictor of mortality than systolic blood pressure.[2,8]

Conclusion

Handgrip strength is a valuable and cost-effective marker for predicting adverse health outcomes. Integrating it into risk prediction models could improve the identification of individuals at high risk and enhance targeted interventions. Further research is needed to confirm these findings across diverse populations and refine clinical guidelines.

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Abstract # 87

BEYOND GUIDELINES: SURGICAL STABILIZATION OF RIB FRACTURES IN CHRONIC PAIN PATIENTS

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Case Presentation:

A 63-year-old male with a history of pelvic radiation and chronic pain (requiring 80 mg oxycodone ER daily) was transferred to our institution following a high-speed motor vehicle collision, presenting with left rib fractures (7-10) and a hemopneumothorax. After initial management with a chest tube and intubation due to hypoxia, he was extubated on hospital day 1 but experienced severe pain despite an erector spinae plane block and epidural catheter. A new CT on day 3 showed worsening rib fractures and atelectasis, yet he did not meet traditional criteria for rib plating. Due to escalating pain and new paradoxical chest wall motion, surgical stabilization was reconsidered. The patient underwent open reduction and internal fixation of ribs 8-10, hemothorax evacuation, and cryoablation of intercostal nerves (7-10), with informed consent regarding potential risks. Postoperatively, his pain improved, allowing transition to oral pain medication and downgrading from the ICU by day 8.

Discussion:

This case highlights the need for flexibility in treatment guidelines, especially in patients with chronic pain who may not initially meet criteria for surgical stabilization. The patient's escalating pain and new physical findings necessitated a tailored approach, leading to successful rib stabilization and pain management. This suggests that earlier surgical intervention, combined with novel techniques like cryoablation, may benefit select patients with complex rib fractures and chronic pain. Further research is needed to refine treatment strategies for this patient population.

Abstract # 88

COMPARING LAPAROSCOPIC APPENDECTOMY TO OPEN ABDOMINAL APPENDECTOMY: A COMPREHENSIVE REVIEW OF CURRENT EVIDENCE

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Introduction

Appendicitis is the most common cause of abdominal pain requiring urgent surgery in the U.S., affecting 5-9% of the global population. [1] It predominantly impacts males and individuals aged 10-20, with 70,000 children in the U.S diagnosed annually. [7] Untreated appendicitis can lead to complications such as peritonitis and abscess formation due to the release of Escherichia coli (E. coli) and mixed anaerobes from a ruptured appendix. Treatment options include laparoscopic appendectomy (LA) and open appendectomy (OA). [1-8] This comprehensive literature review synthesizes findings from multiple studies to evaluate and compare the efficacy of LA versus OA in managing complicated appendicitis.

Methods/Results

A comprehensive review of the literature was conducted to compare outcomes of LA and OA for complicated appendicitis. The review included data on surgery duration, hospital stay, infection rates, and abscess formation from various studies. Results indicated that LA, while 19 minutes longer in duration, was associated with a shorter median hospital stay (3 days vs. 6 days for OA, $p<0.05$). [5] Infection rates were significantly lower for LA (0.6%) compared to OA (10%). Abscess formation rates varied, with 5.7% for LA and 4.3% for OA, though other studies reported 8.2% for LA and 22.9% for OA. LA patients reported lower postoperative pain and had an overall morbidity rate of 4.5% versus 18% for OA. Additionally, children who underwent LA returned to oral intake faster than those who received OA. [6-8]

Conclusion

Laparoscopic appendectomy shows considerable benefits over open appendectomy in treating complicated appendicitis, including shorter hospital stays, lower infection rates, and reduced morbidity. Adapting surgical guidelines to incorporate LA could enhance patient outcomes. Further research is necessary to explore the advantages of laparoscopic approaches in other types of surgery.

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Abstract # 89

EVALULATING IMMUNIZATION BARRIERS AND INTERVENTIONS AMONG PEDIATRIC IMMIGRANTS: A COMPREHENSIVE REVIEW OF CURRENT EVIDENCE AND GUIDELINES

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Introduction

Immunizations are crucial for reducing infant mortality, yet children in immigrant families (CIF), making up 25% of US children, face barriers like poverty, limited English proficiency, and lack of insurance. [2] Higher exposure to diseases like COVID-19 due to essential work roles and crowded living conditions exacerbates the issue. [4,5] Vaccine hesitancy, driven by safety concerns, religious beliefs, and misinformation, remains prevalent. [5,6] This review examines current immunization guidelines, barriers, and interventions for addressing vaccine hesitancy among US pediatric immigrants.

Methods/Results

A literature review assessed immunization rates, barriers, and interventions for vaccine hesitancy among US pediatric immigrants. Studies highlighted cultural, socio-economic, and logistical barriers. Survey data from 244 foreign-born adults showed 57.4% intended to get vaccinated, with acceptance varying by household size: 83.3% in single-person households vs. 47.3% in larger households ($p = 0.04$). Although 92% had never previously declined a vaccine, those who had were more likely to decline COVID-19 vaccination (42.1% vs. 24%, $p = 0.01$). Social vulnerability influenced vaccination intent, with higher acceptance in lower-vulnerability areas (ANOVA F-test = 6.36, $p = 0.0124$). Key barriers included misinformation and logistical challenges, with 34.4% remaining hesitant despite vaccine availability. [1]

Conclusion

Addressing vaccination disparities in immigrant families is vital for public health. Effective strategies include engaging community leaders, providing culturally sensitive communication, and enhancing access through mobile clinics and local sites. Future research should evaluate these strategies' impact on vaccination coverage and health disparities in pediatric immigrants.

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Poster Abstracts

Abstract # 90

ADVANECEMENTS IN DEEP VEIN THROMBOSIS: RISK FACTORS, DIAGNOSTICS, AND MANAGMENT

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Introduction

Deep Vein Thrombosis (DVT) involves blood clot formation in deep veins, commonly in the legs, and poses significant risks, including potentially life-threatening pulmonary embolism (PE).[1-3] Its pathophysiology is influenced by genetic, environmental, and acquired factors. Despite advancements in diagnostic and therapeutic strategies, optimizing DVT prevention and treatment remains challenging. [3] This review evaluates current research on DVT risk factors, diagnostic methods, and management, highlighting recent advancements and gaps in the literature.

Methods/Results

A comprehensive literature review was conducted, encompassing studies published over the past decade related to DVT risk factors, diagnostic techniques, and treatment options. Meta-analyses reaffirm that prolonged immobility, recent surgery, malignancy, and hormonal therapies are strongly associated with an increased risk of DVT. [3-7] For instance, research indicates that the incidence of DVT following major orthopedic surgery can be as high as 60%, with associated mortality rates of 6% for DVT and 12% for pulmonary embolism (PE). [13] The economic burden of venous thromboembolism (VTE) is also substantial, with costs estimated to be more than twice as high for patients with VTE compared to those without. [11,13]

Regarding diagnostic strategies, advances in imaging techniques, such as high-resolution ultrasound and MRI, have significantly improved DVT detection. Doppler ultrasound remains the gold standard for DVT diagnosis, with a sensitivity of 94% and specificity of 97%. [16] MRI is particularly useful for complex cases and for assessing associated complications. [16] For management, anticoagulation therapy remains central to DVT treatment. New oral anticoagulants (NOACs) have emerged as effective alternatives to traditional therapies like warfarin, offering similar efficacy with a lower risk of bleeding. [9] A recent trial with 6,500 participants demonstrated that NOACs are associated with a 30% reduction in recurrent DVT compared to warfarin, with fewer adverse effects. [9,17]

Conclusion

DVT remains a critical issue due to its severe complications and impact on quality of life. Advances in diagnostic technology and new anticoagulants have improved management, but personalized prevention and treatment approaches are still needed. Future research should refine risk assessment models, evaluate long-term outcomes of new therapies, and enhance DVT prevention strategies for high-risk populations to optimize patient care.

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Abstract # 91

Attitudes and Practice Behaviors of Resident Physicians Surrounding Cancer Screening

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Cancer screening is essential for early detection and reducing mortality, yet variations in guidelines across healthcare providers create confusion and potentially compromise patient care. This study hypothesizes that resident physicians' understanding, and application of screening guidelines may be inconsistent, particularly in breast, cervical, and colorectal cancer, due to discrepancies in available guidelines. To test this, a multi-institutional survey was conducted among 72 resident physicians across family medicine, internal medicine, and general surgery. The survey assessed their preferred sources of cancer screening guidelines, accuracy in their recommendations, and knowledge of screening protocols. Findings reveal that while most residents adhere to the United States Preventive Services Task Force (USPSTF) guidelines, inconsistencies remain, particularly regarding breast cancer screening age recommendations. Stronger adherence and understanding were observed for cervical cancer screening, with more variation noted in colorectal cancer guidelines. These results underscore the need for streamlined, uniform guidelines to ensure consistency in clinical practice and enhance patient outcomes.

Abstract # 92

AUTOIMMUNITY AND HEALTHCARE INEQUITY: THE IMPACT OF SOCIOECONOMIC STATUS ON AUTOIMMUNITY PREVALENCE IN COLORADO

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Autoimmune disorders are complex and multifactorial, yet little research exists regarding the comparative contributions of socioeconomic status (SES) on disease prevalence. Socioeconomic status is defined as high, medium or low based on income, education, employment, and social opportunities. Lower SES is defined as having a limited economic income, education, access to healthcare, and social resources. Previous studies have identified that chronic psychosocial stressors can contribute to the development of health conditions. This study aims to explore the correlation between lower socioeconomic status and the risk of autoimmune diseases.

We will identify areas in Colorado with a higher number of autoimmune diagnoses, using the Colorado Hospital Association (CHA) hospital utilization dataset to estimate disease prevalence. We will cross-reference this information with data from the Distressed Communities Index, which identifies zip codes in Colorado with lower SES.

Given the established link between increased stress and higher autoimmunity, we anticipate areas with lower SES will have a higher prevalence of autoimmune diseases. Potential limitations include limited data availability from the CHA set, confounding factors like diet and unknown stressors, and the potential for underdiagnosis in lower SES regions.

Identifying areas with a higher prevalence of autoimmune disorders could show how vulnerable patient populations are disproportionately affected by these progressive diseases. This may highlight the need for earlier screenings, increased patient education, and earlier treatment interventions in these communities. By beginning treatments earlier, outcomes may be improved in these communities.

Abstract # 93

Barriers to Optimal Healthcare: Diminished Health Outcomes Among Children with Autism Spectrum Disorder in the United States due to Communication and Familial Barriers

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Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that affects communication, social interaction, and cognitive function. These individuals face inadequate access to healthcare, thus a shorter life expectancy. This research paper aims to explore barriers-to-care experienced by children with ASD, and outline a way to combat these barriers and allow those with ASD to live a longer life.

Using Google Scholar, ClinicalKey and PubMed, we conducted a literature review using keywords focused on patient- and provider-level barriers, and familial barriers children with ASD experience. Our inclusion criteria consisted of articles related to children with ASD (<18 years old), from the years 2009-2024, in English and digitally accessible. Studies were excluded if the article focused on individuals with special needs other than ASD. We conducted a thematic analysis to identify key obstacles and suggest potential solutions offered in the resulting papers.

The search returned 3,500 articles, however, most were >15 years old, did not address ASD, nor address access to health care. The remaining articles identified multiple barriers-to-care for children with ASD. The primary concerns were communication difficulties between patient and provider, and familial barriers including financial struggles. We found the ECHO (Extension for Community Healthcare Outcomes) model may provide resources to facilitate communication barriers. Additionally, UHC (Universal Health Coverage) may provide financial support for families.

We show that to improve the quality-of-care for children with ASD, and extend life expectancy, a tailored health plan focused on addressing communication and financial burdens is needed, including the ECHO model and UHC.

Poster Abstracts

Abstract # 94

Exploring the Role of Eye Lymphatics and Exosomes in Drusen Formation

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The lymphatic system plays a critical role in maintaining bodily homeostasis and preventing disease. However, our understanding of ocular lymphatics has been historically limited. Recent advances have uncovered the properties of eye lymphatics, including their heterogeneity, which has deepened our knowledge of the relationship between exosomes and drusen formation—key factors in age-related macular degeneration (AMD). As AMD is a leading cause of global blindness, further exploration into the lymphatic system's role in the eye is essential for developing targeted therapies. This poster presents a focused analysis of current literature on exosomes' role in drusen formation and their clinical significance in AMD. This analysis is crucial not only for synthesizing existing knowledge but also for identifying gaps and weaknesses in current data. The literature review will be conducted using peer-reviewed articles from PubMed, with keywords including "eye," "ocular," "lymphatics," "drusen," and "age-related macular degeneration." Exclusion criteria will include studies published before 2000, those employing qualitative methodologies, and papers lacking citations in other published research.

Abstract # 95

IATROGENIC INJURIES ASSOCIATED WITH MECHANICAL CARDIOPULMONARY RESUSCITATION DEVICES

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Abstract:

Cardiopulmonary Resuscitation (CPR) is a mechanism that is widely known to sustain life in a critical patient suffering from cardiac arrest but mechanical CPR has been shown to have increased associated risks and drawbacks. The two types of mCPR devices discussed in this paper are the Zoll Autopulse and the Stryker LUCAS. We endeavor to discuss how a proposed solution to manual CPR may not be a solution at all, but rather a means to cause more harm than good to the patient. This paper examines the efficacy of manual CPR compared to mCPR while incorporating evidence from various case studies and reports. By examining retrospective studies and case reports, we have elucidated that mCPR is a medical technique that causes unnecessary harm whereas manual CPR may not cause such harm. In our discussion, we have identified alarming problems associated with mCPR, and in the future, more research is needed to definitively show whether there is space for it in the medical field for practical use. Future studies should continue to target efficacy of both types of CPR while implementing studies to see if proper training may make mCPR more safe.

- Statement of the problem and gap in knowledge (1-3 sentences)
- Your solution or hypothesis (1 sentence)
- Your approach or how you will/did accomplish testing your hypothesis. (1 sentence for each step)
- Your findings or expected findings (1-2 sentences)
- Your conclusion/how your findings address the gap (1 sentence)

Abstract # 96

MAN VERSUS MACHINE

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Cardiopulmonary resuscitation (CPR) is crucial to the survival of out-of-hospital cardiac arrests; therefore, several machines have been built that mechanically perform CPR to the exact depth and rhythm required for adequate compressions. This study aims to stimulate research into the opinions of first responders on the perceived benefits of using a mechanical CPR device versus manual CPR. There is research studying the outcomes of patients after mechanical CPR versus manual CPR and these studies do not provide clear answers on the more effective modality. This study examines the perceived benefits of mechanical CPR devices by surveying the first responders that use these devices to provide clarity on the specific benefits mechanical CPR may have. We distributed a survey via snowball sampling to fire stations in Colorado and Ohio that asked about the responders' experience using manual and mechanical CPR and their attitude regarding these tools. The data were collected, organized, and analyzed via descriptive statistics. Overall, our data demonstrate paramedics/EMTs perceive benefits from using mechanical CPR over manual CPR including continuous compressions while defibrillating (probably/definitely yes, 77%), quality compressions in a moving vehicle (yes, 81%), and ability to perform other life saving tasks during continuous compressions (yes, 93%). An overwhelming 92.1% of those surveyed chose to use a mechanical CPR device over manual CPR. These data, combined with other data from randomized control trials, could lead to better funding for mechanical devices to allow for better patient outcomes when treating out-of-hospital cardiac arrests.

Abstract # 97

MENTAL HEALTH PROGRAMS REDUCING RATES OF MENTAL HEALTH ISSUES AMONGST UNDERSERVED POPULATIONS

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Mental health care remains a critical issue, particularly within immigrant populations, where access to care is limited and cultural stigma is prevalent. This study addresses the effectiveness of various mental health interventions designed to meet the unique needs of these populations for reducing mortality rates in immigrant populations. Thus, a literature review was conducted to analyze U.S.-based studies on mental health interventions and stigma barriers among immigrant populations, with data organized and analyzed through thematic analysis and statistical evaluation. Methods studied include culturally adapted cognitive behavioral therapy, collaborative care models, integrative medicine approaches, and peer support groups. These methods have been researched previously but have not been adequately compared to determine mortality levels. The results show these interventions significantly improve mental health outcomes, with high satisfaction rates and marked reductions in depression and anxiety symptoms seen with different screenings. Despite the effectiveness of these interventions, stigma remains a substantial barrier to accessing mental health care. Cultural beliefs, fear of deportation, and religious concerns contribute to the reluctance of many immigrants to seek help. Addressing these barriers through culturally sensitive education, community engagement, and collaboration with faith-based organizations may further enhance the impact of mental health interventions. This study highlights the importance of integrating culturally appropriate strategies to improve mental health care accessibility and effectiveness among immigrant populations. By reducing stigma and expanding access to tailored mental health services, significant improvements in mental health outcomes may be achieved, leading to better overall well-being and reduced mental health-related mortality within these communities.

