2026

SDSMA Annual Leadership Conference

Advancing Patient Care Through Lifestyle Medicine

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TABLE OF Contents

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Welcome

Welcome to the 2026 SDSMA Annual Leadership Conference!

Our program this year explores the essential role of lifestyle medicine. We are honored to host an exceptional lineup of speakers and panelists whose insights will challenge us to think differently about the long-term health and well-being of our patient populations. My sincere thanks go to the SDSMA Board of Directors and our dedicated staff for their work in organizing this event, as well as to our sponsors and advertisers for their support.

In addition to our speaker sessions, I encourage you to visit the Medical Student and Resident Poster Session. It is an excellent opportunity to engage with the next generation of physicians and see their impressive work.

After the daytime activities conclude, be sure to join us for an evening of connection and celebration! We'll have a social at 6:00 pm followed by our annual awards dinner. The evening is a special opportunity to recognize the achievements of our colleagues, celebrate our newest scholarship recipients, and inaugurate our next president, Ben Meyerink, MD.

Thank you for your commitment to the SDSMA and for joining us.

Keith Hansen, MD
SDSMA President, 2025-26

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Schedule

All presentations and meetings are in the Four Winds Ballroom unless otherwise noted.

Friday, May 29

7:00-8:00 am	**SDSMA Past Presidents' Breakfast** (reserved for past presidents) Bar Clara Room
8:00-8:30 am	**American Medical Association Update – Physician Advocacy** David Welsh, MD, MBA, Board of Trustees, American Medical Assocation
8:30-8:40 am	**Introduction to Lifestyle Medicine** Marty Allison, MD, FAAP, DipABLM, Avera Pierre Pediatrics
8:40-9:30 am	**Opening Keynote: From Sick Care to Self-Care: Transforming Self and Systems Through Lifestyle Medicine** Michelle L. Thompson, DO, AOBFP, ABOIM, DipABLM, FACLM, Medical Director, UPMC Lifestyle Medicine Program
9:30-10:30 am	**Prevention as a Cure for Healthcare and Our Nation's Economy** Allen Weiss, MD, FACP, FACR, MBA, Senior Executive Consultant, Blue Zones
10:30-10:40 am	**Break**
10:40-11:40 am	**Panel Discussion: The Growth of Lifestyle Medicine in South Dakota** ▪ Moderator: Rob L. Allison, MD, MACP, Avera Internal Medicine Clinic ▪ Marty Allison, MD, FAAP, DipABLM, Pediatrician, Avera Pierre Pediatrics ▪ Melissa Magstadt, MS, MBA, APRN, Secretary, South Dakota Department of Health ▪ Amy Prunuske, PhD, Associate Dean of Medical Education, University of South Dakota Sanford School of Medicine ▪ Michelle L. Thompson, DO, AOBFP, ABOIM, DipABLM, FACLM, Medical Director, UPMC Lifestyle Medicine Program ▪ Allen Weiss, MD, FACP, FACR, MBA, Senior Executive Consultant, Blue Zones ▪ Kathryn Wermers, DNP, FNP-C, DipACLM, Cancer Care Institute, Monument Health
11:40-11:45 am	**Closing Remarks** Rob L. Allison, MD, MACP
12:00-1:00 pm	**Lunch Program – Rural Health Transformation** Melissa Magstadt, MS, MBA, APRN, Secretary, South Dakota Department of Health Clarissa Barnes, MD, MBA, FACP, Chief Medical Officer, South Dakota Medicaid Program
1:15-1:45 pm	**Update from the University of South Dakota Sanford School of Medicine** Tim M. Ridgway, MD, MACP, FASGE, Dean, USD SSOM; Vice President for Health Affairs, USD
1:45-2:30 pm	**Medical Student & Resident Poster Session with Desserts**
2:30-5:00 pm	**SDSMA Policy Council Meeting** ▪ #1 Scientific Presentation: "Conducting a Cadaveric Suturing Laboratory to Increase Clinical Readiness in Medical Students – An Education Research Project" - Matthew Schmitz, MS III ▪ Membership Open Forum ▪ Medical Liability Insurance Update – Kristin Stepien, Senior Vice President of Sales and Business Development, Copic
5:00-5:30 pm	**SDSMA Board of Directors Meeting** Bar Clara Room
6:00-7:00 pm	**Social Hour** Live music with Jeremy DeWall starting at 5:30 pm
7:00 pm	**Awards Banquet, Scholarship Recognition and Presidential Inauguration** *ADVANCE REGISTRATION REQUIRED*

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Presenters

Clarissa Barnes, MD, MBA, FACP

Medical Director, South Dakota Medicaid Program

Dr. Barnes is chief medical officer for the South Dakota Medicaid Program. Dr. Barnes previously held leadership roles with Avera including lead physician advisor for Clinical Documentation Integrity and Utilization Review and system medical director of the LIGHT Program. She is the immediate past president of the American College of Physician Advisors. Dr. Barnes received her bachelor's degree from the University of South Dakota with majors in chemistry and political science. She earned her MD from the Johns Hopkins University School of Medicine, completed her internal medicine residency at Johns Hopkins Hospital, and holds an executive MBA from Creighton University's Heider College of Business. She continues to practice clinically as a hospitalist and is a clinical professor in the Department of Internal Medicine at the University of South Dakota Sanford School of Medicine.

Melissa Magstadt, MS, MBA, APRN

Secretary, South Dakota Department of Health

Secretary Magstadt has been involved in South Dakota healthcare for over 30 years. She is an advanced practice registered nurse and co-owner of Quick Care SD. She served in the state legislature from 2011-2014. She received her master's degree from South Dakota State University with a focus on family nurse practitioner. She also has a MBA from Mount Marty University. She graduated from the Great Plains Public Health Leadership Institute at the University of Nebraska and completed her fellowship at the University of Arizona's Center for Integrated Medicine.

Tim M. Ridgway, MD, MACP, FASGE

Dean, University of South Dakota Sanford School of Medicine/Vice President for Health Affairs, University of South Dakota

Dr. Ridgway is Dean of the University of South Dakota Sanford School of Medicine/vice president for Health Affairs. He received his bachelor's degree from Augustana College and MD from the USD School of Medicine. After a transitional residency at McKennan Hospital, he completed his internal medicine residency and gastroenterology fellowship at the Mayo Graduate School of Medicine. Dr. Ridgway has been the recipient of numerous awards, including the SDSMA Presidential Award, the USD Sanford School of Medicine Distinguished Alumnus Award, the Leonard Tow Humanism in Medicine Award, the Augustana University Alumni Achievement Award, and Teacher of the Year and Laureate Awards from the American College of Physicians. He has been president of the SDSMA and councilor of the Alpha Omega Alpha-South Dakota chapter. From 2015-2021 he served as the Dr. Charley F. and Elizabeth Gutch Chair in Medicine.


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Presenters

Michelle L. Thompson, DO, AOBFP, ABOIM, DipABLM, FACLM

Medical Director, UPMC Lifestyle Medicine Program

Dr. Thompson is triple board-certified in lifestyle medicine, integrative medicine, and osteopathic family medicine. She is also certified in Blue Zones, mind-body medicine, and psychedelic medicine, and integrates culinary medicine and mind-body practices into her clinical care. Since 2006, she has been deeply involved in medical education at UPMC, with a focus on prevention, whole-person care, and lifestyle-based approaches to health. As the founder and medical director for UPMC Lifestyle Medicine, she is leading the initiative to place self-care in the center of patient care and employee health. Dr. Thompson created a "Doctors in the Kitchen – Food as Medicine and Physician Wellness" program offering CME for her colleagues to learn about self-care and lifestyle medicine. Dr. Thompson has transformed the way health care is offered in her primary care practice and community offering free classes in nutrition, WFPB teaching kitchens, mindfulness workshops, yoga, tai chi, qigong, meditation, sound therapy, art therapy, forest bathing, shop with a doc, aromatherapy, dancing mindfulness, Ayurveda, mind-body medicine, and many other tools. Her pop-up teaching kitchen she designed moves through the community teaching churches, schools, businesses, first responders, and doctors' offices the daily dozen and pillars of lifestyle medicine. She was featured in the recent documentary *Going Om* discussing the health benefits of sound therapy as a tool in healing. She is an advocate for system change and has been a pioneer in changing the way health care is delivered.

Allen Weiss, MD, FACP, FACR, MBA

Senior Executive Consultant, Blue Zones

Dr. Weiss is senior executive consultant for Blue Zones, and has been president and CEO of a 716-bed, two-hospital integrated system. Dr. Weiss now has a national scope focused on prevention. After graduating from Columbia University's Vagelos College of Physicians and Surgeons and completing his training at the New York Presbyterian Hospital and Hospital for Special Surgery of Cornell University, he had a solo practice in rheumatology, internal medicine, and geriatrics for 23 years. Dr. Weiss was named as one of the Top 100 outstanding physician leaders of healthcare systems by Becker's Hospital Review multiple times, and served five years on the Regional Advisory Council of the American Hospital Association. In 2005, he was invited to testify on information technology before the U.S. House Ways and Means Health Subsection. In Florida, Dr. Weiss is past Chair of the Florida Hospital Association as and its Quality Committee. He is married to Marla Weiss, PhD, a writer and educator. They have two daughters who are physicians, one a biomedical illustrator/associate professor of anatomy and physiology, and the other an adolescent medicine physician/professor of pediatrics.

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Presenters

David J. Welsh, MD, MBA

Board of Trustees, American Medical Association

Elected to the AMA Board of Trustees in 2024, Dr. Welsh is a board-certified general surgeon practicing in Southeast Indiana. A former president of the Indiana State Medical Association, Dr. Welsh has been involved in the AMA Organized Medical Staff Section and the AMA Council of Science and Public Health, serving as chair for both. Beyond surgery, Dr. Welsh is a dedicated public health advocate. He has served as a county health officer for over 25 years and currently serves on the Indiana Trauma Care Commission, working to complete a statewide trauma system. As a former member of the Indiana Public Health Commission, he helped author key reports on innovation in public health delivery. Dr. Welsh earned his MD from the Indiana University School of Medicine and an MBA from Ball State University. A fellow of the American College of Surgeons, he serves on the ACS Board of Regents and chairs the Surgeon Specific Registry Quality Improvement Program and is a member of the Advisory Council for Rural Surgery. Improving quality and safety in the health care workplace are top priorities for Dr. Welsh, especially reducing ergonomic injuries. He teaches students and residents at all levels, bringing a vital rural perspective to training. Dr. Welsh resides in Batesville with his wife, Mary Beth.

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copic Humanitarian Award

Titus Weller, MD

Titus Weller, MD is year's recipient of the Copic Humanitarian Award. Dr. Weller is an emergency medicine physician at Avera St. Mary's Hospital in Pierre who volunteers his time with the community ambulance service.

The Copic Humanitarian Award recognizes a South Dakota physician for volunteer medical service and contributions to the community. The recipient designates a $10,000 donation from Copic to a health care related 501(c)(3) organization within South Dakota. Dr. Weller has designated this donation to Avera Foundation – St. Mary's.

