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HENRY FORD HEALTH

Henry Ford Health Publication List – October 2022

This bibliography aims to recognize the scholarly activity and provide ease of access to journal articles, meeting abstracts, book chapters, books and other works published by Henry Ford Health personnel. Searches were conducted in PubMed, Embase, and Web of Science during the month, and then imported into EndNote for formatting. There are 91 unique citations listed this month, with 86 articles and 5 conference abstracts.

Articles are listed first, followed by conference abstracts. Because of various limitations, this does not represent an exhaustive list of all published works by Henry Ford Health authors.

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Articles

Allergy and Immunology
Anesthesiology
Behavioral Health Services/Psychiatry/Neuropsychology
Cardiology/Cardiovascular Research
Center for Health Policy and Health Services Research
Dermatology
Diagnostic Radiology
Emergency Medicine
Endocrinology and Metabolism
Family Medicine
Gastroenterology
Hematology-Oncology
Hospital Medicine
Infectious Diseases
Internal Medicine
Neurology
Neurosurgery
Ophthalmology and Eye Care Services
Orthopedics/Bone and Joint Center
Otolaryngology – Head and Neck Surgery
Pathology and Laboratory Medicine
Pharmacy
Public Health Sciences
Pulmonary and Critical Care Medicine
Radiation Oncology
Sleep Medicine
Surgery
Urology

Conference Abstracts

Anesthesiology
Neurosurgery
Surgery

Articles

Allergy and Immunology

Eapen AA, **Sitarik AR**, **Cheema G**, **Kim H**, Ownby D, **Johnson CC**, and **Zoratti E**. Effect of prenatal dog exposure on eczema development in early and late childhood. *J Allergy Clin Immunol Pract* 2022; Epub ahead of print. PMID: 36229332. Full Text

Division of Allergy and Clinical Immunology, Department of Medicine, Henry Ford Health, Detroit, MI. Electronic address: aeapen1@hfhs.org.
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Division of Allergy and Clinical Immunology, Department of Medicine, Henry Ford Health, Detroit, MI.
Department of Pediatrics, Augusta University, Augusta, Ga.

Anesthesiology

Penning DH, Jones B, **Fayed M**, **Han X**, and **Brodie C**. Effect of cocaine on potassium-evoked release of glutamate from fetal rat brain synaptosomes. *Cureus* 2022; 14(10). PMID: Not assigned. Full Text

Introduction: Cocaine use during pregnancy can affect fetal brain development. A fetal brain injury could happen from the direct effect of cocaine on the developing brain or from the reduction of placental perfusion from vasoconstriction, which may lead to hypoxia-ischemia. A potential mechanism for brain injury could be due to a neurotransmitter imbalance within the brain, especially glutamate. In an immature rat brain synaptosome model, we explored the additive effect of cocaine alone on glutamate release and the effect of cocaine combined with simulated hypoxic depolarization using potassium as a surrogate. Method: Rat pups' brains were dissected and placed on a chilled petri dish. They then entered the experimental protocol. The suspended synaptosomes were divided equally into four experimental groups (control, high potassium "surrogate to hypoxic stimulation," cocaine, and cocaine + high K). Reversed-phase high-performance liquid chromatography analyzed glutamate with fluorescent detection. Results: The glutamate level was lowest in the cocaine-only group, with a level of 1.96 × 104, compared to the control and high potassium group. However, combining cocaine with high potassium seemed to generate a synergistic effect, achieving the highest glutamate level of all groups with a value of 5.31 × 104. Post hoc Conover's test for multiple pairwise-comparison between groups was done. In comparing various solutions to control, we did not find a statistically significant difference with the cocaine-only solution with a p-value of 0.074. Also, on comparing various other solutions to each other, there was no statistically significant difference between cocaine vs. cocaine + high potassium a p-value of 0.074. Conclusion: Our data support the conclusion that cocaine alone does not induce glutamate release from fetal rat brain synaptosomes. Exposure to high potassium does lead to glutamate release. However, cocaine greatly enhances glutamate release in the presence of high potassium levels. This could explain how cocaine affects brain maturation during pregnancy with a low oxygen tension environment in the placenta. This hypothesis should be tested in vivo.