Abstract # 98

Outcomes of Direct Anterior versus Posterior Approaches in Total Hip Arthroplasty: A Systematic Review

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Total Hip Arthroplasty (THA) is a widely performed procedure in orthopedic surgery, yet the optimal surgical approach remains debated. The Direct Anterior Approach (DAA) has gained traction for its potential to reduce complications, particularly dislocation, compared to the traditional Posterior Approach (PA). However, there is still no consensus on the superiority of DAA, especially when considering patient-reported outcome measures (PROMs) and individual patient factors. This systematic review aims to evaluate the existing literature that directly compares DAA to PA, focusing on complications, PROMs, and long-term success rates. We hypothesize that both DAA and PA are comparable in terms of overall patient complications, success rates, and PROMs.

To address this, we conducted a comprehensive search of MEDLINE and PubMed databases, adhering to PRISMA guidelines. The inclusion criteria spanned randomized controlled trials, non-randomized clinical trials, cohort studies, and case-control studies comparing DAA and PA in THA. Data were systematically extracted, capturing study demographics, PROMs, and statistically significant outcomes.

The review included 38 studies. Key findings showed that nine studies reported a significantly higher dislocation rate in PA, while seven found no difference between the two approaches. Infection rates were mixed, with one study showing higher infection rates in PA and five showing no significant difference. Hip revision rates were similarly mixed, with both approaches showing higher revision rates in different studies. PROMs, such as satisfaction and pain, favored DAA in seven studies, while eight found no significant difference. Additionally, DAA was associated with shorter hospital stays in three studies.

In conclusion, DAA may offer advantages like reduced dislocation rates and shorter hospital stays, but both approaches demonstrate comparable overall complication rates and long-term outcomes. Surgeon preference, driven by training and experience, along with patient-specific factors, should guide the selection of the surgical approach. Further research, particularly prospective multicenter trials, is needed to better define each approach's long-term benefits and economic implications.

Poster Abstracts

Abstract # 99

PRIMARY CUTANEOUS ENDOMETRIOSIS

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Endometriosis is a condition that primarily affects females of reproductive age and is defined as the presence of non-neoplastic endometrial tissue outside of the usual confines of the uterus. Endometriosis affects 5- 15 percent of women of fertile age. There are cases of extra pelvic endometriosis, such as cutaneous endometriosis, which comprise less than 1 percent of all the total instances of endometriosis. Cutaneous endometriosis can be separated into either primary or secondary cutaneous endometriosis. Primary cutaneous endometriosis is less common than secondary.

Both primary and secondary cutaneous endometriosis are rare and can present like various other diseases, which makes diagnosis difficult. The patient may present with a history of surgical procedures that could predispose endometrial tissue into the scar, or the patient will present with cyclic pain during menstruation along with swelling of the mass. There are several reasons for underdiagnosis of this condition, including the rarity of the diagnosis, the often-irregular clinical presentation, and the broad differential diagnoses available.

Here we discuss a 24-year-old female who presented to a dermatology clinic with a mass in her umbilicus. She did not have the typical cyclical pain or bleeding of the mass with menses. Dermatologists initially diagnosed the patient with an umbilical cyst via ultrasound. It was not until the 'cyst' was opened and dermatologists removed endometrial tissue that they realized that their original diagnosis was incorrect. We aim to increase awareness of this presentation to help patients receive timely treatment for this rare diagnosis.

Abstract # 100

Tele-Robotic Surgery: Advancements, Challenges, and Future Directions

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Abstract:

Tele-robotic surgery represents a significant advancement in minimally invasive surgery by combining robotics with remote operation, yet several technical and logistical barriers limit its widespread adoption. The current gap in knowledge lies in understanding how to optimize this technology while addressing issues such as latency, loss of tactile feedback, high costs, and ethical concerns around access in low-resource settings. We hypothesize that addressing these challenges through technological improvements and system integration can increase tele-robotic surgery's accessibility and effectiveness. To test this, we will assess the current technological limitations, evaluate the costs of equipment, analyze training programs, and review cybersecurity protocols in existing tele-robotic surgery platforms. Our findings are expected to reveal specific areas for improvement in both the technology and its implementation, particularly in low-resource settings. By addressing these limitations, tele-robotic surgery can be better integrated into global healthcare systems, enhancing patient care and expanding access to expert surgical services.

Poster Abstracts

Abstract # 101

THE EFFECTS OF DIETS IN GHANA, PAPUA NEW GUINEA, MEXICO, INDIA, and the UNITED STATES ON THE OPTIMAL APPROACH TO CULTURALLY COMPETENT PHARMACEUTICAL AND NON-PHARMACEUTICAL TREATMENT IN THE MANAGEMENT OF TYPE 2 DIABETES MELLITUS: A LITERATURE ANALYSIS

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Type 2 Diabetes Mellitus is one of the most prevalent chronic illnesses worldwide, contributing to incidence of disabilities and deaths each year. Though onset can be insidious, there are multiple complications inflicted upon the body by this singular disease. This can result in a catastrophic prognosis, affecting multiple organ systems, with the nervous, cardiovascular, and renal systems getting hit the hardest. Type 2 Diabetes Mellitus affects individuals regardless of location; however, its level of impact can be dependent on the predominant carbohydrate source of each region's average diet in conjunction with the percentage of daily intake that is derived from carbohydrates. In this paper we investigate the average diets of multiple countries and how this relates to T2DM prevalence and treatment methods. We feel this will provide better insight as to how health professionals can approach discussions and treatment surrounding the illness, such as altering nutritional advice based on the culture the patient identifies with and what they may have access to. Within the United States alone, the population is growing in diversity, therefore each patient has a different need when it comes to treatment. Many of the increased health care costs could be diminished if physicians and practitioners were able to prescribe a cost-efficient treatment that not only works with the patient's diet but also their culture in regard to health practices.

PubMed was utilized to compile publicly accessible publications between the years of 2010 and 2024. Our inclusion criteria requirements are human subjects above the age of 18 yrs who reside in one of the 5 following countries; Ghana, Papua New Guinea, Mexico, India, and the United States. The countries were chosen based on economic differences and primary carbohydrate, aiming to obtain a diverse global view while also considering carbohydrate variety between countries.

The data is qualitatively analyzed, investigating the potential link between regional diets and response to T2DM treatment. This should allow us to better define treatment methods and personalize care in relation to lifestyle and culture. By examining the prevalence of diabetes, the glycemic impacts of regional diets, and the standardized plan surrounding T2DM for each region, we can further understand how the pathology and metabolism of the disease might fluctuate depending on region/culture and how to utilize this information in the melting pot of cultures present in the United States.

Abstract # 102

COMPARISON OF SKIN CANCER SCREENING GUIDELINES AND MELANOMA STAGE AT DIAGNOSIS

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Skin cancer, particularly melanoma, is a critical public health issue. Due to its aggressive nature and rising incidence, early detection is crucial for improving survival rates. Countries like Germany have recognized this need and implemented national skin cancer screening guidelines, recommending routine screening every two years for individuals aged 35 and older. In contrast, the United States (US) and the United Kingdom (UK) lack systematic screening guidelines, potentially affecting the stage at which melanoma is diagnosed and subsequent survival outcomes.

This study evaluates the impact of national screening guidelines on melanoma stage distribution at diagnosis across the US, Germany, and the UK. A comprehensive literature review of clinical trials, meta-analyses, and systematic reviews from 2010 and 2024 was conducted. We found that Germany had significantly higher stage I diagnoses, the UK had a higher proportion of stage II diagnoses, and the US had substantially higher late-stage (III/IV) diagnoses ($p<0.05$).

These findings suggest that routine skin cancer screening, as practiced in Germany, may lead to earlier melanoma detection, improving survival rates. The lack of routine screening in the US and the UK may contribute to a higher proportion of later-stage diagnoses associated with poorer outcomes. However, this research also highlights the potential for change, emphasizing the need for reassessing and potentially adopting proactive screening strategies in countries without routine skin cancer screening to enhance early detection and reduce melanoma-related mortality. Further studies are recommended to explore the feasibility and effectiveness of integrating similar screening models in diverse healthcare systems.

Abstract # 103

A CASE OF CHRONIC POSTHERPETIC NEURALGIA AFTER HERPETIC KERATITIS

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This case report describes a rare instance of chronic postherpetic neuralgia (PHN) following herpetic keratitis (HK) caused by herpes simplex virus-1 (HSV-1). Often associated with herpes zoster (HZ) infections, PHN is a debilitating condition, but it is not associated with HSV-1 in scientific literature. Furthermore, PHN of the ophthalmic branch of the trigeminal nerve (TG-PHN) is particularly life-altering. The patient, a female schoolteacher in her 40s, experienced severe left eye and facial pain, blurry vision, and persistent headaches, leading to significant anxiety and negative impact on her work and home life. Weeks after the initial onset of symptoms, she was finally diagnosed with HK. Unfortunately, despite antiviral treatment and various pharmacological and non-pharmacological interventions, she developed TG-PHN. Symptoms included blurry vision, eye pain and headache triggered by bright lights, confusion, and difficulty concentrating. Her symptoms have continued to persist for over four years, leading to significant anxiety and impact on her quality of life, requiring her to cease teaching and pursue long-term disability. The patient's pain management has included gabapentin, trigger point injections, and neuromuscular massage, with partial success. Psychological approaches, including talk therapy and neurofeedback, have been more effective in improving her coping mechanisms than other treatments. This case highlights the need for early diagnosis and a multidisciplinary approach to manage PHN, particularly in cases arising from atypical causes like HSV-1, and underscores the importance of integrating pharmacological, psychological, and somatic therapies to optimize patient outcomes and quality of life.

Abstract # 104

COMPARATIVE ANALYSIS OF MELANOMA FOLLOW-UP GUIDELINES AND IMPACT ON MORTALITY RATES

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Melanoma is the most dangerous form of skin cancer, posing significant challenges due to its tendency to recur and metastasize. The National Comprehensive Cancer Network (NCCN) and European Society for Medical Oncology (ESMO) offer differing guidelines in regard to the frequency and nature of follow-up appointments following a melanoma diagnosis. This paper aims to compare the NCCN and ESMO guidelines for melanoma follow-up frequency and explore their impact on melanoma mortality rates. A literature review was conducted, analyzing NCCN and ESMO guidelines published within the past 10 years. Mortality and incidence data from the United States and selected European countries (Poland, Italy, Germany, and Norway) were examined to explore the efficacy of follow-up strategies and possible impact on melanoma outcomes. The NCCN's aggressive follow-up strategy, involving frequent clinical examinations and imaging, correlates with a lower melanoma mortality rate (1.0 per 100,000) in the U.S., despite a high incidence. In contrast, ESMO's conservative and individualized approach, emphasizing self examinations, correlates with higher mortality rates in European countries (average 1.725 per 100,000). Statistical analysis shows the US mortality rate is significantly lower than the average of selected European countries (Z-score: -2.76, p-value: 0.012), implying better early detection or follow-up practices in the US. The NCCN's aggressive follow-up strategy may improve melanoma outcomes by enabling earlier detection, while ESMO's conservative approach reduces unnecessary appointments and costs for patients. This study underscores the need for a balanced approach, integrating the strengths of both guidelines to enhance melanoma management and patient outcomes.

Abstract # 105

THE PATIENT-PROVIDER RELATIONSHIP AS A BARRIER TO CARE FOR THE TRANSGENDER COMMUNITY

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The transgender community faces barriers to care that are unique to that patient population. This research aims to discover how patients perceive the lack of transgender-specific education, how it affects providers' level of competence and attitude around caring for these patients, and whether implementing educational interventions has the potential to reduce the barrier to care. A literature review was performed on studies that address transgender patients' perception of care (n=11), provider lack of education (n=15), and effects of educational interventions (n=15). Microsoft Excel was used to organize the papers for thematic analysis and perform statistical analysis of findings across papers to determine the significance of previously gathered data as it applies to the current research. This research found that the lack of provider education on transgender health topics creates a negative perception of health care for this population as they do not feel their providers are knowledgeable and anticipate they will not have their needs met. The lack of education creates a situation where a significant amount of providers care for transgender patients without receiving formal training ($p<0.001$, t-test), resulting in a lack of comfort in caring for those patients and an inability for the patients to receive adequate care. This research reviewed studies of transgender-specific educational interventions, finding post-intervention improvement in providers' clinical knowledge and attitude toward treating this population. To dismantle the barrier to care that arises from a lack of education, we propose two hours of Continuing Medical Education on transgender-specific health care to be required annually for all providers.

Abstract # 106

BENCHMARK BREAKDOWN: CHARTING THE TRUE COURSE OF MEDICAL COMPETENCY IN A PHYSICIAN ASSISTANT TRAINING PROGRAM

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Assessments in medical education attempt to ensure the production of competent professionals. Historically, if students completed the scheduled time in school, they were expected to progress and practice. However, a lack of competency at graduation is one factor that can lead to medical errors. Thus, a shift was created to assess the growth of medical students within professional attributes with the utilization of criterion-based rubrics to provide feedback to learners. This became competency-based medical education (CBME). This report evaluates the accuracy of CBME benchmarks used by Rocky Vista University's Physician Assistant program in predicting student progression in patient care competencies during the didactic phase. We analyzed the academic milestone achievements of three cohorts to compare observed progression with program-defined expectations. Descriptive statistics were used to assess milestone progression in five patient care competencies.

Our findings indicate that the program's benchmarks are conservative, with students reaching expected milestones earlier than predicted. For example, 80 percent of Patient Care Competency 2 assessments reached Milestone Level 2 by the second month, far ahead of the expected tenth month. Similar trends were observed in other competencies, suggesting that students progress faster than anticipated.

These results imply that the curriculum effectively fosters rapid competency development, necessitating a reevaluation of educational benchmarks to better reflect student performance. This is critical for ensuring that students are adequately challenged and prepared for the clinical phase and professional practice. These findings will also act as a stepping-stone for further evaluation of the implementation of CBME in physician assistant programs.

Abstract # 107

HEROIN AND FENTANYL USE COMPLICATED BY SENSORINEURAL HEARING LOSS: A CASE REPORT

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Abstract:

Fentanyl is a potent synthetic opioid commonly used for pain management, particularly in perioperative and chronic pain settings. While its analgesic efficacy is well-known, its potential for adverse effects, including ototoxicity, has been less frequently reported.

We present a case of a 25-year-old Caucasian male with no history of hearing impairment who developed sudden-onset sensorineural hearing loss hours after insufflating heroin. A bilateral, intermittent sensorineural pattern characterized the patient's hearing loss. His medical history and physical examination excluded other potential etiologies such as middle ear infections, head trauma, or exposure to other ototoxic medications. The patient's hearing loss subsided completely following adequate medical management.

Fentanyl exerts its analgesic effects primarily through mu-opioid receptor binding in the central nervous system. However, emerging evidence suggests that opioids, including heroin, may have direct effects on the auditory system, potentially leading to sensorineural hearing loss (Oroei, 2018). The exact mechanism by which heroin induces ototoxicity remains unclear but may involve a combination of vascular compromise, inflammatory processes, and oxidative stress within the cochlea (Aulet, 2014). Prompt recognition of this adverse effect is crucial for reversing hearing loss or preventing further deterioration. Audiologic follow-up is essential for monitoring the patient's progress.

This case report highlights the potential association between heroin use and sensorineural hearing loss, emphasizing the need for healthcare providers to be vigilant in monitoring auditory function in patients receiving opioids, especially those with opioid use disorder. Further research is required to elucidate the underlying mechanisms and risk factors for heroin-induced ototoxicity to develop preventive strategies and improve patient counseling.

Abstract # 108

HEALTH OUTCOMES OF CARDIAC ARREST PATIENTS ACROSS EMERGENCY DEPARTMENTS IN THE WESTERN UNITED STATES: URBAN VERSUS RURAL REGIONS

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Cardiac arrest survival rates vary significantly across different geographic settings, with rural and urban environments presenting distinct challenges and opportunities for emergency care. This capstone project investigates the disparities in survival outcomes for cardiac arrests between rural and urban areas. Utilizing data from the 2021 Nationwide Emergency Department Sample through the Healthcare Cost and Utilization Project, we performed a comparative analysis of survival to hospital discharge of cardiac arrest patients across central metropolitan (population >1 million), micropolitan (population <50,000), and frontier (population <6 persons per square mile) emergency department (ED) settings. A total of 3,392 cases across urban and rural regions were included in the study. Contrary to our initial expectations, results reveal that patients treated in rural EDs demonstrated better survivability than those in urban settings ($p<0.05$, ANOVA with Tukey post-hoc test). This outcome may be attributed to the rapid response and individualized care often observed in smaller, rural facilities, where limited resources are highly focused on critical emergencies. The lower patient-to-provider ratio in rural areas may facilitate more immediate care. However, rural EDs also exhibited higher transfer rates compared to urban EDs, reflecting their reliance on transferring critical patients to more extensive facilities for specialized care. These findings challenge the conventional assumption that urban areas, with their advanced medical facilities, inherently provide better outcomes for cardiac arrest patients. The study highlights the need for further research, especially in rural settings, to explore the underlying factors contributing to this discrepancy while identifying potential improvements in emergency care strategies to enhance survival rates.