Incoming 2026-27 SDSMA President

Benjamin D. Meyerink, MD

145th President

Dr. Meyerink has been an active member of the SDSMA since 2014. Prior to joining the association as an actively practicing physician, Dr. Meyerink was a member as a medical student while attending the University of South Dakota Sanford School of Medicine.

Dr. Meyerink is a family medicine physician in Sioux Falls at Avera Medical Group Family Medicine 69th & Cliff. He has been involved in leadership in medicine for several years. Prior to becoming SDSMA president, he held positions on the SDSMA Board of Directors, Policy Council, committees, his local District 7 Medical Society and is a member of the American Medical Association. Dr. Meyerink also volunteers for the SDSMA Doctor of the Day Program at the State Legislature.

In addition to his work with the SDSMA, Dr. Meyerink has been involved in the Academy of Family Physicians at the state and national levels and as a resident was elected by the AAFP body to serve as their national delegate for their own House of Delegates. He also has been active in research and education. During his residency at Mayo Clinic, he presented at national and international research conferences and was part of numerous publications. He also received his department's Resident of the Year and other awards during his time there. Currently, he serves as the University of South Dakota Sanford School of Medicine's director of Advising and Student Success and plays an integral role in the residency match process for all medical students.

Originally from Platte, Dr. Meyerink received his medical degree from USD SSOM and completed his residency training at Mayo Clinic in Rochester. After residency he returned home to South Dakota to practice medicine. He holds a faculty appointment in the Department of Family Medicine at USD SSOM.

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ORAL PRESENTATION – #1 ABSTRACT

Conducting a Cadaveric Suturing Laboratory to Increase Clinical Readiness in Medical Students – An Education Research Project

Matthew Schmitz, MS III; Gary Timmerman, MD; William Spanos, MD; Amy Prunuske, PhD; Taylor Soderling, PhD

Introduction: Suturing is a fundamental surgical skill, yet many medical students learn independently on synthetic models with limited guidance. This presentation evaluates the impact of a cadaveric suturing curriculum on the clinical readiness of preclinical medical students.

Methods: Seventy preclinical medical students at the USD Sanford School of Medicine participated in a mandatory suturing curriculum integrated into the preclinical phase of training. The curriculum consisted of a 90-minute laboratory, where students received instruction and performed suturing on individual cadaveric specimens. The laboratory focused on teaching five suturing techniques with their appropriate ties: simple interrupted, simple running and locking, vertical mattress, horizontal mattress, and subcuticular sutures. After two semesters of clinical experiences, students were surveyed on their clinical readiness, anatomic suturing locations in the clinic, and specialty where suturing occurred.

Results: Forty-one students (59%) completed the optional survey one-year postlaboratory. A 5-point Likert scale assessed student confidence in the order of "not at all," "slightly," "moderately," "significantly," and "extremely" confident. Twenty-six respondents (63%) felt moderately to extremely confident if faced with the opportunity to suture on a live patient. Among students who performed clinical suturing (n=11), 100% reported the laboratory provided moderate to extreme preparation for the procedure. Additional survey data revealed that the abdomen and upper extremities are the most common locations to suture during clinical experiences. General surgery was the most common specialty that provided suturing experiences, followed by plastic surgery, orthopedic surgery, and otolaryngology.

Conclusions: Consistent with existing literature, these findings demonstrate that suturing on cadaveric models enhances clinical readiness. Novel contributions include assessment of a suturing curriculum formally integrated into the preclinical phase of medical school and categorization of clinical suturing experiences by anatomy and specialty. These results provide a framework for suturing curriculum development.

POSTER PRESENTATIONS

(SHOWN IN ALPHABETICAL ORDER BY PRESENTER'S LAST NAME)

14-Day ECG Patch vs 24-Hour Holter Monitoring for Detection of Clinically Significant Arrhythmias: A Systematic Review and Meta-Analysis

FNU Abubakar, MD; Danish Hassan, MBBS; Rida Shakeel, MBBS; Muhammad Hasnain Azeem, MBBS; Hakim Wazir, MBBS; Syeda Masooma Jafri, MBBS; Alishba Fatima, MBBS; Syed Rayyan Ahmad, MBBS; Inamullah Soomro, MBBS; Taha Ibrahim, MBBS; Alishba Raza, MBBS; Tooba Ali, MBBS; Emad Uddin Sajid, MD; Hafsa Parveen, MBBS

Background: Prolonged ambulatory ECG monitoring is hypothesized to improve detection of paroxysmal

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arrhythmias compared with standard 24-hour Holter monitoring. This systematic review and meta-analysis evaluated whether 14-day single-lead adhesive ECG patch monitoring enhances detection of clinically significant arrhythmias versus conventional Holter monitoring.

Methods: Following PRISMA guidelines, PubMed, Scopus, and Embase were searched. Studies comparing 14-day ECG patch with Holter monitoring (primarily 24–72 hours) in ambulatory adults with suspected paroxysmal arrhythmia were included. Primary outcomes were detection rates of atrial fibrillation/flutter (AF), major arrhythmias, atrioventricular block, sinus pause, ventricular tachycardia, and supraventricular tachycardia. Risk of bias was assessed using ROBINS-I and RoB 2. Risk ratios (RR) with 95% confidence intervals were pooled using random-effects models in Review Manager (RevMan). Heterogeneity was evaluated with I^2 statistics, and sensitivity/subgroup analyses performed. The protocol was registered on PROSPERO (CRD420251248305).

Results: Six studies met inclusion criteria. Primary analyses showed substantial heterogeneity for most outcomes. No significant differences were observed for AF (RR 0.43, 95% CI 0.05–3.51), major arrhythmias (RR 0.41, 95% CI 0.16–1.01), atrioventricular block (RR 1.10, 95% CI 0.42–2.90), sinus pause (RR 1.09, 95% CI 0.47–2.49), ventricular tachycardia (RR 0.62, 95% CI 0.03–11.98), or supraventricular tachycardia (RR 0.39, 95% CI 0.11–1.44). Sensitivity analyses excluding one influential study often resolved heterogeneity and shifted results, favoring Holter monitoring for AF, major arrhythmias, and ventricular tachycardia, or the 14-day patch for supraventricular tachycardia. Subgroup analysis by patient type showed no significant interaction.

Conclusion: Fourteen-day ECG patch monitoring showed no overall statistically significant superiority over 24-hour Holter monitoring for detecting clinically actionable arrhythmias. High heterogeneity and strong sensitivity to individual studies reflecting variability in devices, populations, and designs shows key limitations in current evidence. Larger, high-quality, standardized randomized trials are essential to clarify if extended patch monitoring offers true diagnostic advantages.

Evaluating the Educational Impact of the OSCE 360 Method in Pre-Clerkship Medical Students: A Cross-Sectional Survey Study

Carly Alley; Andrew Kremer; Maggie Derner; Arica Schuknecht; Valeriy Kozmenko, MD, CHSE-A; Roy Mortinsen, MD, FAAFP

Introduction: Traditional Objective Structured Clinical Examinations (OSCEs) primarily assess students in the physician role. The OSCE 360 model expands this framework by incorporating student-authored cases and role rotation (student-doctor, student-patient, and evaluator), promoting experimental learning and exposure to multiple perspectives in patient care. Case writing may enhance clinical reasoning and diagnosis generation, while participation as standardized patients and peer evaluators reinforces understanding of clinical encounters. This study evaluates student perceptions of the educational impact of OSCE 360.

Methods: A cross-sectional anonymous Qualtrics survey was administered to pre-clerkship medical students (Class of 2028) following participation in the OSCE 360 sessions. The survey assessed perceived case complexity, number of differential diagnoses considered, learning across roles, and confidence in case-writing. Descriptive statistics were used to summarize responses.

Results: Twenty-seven students responded, with 16 completing all items. Most respondents, 87.5%, rated

their cases as average to somewhat complex. When writing cases, 81.3% considered three or more differential diagnoses, compared to 56.3% when acting as student-doctor. Most agreed or strongly agreed that writing cases improved medical knowledge and patient management skills by 75.0%. Similarly, 68.8% agreed or strongly agreed that portraying the patient enhanced understanding of symptom presentation and clinical reasoning. Self-assessed case-writing proficiency was most commonly rated as average (75.0%).

Conclusions: OSCE 360 is perceived as a valuable educational approach for enhancing clinical reasoning, diagnostic thinking, and understanding of patient presentations through experiential learning. Role rotation and case construction provide meaningful learning beyond traditional OSCE formats. These findings support continued implementation of OSCE 360 and further investigation into its impact on objective performance and longitudinal clinical skill development.

Perioperative Anesthetic Outcomes and Holding Practices in Patients Using GLP-1 Receptor Agonists: A Retrospective Cohort Study

Sara Marroquin, MD; Mariah Block, MS III; Grace Geffre, MS III; Lucas Goetz, MS III; Cole Knoblich, MS III

Introduction: Glucagon-like peptide-1 (GLP-1) receptor agonists are increasingly prescribed for diabetes and obesity and associated with delayed gastric emptying, raising concern for perioperative aspiration and anesthetic complications. However, observational studies have not consistently demonstrated increased anesthetic risk. In 2023, the American Society of Anesthesiologists recommended perioperative discontinuation of GLP-1 agonists despite limited supporting evidence. We conducted a retrospective cohort study to describe perioperative anesthetic outcomes among patients with and without GLP-1 agonist exposure to assess complication rates by perioperative holding status.

Methods: We performed a retrospective cohort study using electronic medical records from the Sanford Health system. Adult patients undergoing procedures requiring general anesthesia with an active outpatient GLP-1 agonist prescription at the time of surgery were included. All other surgical patients served as controls. Records were identified using SlicerDicer and manually reviewed for demographics, comorbidities, procedure type, ASA classification, GLP-1 agonist discontinuation status, and perioperative anesthetic outcomes. Primary outcomes included aspiration, aspiration pneumonia, difficult intubation, postoperative nausea and vomiting (PONV), anesthesia-related complications, and 30-day mortality.

Results: A total of 234 patients were included (mean age 56.4 ± 13.0 years); 61.5% were female and 73.0% were ASA class 3. GPL-1 agonists were used by 80.5% of patients and 90.2% had diabetes. Perioperative anesthetic complications were minimal. No cases of aspiration, aspiration pneumonia, or anesthesia-related complications occurred. Anticipated difficult airway was noted in 4.3%, PONV in 0.9%, and 30-day mortality in 0.8%. GLP-1 agonists were held preoperatively 57.7% (mean 5.1 ± 4.3 days), with similarly low complication rates regardless of holding status.

Conclusions: Major perioperative anesthetic complications were uncommon, regardless of GLP-1 use or perioperative holding. These findings suggest no observable increase in anesthetic risk associated with GLP-1 agonists, though conclusions are limited by low event rates. Larger prospective studies are needed to guide evidence-based perioperative management.

Atypical Melanocytic Matricoma: A Case Report

Linze M. Christensen, MS III, Marcus L. Frohm, MD

Introduction: Melanocytic matricoma is a rare biphasic cutaneous adnexal neoplasm composed of matrical epithelial cells admixed with dendritic melanocytes. First described in 1999, fewer than several dozen cases have been reported in the literature. These lesions most commonly arise on chronically sun-exposed skin of older adults and typically present as small, pigmented papules or nodules that may clinically mimic melanoma. Histopathologic evaluation is required for diagnosis and characteristically demonstrates matrical differentiation with shadow cell formation and admixed melanocytes. Atypical variants with increased cytologic atypia or mitotic activity can further complicate distinction from malignant melanocytic proliferations.