Anesthesiology

Rajan S, **Ahuja S**, Cohen B, Martin A, Pursell A, Liang C, Mao G, Komatsu R, Farag E, and Sessler DI. Chronic Use of Angiotensin Converting Enzyme Inhibitors and/or Angiotensin Receptor Blockers is Not Associated With Stroke After Noncardiac Surgery: A Retrospective Cohort Analysis. *J Neurosurg Anesthesiol* 2022; 34(4):401-406. PMID: 34569768. Full Text

Departments of Outcomes Research.
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Division of Anesthesia, Critical Care, and Pain Management, Tel-Aviv Medical Center, Tel-Aviv, University, Tel-Aviv, Israel.
General Anesthesiology.
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BACKGROUND: Inhibition of the renin-angiotensin-aldosterone pathways reduces blood pressure and proliferation of vascular smooth muscles and may therefore reduce the risk of stroke. We tested the hypothesis that patients taking angiotensin converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) for at least 6 months have fewer postoperative strokes after non-neurological, noncarotid, and noncardiac surgeries than those who do not. METHODS: We considered adults who had noncardiac surgery at the Cleveland Clinic between January 2005 and December 2017. After excluding neurological and carotid surgeries, we assessed the confounder-adjusted association between chronic use of ACEIs/ARBs (during 6 preoperative months) and the incidence of postoperative stroke using logistic regression models. RESULTS: Postoperative strokes occurred in 0.26% (27/10,449) of patients who were chronic ACEI/ARBs users and in 0.18% (112/62,771) of those who were not. There was no significant association between ACEI/ARB use and postoperative stroke, with an adjusted odds ratio of 1.15 (95% confidence interval [CI]: 0.91-1.44; P =0.24). Secondarily, there was no association between exposures to ACEIs and postoperative stroke, versus no such exposure (adjusted odds ratio 0.88, 95% CI: 0.65-1.19; P =0.33). Similarly, there was no association between exposure to ARBs and postoperative stroke, versus no such exposure (adjusted odds ratio 1.05, 95% CI: 0.75-1.48; P =0.75). CONCLUSION: We did not detect an effect of chronic ACEI/ARB use on postoperative strokes in patients who had non-neurological, noncarotid and noncardiac surgery; however, power was extremely limited.

Anesthesiology

Syed S, **Ayala R**, and **Fidkowski CW**. Bilateral erector spinae plane catheters for labor analgesia in the setting of idiopathic thrombocytopenia purpura. *Int J Obstet Anesth* 2022; 52:103602. PMID: 36270054. Full Text

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Behavioral Health Services/Psychiatry/Neuropsychology

Holm AM, Fedson S, Courtwright A, Olland A, **Bryce K**, Kanwar M, Sweet S, Egan T, and Lavee J. International society for heart and lung transplantation statement on transplant ethics. *J Heart Lung Transplant* 2022; 41(10):1307-1308. PMID: 35871113. Full Text

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Heart Transplantation Unit, Leviev Cardiothoracic Center, Sheba Medical Center, Faculty of Medicine, Tel Aviv University, Ramat Gan, Israel.