Abstract # 109

USE OF LIPOPROTEIN(a) IN RURUAL MEDICINE: PREVENTING INCREASED TRAVEL AND HEALTHCARE COSTS

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Coronary artery disease (CAD) is a leading cause of mortality in the US, particularly affecting rural populations who have limited access to advanced diagnostic tools and specialized treatments. Lipoprotein(a) [Lp(a)] has been shown to be a biomarker that offers insights into cardiovascular disease (CVD) risk. Using guidelines and other research, this study evaluates the use of Lp(a) in the risk of atherosclerotic cardiovascular disease (ASCVD) in rural populations, possibly reducing travel and healthcare costs. PubMed/MEDLINE and Google Scholar were searched for "lipoprotein(a)," "ASCVD," and "CAD," research published between 2009-2024. Overall, 26 papers were reviewed, and three were selected for analysis using consistent odds ratio not covered in three primary guidelines (ACC/AHA, ESC/EAS, CCS). Data were visualized using forest plots created in Microsoft Excel. We found discrepancies among guidelines in the measurement and management of Lp(a). Specifically, the ACC/AHA lacks recommendations for Lp(a) measurement frequency and treatment, while the ESC/EAS advises a one-time measurement without treatment. The CCS provides treatment strategies based on Lp(a) levels. Studies consistently showed that elevated Lp(a) significantly raises ASCVD risk, emphasizing its value in rural healthcare for early detection and intervention. Incorporating Lp(a) measurement into routine assessments in rural healthcare may enhance risk stratification provide early detection of cardiovascular complications and reduce the need for specialist referrals minimizing travel and healthcare costs for rural patients. The study underscores the need for standardized guidelines and further research on implementing Lp(a) testing to improve cardiovascular outcomes in underserved rural communities.

Abstract # 110

CN XII CORTICOBULBAR TRACT VARIABILITY

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Inconsistent descriptions of the upper motor neuron pathway for the hypoglossal nerve in neuroanatomy curricula and board prep resources for osteopathic medical students leads to varied clinical understandings and expectations. Standardizing educational materials on hypoglossal nerve upper motor neuron pathways is essential for uniform clinical training and exam preparation.

A literature review identified four distinct upper motor neuron pathways for the hypoglossal nerve, affecting the understanding of clinical presentations. Analyzing osteopathic medical school textbooks and USMLE Step 1 board prep books revealed several variations. This inconsistency underscores the need for standardized neuroanatomy curricula to provide accurate and uniform information on upper motor neuron pathways and their clinical impacts.

Thirty-one neuroanatomy syllabi from U.S. osteopathic medical schools were reviewed, compiling 27 required or recommended textbooks for evaluation. Additionally, 25 USMLE Step 1 board review textbooks were assessed. The review focused on textbooks describing upper motor neuron pathways and associated tongue deviation following hypoglossal nerve upper motor neuron lesions.

Four variations in upper motor neuron innervation to the hypoglossal nucleus were found: purely contralateral, contralateral and ipsilateral, contralateral and bilateral, and completely bilateral. Most osteopathic textbooks described an exclusively contralateral pathway. USMLE Step 1 prep books mostly described contralateral pathways, though some showed variability.

Variations in upper motor neuron pathway descriptions highlight the need for standardized educational resources. Consistent information would enhance board exam performance and clinical understanding. Further research should include broader medical texts and patient data to confirm findings.

Abstract # 111

OSTEOPATHIC MANIPULATIVE TREATMENT FOR ROUND LIGAMENT PAIN IN PREGNANCY: A CASE REPORT

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Round ligament pain (RLP) is a common but often inadequately addressed complaint during pregnancy, typically manifesting as sharp or stabbing pain in the lower abdomen or groin. Traditional management strategies, including rest and supportive garments, often provide limited relief, leaving many patients with persistent discomfort. This case report describes a 29-year-old pregnant patient presenting with severe bilateral groin and inner thigh pain attributed to RLP. The patient had experienced similar pain during a previous pregnancy and found conventional treatments ineffective. An osteopathic structural exam identified multiple somatic dysfunctions, including a sacral torsion, pubic compression, and cervical and thoracic spine restrictions. A tailored osteopathic manipulative treatment (OMT) plan was implemented, focusing on these dysfunctions. Post-treatment, the patient reported significant pain reduction and improved mobility. This case highlights the effectiveness of OMT in alleviating RLP, suggesting that OMT should be considered a viable treatment option for pregnancy-related pain, especially when conventional methods fall short. Given the limited research on OMT in pregnancy, this case adds to the existing literature by demonstrating its potential benefits and advocating for its broader use in obstetric care. The findings underscore the importance of integrating OMT into routine obstetric practice and call for further research to fully understand its role in managing pregnancy-related conditions. This report emphasizes that RLP, while often viewed as an inevitable aspect of pregnancy, can be managed effectively through OMT, potentially improving maternal comfort and outcomes throughout pregnancy.

Abstract # 112

OSTEOPATHIC SELF TREATMENT (OST) TO REDUCE MENSTRUAL PAIN

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Dysmenorrhea, or menstrual pain, is estimated to affect 45-93% menstruating biological females. Further, dysmenorrhea can disrupt daily activities and lower quality of life. While primary dysmenorrhea stems from physiological menstrual changes, its management typically relies on over-the-counter non-steroidal anti-inflammatory drugs (NSAIDs), and hormonal contraceptives. However, these treatments vary in effectiveness and may have associated side effects, particularly with prolonged NSAID use. Lifestyle interventions like diet, exercise, and heat therapy are also recommended. **This study** explores the impact of Osteopathic Self-Treatment (OST) techniques, derived from Osteopathic Manipulative Treatment (OMT), on dysmenorrhea symptoms among RVU faculty, staff, and students across our three campuses (Colorado, Montana, and Utah). On-site OST workshops and video training will be provided to empower individuals to self-administer techniques. Outcomes of interest will be measured with surveys at the beginning and conclusion of the study. If findings support the use of OST for dysmenorrhea, this would be a cost-effective, accessible, and flexible treatment option for providers to recommend. By focusing on the self-application of OMT principles, this research aims to evaluate whether OST can serve as a non-pharmaceutical alternative to standard dysmenorrhea management strategies.

Abstract # 113

UNIQUE PRESENTATION OF A LARGE MASTOCYTOMA IN AN ADULT

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A 44-year-old male presented to dermatology clinic with a 20-year history of pruritic erythematous-violaceous papules coalescing into patches and plaques on his trunk and extremities. The patient described worsening of his rash with tobacco and alcohol use. He denied any episodes of anaphylaxis. Notably his left upper arm had an 8 cm x 5 cm x 2.5 cm erythematous nodule with cobblestone surface. The nodule started 10 years ago with slow growth until 1.5 years ago when growth accelerated.

Past medical history is significant for a diagnosis of cutaneous mastocytosis 15 years ago without treatment or subsequent follow up. Skin biopsy confirmed cutaneous mastocytosis. Due to growth of the left upper arm nodule, he underwent excision. Pathology revealed a mastocytoma. Elevated serum tryptase levels (45 ng/mL) prompted further investigation. A bone marrow biopsy demonstrated multifocal dense infiltrates of mast cells, indicating indolent systemic mastocytosis.

Cutaneous mastocytosis typically presents during infancy and often resolves prior to puberty. However, the disease may progress, leading to systemic involvement in later years, highlighting the importance of long-term surveillance in mastocytosis cases. This presentation was unique due to its onset in adulthood and the formation of an unusually large mastocytoma, which typically remains small, especially in adults. This case reveals the uncommon dermatological findings that mastocytosis may present with.

This patient was treated with antihistamines for pruritis. He was also counseled on risk of anaphylaxis if exposed to NSAIDs, opiates, general anesthesia, or certain antibiotics.

Abstract # 114

VARIABILITY IN ULTRASOUND METHODOLOGIES FOR MEASURING TONGUE THICKNESS

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Obstructive sleep apnea is a condition where the upper airway becomes blocked during sleep, causing breathing interruptions. Recent studies suggest that tongue thickness (TT) might help diagnose obstructive sleep apnea because reduced muscle tone (as evidenced by increased TT) can contribute to airway blockage during sleep. TT can be measured non-invasively using bedside ultrasound, however, there is currently no standardized protocol for obtaining these measurements.

This review aims to evaluate current protocols for obtaining TT measurements and contrast the nuances across them. Specifically, this review examines 17 peer-reviewed articles published between 2019 and 2024 utilizing various methods for measuring TT, including descriptions of: ultrasound probe frequency, patient positioning, probe placement, and anatomical landmarks.

Although patient positioning and anatomical landmarks showed some similarities between studies, variability in tongue positioning and probe placement were more common. Only 5 of the 17 studies reported intra- and interrater reliability statistics and were in the range of: 0.76 - 0.98 and 0.92 - 0.95 respectively.

A standardized, reliable, and reproducible protocol for measuring TT is still needed to establish a foundation for the increasing ways in which TT measurements are being incorporated into bedside research as a potential clinical diagnostic tool. Future directions include establishing a standardized protocol for measuring TT using bedside ultrasound, beginning with embalmed human cadavers before transitioning to human subjects.

Abstract # 115

COLLATERAL ANASTOMOSES OF THE MESENTERY: ARC OF RIOLAN AND MEANDERING ARTERY OF MOSKOWITZ. A LITERATURE REVIEW.

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The Arc of Riolan (AOR) and Meandering Moskowitz Artery (MMA) are well-known eponyms that refer to anastomoses between the superior and inferior mesenteric arteries. Despite frequent use, their definitions vary in the literature. Preservation of these collaterals is crucial for maintaining colonic blood supply and avoiding surgical complications. Our study sought to clarify these definitions by examining their origins, evolution, and varying descriptions. The RVU-MCOM library literature search tool and Google Scholar were used to access online databases (MEDLINE Complete, DOAJ, ASI). Search terms included “Arc of Riolan,” “Riolan’s arch,” “Arcus Riolani,” “Meandering artery of Moskowitz,” “Meandering Moskowitz artery,” and “Moskowitz artery” in different combinations. 55 full-text articles were included in our review, with no restrictions on publication date. Non-English articles and those lacking relevant information on the MMA and AOR were excluded. The AOR was described as a connection between the Middle Colic artery (MCA) and the Left Colic artery (LCA), with about 82% of authors distinguishing it from the Marginal artery (MA). The MMA was more consistently defined as linking the proximal MCA to the ascending LCA. Although descriptions became more detailed, the literature remains divided: some authors consider the AOR, MMA, and MA distinct, while others view only the AOR or MMA as an additional collateral to the MA. Limitations included access to historical works and language barriers that prevented use of potentially relevant articles. The use of eponyms for these anastomoses remains problematic and ambiguous within the literature, highlighting the need for a new naming convention free of eponyms.

Abstract # 116

VARIABILITY IN NEROANATOMICAL RESOURCES IN OSTEOPATHIC MEDICAL EDUCATION

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Neuroanatomy is widely regarded as one of the most challenging subjects in preclinical medical education, but there is a lack of research on how consistent or varied neuroanatomy lab curricula are across Osteopathic medical schools and their impact on student success. Currently, medical schools employ a range of teaching methods for neuroanatomy, including student-led dissections, professor-led demonstrations, virtual and augmented reality, plastinated specimens, models, radiographic images, and 3-D computer images. Schools have the option to develop their own lab manuals or use commercially available ones. To address the gap in understanding, a survey was conducted involving 66 Osteopathic Medical Schools in the U.S. This survey aimed to investigate the different methods and resources utilized in neuroanatomy curricula across these institutions. The goal is to establish best practices for teaching neuroanatomy, enhancing educational outcomes and standardizing approaches within Osteopathic Medical schools. This research is essential for identifying effective strategies and potentially improving student performance in neuroanatomy, thereby advancing medical education in this complex field.

Abstract # 117

MORGAGNI'S DIAPHRAGMATIC HERNIA IN A 75-YEAR-OLD FEMALE: A CASE REPORT

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Morgagni hernias are rare congenital diaphragmatic hernias resulting from a defect in the anterior diaphragm. They often remain asymptomatic for decades, which can lead to delayed diagnosis and management. This case highlights the rarity and potential for a late symptomatic presentation, emphasizing the need for heightened clinical awareness. The case demonstrates that early surgical intervention following diagnosis leads to favorable outcomes in patients with a Morgagni hernia, even with late-onset symptoms.

In this case, a 75-year-old woman presented to the emergency department with upper abdominal pain, constipation, and the unusual sensation of hearing bowel sounds behind her right breast. Imaging studies revealed a Morgagni hernia. The patient was treated conservatively with a nasogastric tube initially, followed by successful hernia repair surgery. The patient tolerated surgery well and was discharged in stable condition, highlighting the importance of prompt surgical management in symptomatic Morgagni hernia cases.

This case underscores the necessity for increased awareness of Morgagni hernias, especially in older adults, as these congenital anomalies can remain undetected for decades. Early recognition and appropriate surgical intervention are critical to avoid complications and achieve positive patient outcomes.

Keywords: Morgagni hernia, congenital anomaly, defect in anterior diaphragm, surgical intervention, hernia repair surgery, case report

Abstract # 118

ADDRESSING MATERNAL MORTALITY IN SOUTH ASIA: STRATEGIES FOR HEMORRHAGE PREVENTION AND SANITATION IMPROVEMENT

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Abstract

Introduction: The World Health Organization (WHO) defines maternal mortality as death resulting from pregnancy-related causes during pregnancy, childbirth, or within 45 days postpartum. South Asian women are at a disproportionately higher risk of maternal mortality compared to women in other regions. This research review aims to investigate the factors contributing to the elevated maternal mortality rates in South Asia.

Methods: A systematic review of peer-reviewed journals was conducted, focusing on maternal mortality in the following South Asian countries: Afghanistan, Bangladesh, Bhutan, India, Nepal, Pakistan, and Sri Lanka. The databases searched included PubMed, Google Scholar, and JSTOR, with a focus on studies examining maternal health issues and mortality rates among South Asian women.

Results: A total of 3,504 research articles were identified using the specified search terms. Of these, approximately 800 discussed the causes of maternal mortality. Most of the data originated from studies conducted in India and West Bengal and Nepal. The recurring factors contributing to maternal mortality across regions were: hemorrhage (India: 47%, West Bengal: 33%, Nepal: 34%), sepsis (India: 12%, West Bengal: 10%, Nepal: 14%), and hypertensive disorders (India: 34%, West Bengal: 14%, Nepal: 21%).

Conclusion: The findings suggest that hemorrhage, sepsis, and hypertensive disorders are the leading contributors to the high maternal mortality rates in South Asia. This review highlighted the importance of primordial preventive policies focusing on mass education and provision of:

Adequate and appropriate sanitation. Increasing funding sources to skilled physician, and reproductive education in low income or socio-economically challenged countries.

South Asia accounts for a significant portion of global maternal deaths, highlighting a regional crisis that requires targeted interventions. Addressing these factors is crucial for reducing maternal deaths and improving maternal health outcomes in the region.

Abstract # 119

OSTEOPATHIC MANIPULATIVE MEDICINE AS AN ALTERNATIVE TREATMENT TO KETAMINE INJECTIONS

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Rooted in the 19th century, Osteopathic Manipulative Medicine (OMM) offers a hands-on, nonpharmacologic approach that emphasizes self-healing. This literature review examines whether OMM is an effective alternative for ketamine injections, a treatment introduced in the 1960s, in pain management. Current literature focuses primarily on these treatments independently, with limited comparative studies. To address this, a systematic review was conducted comparing the efficacy of OMM and ketamine injections for musculoskeletal and neurologic pain. The review included studies published in the last 10 years reporting pain reduction outcomes. Searches were performed in PubMed and Open Evidence using keywords like "OMM," "ketamine," "chronic pain," and "musculoskeletal pain." Studies not focusing on musculoskeletal or neurologic pain or lacking pain reduction data were excluded. Key findings indicate that OMM significantly reduces pain and improves function in conditions such as chronic low back pain, neck pain, and tension headaches. OMM was also associated with higher patient satisfaction, especially in chronic low back pain, where patients reported sustained pain relief, improved mobility, and a better quality of life. In contrast, ketamine injections provided rapid pain relief but were linked to side effects such as dissociation and cardiovascular issues, resulting in mixed satisfaction. These findings suggest that OMM may be a preferable long-term option for pain management, particularly for patients seeking sustained relief without the side effects of pharmacologic treatments. However, the limited number of direct comparative studies highlights the need for further research to better understand the relative benefits and risks of OMM versus ketamine injections.