Case: An 83-year-old Caucasian male presented for a general skin evaluation with concerns of an irregular papule on the dorsal hand that had been present for over one year. Physical examination revealed a 7 mm verrucous crusted papule. A shave biopsy demonstrated a dermal proliferation of basaloid matrical cells with scattered shadow cells and numerous pigmented dendritic melanocytes. Cytologic atypia and increased mitotic activity were noted. Immunohistochemical staining supported a biphasic epithelial and melanocytic population and helped exclude melanoma. These findings were most consistent with atypical melanocytic matricoma. The lesion was subsequently treated with complete surgical excision, and histopathology confirmed clear margins without residual tumor.

Conclusion: This case highlights the diagnostic challenges posed by atypical melanocytic matricoma, particularly its clinical and histologic overlap with melanoma and other pigmented adnexal tumors. Recognition of characteristic matrical differentiation and the use of immunohistochemical analysis are essential for accurate diagnosis. Complete surgical excision with negative margins appears to be curative in most cases, though the limited number of reported cases makes prognostic assessment difficult. This report adds to the growing literature describing the clinical and histopathologic features of this uncommon neoplasm and emphasizes the importance of clinicopathologic correlation in guiding management.

Understanding the Financial Education Needs of Midwest Medical Students – A Cross-Sectional Survey Study

Linze M. Christensen, MS III, Marcus L. Frohm, MD

Introduction: Medical students nationwide suffer from increasing costs associated with tuition, supplemental learning resources, and costs of living. National reports show an average graduating debt burden of $234,597, excluding undergraduate loans. Fiscal year 2026 interest rates will increase debts of $125,000 or more by at least five figures annually. Legislation and accreditation measures offer little guidance for schools to develop financial wellness curriculum. Interpretive ambiguity exists between the lines, and students absorb the impact from the execution of these guidelines.

Methods: USD IRB exemption was obtained. Surveys were developed with input from an interdisciplinary team of advisors from Sanford School of Medicine and Beacom School of Business. Likert scale responses and qualitative feedback were analyzed to assess student attitudes stratified by Pillars.

Results: Initial data yielded an 18% response rate with respondents representing all years of training, with

a majority from the clinical phase. Early analysis revealed that while students expressed general interest in financial literacy, most reported low confidence in managing student loans, budgeting, and long-term financial planning. A recurring theme in open-ended responses was a strong preference for more individualized financial education, with several students comparing their ideal experience to the academic advising model. Many noted that current offerings felt too generic or disconnected from their specific financial situations and career plans. These preliminary findings suggest a need for tailored, relationship-based approaches to financial education within medical curricula. Data will be collected again in May 2026.

Conclusions: Preliminary findings highlight a clear demand among medical students for more personalized, longitudinal approaches to financial education that mirror the structure of academic advising. While overall financial literacy and confidence remain limited, students value individualized guidance over generalized sessions. These results underscore the importance of integrating tailored, mentorship-based financial programming into medical education to better support learners' financial well-being and preparedness for residency and beyond.

Atraumatic Scalp Seroma in an Adolescent: A Case Report

Jaelyn Morehead, MS III; Mason Crow, MS III; Ryder Grantham, MS III; Will Brown, MS III; April Willman, MD

Introduction: Seromas are localized collections of serous fluid that most commonly arise following surgical intervention or significant trauma that disrupts lymphatic channels and create potential dead space. Outside of these contexts, seroma formation is uncommon. In pediatric patients, scalp fluid collections are more frequently associated with birth-related injury, hematoma, infection, or neoplastic processes, and reports of atraumatic scalp seromas in adolescents remain rare.

Case Report: A previously healthy 14-year-old male presented with painless swelling over the superior scalp first noticed three days prior. Five days before presentation, he had fallen from a four-wheeler while mowing but reported wearing a helmet and denied head impact, loss of consciousness, or friction injury. He also denied headache, visual disturbance, or systemic symptoms. Physical examination demonstrated a 9×6 cm soft, fluctuant swelling over the left superior scalp without erythema, ecchymosis, or visible skin disruption. Neurologic examination was normal. Given the lesion's size and the recent fall history, noncontrast head CT was obtained to exclude intracranial injury or hematoma. Imaging demonstrated an approximately 10×5×1 cm crescentic fluid collection within the scalp along the left convexity, most consistent with a seroma, with no abnormalities of the calvarium or intracranial structures. The patient was managed expectantly, and the swelling resolved completely without development of additional symptoms by ten-week follow-up.

Conclusion: This case highlights an uncommon presentation of scalp seroma in an adolescent without a clear traumatic or surgical precipitant. Although posttraumatic entities such as Morel-Lavallée lesions are well described, they are typically associated with high-energy shearing injury and characteristic imaging findings that were absent in this patient. Recognition that benign, self-limited seromas may occur in the absence of significant trauma is important when evaluating pediatric scalp masses and may help avoid unnecessary invasive diagnostic testing or intervention when clinical and radiographic features are reassuring.

MRSA-Associated Acute Purulent Pericarditis: A Case Report

Rilie B. Curd, MS III; Muhammad Hasan, MD; Mishka Ahmed, MD

Introduction: Purulent pericarditis is a rare, but life-threatening condition occurring in roughly 27.7 cases of pericarditis per 100,000 population per year in developed countries. Gram positive cocci are the predominant causative pathogens with *Staphylococcus aureus* and *Streptococcus* species being the most common. Early recognition is essential in preventing complications such as cardiac tamponade, constrictive pericarditis, and effusive-constitutive pericarditis. Despite appropriate medical management including both drainage and antibiotics, mortality rates remain elevated and approximately 50% of cases are diagnosed postmortem.

Case Presentation: An 84-year-old male with a history of myelodysplastic syndrome, permanent atrial fibrillation and heart failure with preserved ejection fraction presented to the emergency department with sharp, left-sided chest pain radiating to the right shoulder, worsened by inspiration. A computed tomography angiogram performed to evaluate for pulmonary embolisms revealed a large pericardial effusion. Electrocardiogram (EKG) demonstrated low-voltage tachycardia. Transthoracic echocardiography showed a large circumferential pericardial effusion with fibrinous strands. The patient underwent pericardiocentesis with drainage of 450 cc of purulent fluid, followed by placement of a pericardial drain. Fluid analysis revealed a pH of 6.9 and 15,095 nucleated cells/μL with 89% neutrophils. Pericardial fluid and blood cultures were positive for MRSA. The patient was initiated on intravenous vancomycin and transesophageal echocardiography was negative for infective endocarditis. He was subsequently transitioned to daptomycin to complete a four-week course of antibiotics. Repeat blood cultures were negative.

Conclusion: This case illustrates the diagnostic challenges and management considerations for MRSA-associated purulent pericarditis in a frail host. Early echocardiography and pericardiocentesis are critical in management. Despite source control and target antibiotics, mortality remains high in frail hosts.

Nurturing Equity in Screening for Perinatal Treatment (NEST)

Abigail Erkonen, MS III; Anna Strahm, PhD

Depression during pregnancy is an important public health concern, with national recommendations calling for universal screening throughout prenatal care. However, recent analysis within the Sanford Health system (2011–2021) found that depression during pregnancy was diagnosed in 11.20% of all pregnancies but in only 4.55% of Black pregnancies, suggesting underdiagnosis in this population. This study aims to identify barriers to effective prenatal depression screening for Black women and assess potential solutions to improve provider practices and patient outcomes.

This qualitative study will involve up to 25 semi-structured informational interviews with prenatal care providers within the Sanford Health system. Providers will be recruited via email using a voluntary participation approach. Interviews will last 15–20 minutes and be conducted in person or via phone in a private setting. Recruitment will continue until thematic saturation, anticipated within 12–25 interviews.

We anticipate identifying several recurring themes representing provider-perceived barriers to screening for depressive symptoms during Black pregnancy. Based on preliminary literature and project rationale,

expected themes may include time constraints in clinical workflow, limited training in culturally sensitive screening, differences in patient–provider communication, provider uncertainty regarding follow-up procedures, and perceived stigma surrounding mental health. Additional themes may reflect systemic, cultural, or institutional gaps that influence screening practices across clinics.

Identifying provider-perceived barriers will inform targeted recommendations for improving depression screening during Black pregnancy within the Great Plains region. Insights from this study may guide development of provider training initiatives, workflow modifications, and system-level supports that promote equitable mental health screening. Ultimately, this work aims to support earlier identification and treatment of depression, reduce disparities in prenatal care, and strengthen culturally responsive practices within regional health systems.

Racial and Socioeconomic Disparities in Inpatient Outcomes Among Older Adults Hospitalized With Prostate Cancer: Insights from the National Inpatient Sample (2020–2022)

Hareem Tahir, MD; Muhammad Zahid Anwar, MD; Rafia I. Waheed, MD; Maheera Farooqi, MD; Michael Roberts, MS IV; Dawlat Khan, MD

Background: Prostate cancer is the most common malignancy among men in the U.S. Despite therapeutic advances, outcome disparities driven by racial and socioeconomic factors persist. This study uses the National Inpatient Sample (NIS) to evaluate inpatient outcomes by race and socioeconomic status among older adults hospitalized with prostate cancer.

Methods: We conducted a retrospective analysis using the NIS (2020–2022), identifying men aged ≥65 years with a prostate cancer using ICD-10 codes. Primary outcomes included in-hospital mortality, length of stay (LOS), discharge disposition, and total hospital charges (THC). Race was categorized as White (reference), Black, Hispanic, and Other. Multivariate regression analyses adjusted for demographic, clinical, and hospital-level factors.

Results: An estimated 437,810 hospitalizations were identified. White patients comprised 69.2%, followed by Black (16.3%), Hispanic (7.2%), and Other (7.4%). Most had a high comorbidity burden (Charlson index ≥3 in 85.1%). Black patients were younger, with a higher proportion aged 65–74 years (71.0% vs. 59.2%) and were more often from the lowest income quartile (46.3% vs. 28.1%) compared with White. Medicare was the predominant payer (87.9%), and 75.1% of admissions occurred at urban teaching hospitals. Nearly half were discharged home (44.6%), 50.1% to facilities or home health, and 5.3% died in-hospital. After adjustment, Black (OR 1.24), Hispanic (OR 1.19), and Other (OR 1.17) patients had higher odds of inpatient mortality. LOS was longer for Black (+1.17 days) and Other (+0.47 days). Black patients had higher odds of non-home discharge (OR 1.31), and THC were higher for Black (+$3,394), Hispanic (+$15,985), and Other (+$10,934) patients compared with White (all $p < 0.05$).

Conclusion: Racial and socioeconomic disparities persist in prostate cancer hospitalizations. Disparities were seen as they related to number of hospitalizations, inpatient mortality, income, LOS, odds of non-home discharge, and THC. Thoroughly addressing these disparities will promote better outcomes for all patients.