Cardiology/Cardiovascular Research

Cascino TM, Colvin MM, **Lanfear DE**, Richards B, Khalatbari S, Mann DL, Taddei-Peters WC, Jeffries N, Watkins DC, Stewart GC, and Aaronson KD. Racial Inequities in Access to Ventricular Assist Device and Transplant Persist After Consideration for Preferences for Care: A Report From the REVIVAL Study. *Circ Heart Fail* 2022; e009745. Epub ahead of print. PMID: 36259388. Full Text

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BACKGROUND: Racial disparities in access to advanced therapies for heart failure (HF) patients are well documented, although the reasons remain uncertain. We sought to determine the association of race on utilization of ventricular assist device (VAD) and transplant among patients with access to care at VAD centers and if patient preferences impact the effect. METHODS: We performed an observational cohort study of ambulatory chronic systolic HF patients with high-risk features and no contraindication to VAD enrolled at 21 VAD centers and followed for 2 years in the REVIVAL study (Registry Evaluation of Vital Information for VADs in Ambulatory Life). We used competing events cause-specific proportional hazard methodology with multiple imputation for missing data. The primary outcomes were (1) VAD/transplant and (2) death. The exposures of interest included race (Black or White), additional demographics, captured social determinants of health, clinician-assessed HF severity, patient-reported quality of life, preference for VAD, and desire for therapies. RESULTS: The study included 377 participants, of whom 100 (26.5%) identified as Black. VAD or transplant was performed in 11 (11%) Black and 62 (22%) White participants, although death occurred in 18 (18%) Black and 36 (13%) White participants. Black race was associated with reduced utilization of VAD and transplant (adjusted hazard ratio, 0.45 [95% CI, 0.23-0.85]) without an increase in death. Preferences for VAD or life-sustaining therapies were similar by race and did not explain racial disparities. CONCLUSIONS: Among patients receiving care by advanced HF cardiologists at VAD centers, there is less utilization of VAD and transplant for Black patients even after adjusting for HF severity, quality of life, and social determinants of health, despite similar care preferences. This residual inequity may be a consequence of structural racism and discrimination or provider bias impacting decision-making. REGISTRATION: URL: https://www. CLINICALTRIALS: gov; Unique identifier: NCT01369407.

Cardiology/Cardiovascular Research

Kostantinis S, Simsek B, Karacsonyi J, **Alaswad K**, **Basir MB**, **Megaly M**, Gorgulu S, Krestyaninov O, Khelimskii D, Davies RE, Benton SM, Khatri JJ, ElGuindy AM, Goktekin O, Abi Rafeh N, Allana S, Brilakis ES, and Prasad M. Gender differences in chronic total occlusion percutaneous coronary interventions: Insights from the PROGRESS-CTO registry. *Catheter Cardiovasc Interv* 2022; Epub ahead of print. PMID: 36284458. Full Text

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BACKGROUND: There are limited data describing gender differences in patients undergoing chronic total occlusion (CTO) percutaneous coronary interventions (PCI). METHODS: We compared baseline clinical and angiographic characteristics and procedural outcomes between men and women among 9457 CTO PCIs performed at 38 centers between 2012 and 2022. RESULTS: A total of 7687 (81%) men and 1770 (19%) women were treated. Women were older, more likely to have comorbidities such as diabetes,

hypertension and peripheral arterial disease, and had higher left ventricular ejection fraction. The most common CTO target vessel was the right coronary artery for both men (53%) and women (52%), although the left anterior descending artery was more frequently the target vessel among women (31% vs. 25%; $p < 0.001$). The J-CTO score (2.4 ± 1.3 vs. 2.2 ± 1.2; $p < 0.001$) as well as the PROGRESS-CTO score (1.3 ± 1.0 vs. 1.1 ± 1.0; $p < 0.001$) were higher among men. In female patients, antegrade wiring was more frequently the initial crossing strategy (87.6% vs. 82.4%; $p < 0.001$) and was more successful in crossing the target lesion (62.7% vs. 54.0%; $p < 0.001$) compared with men. Interventions in men required longer procedure time and fluoroscopy time, as well as higher air kerma radiation dose and contrast volume when compared to women. Technical (89% vs. 86%; $p < 0.001$) and procedural (87% vs. 84%; $p = 0.003$) success rates were higher among women. In-hospital major adverse cardiovascular events (MACE) were also higher in women (2.9% vs. 1.8%; $p < 0.001$). CONCLUSIONS: Women undergoing CTO PCI had higher technical and procedural success rates, but also higher in-hospital MACE compared with men.