Abstract # 120

Assessing Micronized Lipoaspirate Injections for Optimal Dermatological Results Following Craniotomy

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During a craniotomy, part of the skull is removed which can cause postoperative complications like slow hair regrowth, bone repair issues, hyperpigmentation, and scarring. These complications can be improved through micronized lipoaspirate injections (MLI) that send autologous adipose-derived stem cells that enhance the healing process. This review explores the efficacy of MLI in improving recovery after a craniotomy.

PubMed database and Google Scholar search engine was utilized for this literature review. The following search terms used were MLI, craniotomy, scar reduction, and hair regrowth. Following the collection of data, relevant articles were identified using specific inclusion and exclusion criteria such as not including scar reduction and hyperpigmentation, or any articles published before 2014.

Although no studies directly addressed MLI in the context of craniotomies, relevant research on MLI for hair regrowth and scar reduction was found. These studies indicated that MLI can reduce hypertrophic scars and hyperpigmentation and improve hair count with longer retention.

The results may have been influenced by bias from only using a limited amount of search engines. Additionally, there was a limited sample size about the effects of MLI.

This literature review identified a critical gap in the literature regarding the use of MLI for improving recovery and reducing complications after craniotomy. While previous studies suggest MLI's potential in promoting hair growth and reducing scarring, further research is needed to evaluate its efficacy in post-craniotomy patients. Addressing this gap could advance postoperative dermatological outcomes.

Abstract # 121

COMPARING PATIENT OUTCOMES BETWEEN CONSCIOUS AND UNCONSCIOUS SEDATION IN THIRD MOLAR EXTRACTION

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The evolution of sedation techniques in dental procedures has been significant since the introduction of nitrous oxide in the mid-19th century and the subsequent development of intravenous sedatives in the 20th century. As patients face the daunting prospect of wisdom teeth removal, this study explores whether conscious sedation or unconscious sedation leads to a better overall experience. Despite the availability of various sedation methods, it remains unclear which technique leads to the highest patient satisfaction and best outcomes. To address this, a comprehensive literature review was conducted, comparing conscious and unconscious sedation in third molar removal. Search terms like “laughing gas,” “nitrous oxide,” “propofol,” “third molar,” “conscious sedation,” and “unconscious sedation” were used in PubMed and Google Scholar to find peer-reviewed articles. Inclusion criteria were limited to studies published on third molar removal within the last 10 years, while studies outside this timeframe were excluded. Key outcomes, including patient satisfaction, recovery times, and complication rates, were compared between sedation groups. The analysis revealed that conscious sedation is associated with higher patient satisfaction and fewer postoperative complications compared to unconscious sedation. Patients under conscious sedation reported lower anxiety and discomfort, contributing to a more positive experience, with shorter recovery times due to fewer side effects like nausea and grogginess. However, the review primarily addresses immediate outcomes, with limited data on long-term effects. These findings suggest that conscious sedation may be the preferable option for third molar removal, guiding clinicians toward more effective sedation practices and improved patient outcomes.

Abstract # 122

ASSESSING TREATMENT SATISFACTION IN PATIENTS WITH RECURRENT BACTERIAL VAGINOSIS

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Recurrent bacterial vaginosis (BV) represents a significant challenge in female reproductive health, with recurrence rates reaching up to 50% within six to twelve months post-treatment. BV not only poses risks to reproductive health but also significantly disrupts quality of life, causing discomfort, anxiety, and social stress. Despite ongoing research, long-term effective treatment strategies remain elusive, necessitating the exploration of novel management approaches to prevent adverse outcomes and improve quality of life. We hypothesized that current treatment guidelines for recurrent BV may not be clinically effective or sufficiently address patients' quality of life. Our objective was to assess the effectiveness of the various management approaches currently used for recurrent bacterial vaginosis. A questionnaire was created using current diagnostic criteria, identified risk factors, and common treatment recommendations for BV, including lifestyle modifications and medications. Validity was ensured by sending the survey to a test group of 20 participants to identify any misleading questions. This questionnaire was then distributed online via recurrent BV support groups and social media platforms. Eligible participants were identified as individuals who have experienced three or more symptomatic episodes of BV in the past year. While the majority of participants have tried multiple treatments, including metronidazole, boric acid, and probiotics, only a small portion found these treatments to be successful. Only 20% of participants reported satisfaction with their BV treatments, with about 80% reporting that their provider addressed their BV concerns about half the time or less. This study highlights the need for ongoing research to develop more effective and personalized treatment strategies, considering the persistent challenge posed by recurrent BV and its impact on reproductive health and quality of life.

Abstract # 123

Drug-Induced Hearing Loss

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Introduction and purpose:

Hearing loss is one presentation of ototoxicity and can be caused by many drugs. It is devastating, especially in children during language acquisition, in addition to long-term economic and social impacts. Intrauterine exposure to drugs such as aminoglycosides and loop diuretics can elicit a significant impact on the fetus causing hearing loss by the age of two. The purpose of this study is to summarize drugs that can induce hearing loss and explore the possible mechanism underlying this side effect.

Methods:

A literature search was performed using PUBMED, Google Scholar, and Cochrane Central Register for controlled trials. Keywords or phrases were “drug-induced ototoxicity”, “treatments for ototoxicity”, “mechanisms of action of ototoxic drugs”, “ototoxic agents”, “prevention of ototoxicity”, and “Animal model of ototoxicity”.

Results:

The top drugs inducing hearing loss include antimicrobials (aminoglycosides, vancomycin, amphotericin B, anti-malaria drugs), platinum and other anticancer drugs (cisplatin, methotrexate), loop diuretics, NSAIDs (nonsteroidal anti-inflammatory drugs), anti-hyperthyroid drugs, opioids, etc. The possible mechanisms are nerve demyelination, apoptosis via caspase cascade, glutamate toxicity, reactive oxidative species, inner ear hypoperfusion via vasculitis or vasoconstriction, ion disturbance on the background of gene mutations, and increased permeability of triggered drugs. If multiple trigger drugs are used simultaneously, the risk of hearing loss will be increased. In addition, if patients have sepsis, inflammations, or malnutrition, their risk is enhanced. Furthermore, the risk is present in drugs used topically. Intrauterine exposure to aminoglycosides and loop diuretics has been incriminated to cause hearing loss in children by age two.

Conclusions:

The current study will alert physicians of drug-induced hearing loss and the risk assessment for certain populations. Because hearing loss sometimes could be irreversible, therefore, avoiding the concomitant use of multiple triggered drugs should be recommended to reduce this side effect. Additionally, treatment with these drugs should start at the lowest dose. Finally, it is worth noting that there is a greater need for experiments and clinical trials to investigate the mechanism of drug-induced hearing loss and the strategies to prevent this side effect.

Abstract # 124

ERGONOMIC STRATEGIES TO MITIGATE MUSCULOSKELETAL DISORDERS AND BURNOUT AMONG SURGEONS: A LITERATURE REVIEW

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Background: Surgical ergonomics significantly impact the well-being of surgeons, with musculoskeletal disorders (MSDs) prevalent across various specialties. High rates of MSDs are reported among orthopedic, spine, and cardiothoracic surgeons, with the back and neck being the most commonly affected areas. For instance, the career prevalence of MSDs among orthopedic surgeons ranges from 37% to 97%, and spine surgeons report a prevalence of 70.4%.

Method: A literature review was performed to assess the impact of surgical ergonomics on surgeons' well-being. Sources were gathered from PubMed, Cochrane, Scopus, and Google Scholar using search terms including musculoskeletal disorders, surgical ergonomics, burnout, economic impact, and ergonomic interventions. Studies focusing on various surgical specialties and their ergonomic practices were included.

Results: High rates of musculoskeletal pain are strongly correlated with increased burnout rates and reduced job satisfaction among surgeons. Surgeons experiencing physical discomfort are more likely to report burnout, which affects their performance and mental health. MSDs result in significant economic consequences, including time off work, early retirement, or changes in clinical duties. For example, 30% of cardiothoracic surgeons needed time off due to MSD-related injuries, and 20% needed surgery or narcotics. Effective ergonomic adjustments, such as robotic assistance, proper visualization aids, and ergonomic training programs, have shown promise. However, underreporting of symptoms and lack of awareness of ergonomic principles hinder widespread adoption.

Discussion: The integration of ergonomic principles and devices in surgical practice is crucial to mitigate MSDs and improve surgeons' well-being and career longevity. Despite the high prevalence of MSDs, ergonomic practices and devices are not widely implemented. Further research and understanding of ergonomic interventions are necessary to facilitate their widespread adaptation in the operating room. These efforts will guide strategies to mitigate the risks associated with prolonged surgical practice and enhance the overall health and productivity of surgeons.

Abstract # 125

Unveiling the Rise in Achilles Tendinopathy: A Comprehensive Review of Risk Factors, Mechanisms, and Evidence Gaps

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Achilles tendinopathy, a prevalent musculoskeletal condition, has seen a global increase in incidence, yet the factors driving this rise remain poorly understood. Current literature predominantly focuses on treatment, with limited high-quality research addressing risk factors, mechanisms of injury, and prevention strategies. Nearly half of the most cited studies are of poor quality, lacking standardized methods and long-term data.

We hypothesize that the rising prevalence of Achilles tendinopathy is associated with previously unidentified societal trends, biomechanical factors, and critical gaps in the literature. This review synthesizes findings from 56 sources, including peer-reviewed studies and media insights, focusing on risk factors, injury mechanisms, and public perceptions. Key populations include athletes from the NFL, NBA, NCAA, and major soccer leagues, with data spanning from 1984 to 2024.

Our findings reveal a multifactorial etiology, with mechanical overuse, abnormal foot mechanics, and genetic factors identified as key contributors. Regional variation in the incidence of Achilles tendinopathy and ruptures was noted, with a marked increase among elite athletes. However, significant weaknesses in the literature were found, including insufficient long-term data and a lack of standardized prevention protocols.

By identifying these patterns and proposing targeted prevention strategies, this review aims to clarify existing literature, provide evidence-based insights into the global increase in incidence, and address critical gaps in the current understanding of Achilles tendinopathy.

Abstract # 126

EVALUATING THE EFFECTIVENESS OF DIFFERENT ANTIMICROBIAL COATINGS ON TOTAL KNEE REPLACEMENT IMPLANTS IN REDUCING PERIPROSTHETIC JOINT INFECTION

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Introduction: Periprosthetic joint infections (PJI) following total knee replacement (TKR) surgeries occur in approximately 2% of cases, leading to significant healthcare costs, sepsis, and revision surgeries. Antimicrobial coatings on implants are used to prevent PJI. This literature review evaluates the effectiveness of different antimicrobial coatings on TKR implants, including silver-based, antibiotic-loaded, and chitosan-based coatings, in reducing PJI rates, assessing their impact on patient outcomes and cost-effectiveness.

Methodology: A search was conducted using databases such as PubMed, Scopus, Cochrane, and Google Scholar, employing MeSH terms and keywords like “antimicrobial coating,” “total knee replacement,” “periprosthetic joint infection,” and “patient outcomes.” Studies published between 2014 and 2024 were included if they evaluated antimicrobial coatings, reported on PJI outcomes, and analyzed cost-effectiveness. Non-English articles and those lacking clear outcome data were excluded. Boolean operators refined the search.

Results and Conclusion: Current clinically approved methods for reducing infection in total knee replacement implants include various antimicrobial coatings that either limit pathogen colonization through surface topology and chemistry or actively kill bacteria through antibiotic release or immobilization. While these coatings reduce the risk of PJI, no device is entirely immune to infection. Despite their benefits in lowering infection rates and improving patient outcomes, the potential for infection persists. This underscores the need for further research to optimize antimicrobial coatings and develop more comprehensive infection prevention strategies that balance effectiveness, cost, and patient safety in TKR procedures.

Abstract # 127

EVALUATING THE IMPACT OF PARASTERNAL BLOCK AND OSTEOPATHIC MANIPULATIVE TECHNIQUES TO IMPROVE POSTOPERATIVE STERNAL PAIN

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Procedures such as coronary artery grafting (CABG) require a median sternotomy, which may result in inadequate pain control, reduced mobilization, and longer hospital stays. Historically, extensive prescribing of opiates has been standard of care for postoperative CABG sternotomy pain (PCSP). This study aims to explore whether combining non-opioid therapy, such as parasternal block, and osteopathic manipulative treatment (OMT), outperforms standard therapy used to manage PCSP.

The literature review was conducted through PubMed using the following search terms: CABG, OMT, infiltration, and sternotomy. Afterwards, a fixed inclusion and exclusion criteria were employed to eliminate articles that didn't mention soft-tissue technique (STT), CABG, or parasternal block.

Five articles investigated the efficacy of OMT in reducing sternotomy pain and shortening postoperative recovery. Four of these studies, including Racca et al., found statistically significant results. Racca et al. reported reduced hospital stays and a median pain score of 1 for OMT recipients versus 3 for controls. Both Racca et al. and O-Yurvati et al. observed improvements in functional capacity, including mixed venous oxygen saturation, cardiac index, and inspiratory volume in OMT patients compared to controls. However, no studies have explored OMT in conjunction with parasternal blocks and PCSP. Previous research has examined physical therapy methods like TENS and exercise for PCSP but has not combined CABG, parasternal blocks, and STT in this context.

Some limitations to this study include an extremely narrow search utilizing PubMed that explored the combined effects of introducing the OMT technique of STT and parasternal blocks for PCSP management.

This literature review reveals gaps in existing research addressing the combined use of non-opiate regional analgesia and OMT for PCSP. The absence of studies integrating these modalities highlights the need for further exploration of alternative, opioid-sparing pain management strategies in postoperative cardiac care.

Abstract # 128

Exploring the Efficacy of Osteopathic Manipulative Treatment in Ulcerative Colitis Management

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Ulcerative colitis (UC) is a chronic disease of the large intestines that leads to chronic inflammation with symptoms of abdominal pain, abdominal cramping, and rectal bleeding. The physical as well as the psychosocial impact of living with these symptoms can be debilitating, especially if treatment options are limited. Consequently, a variety of solutions to reduce inflammation, such as myofascial release (MR) and soft tissue techniques (STT), should be investigated to decrease the inflammation and severity of symptoms in patients with UC.

For this literature review, PubMed was used for the electronic searches. Search terms used were Ulcerative Colitis, inflammation reduction, soft-tissue-technique, and myofascial release. Once the data was collected, it underwent strict inclusion and exclusion criteria such as lack of mentioning STT, MR, or UC and any articles before 2014.

There was a paucity of published research that addressed UC, STT, and MR in the same paper. Although, patients with other gastrointestinal conditions, such as Crohn's disease, have had their pain reduced which is very similar to UC in nature.

One main limitation of this study included a lack of published research treating UC with OMT on PubMed.

This literature review highlights a significant gap in research exploring the use of MRs and STTs in managing UC symptoms. While similar inflammatory conditions like Crohn's disease have shown positive responses to OMT, the absence of studies specifically addressing UC emphasizes the need for further investigation into the potential benefits of OMT for reducing inflammation and improving the quality of life for UC patients.

Abstract # 129

INVESTIGATING POST-DERMABRASION EFFECTS IN HIGH FITZGERALD SCORE PATIENTS

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Patients may undergo treatment to remove scars, however, patients with a Fitzgerald score of III or higher typically have structural features that create a more sensitive immune response. Dermabrasion is controlled surgical scraping that may trigger such an immune response. For the safety of patients, delving into whether patients of darker skin tones are at risk of exacerbating or creating new skin disorders, such as melasma, is pertinent.

An electronic search using PubMed was used to conduct this literature review. Key words used were scar reduction, light skin tones, dermabrasion, and dark skin tones were used. A specific inclusion and exclusion criteria was established that removed articles that failed to mention the ethnicity, Fitzgerald score, or skin color of a patient and dermabrasion.

Although dermabrasion is considered safe, people with a Fitzgerald score of III and above ought to choose an alternative method of reducing their scars. There was a high risk associated with hypopigmentation from general healing, post inflammatory hyperpigmentation, and hypertrophic scarring if the practitioner went too deep.

Majority of the published literature was outdated, some with language that reflected this limitation. Additionally, only PubMed was used for the electronic search.

When patients opt for dermabrasion, the ideal result is an improvement in their skin, however, in darker skin the risks may outweigh the benefits. However, further research into dermabrasion and darker skin tones is a necessity since the published literature pertaining to darker skin tones and dermabrasion is miniscule compared to the number of published works with lighter skin tones.

Abstract # 130

EXPLORING THE EFFICACY OF OMT AND TRADITIONAL EYE EXERCISES IN ALLEVIATING EYE STRAIN: A LITERATURE REVIEW

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Digital eye strain, dry eye, and elevated intraocular pressure (IOP) have become increasingly common due to extended screen time, yet the effectiveness of non-pharmacological interventions, such as Osteopathic Manipulative Medicine (OMM) and traditional eye exercises, remains under-researched. OMM, along with traditional eye exercises like Chinese eye exercises and eye yoga, is hypothesized to reduce IOP, alleviate dry eye symptoms, and relieve eye fatigue. A comprehensive literature review was performed using PubMed, Scopus, and Ovid databases. Keywords included «OMM,» «osteopathic manipulative,» «osteopathic medicine,» «OMT,» «Chinese eye exercises,» «eye yoga,» «eye exercise,» «intraocular pressure,» «IOP,» «dry eye,» «fatigue,» «strain,» «acupuncture,» «digital eye strain,» «blue light,» and «visual acuity.» The literature suggests that OMM and traditional eye exercises may help reduce eye strain, improve visual acuity, and lower IOP, although variability in methodologies highlights the need for further research. OMM and traditional eye exercises show potential in enhancing ocular health, but additional controlled studies are required to establish standardized protocols and confirm their efficacy.