Unexplained Microcytosis in a 40-Year-Old Male: Case Report of a Missed Opportunity for Early Colorectal Cancer Diagnosis

Kennedy Forest, MD; Prajith Raj Ramesh, MD; Jyotroop Kaur, MD; Ahmed T. Kurdi, MD

Introduction: In the United States, colorectal cancer ranks as the third most commonly diagnosed malignancy and the second leading cause of cancer-related death in both men and women. Colorectal cancer incidence is rising among people under the age of 50 who account for an estimated 13% of cases. Colon cancer typically develops slowly over the course of five to ten years, so primary care physicians should maintain a high index of suspicion for early clinical indicators of potential malignancy to promote timely detection.

Case Report: We report the case of a 40-year-old male with a history of morbid obesity (BMI 54 kg/m2), type 2 diabetes mellitus, and hypertension with isolated microcytosis (MCV 77.1 fL, hemoglobin 13.9 g/dL) and iron deficiency (iron 35 ug/dL, ferritin 68 ng/mL) during an annual wellness visit. The patient re-established care five years later and reported intermittent rectal bleeding that he owed to hemorrhoids. Labs were notable for iron deficiency anemia (hemoglobin 11.7 g/dL, MCV 69.2 fL, iron 17 ug/dL, ferritin 26 ng/mL). Colonoscopy revealed a partially obstructing infiltrating and circumferential tumor in the descending colon and several large, scattered pedunculated polyps. Biopsies confirmed invasive adenocarcinoma with intact expression of mismatch repair genes. Staging CT scan was unable to localize a colonic mass but identified clustered enlarged metastatic lymph nodes. Stage IIIb colon adenocarcinoma (cT3 cN1b cM0) was treated with neoadjuvant chemotherapy (mFOLFOX 6) followed by a left hemicolectomy eight months after the diagnosis with remission.

Conclusion: Iron deficiency anemia is a well-known clinical indicator for colorectal cancer. Any early signs of anemia including isolated microcytosis in men or post-menopausal women should be further investigated for gastrointestinal blood loss. With rising incidence of colorectal cancer in younger adults, laboratory abnormalities warrant thorough evaluation as they may be the only indicator of occult blood loss from malignancy.

Recognizing Early Signs of Primary Congenital Glaucoma in Infancy

Alexander D.M. Withrow, MS III; Jeffrey Schuch, MS III; Michael Frick, MS II; David W.M. Withrow, MD

Introduction: Primary congenital glaucoma (PCG) is a rare and vision-threatening condition caused by abnormal development of the anterior chamber angle, leading to impaired aqueous humor outflow and subsequent elevated intraocular pressure. Although uncommon, PCG remains an important cause of irreversible visual impairment in the pediatric population. Early recognition is critical, as delayed diagnosis may result in optic nerve damage, amblyopia, and permanent vision loss. Classic clinical findings include epiphora, photophobia, blepharospasm, corneal clouding, and increased corneal diameter. This report describes an early presentation of PCG in a previously healthy infant and emphasizes the importance of prompt referral and surgical management.

Case Report: A three-month-old male with no significant past medical history presented to pediatric clinic with a one-day history of progressive eye swelling, cloudy pupils, and fussiness. Patient's mother denied respiratory symptoms, fever, or ocular discharge. Patient was born at term via uncomplicated vaginal

delivery. Prior examinations documented normal pupillary responses and bilateral red reflex.

On examination, the right eye appeared cloudy with an absent red reflex, prompting same-day referral to pediatric ophthalmology. Evaluation revealed right corneal clouding and elevated intraocular pressures of 26 and 24 mmHg. The patient was started on topical brinzolamide. At follow-up two days later, the corneal clouding had improved; however, intraocular pressures increased to 37 and 45 mmHg. The patient was diagnosed with primary congenital glaucoma and referred to a tertiary pediatric glaucoma center for surgical management. He subsequently underwent bilateral canaloplasty and trabeculotomy with additional revisions and continued ophthalmologic follow-up.

Conclusion: This case highlights the importance of rapid identification of primary congenital glaucoma in early infancy. Subtle findings, including corneal clouding and abnormal red reflex, should prompt urgent ophthalmologic evaluation. Early diagnosis and surgical intervention are essential to reduce intraocular pressure, prevent optic nerve damage, and preserve visual function.

Solitary Colonic Ganglioneuroma Identified on Screening Colonoscopy: A Case Report

Grace Geffre, MS III; Brandon Rosell, DO; Ashwyna Sunassee, MD; Ahmed T. Kurdi, MD

Introduction: Ganglioneuromas are rare benign tumors derived from neural crest cells of the enteric nervous system. Stemming from the sympathetic nervous system, they are mostly encountered in the abdomen and rarely in the gastrointestinal tract. Polypoid ganglioneuromas are usually solitary. Ganglioneuromatous polyposis can be associated with systemic and familial syndromes such as Neurofibromatosis type I, Cowden syndrome, and Multiple Endocrine Neoplasia type 2B.

Case Report: We report the case of an asymptomatic 60-year-old female who was incidentally found to have a 4 mm sessile sigmoid polypoid lesion on a routine screening colonoscopy. The lesion was resected with a cold snare. Other diminutive polyps were similarly resected and consistent with tubular adenomas. Histopathology of the lesion confirmed a colonic ganglioneuroma. Unique features included expansion of the lamina propria by edema and a poorly circumscribed population of eosinophilic spindle cells with curved and tapered nuclei without atypia (H&E x40). Higher magnification (H&E x200) showed larger ganglion cells admixed with abundant amphophilic cytoplasm, round nuclei, and prominent eosinophilic nucleoli. Immunohistochemical staining reveals the spindle schwannian cells and larger ganglion cells are positive for S100 and SOX10 and negative for smooth muscle actin (SMA), CD117 (KIT), and DOG-1 (x40).

Conclusion: Solitary polypoid ganglioneuromas of the colon are rare benign tumors with unique histopathologic features that do not tend to recur with adequate resection. Notably for these tumors, polyposis can be associated with systemic and familial syndromes. Till present, there are no recommendations on surveillance colonoscopy for solitary ganglioneuromas. Given tubular adenomas were concurrently resected, a repeat evaluation in 5 years was recommended to this patient.

National Trends of Cholangiocarcinoma Mortality in the United States with reference to South Dakota: A Negative Binomial Analysis

Amna Gill, MD; Ali Zubair; Muhammad Arham, MD; Jyotroop Kaur, MD; Eesha Gill, MD

Introduction: Cholangiocarcinoma (CCA) has been noted to have increasing mortality globally. This study aims to evaluate the demographic, racial and geographic trends in CCA mortality across the United States.

Methods: Data was extracted through Centers for Disease Control and Prevention Wide-Ranging Online Data for Epidemiologic Research by using ICD-10 codes C22.1, C24.0, C24.8 and C24.9 for people over 65 years of age, for the years 1999-2023. Age-adjusted mortality rates (AAMR) per 1,000,000 individuals and annual percentage changes (APC), with 95% confidence intervals, were analyzed across various demographic groups and geographical regions through Joinpoint regression. Negative Binomial Regression was utilized to compute adjusted Incidence Rate Ratios (IRRs), with South Dakota (SD) as the reference.

Results: Our analysis revealed a total of 131,125 deaths in the United States from 1999 to 2023 due to CCA. Overall, there was a consistent increasing trend in the AAMR from 90.8 to 163.1 per 1,000,000 (AAPC: 2.40, 95% CI: 2.15 to 2.65). Males had a consistently higher AAMR than females across all years. African American population showed the highest increase in AAMR over the study years (AAPC: 3.36). Highest CCA-related mortality was seen in Rhode Island, followed by Massachusetts. Highest increase in mortality over the period was seen in Louisiana (AAPC 3.38, 95% CI: 1.70-5.10). Based on negative binomial regression, each one-year increase was associated with approximately 1% increase in AAMR (IRR=1.021, 95% CI: 1.020-1.022). Alaska had a 66% higher (IRR 1.66) and Rhode Island had a 23% higher incidence of mortality (IRR 1.23) when compared to SD. Mississippi had the lowest incidence of mortality, 51% less when compared to SD (IRR 0.49).

Conclusion: The upward trajectory of CCA mortality is disproportionately higher in some states and underscores the need for additional research aimed at understanding risk factors driving this increase.

A Rare Cause of Chronic Cough and Hemoptysis: Isolated Tracheobronchial Amyloidosis

Jeffrey Schuch, MS III; Ryder Grantham, MS III; Alex Withrow, MS III; Michael Pietila, MD

Introduction: Amyloidosis comprises a group of disorders characterized by extracellular deposition of misfolded amyloid proteins within tissues and organs. Tracheobronchial amyloidosis is a rare form of localized amyloidosis involving deposition within the tracheobronchial tree and often presents with nonspecific respiratory symptoms that can mimic more common pulmonary diseases. Because of its rarity and variable presentation, diagnosis may be delayed. Increased awareness of this condition is important to facilitate timely recognition and management.

Case Report: A 49-year-old male presented to a pulmonology clinic with a nine-month history of intermittent cough and hemoptysis. Episodes were characterized by sore throat followed by nonproductive cough, wheezing, dyspnea during coughing spells, and blood-tinged sputum. Symptomatic episodes lasted several weeks and recurred three times over nine months. Prior treatment with antibiotics, corticosteroids, and bronchodilators provided partial relief. Chest radiography demonstrated mild hyperinflation without acute

findings, and physical examination revealed rhonchi.

Computed tomography of the chest demonstrated irregular thickening of the anterior tracheal wall with calcifications near the level of the aortic arch. Subsequent bronchoscopy revealed a friable papillomatous lesion nearly obstructing the mid-trachea. Biopsy was negative for acid-fast and fungal organisms. Histopathology demonstrated amyloid deposition with apple-green birefringence on Congo red staining. The patient underwent rigid bronchoscopy with successful soft tissue debulking. Follow-up bronchoscopy two months later showed a normal airway without recurrence, and evaluation revealed no evidence of systemic amyloidosis.

Conclusion: Tracheobronchial amyloidosis is an uncommon cause of chronic cough and hemoptysis that may mimic other airway diseases. Recognition of characteristic imaging and bronchoscopic findings, along with confirmatory Congo red staining, is essential for diagnosis. Early bronchoscopic intervention can restore airway patency and improve symptoms.

When "Sepsis" Means Everything and Nothing: The SEPSIS Dialogue as a Framework for Reconciling Medical Terminology with Family Understanding

Mackenzie Gustafson, MS III

Background: The term sepsis is commonly used in surgical and critical care settings, yet its linguistic and emotional impact on patients' families is underexplored. Misinterpretation can influence perception, critical decision, and heighten fear. This work examines how the diagnosis of sepsis functions as both a physiologic and communicative event, and to propose the SEPSIS Dialogue; a novel, structured framework for family-centered communication in acute surgical care.

Methods: Narrative reflection and synthesis integrating surgical physiology, health literacy, and communication ethics. This framework was developed by mapping common communicative friction points in the ICU and perioperative setting against established principles of serious illness conversations.

Results: Families frequently interpret sepsis as a fixed, catastrophic outcome, whereas clinicians view it as a dynamic spectrum. In surgical contexts, this "comprehension gap" is often widest at critical decision points, such as the need for re-operation. The SEPSIS Dialogue (State mechanism, Explain source, Present the spectrum, Speak to uncertainty, Invite questions, Support emotions, Demonstrate understanding) provides a structured pathway to bridge the gap in ways that respect comprehension, emotional experience, and clinical context.