Abstract # 131

EXPLORING THE KNOWN QUANTITATIVE EFFECTS OF OSTEOPATHIC MANIPULATIVE TREATMENTS ON BLOOD FLOW

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Osteopathic Manipulative Treatment (OMT) has been explored for its potential to improve vascular flow, though quantitative data on its efficacy remains limited. OMT's proposed effect on blood flow involves techniques aimed at releasing tissue tension, improving perfusion, manipulating the autonomic system, enhancing venous and lymphatic return, and promoting diaphragmatic function. This review synthesizes findings from studies that quantitatively assess OMT's impact on blood flow, addressing a notable gap in the literature. We analyzed studies that examined OMT's effects on blood volume and vascular parameters using tools such as color Doppler ultrasound, laser Doppler flowmetry, photoplethysmography (PPG), flow-mediated dilation (FMD), resistive index (RI), endothelial function, peak systolic velocity (PSV), end diastolic velocity (EDV), and MRI arterial spin labeling (ASL). A comprehensive search identified randomized controlled trials and experimental studies focusing on OMT's effect on vascular health in populations including heart failure patients, individuals with peripheral artery disease (PAD), osteoarthritis patients, pregnant patients, and healthy volunteers. Most studies found OMT to have a statistically significant effect on blood flow, supporting its potential to enhance vascular function in both healthy and diseased populations, particularly as a valuable adjunctive therapy for conditions marked by reduced arterial flow. The synthesis of peer-reviewed quantitative data advances the understanding of OMT's impact on vascular health and underscores the need for further research to confirm its long-term benefits and mechanisms.

Abstract # 132

LONG TERM OUTCOMES AND CLINICAL IMPLICATIONS OF FOCUSED ULTRASOUND ABLATION IN PARKINSON'S DISEASE MANAGEMENT

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Parkinson's disease (PD) presents a growing global challenge, with rising incidence rates and significant economic impacts on healthcare systems. Traditional management strategies, including pharmacological and surgical interventions, provide symptomatic relief but are often accompanied by long-term complications and fail to halt disease progression. The pursuit of innovative treatments has introduced focused ultrasound ablation (FUS ablation), a noninvasive technique that precisely targets and destroys tissue using high-energy ultrasound. This novel approach has the potential to revolutionize PD treatment. This literature review explores FUS ablation's potential for managing motor and nonmotor symptoms of PD. It assesses long-term outcomes, drug dosage, safety, quality of life, and overall efficacy, focusing on drug-resistant PD cases. A systematic search strategy was employed to aggregate studies that meet rigorous inclusion criteria, ensuring a detailed evaluation of FUS ablation in PD care. The review highlights the success of FUS ablation, particularly in drug-resistant cases, and discusses its integration into clinical practice. This review elucidates the need for continued research with long-term follow-up to understand potential adverse effects better and optimize treatment. This work advances knowledge by providing a balanced perspective on FUS ablation, underscoring the importance of further investigation, particularly regarding circumstances where FUS is most efficacious and safe.

Abstract # 133

FURTHER ANALYSIS OF TRENDS IN NRMP MATCH DATA: PHYSICAL MEDICINE AND REHABILITATION

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The competitiveness for physical medicine and rehabilitation (PM&R) residency positions has increased significantly over time, with higher USMLE Step 1 and Step 2 CK scores, longer rank order lists, and more publications correlating with match success. However, trends from recent *NRMP Charting Outcomes* reports for 2020 and 2022, as well as the role of COMLEX scores for osteopathic candidates, have not been thoroughly explored. This study aims to update the literature by analyzing data from the NRMP Charting Outcomes reports from 2007 to 2022, focusing on osteopathic PM&R applicants. We examined changes in applicant characteristics such as the number of abstracts, presentations, publications, and board exam scores. Our analysis revealed that from 2020 to 2022, osteopathic applicants saw a 51.6% increase in the number of abstracts, presentations, and publications, with a projected 80.9% increase by 2040. Additionally, research experience averages increased by 25% from 2016 to 2022, and mean COMLEX Level 1 and Level 2 scores are anticipated to rise significantly. These findings underscore the increasing competitiveness of the PM&R residency match. Future NRMP data, including the anticipated future *Charting Outcomes*, will be crucial for understanding evolving trends and assessing the impact of changes in the match process, including limited away rotations, pass/fail Level 1 and Step 1, and program signaling

Abstract # 134

GENDER DISPARITIES ON MALE CONTRACEPTIVES AND SIDE EFFECT TOLERANCE

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It's been over 60 years since the release of the combined oral contraceptive pill. Since that time women have borne the responsibility for the majority of contraceptive methods along with their social and physical side effects. However, some promising new male contraceptive methods are currently under investigation and may soon be commercially availability. Therefore, we wanted to assess whether or not men would be willing to utilize a new male contraceptive method and identify any barriers to utilization including potential side effects.

To assess current attitudes of men towards male contraceptives, a PubMed literature search was performed using the terms "male contraception" and "survey". All manuscripts identified in the search were evaluated for inclusion criteria. Manuscripts were included in this review if they contained quantitative data on men's willingness to use contraceptives, and/or men's tolerance of potential side effects of a contraceptive method. Manuscripts with qualitative insights into sociocultural factors influencing contraceptive decision-making were also considered for inclusion.

Our literature review yielded four studies on male contraceptive methods that fit our pre-selected review criteria. Analysis of these surveys revealed that up to 83% of men are open to using some form of male contraceptive. However, this enthusiasm was tempered by findings that men's willingness to use these methods sharply decreased when side effects like mood swings, weight gain, and decreased libido were considered. In fact, fewer than 10% of men were willing to tolerate such side effects.

As highly effective male contraceptives move closer to becoming a reality, it is crucial to address gender differences in regards to responsibility for contraception and tolerability to potential side effects. Although the availability of a new male contraception method could transform contraception, normalization of male contraceptive use and acceptance of side effects may take time.

Abstract # 135

Genetic Associations with Neurophysiological Biomarkers in Early Onset Schizophrenia: Precision Treatment Strategies

Abstract

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Introduction:

Pediatric schizophrenia is a serious illness detrimentally effecting childhood development and adulthood morbidity. Early identification is crucial for decreased severity of psychosis symptoms, but importantly for the morbidity of the disease. The current identification and diagnosis of pediatric schizophrenia relies on the DSM-5-TR criteria for adult-onset schizophrenia. The goal of this paper is not only reliant on psychosis symptomatology, but more understanding of pediatric progression of schizophrenia. We want to corelate the genetic and/or blood markers with the neurophysiology and imaging commonly done throughout the differential diagnosis of patients with psychotic symptoms.

Methods:

A literature review was conducted using Rayyan Research Software to identify relevant studies. The search included terms such as “Early Onset Schizophrenia,” “Children,” “Neurophysiological Biomarkers,” “Gender Differences,” “Physiopathology,” “Precision Treatment,” “Genetics,” and “Neuroimaging.” Studies were screened based on their focus on pediatric patients with EOS, with adult studies excluded to maintain relevance to the target population.

Results:

The review identified several significant genetic markers associations with specific neurophysiological biomarkers in children with EOS. These genetic markers seem to correlate with distinct neurodevelopmental patterns observed in the disorder and imaging studies. These associations suggest a potential role for these genetic markers in predicting neurodevelopmental outcomes.

Conclusion:

Our propose schematic protocol attempts to elucidate a targeted detection for childhood schizophrenia by combing information found on inflammatory, genetic, electrophysiology biomarkers and radiology.

Abstract # 136

Unraveling Sex Differences for Enhanced Treatment Strategies in Glioblastoma

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Introduction & Objectives:

Glioblastoma Multiforme (GBM) is an aggressive brain tumor with an extremely low survival rate with the current standardized treatment protocols. Despite the similarity in clinical presentations between men and women diagnosed with the same tumor grade, there are many differences in the tumor microenvironment that contribute to the response to certain treatments and survival timeline. The goal of this paper is to highlight the sex differences in the pathophysiology of GBM with a focus on factors that contribute to the microenvironment of the tumor, such as hormones, metabolic pathways, the immune system, and genetic and molecular changes in both men and women for better treatment and management of the disease.

Methods:

A comprehensive literature search was conducted utilizing PUBMED, Google Scholar, and the Cochrane Central Register of Controlled Trials. The search incorporated keywords and phrases such as “sexual dimorphism in GBM,” “treatments for GBM,” “microenvironment of GBM,” “precision treatment of GBM,” and “GBM growth in sex-specific contexts.” Studies focusing on brain tumors other than glioblastoma were excluded from this review.

Results:

GBM is male-dominated in diagnosis not only in adults but also in the pediatric population. Despite similarities in symptoms and recurrence in men and women presenting with GBM, there are many anatomic and cellular features, including hormonal, genetic, molecular, metabolic, and immune differences. For example, the protective role of the female sex hormone estrogen includes its function as a neurogenesis effector, Th2 enhancer, and inflammation suppressor. In contrast with males, testosterone suppresses the TH2 response. These factors and others contribute largely to the survival timeline and response to surgery and current treatments.

Conclusion:

Precision treatment is the future of medicine as it considers individual differences in genetics, hormonal, molecular, and immunological differences, environment, and lifestyles. Hence, it becomes valuable to consider the differences in challenging brain tumor, Glioblastoma Multiforme, with a shallow survival rate of less than a year in most patients. Current drugs don’t consider the individual microenvironment differences, rendering many of these drugs ineffective in treatment and disease management. Finally, further investigations of genetic differences can play a significant role in the development of better, more effective treatments and in the early detection of disease.

Poster Abstracts

Abstract # 137

CMV viral genetics Influence on development and progression Alzheimer's Disease

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INTRODUCTION

Alzheimer's disease (AD) is a progressive neurodegenerative disorder that profoundly affects both morbidity and mortality while placing a considerable economic strain on the healthcare system. Although the exact cause of AD remains unknown, one hypothesis suggests that cytomegalovirus (CMV) may play a role in the disease's development by driving chronic neuroinflammation. The goal of this paper is to highlight the genetic factors associated with CMV that contribute to the progression of AD, with the goal of advancing future management and treatment strategies for this challenging condition.

METHODS

A search was performed using keywords like "Cytomegalovirus and Alzheimer's Disease" and "Mechanisms of Alzheimer's Disease and CMV Genetics." This search identified 140 articles, which were then screened using DistillerRS. Articles specific to CMV genetic association to development and progression of AD were included, while others focused on other Herpes viruses were excluded.

RESULTS

CMV may contribute to AD through a variety of different mechanisms. Seen in Figure 1., there are multiple genetic components of CMV that allow the virus to infect the host, suppress host immunity, and remain latent in host cells. In addition, CMV can penetrate the CNS by decreasing BBB permeability. This may be seen more in those who are infected more than once or may have a "superinfection" due to being in an immunocompromised state leading to neuronal damage.

CONCLUSION:

The inflammatory response triggered by CMV infection in the brain could be a major factor in neurodegeneration associated with Alzheimer's disease (AD). However, the diverse hypotheses suggest that CMV may play a multifaceted role in AD pathogenesis. Further research is essential to clarify the definitive relationship between CMV and AD, which is crucial for advancing diagnosis, management, and treatment strategies for the disease.

Abstract # 138

GENITOURINARY INFECTION FOLLOWING ORAL SEX LINKED TO GROUP A STREPTOCOCCUS IN A YOUNG ADULT MALE: A CASE REPORT

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Abstract:

Streptococcus pyogenes ('Group A strep' or GAS), most commonly known as the causative agent for streptococcal pharyngitis or "strep throat," is often transmitted through respiratory droplets or contact with contaminated surfaces. A much less documented and known specific mode of transmission, however, is via oro-genital exposure.

This case report describes a 23-year-old male with no significant past medical history, who presented with dysuria and suprapubic pain three days following oral-penile intercourse with his partner. Routine urine culture revealed that the patient was infected with Group A Streptococcus. The patient's symptoms were resolved following treatment of a 10-day course of amoxicillin + clavulanate.

The case underscores the importance of considering non-traditional transmission routes for GAS, particularly in patients presenting with genitourinary complaints following sexual activity. If left untreated, GAS can progress to more severe complications, including Rheumatic Fever and Glomerulonephritis. Increased awareness among healthcare providers and the public about the potential for GAS to act as an STI could lead to better diagnosis and management, ultimately reducing the incidence of such infections.

Keywords: Group A Streptococcus, genitourinary infection, oral sex, sexually transmitted infection, case report

Abstract # 139

INVESTIGATING THE IMPACT OF GUA SHA THERAPY ON CYOTKINE REGULATION

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Cytokine modulation is essential in managing immune responses and inflammation across various medical fields. Key cytokines, including Interleukin-6 (IL-6), Interleukin-8 (IL-8), and Tumor Necrosis Factor-alpha (TNF-alpha), are critical in inflammatory processes, impacting conditions like autoimmune diseases and dermatological disorders. Gua Sha, a traditional East Asian therapy renowned for its ability to alleviate pain, has demonstrated potential in modulating lymphatic drainage and blood flow and, in turn, could influence the regulation of cytokines. Given the significance of cytokine regulation in dermatology, particularly in inflammation-related conditions, more focused research in this area is needed.

This review explores Gua Sha's effects on IL-6, IL-8, and TNF-alpha levels, focusing on its biochemical impacts and therapeutic potential. A systematic search of PubMed, Scopus, and Google Scholar using keywords like "Gua Sha," "cytokines," "interleukin," "inflammation," and "dermatology" identified studies published in the last 15 years that quantitatively measured cytokine levels after Gua Sha treatment. Studies lacking relevant data were excluded. The quality of included studies was evaluated based on their methodologies, participant selection, validity, relevance, and resources. Inconsistencies were identified by comparing study designs and outcomes.

Although many studies indicate that Gua Sha can significantly reduce proinflammatory cytokines, there is currently a lack of data on the specific cytokines that Gua Sha regulates, such as IL-6, IL-8, and TNF-alpha. This highlights the necessity for more rigorous and standardized research, especially in dermatology, where precise cytokine modulation could significantly improve treatment outcomes for inflammatory skin conditions.

Abstract # 140

NECROTIZING FASCITIS: DIAGNOSIS AND TREATMENT

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Necrotising Soft Tissue Infections (NSTIs) are a group of life-threatening tissue infections that cause skin and soft tissue infections that travel through the fascia and subcutaneous tissue. Left untreated, the infectious process is rapid and aggressive, with the potential to lead to life-threatening systemic infection, tissue loss, and even increased mortality. Patients with diabetes mellitus and immunosuppression are at an increased risk due to compromised immune systems. NSTI is a clinical diagnosis requiring timely management with fluid resuscitation, broad-spectrum antibiotics, and surgical intervention as the mainstay of tissue preservation and optimal wellness treatment. Mr. DE was a 71-year-old man with a past medical history of type 2 Diabetes Mellitus (DM), chronic kidney disease, and hypertension with a surgical history of right hallux amputation, recipient of kidney donation five years ago, and currently on immunosuppressant medication; he presented to the emergency department with generalized weakness after a fall 24 hours prior. He was alert and oriented on presentation but had fever, chills, and generalized weakness. Foul purulent drainage was present over the lower extremities ulcer. Crepitus and palpable fluctuation extending up to the lateral aspect of the knee were palpated from the tarsal bone. He had elevated white blood cells at 21.2k, creatinine at 3.5, lactate at 15.4, and erythrocyte sedimentation rate at 25. He was immediately worked up for sepsis and resuscitated with Intravenous lactated ringer fluid. Wound cultures were taken, and broad-spectrum antibiotics with vancomycin, gentamicin, and Zosyn were administered. Within 4 hours of presentation, immediate surgical intervention with guillotine amputation of his right foot was performed. Throughout his 21-day course of hospitalization, he had daily wound dressing and two more operating room visits that involved a stump washout on day 3 and an above-the-knee amputation on day 14. He experienced acute kidney injury from the nephrotoxic effect of his antibiotic regimen, requiring a change from vancomycin to ciprofloxacin. Multiple rounds of wound cultures were taken, and antibiotics were trended based on their sensitivity. To ensure optimal return to wellness, he had interdisciplinary collaborations with Nephrology, Infectious Disease, Psychiatry, Vascular Surgery, Occupation, and Physical therapy.NSTIs in patients with DM and End Stage Renal Disease are associated with complex clinical scenarios and require tailored management strategies. This is related to the increased risk of systemic infection/Multiple organ dysfunction, the possibility of utilizing nephrotic medication in an ESRD patient, and increased surgical stress on the patient required to manage the patient in the management. Early recognition and aggressive treatment are critical to improving outcomes.

Abstract # 141

OPEN REDUCTION INTERNAL FIXATION OF HIGHLY COMMINUTED INTER-PROSTHETIC DISTAL FEMUR FRACTURE UTILIZING A COMBINATION OF NAILING AND PLATING: A CASE REPORT

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Interprosthetic femur fractures, occurring between an ipsilateral Total Knee Arthroplasty (TKA) and Total Hip Arthroplasty (THA), present unique challenges due to the patient having multiple prosthetic components and, as is commonly seen in elderly patients, poor bone quality. Traditional treatments, such as isolated nailing or plating alone, typically do not support early weight-bearing, which is crucial for active patients seeking rapid recovery. This case report details the management of a highly comminuted interprosthetic femur fracture in an osteopenic 80-year-old active female patient using a combination of nailing and plating (NP fixation).

The patient's primary goal was to quickly resume an active lifestyle post-surgery, which would not be possible utilizing either plating or nailing alone. Therefore, NP fixation was chosen for treatment and the procedure involved using a lateral femoral locking plate in combination with an intramedullary nail, creating a stable construct.

Postoperatively, the patient achieved immediate knee stability and full range of motion without complications. At two weeks, she showed excellent fracture alignment and mobility. Additionally, she was allowed weight bearing as tolerated, and by twelve weeks, she resumed normal activities, discontinuing physical therapy.

This case demonstrates the potential benefits, particularly in elderly patients with high functional demands, of NP fixation in comparison to utilizing either intramedullary nailing or plating alone for complex interprosthetic femur fractures. The approach provided robust stabilization and enabled near immediate weight-bearing, illustrating improvement over the more traditional methods. Further research is needed to validate NP fixation's effectiveness across a broader patient population.

Abstract # 142

Paroxysmal Spasmodic Dysphonia: A Case Study

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Background: Spasmodic Dysphonia (SD) is a rare lifelong condition, affecting only 50,000 people in North America (Mount Sinai). This disorder causes the muscles of the voice to spasm because of abnormal neurological signals, creating breaks and pauses within sentences or between words. The pathophysiology of this voice disorder is unknown with the current hypothesis being that it originates in the basal ganglia (Ludlow 2009).

Case Presentation: A 51-year-old male presented after experiencing changes in voice after specific triggers such as poor sleep, an emotional event or respiratory illness. The episodes lasted for 1-3 days, where he regained full function and the ability to speak afterwards. The patient's inciting event occurred years earlier, prior to a bloodletting procedure in the treatment of Polycythemia Vera. Frequency of events varied from one day to several months between attacks. The events often occurred in clusters, frequently requiring the patient to avoid speaking for days at a time.

The patient received a full neurological exam, including a CT and EEG—both showing no acute changes. The patient continues to experience the changes in voice for which he has been prescribed benzodiazepines as advised by Dysphonia International. Benzodiazepines are one of several medications that can be used for SD, though there is no standard of care for this condition (Termsarasab, Thammongkolchai and Frucht, 2016). Other treatments include botulinum toxin, baclofen and gabapentin in attempts to relax the muscles of the larynx and lessen their spasticity.

Conclusion: While the true cause of this disease has not been found, this case study sheds additional light on inciting factors and characteristics of the disease. The significance of this case study is the paroxysmal characteristic of this patient's SD events and the patient being male. The predominance of SD in females is around 79%, with most of them between the ages of 30-50 and having a history of upper respiratory infection or major life stress (Schweinfurth, Billante & Courey, 2002). Cases within the literature describe a gradual onset after which the disorder becomes chronic (Ludlow, 2011). This was not found in this patient, with total loss of vocal control being the initial symptom. SD is often found alongside a tremor (National Disorder for Rare Disorders), a rhythmic shaking of a body region, where this patient did not present with nor have a history of tremor outside of the larynx. Significant past medical history included developmental stuttering for which the patient does not experience anymore. This case study may open avenues for SD research, including questioning patients on their history of stuttering or other vocal abnormalities.

Poster Abstracts

Abstract # 143

Polycythemia Vera Induced Erythromelalgia in a 51-Year-Old Male

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Background: Polycythemia vera (PV) is a rare blood disorder in which there is an increase in red blood cells. The biggest risk for these patients is blood clotting, especially in addition to the JAK2 mutation, leading to a hypersensitivity to cytokines and over-expression of pro-coagulation factors (Cleveland Clinic).

Case Presentation: A 51-year-old male with a past medical history of polycythemia vera (PV) and Factor V Leiden (FVL) presented with bilateral pulmonary emboli and an elevated d-dimer of 1.22 mcg/L FEU. He was then treated with Eliquis for clot burden and discharged. Two weeks following this event, the patient presented to neurology complaining of generalized weakness and one significant episode of his feet burning bilaterally. The patient described the subsequent peeling of the soles, losing most of the skin on the dorsum of his feet bilaterally. Neurology studies revealed losses of deep tendon reflexes and diminished sensation bilaterally.

The patient was treated with intravenous immunoglobulin and a non-heparin-based anticoagulant as recommended by the World Health Organization (WHO). It is believed that the patient became extremely hypercoagulable and may have induced an erythromelalgia event, triggering the neuropathy of the feet and peeling of the soles. The patient was recommended salicylates for future events and physical therapy for weakness.

Conclusion: Erythromelalgia (EM) is a rare disease affecting 1 in every 400,000 people. This rare case presentation further sheds light on the possibility of its connection to physiological insults such as an upper respiratory infection and cofounding factors such as PV and FVL. Although the cases are rare, it has been found that secondary EM can be caused by myeloproliferative diseases such as PV (Suzuki & Watari, 2020). With Aspirin being the first-line systemic therapy for patients with EM and hypercoagulation, a low threshold for prescribing such medications should be had by physicians to avoid disabling side effects of both diseases (Mayo Clinic).

Abstract # 144

THE EFFECTS OF PATERNAL POSTPARTUM DEPRESSION ON MATERNAL RECOVERY RATES

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There is a lack of research addressing the numerous mental health challenges fathers and spouses face during the postpartum period which can variably impact the recovery rate of the mother during the postpartum time. Obstetricians are well versed in doing thorough depression screens for their patients during the 6 week postpartum visit. However, there is no formal screening done for fathers/spouses of the mothers that have just given birth. This area of research needs to be thoroughly evaluated because the mental health of the father and spouse will strongly play into how the family will be functioning during that sensitive period, which will also affect the period of time it takes for a mother recovering from her PPD. Databases including Pubmed and Embase were used to conduct article searches containing the relevant MeSH: "Postpartum Depression" "Maternal Recovery" "Fathers" "Depressive Disorder" "Domestic Partners". Multiple studies indicate a fathers' postpartum depression is missed and not evaluated by their general physician. Studies also show that the mothers feel more supported during the postpartum time when the father is physically and emotionally present. This review will be important to Family Physicians so they can more aware of the potential risks of depression in new fathers. When the father receives adequate assistance and care for their emotional and mental health, they can then become more supportive partners for their spouse and assist with her postpartum recovery as well.

Abstract # 145

REVIEWING THE GENETICS OF INTERDEPENDENCE OF HSV-1 INFECTION ON ALZHEIMER'S DISEASE DEVELOPMENT

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Herpes Simplex Virus (HSV) is a common virus that affects a large amount of the population and remains dormant unless reactivated under periods of stress or major life changes. HSV-1 is prevalent in 90% of HSV cases and has been implicated in the pathogenesis of Alzheimer's Disease (AD), particularly in individuals carrying the apolipoprotein Eε4 (APOE4) allele. This study explores the genetic factors influencing susceptibility to HSV-1 and their potential role in the development and progression of AD. We conducted a comprehensive literature review to identify genetic markers associated with HSV-1 and AD pathology. Our search, conducted on PubMed, included terms such as "Herpes Simplex Virus Type 1," "Herpes Simplex Virus Type 2," "Alzheimer's Disease," and "Herpes Genitalis," and excluded strains of Herpes Human Viruses 3-8 to focus specifically on HSV-1's association with AD. The review revealed significant associations between HSV and specific genetic variants such as APOE4, TAP2, and EIF2AK2, and an increase in susceptibility of AD. The presence of these genetic markers, particularly TAP2 polymorphisms in APOE4 carriers, suggests a potential mechanism by which HSV-1 may contribute to AD pathology. This review underscores the importance of further research into targeted gene therapies for AD and serves as a reference for pharmacologists and clinicians to look into creating vaccines against HSV for the older population.

Abstract # 146

STRESS-INDUCED VARIATIONS IN THE ORAL MICROBIOME: A STUDY ON MEDICAL STUDENTS DURING INTENSIVE TRAINING

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The oral microbiome plays a critical role in maintaining oral and systemic health, yet little is known about how acute stress impacts microbial balance, particularly in high-stress environments. We hypothesized that acute stress would lead to significant shifts in the composition of the oral microbiome.

To test this, oral cheek swab samples were collected from 20 medical students over three days during Intensive Surgical Skills Week (ISSW), and microbial composition was analyzed using DNA sequencing. Self-reported stress levels were recorded concurrently.

Significant changes in the abundance of Actinobacteriota, Fusobacteriota, Lactobacillales, and Bacteroidia were observed. The study found that acute stress significantly affected specific microbial taxa, with elevated Actinobacteriota and Bacteroidia levels, both of which have been associated with cancer risks. Higher Fusobacteriota levels suggest stress may exacerbate cancer risks related to these bacteria.

Although stress influenced specific microbes, it did not significantly impact overall microbial diversity. These findings highlight potential health implications, warranting further research with larger samples and additional biomarkers to better understand these relationships.

Abstract # 147

Unilateral High Bifurcation of the Brachial Artery Coupled with a Superficial Ulnar Artery

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Variations in upper extremity arterial anatomy, such as superficial ulnar arteries and high-origin ulnar arteries, present a significant challenge in medical procedures but are often underrepresented in educational materials. These variations increase the risk of iatrogenic injury, especially during venipuncture or arterial procedures. Rare combinations of arterial anomalies, including both a superficial ulnar artery and a high bifurcating brachial artery, can be identified in cadaveric dissection. We conducted routine dissection on 17 cadavers, examining 34 upper extremities for vascular anomalies. Our findings revealed that 11.7% of the limbs exhibited high brachial artery bifurcation, while 2.94% had both a high bifurcation and a superficial ulnar artery. This rare combination underscores the importance of recognizing atypical vascular patterns to mitigate risks during clinical interventions. These findings contribute to filling the gap in medical education by highlighting the clinical implications of such arterial variations.

Abstract # 148

EVALUATING THE ROLE OF ARTIFICIAL INTELLIGENCE IN ENHANCING RADIOLOGY RESIDENCY TRAINING FOR THYROID TUMOR DIAGNOSIS

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Artificial Intelligence (AI) is revolutionizing radiology, particularly in the diagnosis of thyroid tumors, by offering advanced tools that significantly aid radiology residents in both their training and clinical practice. This comprehensive review examines the multifaceted role of AI in supporting residents with critical tasks such as the precise segmentation of thyroid tumors, accurate classification between benign and malignant thyroid lesions, and the early detection of metastatic spread. The literature was systematically analyzed from online databases, including PubMed and ERIC, focusing on studies that implement AI-driven technologies. The review highlights how these sophisticated AI tools enhance diagnostic accuracy and operational efficiency, with AI models achieving tumor segmentation and classification. These capabilities often compare similarly to experienced radiologists, making AI an invaluable resource for residents who are still honing their skills. Additionally, AI's ability to detect metastatic spread at an early stage is crucial for enabling timely and effective interventions, further empowering residents to make well-informed clinical decisions. Overall, AI not only significantly improves diagnostic outcomes but also plays a critical role in elevating the training experience for radiology residents, effectively bridging the gap between novice and expert levels of proficiency and ultimately leading to improved patient care.

Abstract # 149

THE EFFECTS OF A SPINAL CORD TRANSECTION ON LOCOMOTION IN P21 RATS

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The current study investigates spinal cord recovery and adaptability by assessing how much hindlimb locomotion develops after a complete thoracic spinal cord transection in young rats. We hypothesized that if we transected a rat's thoracic spinal cord on postnatal day one (P1), then by P21 the rat will have relearned partial hindlimb locomotion due to plasticity of the spinal cord. We also hypothesized that there would be no difference in locomotor development between sexes. Male and female rats were divided into spinal transected and sham (control) surgery groups. Open-field spontaneous locomotion was categorized into full, partial, and non-weight bearing hindlimb movements. Results showed no interaction between surgery condition and sex on hindlimb locomotion. Sham subjects showed significantly more full weight bearing movement, while spinal cord transected rats showed significantly more partial and non-weight bearing movement. There was no significant difference in hindlimb movement between male and female rats. At the end of our experiment, we decided to combine all forms of movement and found no significant difference between the two surgery groups or sexes on total hindlimb movements. Overall, our results provide evidence that the immature spinal cord is capable of learning and supporting substantial hindlimb locomotion, even when isolated from brain inputs. Learning about spinal cord recovery in animal models can lead to better treatment options in humans who have experienced spinal cord injury.

Abstract # 150

MEDICAL STUDENTS' AI PERCEPTIONS: THE ROLE OF DIGITAL HEALTH EDUCATION

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The integration of artificial intelligence (AI) in healthcare is advancing rapidly, with significant implications for medical education. Despite AI's potential benefits, many medical students' express concerns about its impact on their careers, particularly fearing AI displacement in specialties like radiology. This study hypothesizes that formal digital health education can alleviate these concerns and influence students' specialty preferences, thereby preparing future physicians to embrace AI in clinical practice.

To test this hypothesis, a comprehensive survey will be distributed to currently enrolled medical students across various institutions, aiming to gather both quantitative and qualitative data on their views of AI in medicine, concerns about AI displacement, and specialty preferences. The survey will be administered anonymously, with data encrypted using Qualtrics software, and statistical analysis will be performed in Excel. We will compare responses from students with and without formal digital health education to analyze the impact of such training on their perceptions and career intentions.

Existing literature indicates that students are increasingly concerned about AI advancements, especially in radiology, leading some to avoid these fields, while there is a demand for formal training in digital health due to its perceived benefits for future careers. We expect to find that digital health education reduces AI-related concerns and encourages students to consider AI-integrated specialties. The study aims to elucidate these trends, emphasizing the importance of incorporating digital health education into medical curricula to foster a more AI-accepting future workforce.

The findings of this study will provide insights into how digital health education shapes medical students' attitudes toward AI and their specialty preferences. The research will inform curriculum development by examining whether formal education can mitigate AI displacement fears and promote enthusiasm for AI-integrated specialties. The overall goal is to prepare students for an AI-enhanced healthcare environment, equipping them to leverage AI technologies effectively in practice.

Abstract # 151

MAY-THURNER SYNDROME IN PREGNANCY: A CASE REPORT ON DIAGNOSIS AND MANAGEMENT OF THROMBOTIC EVENTS

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May-Thurner Syndrome (MTS), characterized by the compression of the left common iliac vein by the right iliac artery, is a significant yet often underdiagnosed cause of deep vein thrombosis (DVT), particularly during pregnancy when the risk of thrombosis is markedly elevated. This case report presents a 25-year-old pregnant female with a complex obstetric history, including a prior diagnosis of antiphospholipid syndrome (APS) during her first pregnancy. Despite being on anticoagulation therapy during her second pregnancy, she developed a DVT, leading to the subsequent diagnosis of MTS. The patient encountered significant challenges, including multiple episodes of postpartum bleeding after a Caesarean section (CS). The successful delivery of a healthy infant was achieved through the coordinated efforts of a multidisciplinary team, including maternal-fetal medicine, obstetric hospitalists, hematologists, interventional radiologists, and critical care specialists. The mother ultimately had a positive outcome, despite several significant bleeding events. While the current literature does outline the diagnosis of MTS in pregnancy, few sources reviewed patients' complete clinical course including the delicate management between the patient's thrombotic and hemorrhagic risk factors.

Poster Abstracts

Abstract # 152

Unilateral Mydriasis in HEMS: A Case of Ophthalmic Ipratropium Exposure in Pediatric Asthmatic Cardiac Arrest Prompting Cerebral Herniation Prophylaxis

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This case highlights the management of a 14-year-old patient who developed unilateral mydriasis during helicopter emergency medical services (HEMS) transport following acute asthma exacerbation leading to cardiopulmonary arrest. Immediate resuscitative efforts were provided, followed by transport to a rural hospital. The patient was intubated in the emergency department and received continuous nebulized albuterol with ipratropium bromide, racemic, intramuscular, and continuous infusion of epinephrine, methylprednisolone, magnesium sulfate, aminophylline, and fentanyl.