Conclusion: Structured, plain-language communication can transform sepsis conversations from fear-driven moments into opportunities for partnership, clarity, and informed, values-based care.

Commercial Tobacco Use and Perceptions in a Great Plains Tribal Community: Cross-Sectional Survey Analysis

Brant Hannahs, MS III; Connor Corsinin, MS III; Anna Tillery, PhD; Rae O'Leary, MPH

Introduction: Commercial tobacco use is a significant public health concern in American Indian communities. Updated, community-specific data are essential to inform culturally grounded tobacco control and policy initiatives. This study describes commercial tobacco use patterns, cessation behaviors, and policy perceptions among adult members of the Cheyenne River Sioux Tribe (CRST) in 2022.

Methods: A survey was conducted among 400 adult CRST members in 2022. Participants reported tobacco behaviors, quit attempts, cessation methods, sacred tobacco practices, perceptions of Tribal smoke-free policy, and the impact of COVID-19 on tobacco use.

Results: Commercial tobacco use was highly prevalent (58.5%). Cigarette and poly–tobacco use were more common among participants reporting lower income ($p>0.001$) and lower educational attainment ($p=0.014$). Most tobacco users reported at least one quit attempt (62.5%). Family/community resources were frequently cited as sources of quit support, pharmacologic aids and healthcare providers were less commonly utilized. Sacred tobacco use was common (60%) and did not differ significantly by commercial tobacco use status.

Conclusions: Commercial tobacco use among CRST adults is prevalent and socially patterned, despite high levels of quit intent. Findings highlight the need for culturally grounded, multi-product cessation strategies and strengthened integration between policy initiatives and accessible community-based support services.

Sinonasal Undifferentiated Carcinoma in an 81-Year-Old Male with Visual Changes: A Case Report

Cole Knoblich, MS III; Brant Hannahs, MS III;, Matthew Schmitz, MS III; William C. Spanos, MD

Introduction: Sinonasal undifferentiated carcinoma (SNUC) is a rare but aggressive malignancy of the sinonasal cavity that can present with nonspecific symptoms such as nasal congestion and epistaxis. These are common primary care complaints and resemble several benign diseases, often leading to delayed diagnosis. We present an advanced case of SNUC in a patient with progressive nasal obstruction and new-onset vision changes to highlight concerning features that warrant urgent evaluation.

Case Report: We present an 81-year-old male with a history of nasal polyps that presented with a two-year history of unilateral nasal congestion and intermittent left-side epistaxis. Symptoms progressively worsened and were accompanied by new-onset blurred vision in the left eye, headache, imbalance, and facial pressure. His physical exam was unremarkable on external inspection. CT and MRI were significant for an expansile mass in the left ethmoid air cells with erosion of the cribriform plate, extension into the anterior cranial fossa, and invasion of the extraconal orbital space. There were no concerns for distant metastases based on chest imaging. Endoscopic biopsy revealed poorly differentiated carcinoma consistent with SNUC. He was started on chemotherapy and follow up at one month showed significant clinical and radiographic

response, including return of baseline vision.

Conclusion: Patients with SNUC can present with vague symptoms mimicking sinusitis, often leading to delayed diagnosis. High risk symptoms such as persistent unilateral nasal obstruction, recurrent epistaxis, new-onset visual changes, or neurological symptoms warrant early imaging and specialist referral. Sinonasal malignancies should be included in the differential when high risk symptoms are present or not responding to medical management. Despite its rarity, SNUC is highly aggressive and tends to invade nearby structures at presentation. Primary care clinicians serve a critical role in early recognition of alarming features to promote timely diagnosis and multidisciplinary management, which may improve patient outcomes.

Empowering Collegiate Female Athletes Through a Brief Educational Intervention on the Female Athlete Triad: A Quasi-Experimental Pre-Post Study

Carly Haring, MS III; Jon Olson, MD

Introduction: The Female Athlete Triad, characterized by low energy availability, menstrual dysfunction, and impaired bone health, poses short- and long-term health risks for female athletes. Despite its prevalence, awareness and education surrounding the Triad remain limited, contributing to delayed recognition and care. This project assessed baseline knowledge and comfort discussing Female Athlete Triad-related topics among collegiate female athletes and evaluated the impact of a brief educational intervention on knowledge, attitudes, and help-seeking intentions.

Methods: A community-based educational initiative was conducted among collegiate female athletes at a South Dakota university. Participants completed anonymous pre- and post-surveys surrounding a 30-minute educational session on the Female Athlete Triad. Surveys assessed prior education, knowledge of the Triad and its components, likelihood of seeking medical care for menstrual irregularities, and comfort discussing related concerns. Paired t-tests analyzed changes in Likert-scale items, and a chi-square test evaluated changes in comfort discussing health concerns.

Results: A total of 79 female athletes completed both surveys. While most participants reported prior education on nutrition (72), fewer had received education on bone (31) or menstrual health (37). Following the intervention, mean knowledge scores improved for understanding of the Female Athlete Triad (3.00 to 4.27), the role of nutrition (3.95 to 4.35), and factors affecting bone health (2.46 to 4.22) (all $p < 0.001$). The likelihood of seeking care for irregular menses increased (3.19 to 4.10, $p < 0.001$). Comfort discussing Triad-related concerns also improved, with more participants selecting "yes" and fewer selecting "unsure" ($p = 0.002$).

Conclusions: A brief educational session significantly improved collegiate female athletes' knowledge of the Female Athlete Triad and enhanced comfort with help-seeking behaviors. These findings support the feasibility and impact of concise educational interventions as a preventive strategy and highlight opportunities to integrate Triad education into athletic programs and pre-participation sports physicals.

"The Lightning Bolt Flap:" A Novel C-V Flap Modification for Nipple Reconstruction

Olivia Heinecke, MS II; Whitney Twitero, MS II; Heather Karu, MD

Nipple reconstruction following total mastectomy with breast reconstruction is often a crucial final step in restoring natural breast aesthetics and improving patient self-image. Among available techniques, the C-V flap is widely utilized due to its technical simplicity, reliability, and high patient satisfaction rates. However, lasting nipple projection is limited by its reliance on subcutaneous fat to fill dead space beneath the elevated flaps. To address this limitation, implants – such as synthetic or biologic cylindrical grafts – have demonstrated long-term maintenance of cosmetic outcomes. Despite improved nipple projection, inserts are associated with a higher risk of complications, including graft extrusion or exposure, necrosis, and wound dehiscence. Furthermore, some patients may desire optimal cosmesis while declining implants for financial considerations or personal preference. In this technical report, we describe a novel modification of the C-V flap that uses de-epithelialized, vascularized dermal V flaps to provide internal structural support and maintain nipple projection following implant-based breast reconstruction after total mastectomy.

Clinic Patient Perspectives on Organ Donation and Transplantation in Rural Northern Great Plains: A Prospective Survey

Rebecca Hofer, MS III; Abbey Rieber, MS III; Benjamin Limburg, MS III; Sujit Vijay Sakpal, MD, FACS, FICSB

Introduction: More than 100,000 patients are on the U.S. transplant waitlist, with proportionally fewer organ donations coming from rural areas. Optimization of donation services in rural and frontier communities could address this discrepancy. We sought to better understand attitudes, knowledge, and concerns regarding organ donation and transplantation among frontier populations by surveying patients in the United States Great Plains region.

Methods: A 15-item survey was distributed for voluntary completion to patients ≥18 years at three rural clinics in the Great Plains from July 2025 to January 2026. The survey included questions on demographics, exposure to and knowledge of organ donation, and attitudes regarding organ donation and transplantation. A total knowledge score was created by scoring participants' accuracy in selecting which organs/tissues can be donated. Statistical analyses included Fisher exact and Mann Whitney U testing, as well as a multiple logistic regression. A p-value of ≤0.05 was considered significant.

Results: Among 101 respondents (74.3% female, 77.2% registered donors), 90.1% were White and 7.9% were Native American/Alaska Native (NA/AN). Registered donors had significantly higher knowledge scores than non-donors (p=0.0012). Men were more likely to limit transplant acceptance to donations from friends/relatives (p=0.024), while NA/AN respondents showed higher willingness for unconditional living donation (p=0.039). Multivariable regression identified knowledge score as the sole independent predictor of donor status amongst variables surveyed (OR 1.48; 95% CI 1.13–1.99). The primary concern with donation reported was fear of health complications (37.5%) and the most requested intervention was more information on the donation process (18.1%).

Conclusion: Medical literacy appears to be positively associated with organ donor status in this population.

Sex-, race-, and education-specific differences in donation attitudes exist and may inform targeted interventions. Addressing knowledge gaps and specific concerns through education and outreach could provide a strategy to increase donation rates in rural populations.

Impact of Chronic Hepatitis C Infection on Inpatient Outcomes and Complications Among Patients With Hepatocellular Carcinoma: A National Inpatient Sample Analysis (2020–2022)

Hareem Tahir, MD; Rafia Irfan Waheed, MD; Muhammad Zahid Anwer, MD; Fizzah Kazim, MD; Mamoon Ahmed, MD

Introduction: Hepatocellular carcinoma (HCC) is the most common primary liver cancer and a leading cause of cancer-related mortality. Although chronic hepatitis C virus (HCV) infection has historically been a major driver of HCC, the proportion of HCC related to metabolic, alcohol-associated, and other nonviral liver diseases has been increasing. In the era of direct-acting antivirals, the clinical profile and outcomes of HCV-related HCC may differ from those of HCC from other causes. We evaluated differences in inpatient outcomes and complications among hospitalized patients with HCC with versus without chronic HCV infection in the United States.

Methods: We performed a retrospective study using the National Inpatient Sample (NIS) from 2020–2022, a weighted national database of U.S. hospitalizations. Adults aged ≥18 years with HCC, with or without chronic HCV infection, were identified using ICD-10 codes. Outcomes included in-hospital mortality, length of stay (LOS), total hospital charges, and complications including hepatic failure, hepatorenal syndrome (HRS), sepsis, variceal bleeding, and spontaneous bacterial peritonitis (SBP). Multivariable logistic and linear regression models adjusted for demographics, comorbidities, insurance, income quartile, and hospital characteristics.

Results: Among 148,475 HCC hospitalizations, 16% had chronic HCV infection. Compared with non-HCV HCC hospitalizations, HCV-related cases were younger, more often male, had a higher proportion of Black patients and fewer White patients, and were more likely to have Medicaid coverage and lower income status (all $p<0.05$). In adjusted analyses, chronic HCV was not associated with higher in-hospital mortality (OR 0.94; $p=0.33$) or longer LOS, but was associated with lower total hospital charges (−$9,900; $p<0.05$). HCV-positive patients had lower odds of sepsis (OR 0.86), but higher odds of hepatic failure (OR 1.14) and variceal bleeding (OR 1.27), with no significant differences in HRS or SBP.

Conclusion: Chronic HCV accounted for a minority of recent HCC hospitalizations and was not associated with worse short-term inpatient outcomes. Differences in complications likely reflect underlying liver disease burden rather than HCV status alone.