During HEMS transport to a pediatric tertiary care center, reassessment revealed a “blown” left pupil, raising concern for cerebral herniation. The flight team initiated cerebral herniation prophylaxis with 3% hypertonic saline and increased minute ventilation to maintain ETCO2 between 30-35 mmHg. Subsequent diagnostic evaluation revealed unremarkable neurological sequelae, and the patient was discharged with a favorable neurological outcome. A retrospective review of referring hospital medical records noted endotracheal tube administration of ipratropium, suggesting ophthalmic mucosal exposure. Therefore, muscarinic receptor antagonism and unopposed sympathetic innervation are suspected.

While unilateral mydriasis often signals life-threatening intracranial pathology, other differential diagnoses must also be considered, such as Adie’s tonic pupil, pharmacological exposures (e.g., scopolamine, atropine), and toxin exposure from plants like Angel’s Trumpet. Anoxic encephalopathy following hypoxic-ischemic brain injury from cardiac arrest is another potential cause.

This is the first documented case of ipratropium-associated mydriasis in flight medicine. This frequently overlooked side effect can lead to unnecessary treatment and imaging. The differential diagnosis of unilateral mydriasis and the pharmacology of ipratropium are discussed to promote education of this pharmacodynamic effect.

Abstract # 153

UTILIZING PHOTOBIOMODULATION FOR THE TREATMENT OF ATOPIC DERMATITIS

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Atopic dermatitis (AD) is a chronic inflammatory skin condition characterized by persistent pruritus and erythema, leading to diminished quality of life and increased medical costs. Photobiomodulation, or low-level laser therapy (LLLT), is a UV-free, low-intensity light therapy that penetrates the skin and reduces inflammatory cytokines. Its success in treating acne and scarring, along with its ease of use via red light masks, has popularized it as a potential treatment for AD. This review seeks to evaluate whether LLLT is an effective and accessible treatment option for managing symptoms in patients with AD.

An electronic database, PubMed, was utilized for this literature review using the following terms: “photobiomodulation,” “low-level laser therapy,” and “atopic dermatitis.” Studies were included if they discussed photobiomodulation, red light therapy, and inflammatory skin conditions. Studies were excluded if they did not separate photobiomodulation from other treatments and did not specify AD.

Studies reported that photon absorption by the skin led to activation of stem cells, increased electron transport, and promotion of blood flow, leading to tissue repair. However, one study found no significant difference between LLLT and placebo treatments.

This review identified the potential of LLLT in treating AD by regulating inflammatory cytokines and promoting skin repair. However, limitations of small sample sizes, lack of human model studies, and nonuniform results indicate the need for further research. By identifying these gaps, the review suggests directions for future studies to explore LLLT’s efficacy and broader applications, potentially offering a cost-effective and accessible treatment alternative for inflammatory skin conditions.

Abstract # 154

UNDERDIAGNOSIS OF VULVAR LICHEN SCLEROSUS IN REPRODUCTIVE AGE WOMEN

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Vulvar lichen sclerosus (VLS) is a chronic skin condition that has an etiology that is believed to have multiple contributing factors including genetic disposition, autoimmunity, hormones, repeated physical trauma, and infection. It is most commonly seen in menopausal women, however VLS can present during the reproductive years. These premenopausal cases are at risk of having delayed diagnosis due to the atypical onset. Currently a gap in the literature exists describing the incidence and features of VLS which presents between menarche and menopause. This literature review aims to understand the symptoms of VLS that present in patients that develop VLS during the reproductive years and demonstrate that women in this population are at risk of being misdiagnosed. A search was conducted using the data bases PubMed, Scopus, and Google Scholar with key words including “vulvar lichen sclerosus” and “pre-menopause”. The search yielded 22 articles that met inclusion criteria. The findings demonstrate that vulvar skin conditions are frequently misdiagnosed at the primary care level and are often referred to specialists. Patients in this population often report dyspareunia as the presenting symptom. VLS has been recognized as precancerous lesion. Although there is no cure for VLS, early diagnosis important as treatment decreases the risk of development into vulvar carcinoma.

Abstract # 155

BIOMECHANICAL ANALYSIS OF SILK AS A TENDON OR LIGAMENT REPLACEMENT

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Tendon and ligament injuries pose significant clinical challenges, as traditional auto- and allografts frequently result in immune rejection and complications at the donor site. To improve patient outcomes, there is a growing need for advanced materials that mimic the biomechanical properties of tendons and ligaments. Despite advancements in graft materials, there is a gap in integrating biomechanically superior alternatives into clinical practice.

Spider silk-engineered constructs offer biomechanical compatibility with human tendons and ligaments and could provide a superior alternative to traditional grafts. This review examines the biomechanical properties of silk-engineered grafts, focusing on key attributes such as Young's modulus, tensile strength, and strain to failure. Literature exploring the use of silk and spider silk in tendon and ligament repair was reviewed to assess their clinical viability.

This analysis highlights the biomechanical advantages of silk-engineered grafts, particularly spider silk, demonstrating superior tensile strength, elasticity, and biocompatibility. However, ongoing challenges include the need for rigorous clinical trials and innovation in graft technologies. Silk-engineered constructs are promising for tendon and ligament repair. This research details requirements for ongoing innovation, rigorous testing, and clinical trials to refine and validate graft technologies given the microanatomy of tendons and ligaments, ultimately improving the efficacy of tendon and ligament repair procedures and patient quality of life.

Keywords: Tendon and ligament injuries, spider silk, tissue engineering, orthopedic surgery, grafting options, porcine xenografts

Abstract # 156

OPTIMIZING NERVE REGENERATION: A COMPARATIVE ANALYSIS OF NERVE GRAFTING AND NEUROTROPHIC FACTOR DELIVERY METHODS

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The optimal delivery methods for nerve grafts and neurotrophic factors (NTFs) are crucial in advancing nerve regeneration therapies, which have evolved significantly but still face challenges in repairing long nerve gaps and delivering therapeutic agents. This review examines two primary delivery systems—scaffold-dependent and scaffold-independent approaches—focusing on their effectiveness in controlled NTF release, biocompatibility, and clinical applicability. Articles were selected by focusing on studies comparing scaffold-dependent and scaffold-independent delivery systems in nerve regeneration, with an emphasis on quantitative markers such as nerve growth, controlled NTF release, and biocompatibility. Specific search terms included “nerve grafting with neurotrophic factors,” “thermosensitive hydrogels in nerve repair,” and “scaffold-independent drug delivery for nerve regeneration” to ensure a comprehensive evaluation of relevant, high-quality research.

Scaffold-dependent delivery integrates NTFs into scaffold materials, showing promise in preclinical studies but often involves complex fabrication processes and limited flexibility in drug selection, thus reducing clinical applicability. For instance, layer-by-layer polymer films within nerve conduits achieved sustained NTF release but required complex fabrication, limiting their clinical use. In contrast, scaffold-independent systems, particularly those using thermosensitive hydrogels, offer sustained and controlled NTF release with greater ease in manufacturing and drug substitution. NGF-loaded thermosensitive hydrogel-based tissue-engineered nerve grafts (TENGs) demonstrated sustained NGF release for 28 days, significantly enhancing nerve regeneration outcomes compared to conventional methods. Comparing these systems is significant, as they offer potential solutions to overcome the limitations of conventional techniques, such as donor site morbidity and limited nerve availability, while providing adaptable, cost-effective options for personalized medicine. Despite their advantages, further optimization is needed to control drug release kinetics, enhance stability, and improve biocompatibility. This review concludes that scaffold-independent systems, especially those using thermosensitive hydrogels, hold significant promise for advancing nerve regeneration therapies and improving patient outcomes.

Abstract # 157

Complex Distal Femur Fracture Repair Techniques in the Osteoporotic Patient

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Background: Complex distal femur fractures, particularly in the context of periprosthetic and interprosthetic fractures, present significant challenges in orthopedic trauma care, especially for patients with compromised bone quality, such as those with osteoporosis.

Aim/Objective: This literature review evaluates and compares the efficacy of plating, nailing, and the nail-plate combination technique in treating complex distal femur fractures, with an emphasis on the advantages of the combined approach.

Methods: A systematic search of online databases was conducted using key terms, including Nail Plate Fixation, Interprosthetic Fractures, Distal Femur Fractures, Plating, Intramedullary Nailing, Periprosthetic Fractures, Osteoporosis, Total Knee Arthroplasty, and Total Hip Arthroplasty, focusing on studies from 2013 onward.

Results: The review found that the nail-plate combination technique offers superior mechanical stability and a lower incidence of complications compared to plating or nailing alone. This approach was particularly beneficial in cases with extensive bone loss, comminuted fracture patterns, and weakened bone structure common in osteoporotic patients.

Conclusion: While the limited number of studies underscores the need for further research with larger sample sizes, the findings suggest that adopting the nail-plate combination could significantly improve outcomes in patients with osteoporosis by providing enhanced stability and reducing the risk of post-surgical complications.

Abstract # 158

FROM SELF PERCEPTION TO SEXUAL HEALTH: UNDERSTANDING THE EFFECTS OF BODY IMAGE ON SEXUAL BEHAVIOR

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Body image, or how individuals perceive their bodies, profoundly influences sexual experiences and overall health. The National Organization for Women reports that by age 13, 53% of American girls are dissatisfied with their bodies, rising to 78% by age 17. Understanding the connection between body image and sexual behavior is vital, as it impacts safety, satisfaction, and well-being in intimate relationships.

Despite its importance, this relationship remains underexplored. Positive body image is associated with more frequent sexual activity, safer practices, and higher satisfaction, while negative body image correlates with reduced sexual activity, riskier behaviors, and adverse health outcomes. However, many studies focus on isolated factors and do not fully capture the complexity of this relationship. Addressing these gaps is crucial for developing interventions that promote positive body image and healthier sexual practices.

A comprehensive search of PubMed, Embase, Cochrane, and Google Scholar databases using terms such as body image, body identity, body appreciation, sexuality, female, and sexual behavior yielded 194 articles after screening. These studies focused on adult populations identifying as female, without disease or illness, and included articles referencing elective surgeries. Key factors influencing the relationship between body image and sexual behaviors include body surveillance, BMI, relationship status, sexual orientation, and media exposure.

This review aims to provide healthcare professionals and educators with insights to promote sexual well-being. By fostering a nuanced understanding of body image dynamics, targeted interventions can enhance sexual health and overall well-being for sexually active individuals.

Abstract # 159

Natural vs. Artificial Turf Effects on NFL Injury Rates

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Playing surface is an important modifiable risk factor for injuries in American Football. Much of the research focuses on describing the types of injuries on natural vs artificial playing surfaces. Comparatively little is known about the factors that modify the increased risk of injury that comes from playing on artificial grass. Data from in-game National Football League (NFL) injuries confirms that games played on artificial grass had a higher number of injuries, with an average of 2.8 injuries occurring per game when played on natural grass vs 3.1 injuries per game on artificial turf ($P<0.001$). The data was then analyzed to test if the different injury rates were influenced by the position of the injured players. Player position was also found to modify injury risk independent of playing surface ($P<0.001$) but the combined effect of player position and playing surface did not reach statistical significance ($P=0.08$).

Abstract # 160

Play Type and Player Position Effects on NFL Injury Rates

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Background: The epidemiology of injuries in the National Football League (NFL) has been previously studied on a year to year or game to game basis; however, little has been reported concerning how the types of plays or player position influence injury risk.

Purpose: This study determines which types of plays confer a greater injury risk when compared with other plays.

Study Design: Descriptive epidemiology study.

Methods: A retrospective analysis of in-game injuries occurring across 8 NFL seasons (2013 to 2020). Data was extracted from several publicly available sources. Data analyzed included play type, number of injured players, positions of injured players, and snaps played.

Results: Injury rates were found to vary significantly based on both player position ($P<0.001$) and play type ($P<0.001$). Defensive backs had the highest injury rate per 10,000 snaps played at 10.2 (SD 0.65) and pure special teams players had the lowest injury rate at 2.4 (SD 1.4) per 10,000 snaps. Positions also varied in their susceptibility to injury on different play types.

Conclusion: Both player position and play type modify in game injury risk in the NFL.

Abstract # 161

POLYCYSTIC OVARY SYNDROME (PCOS): FACTORS TO CONSIDER FOR EFFECTIVE TREATMENT

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Polycystic Ovary Syndrome (PCOS) is a complex endocrine disorder with significant challenges in treatment, particularly in the area of dietary management. Despite the recognized importance of dietary interventions, there remains a gap in patient engagement and satisfaction with available dietary advice. This study hypothesizes that patient satisfaction with PCOS treatment is directly linked to the accessibility and personalization of dietary guidance. A survey conducted through Qualtrics assessed patient satisfaction, the use of dietary resources, and engagement with specific dietary patterns. The results indicate that a majority of respondents either did not receive dietary advice from healthcare providers or did not seek out specific dietary resources. Additionally, no single dietary pattern emerged as significantly preferred or beneficial among the respondents. These findings suggest that there is a critical need to improve the personalization and accessibility of dietary advice to enhance patient satisfaction and engagement in PCOS management.

Abstract # 162

UTILIZING L-ARGININE SUPPLEMENTATION FOR ENHANCEMENT OF BONE HEALING

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Fractures are one of the most common injuries in the United States, with about 18.3 million fractures sustained per year. As a consequence, many Americans lose their ability to perform normal daily activities for 6 – 8 weeks assuming an average healing time. However, delayed healing times increase the risk of abnormal wound healing, shock, compartment syndrome, fat embolism, thromboembolism, deep vein thrombosis, disseminated intravascular coagulopathy, and infection. Therefore, patient safety requires an emphasis on steps to prevent delays in healing. While it is well known that proper nutrition decreases the risk of sustaining a fracture, it can also be used as one step to enhance fracture healing time. The nutritional supplement L-arginine is an economical potential therapy that can be easily self-administered and has published beneficial effects for the healing period of fractures. Peer-reviewed articles were selected based on the models used and the use of quantitative biomarkers proving efficacy, as well as employing specific search terms like "L-arginine enhancing bone healing" and "effects of nutrition on bone fracture healing," ensuring a comprehensive assessment of relevant and high-quality studies. Mechanistically, L-arginine has been shown to enhance bone healing by increasing nitric oxide (NO) production, stimulating collagen synthesis, promoting osteoblast proliferation, and reducing inflammation in animal studies. Human osteoblasts showed higher alkaline phosphatase (ALP) activity and osteocalcin levels with Arg treatment, indicating improved bone formation and mineralization. Insulin-like Growth Factor-1 (IGF-I) levels, which are crucial for bone growth, skeletal maturation, and maintaining bone mass, were also enhanced. Additionally, Arg reduced interleukin-6 (IL-6) levels, which is associated with bone resorption. These findings suggest that Arg may be beneficial in enhancing bone healing in clinical settings. Currently, numerous studies performed on rodent models support benefits of administering L-arginine supplements in the post-injury or postoperative stages. However, more human studies are now needed to assess efficacy in fracture patients and determine optimal dosing.

Abstract # 163

SPIRITUAL HEALTHCARE & IMPROVED CLINICAL OUTCOMES

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The objective of this project is to provide support for the importance of caring for a patient's spiritual health in order to embrace the osteopathic philosophy of providing holistic healthcare by promoting health of the mind, body, and spirit. A thorough review of the literature reveals chiefly that, almost invariably, spiritual health is a crucial aspect of responsible healthcare that must be included in an appropriate treatment plan.

Studies from across religions, contexts, and countries support the unifying principle that any form of religion or spiritual healthcare is important for providing the highest quality healthcare. The body of evidence most strongly supports three conjectures that will be supported here: spiritual health is beneficial for patients, it is beneficial for providers, and it remains a neglected aspect of medical education, even in osteopathic medical schools.

The review of the literature using keywords and MeSH terms including "spirituality," "physicians," "religion," and many others similar returned 182 articles that were screened for eligibility. Of these, 88 were excluded, and 94 were included in the review. A total of 35 were reported in the literature review. The information from this review will be used to inform a project that will demonstrate the importance of spiritual healthcare and show how it is an underappreciated part of the medical curriculum. It will contribute to the field by highlighting an area of need in osteopathic medicine and encouraging higher quality healthcare not only from RVU graduates, but all providers.

Intramural Grants

Awarded	Project Title	Investigators
12/1/2023	Huckleberries and Glycemic Regulation: Exploring Post-prandial Glucose Excursions When Paired with Carbohydrates	Bianca McQravey, Michael Cannone, Trae Habel, Dr. Jacquelyn Waller
12/18/2023	Comparison of EZ IO Drill to Cranial Access Kit for Skull Trephination by Non-Neurosurgeons	Danielle Kowal, Dr. David Ross, Dr. Mark Payton, Dr. Julia Schearer, Samantha Sposet, Samantha Hiller
12/18/2023	Descriptive Analysis of Regenerative Biomarkers and Cell Types Present in PRP of Knee Osteoarthritis Patients	Julianne McGough, Brecken Roe, Dr. Rebecca Ryznar
3/20/2024	Stress and East Asian Medicine Technique	Mia Panlilio, Dr. Keith Bodrero, Oladapo Durodola, Dr. Rebecca Ryznar
5/31/2024	Sciatica in Pregnancy	Arielle Navarro, JuliAnne Allgood, Dr. Ben Brooks
5/31/2024	Investigation of Stress-Induced Inflammation and GERD	Shana Zadron, Carter Moon, Dr. Mark Payton, Dr. Rebecca Ryznar
5/31/2024	Ultrasound Investigation into Swimming Induced Pulmonary Edema in Open Water Swimming Athletes	Harrison Steins, Patterson, Dr. Kathy Vidlock
5/31/2024	The Dynamic Interplay Between the Oral Microbiome and Chronic Physiological Stress: Possible Beneficial Effects of Physical Exercise	Blake Fredricksen, Christian Klena, Dr. Isain Zapata
6/10/2024	Integrated use of Ultrasound with Physiology Instruction	Ryan Stapley, Dr. Jing Gao, Dr. Brett Condon
6/12/2024	Asynchronous Near-Peer Teacher Training in the Gross Anatomy Lab	Dr. Kristopher Vaudrey
6/18/2024	The Effect of CARES-I Blocks on Academic Performance, Student Well-Being, and Cognitive Load Management in Medical School	Jaime Bazemore

Intramural Grants

6/20/2024	Utilizing Handheld Ultrasound to Evaluate Cardiac Structure in Endurance Athletes	Brogan Crockett, Stephanie Salcedo, Dr. Ben Brooks
6/20/2024	Hyperemesis Gravidarum and the Role of GDF15 in its Onset	Ana Alfaro, Kailee Myxter, Dr. Ben Brooks
6/20/2024	National Emergency	Dr. Jennifer Hellier
6/20/2024	Distiller SR Software	Lynne Stephensen
8/5/2024	Healing in Extremes: Contrasting Wound Healing in High Altitude and Hyperbaric Environments: A Pilot Study	Dr. Leslie Torgerson, Emma Hodson, Hamza Ahmad
8/9/2024	Ultrasonographic Identification of SI ligaments and Associated Musculature in Fresh Frozen Cadaveric Specimens	Dr. Mike Jorgensen

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14. Goeman N. Sigh of Relief: A Successful Extubation Strategy for Patients with Highly Reactive Airways. Presented at: Society for Airway Management; September 19, 2024.

15. Goeman N. Urgent Awake Intubation for Ludwig's Angina: Putting a stop to Airway Emergencies. Presented at: Society for Airway Management; September 19, 2024.

16. Grobengieser K, Stephens S, Forseter S. Septic Pelvic Thrombophlebitis from a Previously Undiagnosed Vaginal Wall Abscess: A Case Report. Presented at: ACOS-MSS; April 6, 2024.

17. Gubler D, Ryznar R, Ryan Z, Elles K, Torres I. Sex Differences in Immune Cytokine Profile Markers in Acute Repeated Stress Exposure Abstract Type/Scientific Area/Clinical Specialty: Basic science, trauma/critical care, Precision Medicine/Biomarkers. Presented at: Military Health System Research Symposium (MHSRS); August 27, 2024. Https://www.asc-abstracts.org/abs2024/95-07-sex-differences-in-immune-cytokine-profile-markers-in-acute-repeated-stress-exposure/

18. Hall B, Wagner C, Wong S, et al. Comparative Analysis of Complication Rates in Rheumatoid Arthritis and Non-Rheumatoid Arthritis Patients Undergoing Patellar Tendon Repair. Presented at: AOCS-MSS Spring Meeting; April 6, 2024.

19. Hammond K, Moraweic J. May-Hegglin Anomaly in Pregnancy: Cesarean Section with Severe Thrombocytopenia. Presented at: 2024 SOAP Annual Meeting; May 1, 2024.

20. Harrington J. Medmicromaps: A Novel Interactive Digital Media Tool for Infectious Disease to Enhance e-Learning in Medical Education. Presented at: Innovations in Medical Education - USC; February 15, 2024.

21. Husband Z, Lange A, Kromberg E. Strategies and Safety In Iliosacral Screw Placement. Presented at: SAOAO Orthopedics Conference; April 18, 2024.

22. Jacobs AK, Al-Juboori SI, Dobrinskikh E, et al. 211 Artificial intelligence-driven precision pathology identifies distinct placental findings in severe fetal growth restriction or hypertension. Presented at: SMFM 2024 Pregnancy Meeting; February 13, 2024. Accessed September 25, 2024. Https://linkinghub.elsevier.com/retrieve/pii/S0002937823010359

23. Kethiereddy M, Barr K, Bosak J, et al. Does Physical Exercise Have a Positive Effect on the Academic Performance of First Year Medical Students. Presented at: American College of Lifestyle Medicine National Conference, Denver CO; October 31, 2023.

Presentations from RVU

From October 20, 2023 - September 20, 2024

24. Knasel C. Analyses of metabolites from transgenic channelrhodopsin axon regenerating optic nerves compared to crush only controls. Presented at: ARVO; May 5, 2024.

25. Lagne A, Morawiec J, Vidlock K. Rebuilding Champions: A Sports Medicine Triumph Over ACL Reconstruction Obstacles. Presented at: 2024 American Medical Society for Sports Medicine (AMSSM) Annual Meeting; April 14, 2024.

26. Lamsal N, Rodrigues N, Linomaz J, Choudhury Q. Impact of Social Determinants of Health on Hemoglobin A1c in Patients with Type II Diabetes. Presented at: AACOM Educating Leaders 2024; April 17, 2024.

27. Lange A, Morawiec J. Thigh Pain in an Olympic Triathlete. Presented at: American College of Sports Medicine Annual Meeting; May 30, 2024.

28. Ling E, Qureshi K, Schulte K, Behnke B, Rus N. Iron in Cirrhotic Liver. Presented at: Southern Regional Meeting; February 22, 2024.

29. Martz K, Paluska M. Assessing Aspiration Risk in Patients on Glucagon-Like Peptide 1 Agonists via Point-of-Care Gastric Ultrasound. Presented at: SPA SPA-AAP Pediatric Anesthesiology 2024; April 13, 2024.

30. Mattson C, Zhong Q, Olson N, Ruiz Y. Drug-Induced Hearing Loss. Presented at: American Academy of Neurology; July 19, 2024.

31. Mccoy M, Lafontano C. Distal Fibula Fractures with Syndesmotic Injuries in Three Collegiate Athletes. Presented at: AMOPS Annual Conference; February 29, 2024.

32. Miknis A, Kulkarni MA, Smearman C, Gubler. Creatinine Greater than Stated Age in a 31-year-old: A case report of possible pulmonary renal syndrome. Presented at: 2024 AMOPS Annual Meeting and Medical Conference; March 2, 2024.

33. Miknis A, Marrs R. Embedded Team Performance Experts Improve Military Medical Student Resilience and Optimize Mental Performance in High Stress Immersion Trauma Training. Presented at: AMSUS Annual Meeting; February 12, 2024.

34. Miller M. Use of Prosthesis in Intertrochanteric Fracture Repair with Ipsilateral Below the Knee Amputation. Presented at: AMOPS Annual Conference; March 1, 2024.

35. Moore J, Waller J. Transforming Assessment Practices in UME: Test-Item Tagging & Post Exam Review Processes. Presented at: AACOM Educating Leaders 2024; April 18, 2024.

36. Moreno D, Grobenjieser K. Perioperative Nerve Blocks and Postoperative Pain Outcomes during Robotic Assisted Laparoscopic Surgery. Presented at: ACOS-MSS Spring Conference; April 6, 2024.

Presentations from RVU

From October 20, 2023 - September 20, 2024

37. Nieman K, Majeskie C, Robbins E, Stephenson L. Heterotopic Ossification Following Bilateral Ischial Tuberosity Avulsion Fractures. Presented at: American Osteopathic Academy of Sports Medicine-Spring 2024 Meeting; May 1, 2024.

38. Olson N. Accuracy of IOL Power Calculators Following Myopic Refractive Surgery. Presented at: ARVO; May 5, 2024.

39. Panlilio M, Gubler K, Wesemann L. Effectiveness of Chlorhexidine Compared to Other Antiseptic Solutions in Preventing Surgical Site Infections in Low- and Middle- Income Countries: A Systematic Review. Presented at: ACOS Annual Clinical Assembly 2024; September 26, 2024.

40. Pfaffinger J, Hays K, Ryznar R. Bacterial pathogenic factors contributing to gut level alpha-synuclein aggregation and systemic inflammation in Parkinson's disease and other neurodegenerative diseases. Presented at: February 9, 2024.

41. Puri K, Stiegmann R. Revectoring Readiness: Optimizing the Warfighter through Sustainable Human Performance: Operationalizing Lifestyle & Performance Medicine. Presented at: United States Air Force Lifestyle & Performance Medicine Summit 2024; February 28, 2024. Https://www.dhaj7-cepo.com/content/revectoring-readiness-optimizing-warfighter-through-sustainable-human-performance

42. Reshetnikoff E, Wendall K, Zhong Q, Roberts J. Semaglutide Induced Delayed Gastric Emptying and anesthesia fasting times. Presented at: AOCA Vapor; September 7, 2024.

43. Restenburg J. Short Video Training for Delivery Injury Diagnoses. Presented at: 71st Annual Meeting of Society for Reproductive Investigation; March 15, 2024.

44. Ricci C. Methotrexate Induced Mucocutaneous Toxicity. Presented at: Michigan Dermatological Society; January 31, 2024.

45. Richardson M, Leung W, Gerber N, Wheeless C, Stephenson L. Solid Pseudopapillary Neoplasm of the Head of the Pancreas in a 15-year-old Female: A Case Report. Presented at: Ogden Surgical-Medical Society 2024; May 14, 2024.

46. Rodriguez N, Linomaz J, Lamsal N, Alessi L, Kok M de, Alessi R. Laryngospasms in Pediatric Anesthesia with Intravenous vs. Inhalational Anesthetic Induction. Presented at: American Society of Anesthesiologists: Anesthesiology 2024; October 19, 2024.

47. Schmitt A, Grobengieser K, Kirk J, Spohn A. Reducing the Cardiotoxicity of Doxorubicin: Exploring Concomitant Therapies with Cardioprotective Abilities. Presented at: 2024 AMOPS Annual Meeting and Medical Conference; March 2, 2024.

48. Schmitt A, Merhav P, Propp M, Paz D, Gubler D, Ryznar R. Resiliency and Cortisol Awakening Response in High Stress Senerios. Presented at: International Trauma Conference 2023 (ITLS); November 4, 2023.

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From October 20, 2023 - September 20, 2024

49. Schmitt A, Merhav P, Propp M, Paz D, Gubler D, Ryznar R. Resiliency and Cortisol Awakening Response in High Stress Scenarios. Presented at: AMOPS Annual Meeting and Medical Conference 2024; March 1, 2024.

50. Schulz P, Huzj T, Zapata I. Attitudes Towards Suicide in Medicine: Opportunity for Growth and Intervention. Presented at: 2024 ACN-ACONP Mid-Year Meeting and Scientific Seminar; February 29, 2024.

51. Seely K, Gelis A, Nigh A. A Critical Analysis Of Online Patient Resources On Robotic Surgery: How Is Content Molding Patient Perspectives?: Presented at: American College of Surgeons, Clinical Congress Boston MA; October 22, 2023.

52. Seely K, Gelis A, Nigh A. Smoking status and race as risk factors for postoperative acute renal failure. Presented at: Academic Surgical Congress; February 7, 2024. Https://www.asc-abstracts.org/abs2024/52-11-smoking-status-and-race-as-risk-factors-for-postoperative-acute-renal-failure/

53. Shahi N, Mcguinness M, Yang A. Advancements in Cell-Based Therapies for Type 1 Diabetes: A Systematic review. Presented at: AMOPS Annual Conference; March 1, 2024.

54. Simon B, Carter S, Shanteer TA. Introduction of a Perforated Diverticulitis Virtual Reality Case Scenario into Medical Student Surgical Education. Presented at: March 14, 2024; American College of Surgeons Simulation Summit.

55. Simon B, Eckhardt D, Jackson T. Make Your Own Abscess/FB Task Trainer. Presented at: International Pediatric Simulation Society Webinar; August 28, 2024.

56. Simon B. Make Your Own Ultrasound Capable Abscess Task Trainer. Presented at: International Pediatric Simulation Society 2024; May 8, 2024.

57. Spohn A, Hall B, Tolson R, Small J, Lafontano C. Analysis of Ehlers Danlos Syndrome Associated Tendon Ruptures. Presented at: Association of Military Osteopathic Physicians & Surgeon; February 28, 2024.

58. Spohn A, Hall B, Tolson R, Small J, Lafontano C. Analysis of Ehlers Danlos Syndrome Associated Tendon Ruptures. Presented at: SAOAO Conference; April 18, 2024.

59. Steins H, Ryan Z, Gubler D. A Survey on Implementation of the EFAST Exam into Slope-side Care and Management of US Ski and Snowboard Team Athletes. Presented at: November 3, 2023.

60. Stone E. T4 Arteriovenous fistula with Superimposed Lumbar Radiculopathy: A Case Report. Presented at: Association of Academic Physiatrists Annual Meeting; February 22, 2024. Https://physiatry24.eventscribe.net/fspopup.asp?Efp=u05trldzreixodywoa&posterid=642087&rnd=0.3631822&mode=posterinfo

61. Sumpter B, Perch J, West K, Spohn A. Hemorrhage Control: Applying Lessons Learned in Civilian Settings to Military Environments. Presented at: AMOPS Annual Meeting and Medical Conference 2024; March 1, 2024.

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From October 20, 2023 - September 20, 2024

62. Talebi-Talghian T, Schulz P, Huzij T. Neuropsychiatric considerations in treating anorexia nervosa patients with osteopathic manipulative medicine: a narrative review. Presented at: Osteopathic Medical Education Conference (OMED); September 21, 2024. Https://www.degruyter.com/document/doi/10.1515/jom-2023-0242/html

63. Thomas D, Riesberg J, Yancey L, Gubler D. Creating Resilient Teams: Outcome Assessment for Team-Focused Trauma Training. Presented at: International Trauma Conference; November 3, 2023.

64. Udy A. A Fatal Case of Encephalitis. Presented at: AMOPS Annual Meeting and Medical Conference 2024; March 1, 2024.

65. Vedova H, Wrigley J, Khan S, et al. Exploring Digital Solutions to Health Insurance Literacy Disparities. Presented at: Texas Conference; September 20, 2024.

66. Vidlock K, Ryan Z. The Tube over the Needle. Presented at: February 29, 2024; Association of Military Osteopathic Physicians and Surgeons.

67. Vidlock K. An Ultrarunner with Chest Pain. Presented at: American Medical Society for Sports Medicine; April 14, 2024.

68. Vidlock K. Evaluation of the Impact of Resident Education on "Movement" Counseling. Presented at: American Medical Society for Sports Medicine; April 14, 2024.

69. Vidlock. A Pianist with Persistent Wrist Pain. Presented at: American Medical Society for Sports Medicine; April 14, 2024.

70. Vidlock K, Ryan Z. The Tube Over the Needle: Thoracic Trauma Interventions. Presented at: American Medical Society for Sports Medicine; April 14, 2024.

71. Welch D. Gone with the wind: accuracy of volatile anesthetic greenhouse gas emissions calculations improved by the use of inspired concentration of agent. Presented at: Society of Technology in Anesthesia annual meeting; January 12, 2024.

72. West K, Steins H, Gubler D. Trauma Simulation Competition as an Educational Modality: Cut Suits, Stress, and Non Traditional Roles. Presented at: Association of Military Osteopathic Physicians and Surgeons; March 1, 2024.

73. Yamada M, Quinn B, Zachary S, et al. Xylazine Usage and Awareness among People who use Drugs in Denver, Colorado. Presented at: American Society of Addiction Medicine's 55th Annual Conference; April 6, 2024.

74. Yu J, Weidner B, Dahl L, Eliopulos A, Schwartz B, Trawick A. An innovative approach to educate first-year medical students in clinical competence. Presented at: STFM Conference on Medical Student Education 2024; February 9, 2024.

Presentations from RVU

From October 20, 2023 - September 20, 2024

75. Zhang H, Naber S, Madsen G, Brooks A. Examining the relationship between nitrous oxide exposure in dental settings and vitamin b12 deficiency, with a focus on depression: a literature review. Presented at: American Society of Anesthesiologists; October 19, 2024.

76. Zhang H, Naber S, Madsen G. Enhancing safety and communication in anesthesia care team models: a survey-based study. Presented at: American Society of Anesthesiologists; October 20, 2024.

77. Zhong Q, Linger R, Waller J, Roberts J. A Joint Physiology-Pharmacology Capstone Project for Dual Campuses in a Premedical Master's Program. Presented at: IAMSE annual meeting 2024; June 17, 2024.

ROCKY VISTA UNIVERSITY

Fall Research Week 2024

Thank you...

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See you in 2025
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