Talk the Talk or Walk the Walk? A Comparative Study of Educational Strategies to Increase High School Students' Interest in Healthcare Careers

Tiffany Knecht, MS III; Parker Owen, MS III; Alan Sazama, MD

Background: The healthcare industry is the largest private employer in the United States, yet workforce shortages persist. The Health Resources and Services Administration (HRSA) estimates that 92 million people live in primary care health professional shortage areas (HPSAs), 64 million in dental HPSAs, and 137 million in mental health HPSAs. An aging population and rising chronic illness rates place a growing burden on the healthcare system, with projected shortages exceeding 140,000 physicians and 100,000 registered nurses3 by 2038. Recruiting younger learners into healthcare careers is therefore critical. This study evaluated whether a traditional informational presentation or a presentation combined with hands-on activities was more effective at increasing high school students' interest in healthcare careers.

Methods: Two medical students visited eight high school chemistry classes, providing either a 30-minute informational presentation with time for questions, or a 10-minute presentation followed by 30 minutes of hands-on healthcare activities, including practicing vital signs and learning intubation techniques. Both presentations discussed motivations for working in healthcare and potential career paths. Students completed anonymous pre- and post-surveys assessing healthcare career interest. Surveys were paired using anonymous identifiers. Parental consent and student assent were obtained per institutional review board requirements.

Results: The study included 129 consented participants, primarily 10th-grade students (n=124). Prior healthcare exposure was reported by 54%, and 62% had previously considered a healthcare career. On a scale of 1-10, baseline interest averaged 4.29. Interest increased by 0.64 (±1.16) in the presentation-only group and by 0.68 (±1.27) in the presentation plus hands-on group. These changes were statistically significant ($p<0.001$), with no significant difference between groups. Overall, 44% of students reported increased interest, 43% no change, and 12% decreased interest.

Conclusion: Both approaches were influential in reaffirming students' interest or disinterest in a healthcare career. However, they did not differ significantly in their effect on interest. Future studies including broader student populations and expanded hands-on activities may better clarify effective strategies for engaging undecided students.

A Rare Surgical Complication of an Internal Hernia Secondary to Ureter Mobilization from an Ileal Conduit: A Case Report

Cole Knoblich, MS III; Michael Brozik, MD

Introduction: Internal hernias occur when abdominal viscera, such as small bowel loops, protrude through a peritoneal or mesenteric defect into the abdominal or pelvic cavity. The origin of these internal orifices can be congenital, or acquired by inflammation, trauma, or previous surgeries, like gastric bypass. Although internal hernias make up a small portion of small bowel obstructions, that number is slowly increasing due to higher volumes of bariatric surgeries. However, these surgeries are not the only ones that increase

patient's risk for internal hernias. Here we present a patient with an internal hernia from ureter mobilization from an ileal conduit.

Case Report: We present a 46-year-old female with history of cervical cancer and ileal conduit for urinary diversion secondary to a vesicovaginal fistula who presented to our emergency department with acute onset of abdominal pain. An abdominal and pelvic CT showed thick-walled, inflamed, and dilated small bowel loops with concerns for a closed loop obstruction from an internal hernia. She became tachycardic and laboratory studies showed elevated white count and lactic acid. Emergent exploratory laparotomy was recommended. Immediately on inspection, ischemic small bowel with proximal dilation was identified. It became apparent that the patient had an internal hernia as a result of her left ureter being mobilized and anastomosed to her ileal conduit. The threatened bowel was reduced with little difficulty and was visually viable with peristalsis. There was no remaining bowel identified within any internal defects and the patient tolerated the procedure well.

Conclusion: Ileal conduits have become a gold standard for urine diversion because of its ease and lower postoperative complications. Defects created often go unclosed which increases the risk for future internal hernias. General surgeons should have increased suspicion for internal hernias in the post-ileal conduit patient who presents with symptoms of bowel obstruction.

Does Neuromodulation of the Insular Cortex Influence Pain?

Tana Lick, MS II; Jamie Scholl, MSc; Lee Baugh, PhD

Background: Chronic pain affects nearly one quarter of U.S. adults and remains difficult to treat with existing pharmacologic therapies. High-definition transcranial direct current stimulation (HD-tDCS) has emerged as a potential non-invasive neuromodulation approach. The insular cortex plays a central role in pain perception and represents a promising stimulation target. Capsaicin-induced hyperalgesia provides a validated experimental pain model for studying analgesic interventions.

Objective: To determine whether HD-tDCS targeting the insular cortex modulates thermal sensitivity and subjective pain perception in a capsaicin-induced pain model.

Methods: Fifteen healthy participants underwent both active and sham HD-tDCS conditions. Capsaicin was applied to induce localized thermal hyperalgesia. Thermal sensory testing was performed before and after stimulation, including heat pain threshold (HPT), thermal sensory limen (TSL), and numeric rating scale (NRS) pain ratings. Repeated-measures ANOVA evaluated the effects of time and stimulation condition.

Results: Capsaicin application increased thermal sensitivity and pain ratings across participants. However, no significant stimulation × time interaction was observed for HPT, TSL, or NRS scores, indicating no detectable difference between active and sham HD-tDCS conditions.

Conclusions: In this pilot study, insular HD-tDCS did not significantly alter thermal sensitivity or pain perception in a capsaicin-induced pain model. These findings may reflect limited statistical power given the small sample size. Larger studies are needed to determine whether targeted neuromodulation of the insula can modulate acute pain processing.

Cultivating Leadership Identity through Short-term Mentorship: A Retrospective Cross-Sectional Study Examining an Outreach Event for Women in Medicine

Kathryn Hammer, MS II; Hope McMaster, MS II; Kiley Medler, MS III; DenYelle Baete Kenyon, PhD

Introduction: Women pursuing careers in medicine are often highly motivated to participate in mentorship opportunities to develop leadership skills and encourage the growth of prospective women in medicine. Longitudinal near-peer mentorship has been shown to support leadership identity development and produce positive mentor outcomes, including increased professional skills and confidence.[1,2] Acknowledging the logistical barriers to longitudinal mentoring programs, such as scheduling constraints and competing priorities, our project seeks to explore whether short-term mentorship outreach activities may offer a feasible model for female medical students to engage in experiential leadership identity development and attain benefits associated with the mentor role.

Methods: We will host an outreach event providing female medical students at the University of South Dakota Sanford School of Medicine (SSOM) an opportunity to serve as mentors to South Dakota undergraduate and high school women interested in pursuing careers in medicine. During the event, mentors will lead skills simulations and participate in discussions about medical education and experiences as women in medicine. Post-event surveys will be completed by participating medical students to evaluate the effectiveness of this one-time outreach event, especially as it pertains to the short-term practice of leadership and development of leadership identity.

Expected Results: We anticipate that participation in this outreach event, scheduled on April 9 in Sioux Falls, will result in survey data which will demonstrate that this event provides an opportunity for women at SSOM to practice leadership skills, build confidence in leading, and grow in their identity as physician leaders. Findings may help improve future programming offered by SSOM's chapter of Women in Medicine and Science.

Conclusions: Short-term mentorship outreach events may provide a practical avenue for female medical students to grow in their leadership identity and attain benefits of the mentor role while supporting the next generation of women in medicine.

Enhancing Patient Education of Gynecological Conditions with 3D Printing Technologies: Humanities Edition

Rilie B. Curd, MS III; Kiley Medler, MS III; Grace Geffre, MS III

Introduction: Uterine fibroids affect an estimated 70% of women worldwide. Adenomyosis has an estimated prevalence ranging from 8.8% to 61.5% in hysterectomy cases over the past 50 years. Both conditions affect millions, yet remain underdiagnosed and poorly understood by patients. Transvaginal ultrasonography (TVUS) is the first line diagnostic imaging modality for detecting both uterine fibroids and adenomyosis. Despite advancements in diagnostic imaging, 50% of patients with uterine fibroids are unaware of their diagnosis even after TVUS detection, and one third of patients experience diagnostic delays of 5 or more years. Further, traditional 2D imaging such as MRI or ultrasound can be challenging for patients to interpret,

potentially hindering understanding and affecting decision-making regarding treatment.

Case Presentation: A multiparous woman with large uterine fibroids and two prior cesarean sections developed intermittent right lower quadrant pain along her c-section scar which persisted for nine years. Ultrasound and CT imaging repeatedly showed a markedly enlarged, fibroid uterus with no clear etiology. Hysterectomy was suggested as definitive treatment. Using CT data, the patient generated a 3D printed pelvic model of the uterus filling the pelvis, displacing intestines, compressing the bladder and pressing on the rectum. After visualization of this distortion, the patient elected to move forward with a hysterectomy which completely resolved her chronic pain and urinary symptoms.

Conclusion: This case underscores the importance of effective education and communication in managing gynecological conditions, especially when patients face complex decisions regarding treatment options such as undergoing a hysterectomy. Further the case emphasizes the possibility of enhancing patient education through 3D printing technology. As the American College of Obstetricians and Gynecologists (ACOG) notes, "Shared decision-making is a key component of patient-centered care, especially when multiple reasonable management options are available and the best choice depends on patient preferences and values."

What the Skin Reveals: A Reflection on Dermatologic Disease and Structural Vulnerability

Kiley Medler, MS III; Rilie Curd, MD III

A man experiencing homelessness presented to the emergency department with extensive involvement of ulcerative lesions. On examination, the lesions were painful, numerous, crusted, and deeply ulcerated. At first the diagnosis was thought to be cellulitis but was later confirmed after an infectious disease consult to be Group A Streptococcus ecthyma. Ecthyma is a deep-seated skin infection commonly referred to as "deep impetigo". While the diagnosis of ecthyma was straightforward, the encounter prompted reflection of the unique role dermatology plays in revealing the intersection between disease and circumstance.

Skin disease is uniquely visible. Unlike many internal illnesses, dermatologic conditions are displayed on the body's surface where biological processes and social realities often converge. In patients experiencing housing instability, crowded living conditions, limited access to hygiene facilities, wound care, and consistent medical follow-up can allow minor trauma or superficial infection to progress into more extensive disease. In this case, the patient's lesions were not simply the result of bacterial invasion but also a reflection of structural vulnerability. Research has shown that patients experiencing homelessness are at a significantly higher risk of ecthyma.

For clinicians, dermatologic examination requires more than pattern recognition. It invites attention to the broader narrative on the skin. Lesions become more than diagnostic clues; they are markers of lived experience and structural vulnerability. While antibiotic therapy addressed the immediate infection, the encounter underscored how social context can shape the presentation and severity of dermatologic disease.

This experience highlights the importance of approaching dermatologic findings with both clinical precision and humanistic awareness. Recognizing the stories skin can tell may deepen clinicians' understanding

of their patients and the social conditions that influence health. Furthermore, it invites clinicians not only to treat dermatologic disease but also to advocate for greater health equity and address the structural conditions that influence skin health.

Normal Serum IgG4 in Biopsy Proven IgG4 Related Hypophysitis: A Case Report

Areeba Minhaj, MD; Anna Sunny, MD; Mina Al-Sammarraie, MD; Maheera Farooqi, MD; Seba Issa, MD; Nour Alijriri Alhesan MD

Introduction: IgG4-related disease (IgG4-RD) is a systemic fibroinflammatory disorder that can affect multiple organ systems. Pituitary involvement, referred to as IgG4-related hypophysitis (IgG4-RH), is uncommon but is increasingly recognized as a cause of hypopituitarism and central diabetes insipidus.

Case Presentation: A 61-year-old man with type 1 diabetes presented with headaches, fatigue, and decreased libido. Laboratory evaluation revealed hypogonadism, secondary hypothyroidism, and secondary adrenal insufficiency. Brain MRI demonstrated a 9×7 mm hypoenhancing pituitary lesion with suprasellar extension. The patient was initially treated conservatively with hormone replacement therapy for presumed pituitary apoplexy. Three years later he developed polyuria and polydipsia and was diagnosed with central diabetes insipidus requiring desmopressin. He also reported progressive visual changes with bitemporal visual field loss. Repeat MRI showed interval extension of the lesion into the infundibulum. Transsphenoidal resection revealed dense lymphoplasmacytic infiltration with approximately 40 IgG4-positive plasma cells per high-power field and an IgG4: IgG ratio of 30%, consistent with IgG4-related hypophysitis. Notably, serum IgG4 level was normal (29.4 mg/dL), a finding observed in 30% of patients with IgG4-RD. Systemic evaluation did not reveal pancreatic disease. Chest CT showed features suggestive of IgG4-related lung involvement, which occurs in up to 30% of IgG4 related disease cases. PET/CT did not identify additional sites of hypermetabolic disease.

Conclusion: IgG4-RH accounts for less than 5% of all hypophysitis cases. Panhypopituitarism is the most common presentation of IgG4-related hypophysitis. This case highlights a diagnostically challenging presentation of IgG4-related hypophysitis with normal serum IgG4 levels. Clinicians should maintain suspicion for IgG4-RD in patients with unexplained hypophysitis even when serum IgG4 is normal.

The Preeclampsia Mimic: A Case Report of Cyclic Cushing's Disease Unmasked in the Postpartum Period

Jaelyn Morehead, MS III; Ruby Hawks, MS III; Carolyn Gilbertson, MD

Introduction: Cushing's disease in pregnancy is rare and frequently underrecognized due to clinical overlap with physiologic gestational changes and hypertensive disorders of pregnancy, particularly preeclampsia. Delayed diagnosis may result in prolonged maternal morbidity and inappropriate management.

Case Report: A 30-year-old gravida 2, para 1 woman delivered at 37 weeks' gestation via induced vaginal

delivery for preeclampsia without severe features. Her immediate postpartum course was unremarkable. At 12 weeks postpartum, she developed persistent proteinuria with associated hypercalciuria and hyperuricosuria despite preserved renal function. Over the following weeks, she developed hypokalemia, leukocytosis, and progressive cushingoid features including facial rounding, dorsocervical fat pad, central obesity, proximal muscle weakness, hypertension, easy bruising, hirsutism, and frequent falls. Endocrine evaluation revealed markedly elevated serum and urinary cortisol levels with concomitant hyperandrogenism. Magnetic resonance imaging demonstrated a 9-mm pituitary adenoma with evidence of hemorrhage. She was diagnosed with cyclic Cushing's disease with intermittent adrenal insufficiency and initiated on glucocorticoid replacement therapy. Transsphenoidal resection of the adenoma was performed at 26 weeks postpartum, resulting in improvement in blood pressure and clinical symptoms. At one year postpartum, she remained clinically stable on glucocorticoid replacement therapy.

Conclusion: This case highlights the importance of maintaining a broad differential diagnosis in patients with hypertensive disorders of pregnancy. Persistent hypertension, proteinuria, and metabolic abnormalities should prompt evaluation for underlying endocrinopathies such as Cushing's disease. Early recognition and multidisciplinary management are critical to optimizing maternal outcomes and avoiding misattribution of symptoms to preeclampsia alone. Emerging biomarkers, including sFlt-1/PlGF ratios, may further aid in distinguishing preeclampsia from alternative pathologic processes.

Transscaphoid Perilunate Dislocation in a Rural Trauma Patient: A Case Report Highlighting Diagnostic and Management Considerations

Emily Wilde, MS III; Ryan Peldo, MS II; Henry Mullaney, MS II; Brooklyn VanDerWolde, MS III; Hao Li, MD; Aaron Pemberton, MD; Robert Van Demark, Jr., MD

Introduction: Perilunate dislocations are uncommon and frequently missed wrist injuries that can lead to significant morbidity, such as median nerve injury, carpal instability, and poor functional outcomes, if not promptly identified and treated. Early recognition and coordinated management are especially important in rural trauma settings where subspecialty resources are limited.

Case Report: This case describes a 17-year-old male who presented to a rural emergency department following a motorcycle accident. Initial evaluation showed extensive road rash and a gross deformity of the left elbow. Radiographs of the chest, pelvis, left elbow, and right wrist were obtained. The right wrist demonstrated a scaphoid fracture with a perilunate dislocation. A telemedicine consultation was performed with an emergency medicine physician and the patient was transferred for higher-level care. Upon arrival, orthopedic surgery was consulted. Physical exam showed tenderness to palpation and pain with passive wrist motion. Attempted closed reduction of the perilunate injury was unsuccessful. The wrist was splinted, and the orthopedic hand surgeon was consulted. Open reduction of the perilunate dislocation and carpal tunnel release were performed under general anesthesia. A volar approach was performed, with a longitudinal incision made over the palmar aspect of the hand along the radial border of the ring finger. The median nerve was decompressed, a hematoma was removed, and the capitate was reduced back over the lunate with traction, wrist flexion, and direct pressure on the dorsal aspect of the capitate. Reduction was confirmed on orthogonal fluoroscopic views. The wound was irrigated, closed with nylon suture, and a splint

was applied. At 2 month follow-up, the patient was doing well and demonstrated stable wrist alignment with interval healing of all injuries.

Conclusion: This case highlights the complexity of managing perilunate dislocations in resource-limited healthcare settings and the importance of prompt diagnosis, appropriate care, and timely surgical referral.

Dual Endemic Infection in Pregnancy: Coccidioidal Meningitis with Strongyloidiasis — A Case Report

Parker Piorkowski, MS III; Caitlin Hof, MD

Introduction: Coccidioidomycosis and strongyloidiasis are endemic to the Southwestern United States, Mexico, and Central and South America. Pregnancy-related immunosuppression increases the risk of dissemination of coccidioidomycosis, including meningitis, and can uncover asymptomatic infections such as strongyloidiasis. Coinfection during pregnancy is rarely reported and presents diagnostic and therapeutic challenges.

Case Report: A 33-year-old pregnant patient at 26 weeks' gestation presented with headache and fever and was started on broad-spectrum antibiotics for fever of unknown origin. Brain MRI raised concern for stroke versus infection, prompting lumbar puncture. Cerebrospinal fluid showed an elevated opening pressure and protein, leukocytosis, and low glucose. A meningitis panel was negative, but antimicrobial therapy was continued and a stroke workup was completed. Head and neck imaging uncovered a superior lower lobe cavitary pulmonary lesion. The differential diagnosis included central nervous system tuberculosis or endemic fungal infection. QuantiFERON-TB Gold testing was negative; however, empiric therapy for CNS tuberculosis and amphotericin B were initiated. Later, bronchoscopy was used to rule out *Mycobacterium tuberculosis*. During admission, the patient developed progressive hydrocephalus. An external ventricular drain was placed, followed by transition to a ventriculopleural shunt. Plasma microbial cell-free DNA testing (Karius) returned positive for *Coccidioides posadasii*, later confirmed on CSF fungal culture. Strongyloides antibody testing was also positive. Due to high-dose steroid exposure in the setting of increased intracranial pressure and concern for Strongyloides hyperinfection, ivermectin was initiated. Antifungal therapy was transitioned to *lifelong* fluconazole for suppression and prophylaxis.

Conclusion: In pregnancy, treatment modalities must be weighed against the risks to the developing fetus, including the selection of antimicrobials and neurosurgical interventions. Early multidisciplinary evaluation of severe infection is critical to promote positive outcomes for both the mother and the fetus. This patient continued to recover and went on to deliver a healthy baby at 30 weeks' gestation.

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Artificial Intelligence Use in Clinical Reasoning Among Second-Year Medical Students: A Cross-Sectional Survey Study

David Redhage, MS I; William Allen, MS I; Arica Schuknecht; Roy Mortinsen, MD

Introduction: Generative artificial intelligence (AI) tools are increasingly used by medical students and may influence clinical reasoning. These systems can assist with information retrieval, differential diagnosis generation, and clinical decision support. Studies demonstrate widespread student interest in AI despite limited formal training. However, concerns remain regarding overreliance, inaccurate outputs, and effects on diagnostic reasoning. This study evaluated how second-year medical students use AI during clinical reasoning and their primary concerns.

Methods: We conducted a survey of second-year medical students at the USD Sanford School of Medicine. Students reported frequency of AI use for clinical reasoning tasks, including clarifying medical knowledge, generating differential diagnoses, prioritizing diagnoses, suggesting diagnostic tests, and recommending management strategies. Students also identified commonly used AI platforms and completed an open-ended question regarding concerns. Data were analyzed descriptively, with thematic review of qualitative responses.

Results: A total of 28 students completed the survey. AI use was widespread, with nearly all respondents reporting use. ChatGPT was the most commonly used platform (~90%), followed by OpenEvidence. Students most frequently used AI to suggest diagnostic tests, propose management strategies, and clarify medical knowledge, indicating early integration into clinical reasoning workflows. Common concerns included overreliance on AI, loss of independent diagnostic reasoning, and incorrect AI-generated information.

Conclusions: AI is already integrated into clinical reasoning among medical students. Educational efforts should emphasize critical evaluation and calibrated use of AI to support, rather than replace, independent diagnostic reasoning.

Nitrous Oxide-Induced Neuropathy from Misuse of Dental Supply: A Case Report

Jeffrey Schuch, MS III; Matthew Schmitz, MS III; Justin Persson, MD

Introduction: Nitrous oxide (N_2O) is a widely used inhaled anesthetic that has seen increasing recreational misuse in recent years. Chronic exposure can inactivate vitamin B12 through oxidation of its cobalt core, resulting in functional deficiency and subsequent neurologic injury. Because serum vitamin B12 levels may remain within the normal range, diagnosis can be delayed if clinicians are unaware of this mechanism. Increased recognition of N_2O-associated neurotoxicity is essential as misuse becomes more prevalent.

Case Report: We present the case of a 55-year-old woman with a history of daily N_2O inhalation obtained through the dental industry who presented to a family medicine clinic with acute-onset peripheral neuropathy, ataxia, and sensory disturbances. Laboratory evaluation demonstrated elevated methylmalonic acid and homocysteine levels despite normal serum vitamin B12, consistent with functional deficiency. Neurologic examination revealed diminished distal vibration and temperature sensation, areflexia, and a

neuropathic gait. Nerve conduction studies were largely normal. Management included cessation of N_2O exposure, vitamin B12 repletion, and symptomatic supportive care.

Conclusion: N_2O-induced neurotoxicity should be considered in patients presenting with new-onset neuropathy or gait disturbance and a history of possible exposure, even when serum vitamin B12 levels are normal. Recognition of functional vitamin B12 deficiency through elevated methylmalonic acid and homocysteine is critical for accurate diagnosis. Early identification and prompt cessation of N_2O exposure with vitamin B12 supplementation may prevent progression and improve neurologic outcomes.

Disseminated Gonococcal Infection in the Setting of Previous Syphilis: A Diagnostic Dilemma

Krishna Suresh, MBBS; Anna Sunny, MBBS; Nirmal Muthukumarasamy, MD

Introduction: Disseminated gonococcal infection (DGI) is an uncommon but serious complication of untreated *Neisseria gonorrhoeae* infection, which typically presents as either the classic dermatitis–tenosynovitis–migratory polyarthralgia syndrome or as septic arthritis. Diagnosis is often challenging because blood and synovial cultures are frequently negative.

Case Presentation: A 35-year-old male with past medical history of recurrent diverticulitis and syphilis, presented with arthritis involving the left knee and ankle, followed by a progressive rash starting on the palms and soles and spreading towards his trunk during a diverticulitis flare. History was notable for multiple sexual partners. Physical examination was significant for multiple skin lesions with variable morphology involving the palms and soles. Left knee joint exam revealed swelling and reduced range of motion. Labs showed elevated inflammatory markers, and reactive RPR of 1:32 with positive treponemal antibodies. Infective workup, including blood cultures, urine Chlamydia/gonorrhea NAAT were negative. Subsequent arthrocentesis of the left knee and left ankle revealed elevated nucleated cells (73,500/µl ankle, 76,250/µl knee) with positive monosodium urate crystals. Notably, broad range synovial PCR was positive for *N. gonorrhea* but joint cultures negative. He was diagnosed with DGI, and started on IV Ceftriaxone, and received IM Benzathine penicillin G weekly for 3 weeks for concurrent secondary syphilis.

Discussion: This case underscores the diagnostic value of targeted molecular testing in DGI, when urine NAAT and cultures are often negative. Since mucosal gonococcal infections are frequently asymptomatic or may have cleared before dissemination, urogenital testing alone may be misleading. Concurrent rash with stable RPR titers and history of prior syphilis raised concern for active secondary infection. This reinforces the need for comprehensive STI screening in all patients with DGI. Lastly, presence of monosodium urate crystals does not exclude septic arthritis. Clinicians should maintain suspicion for DGI in sexually active patients presenting with fever, rash, and arthritis despite initially negative screening tests.

Incidence of Pathogens in First Episode of Diabetic Foot Infections and Frequency of Empiric Coverage of Pathogens in Emergency Department and on Hospital Admission: A Retrospective Cohort Study

Mykayla Vollmer, MD; Thaddaus Hellwig, PharmD; Angela Roberts, MD; Ibrahim Ahmed, MD

Introduction: Diabetic foot infections (DFIs) are a common complication of diabetes mellitus and a leading cause of hospitalization. Due to the polymicrobial nature of these infections and delays in aerobic and anaerobic culture results, patients are often started on broad-spectrum antibiotics, which may lead to unnecessary antimicrobial use. The purpose of this study was to assess the incidence of methicillin-resistant *Staphylococcus aureus* (MRSA), *Pseudomonas aeruginosa*, and anaerobic organisms in DFIs. Secondary endpoints evaluated the frequency of empiric antibiotic coverage for these organisms in both the emergency department (ED) and on initial hospital admission.

Methods: This single-center retrospective study reviewed medical records over a five-year period for patients admitted with an initial DFI. The incidence of positive cultures for MRSA, Pseudomonas, and anaerobic organisms was compared with the frequency of empiric antimicrobial coverage for each. The incidence of these organisms was also compared between patients with and without hospitalization within the prior 90 days.

Results: Of the 184 patients in the study, 102 patients (55.43%) had cultures positive for one or more of the following: MRSA (17.0%), Pseudomonas (5.40%), and/or anaerobic organisms (45.10%). In the ED, 117 patients (63.59%) were treated empirically for MRSA, 111 patients (60.30%) were treated empirically for Pseudomonas, and 82 patients (44.60%) were treated empirically for anaerobes. On admission, 164 patients (89.10%) were treated empirically for MRSA, 140 patients (76.10%) were treated empirically for Pseudomonas, and 115 patients (62.50%) were treated empirically for anaerobes.

Conclusion: The study demonstrated rates of MRSA and Pseudomonas consistent with prior literature. However, rates of anaerobic organisms, which have historically been less studied in DFIs, were prominent. Despite this, empiric antimicrobial coverage for anaerobes was lowest among the organisms studied. This study may help guide clinicians in considering organism incidence and in selecting empiric parenteral antibiotic therapy.

Expanding Access to Vascular Care Using BlueDop Vascular Expert: A Prospective Cohort Study

Ben Van Bockern, MS III; Mason Woldt, MS III; Jacob R. Devine, MS IV; Alexander D.M. Withrow, MS III; Cole D. Tessendorf, MD; Chelsy Bleeker, RVT; Melissa Ostrem, RVT; Geoffrey A. Answini, MD; Mo Al-Qaisi, MD; Patrick W. Kelly, MD

Introduction: Peripheral artery disease (PAD) affects millions of individuals annually and can lead to severe morbidity and mortality. Risk factors for development of PAD include hypertension, obesity, diabetes mellitus, and smoking. Conventional methods to detect PAD include the Ankle-Brachial Index (ABI) with duplex ultrasound being the gold standard for diagnosis. Factors such as vessel compressibility, cuff placement, patient positioning, and sequence of measurements serve as limitations or sources of inaccuracy for ABI.

The South Dakota Department of Health (DOH) Office of Family Nutrition Services (OFNS) is gathering feedback to better understand the need for nutrition services available to patients, identify gaps in nutrition support across South Dakota, and learn about barriers that limit access to these services. The information collected will help DOH develop nutrition programming that is tailored to the needs of communities and individuals across the state.

DOH Nutrition Services

BlueDop Vascular Expert (BVE) is an artificial intelligence (AI) powered device that offers a standardized, accurate, and reliable method to detect early PAD development regardless of comorbidities. The device is portable, user-friendly, easy to interpret and has the potential to expand early PAD detection.

Method: Individuals at risk for PAD underwent both ABI and BVE testing. Full leg arterial duplex interpreted by an independent vascular surgeon served as the reference standard. Subgroup analysis compared BVE and ABI capabilities among those with underlying comorbidities such as diabetes mellitus, hypertension, tobacco use, and obesity. Data from two cohorts were used: this study and Tessendorf et al.

Results: For all-comers overall accuracy was 91.2% and 80.6% for BVE and ABI respectively. Overall sensitivity for BVE was 82.5% and specificity was 93.9%. In contrast, ABI sensitivity was 58.3%, specificity was 87.4%. Increased accuracy, sensitivity, specificity, and κ constant was present in all analyzed subgroups when comparing BVE to ABI.

Conclusion: Across diverse patient populations, BVE provides more accurate and reliable PAD screening than ABI, including those with comorbidities that reduce ABI accuracy. BVE's portability, usability, and minimal reliance on specialized interpretation support it as a first-line screening tool, particularly in rural and underserved settings. Broader implementation of BVE could help reduce diagnostic disparities and improve outcomes for patients at risk of PAD.

Diagnostic Delays and Impediments in Managing CRAO for Better Outcomes: A Retrospective Cohort Study of Barriers to Thrombolysis Across a Regional Health System from 2018–2025

Mason Woldt, MS III; Brendan Rezich, MS III; Srinivas Bandi, MD

Introduction: Central retinal artery occlusion (CRAO) is an ophthalmic emergency analogous to acute ischemic stroke, presenting with sudden painless vision loss and carrying a poor visual prognosis. The use of thrombolysis in managing CRAO remains controversial; recent randomized trials have not demonstrated statistically significant improvement in visual outcomes, though authors acknowledge potential underpowering to detect a clinically meaningful effect, with larger trials ongoing. Observational data suggest time-dependent treatment effects within a 4.5-hour window. Regardless of treatment efficacy, rapid recognition and evaluation within this narrow therapeutic window are essential for time-sensitive intervention. This study evaluated CRAO incidence and barriers to timely diagnosis within a regional healthcare system.

Methods: Retrospective chart review of patients diagnosed with CRAO across Avera Health facilities (June 2018-September 2025). Cases were identified using ICD-10 codes and confirmed through medical record review. Thrombolysis rates were used as a process measure to identify workflow inefficiencies. Data included presentation site, referral pathways, time from symptom onset to presentation, and thrombolysis eligibility and administration.

Results: Of 107 patients identified, 67 had complete documentation. Initial presentation occurred across multiple settings: 36 (53.7%) to the emergency department, 31 (46.3%) to ophthalmology/optometry/outpatient settings. Forty-three patients (64.2%) presented >4.5 hours after symptom onset. Among 24 presenting within the window, 7 (29%) received thrombolysis, 4 (16.7%) had contraindications to thrombolysis,

and 13 (54.2%) either presented to or were referred to ophthalmology for evaluation, all of whom were diagnosed outside the treatment window.

Conclusion: Timely CRAO evaluation remains uncommon due to delayed presentation and diagnostic delays awaiting ophthalmologic consultation. Among patients presenting within the treatment window, just 45.8% received time-sensitive treatment options. Referral for ophthalmologic evaluation prior to emergency department diagnosis was the most common barrier (54.2%). Streamlined triage pathways, emergency department education, and remote retinal imaging may facilitate earlier diagnosis and preserve treatment opportunities.

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The medical team representing the Board's regulated professions

South Dakota Board of Medical and Osteopathic Examiners

- **Protects the health and welfare of the state's citizens by ensuring that qualified medical health care professionals are licensed to practice in South Dakota**
- **Establishes regulations by proposing legislation and adopting administrative rules**
- **Provides Safe Haven, supports, and promotes confidential monitoring of its healthcare providers**
- **Licenses and regulates 14,900 licensees**

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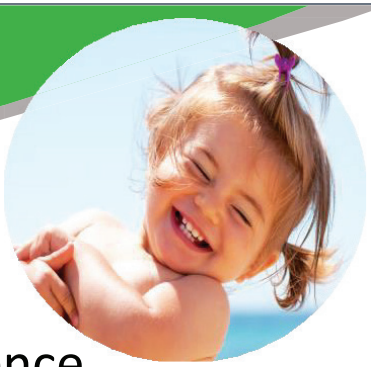
Board News is a monthly feature sponsored by the South Dakota Board of Medical and Osteopathic Examiners. For more information, contact the Board at SDBMOE@state.sd.us or write to SDBMOE, 101 N. Main Avenue, Suite 301, Sioux Falls, SD 57104.

Partners for Prevention



You Can Make a Difference in Children's Oral Health

- In FY 2025, 2,916 SD Medicaid children received dental care under general anesthesia
- Fluoride varnish reduces tooth decay by up to 37%
- Learn how to apply fluoride varnish at a FREE lunch and learn

Contact Cori Jacobson at 605-494-2552 or via e-mail at cori.jacobson@deltadentalsd.com to schedule a training today!

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