Cardiology/Cardiovascular Research

Kostantinis S, Simsek B, Karacsonyi J, **Alaswad K**, Jaffer FA, Khatri JJ, Choi JW, Jaber WA, Rinfret S, Nicholson W, Patel MP, Mahmud E, Toma C, Davies RE, Kerrigan JL, Haddad EV, Gorgulu S, Abi-Rafeh N, ElGuindy AM, Goktekin O, Allana S, Burke MN, Mastrodemos OC, Rangan BV, and Brilakis E. Development and validation of a scoring system for predicting clinical coronary artery perforation during percutaneous coronary intervention of chronic total occlusions: the PROGRESS-CTO perforation score. *EuroIntervention* 2022; Epub ahead of print. PMID: 36281650. Request Article

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BACKGROUND: Coronary artery perforation is a feared complication of chronic total occlusion (CTO) percutaneous coronary intervention (PCI) and often leads to serious adverse clinical events. AIMS: We sought to develop a risk score to predict clinical coronary artery perforation in patients undergoing CTO PCI. METHODS: We analysed clinical and angiographic parameters from 9,618 CTO PCIs in the Prospective Global Registry for the Study of Chronic Total Occlusion Intervention (PROGRESS-CTO). Logistic regression prediction modelling was used to identify variables independently associated with clinical perforation, and the model was internally validated with bootstrapping. Clinical coronary artery perforation was defined as any perforation requiring treatment. RESULTS: The incidence of clinical coronary perforation was 3.8% (n=367). Five factors were independently associated with perforation and were included in the score: patient age ≥65 years +1 point (odds ratio [OR] 1.79, 95% confidence interval [CI]: 1.37-2.33), moderate/severe calcification +1 point (OR 1.85, 95% CI: 1.41-2.42), blunt/no stump +1 point (OR 1.45, 95% CI: 1.10-1.92), use of antegrade dissection and re-entry +1 point (OR 2.43, 95% CI: 1.61-3.69), and use of the retrograde approach +2 points (OR 4.02, 95% CI: 2.95-5.46). The resulting score showed acceptable performance on receiver operating characteristic (ROC) curve (area under the curve [AUC]: 0.741, 95% CI: 0.712-0.773). The Hosmer-Lemeshow test indicated a good fit (p=0.991), and internal validation with bootstrapping demonstrated good agreement with the model with observed AUC: 0.736 (95% bias-corrected CI: 0.706-0.767). CONCLUSIONS: The PROGRESS-CTO perforation score may be a useful tool for predicting clinical coronary perforation during CTO PCI.

Cardiology/Cardiovascular Research

Lanfear DE, and Reza N. Myosin-Related Dilated Cardiomyopathy: Another Elephant Emerges From Darkness. *J Am Coll Cardiol* 2022; 80(15):1462-1464. PMID: 36202535. Full Text

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Cardiology/Cardiovascular Research

Lansky AJ, Tirziu D, Moses JW, Pietras C, Ohman EM, **O'Neill WW**, Ekono MM, Grines CL, and Parise H. Impella Versus Intra-Aortic Balloon Pump for High-Risk PCI: A Propensity-Adjusted Large-Scale Claims Dataset Analysis. *Am J Cardiol* 2022; Epub ahead of print. PMID: 36210212. Full Text

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Impella was approved by the Food and Drug Administration in 2015 for use during high-risk percutaneous coronary interventions (PCIs); however, its safety and efficacy compared with intra-aortic balloon pump (IABP) has not been evaluated in contemporary practice and remains debated. We aimed to compare postapproval outcomes and costs of Impella versus IABP support for high-risk PCI in real-world practice across hospitals in the United States. We identified patients from the Premier Healthcare Database undergoing nonemergent Impella- or IABP-supported high-risk PCI. We used propensity adjustment to control baseline, procedure, and post-PCI medical treatment differences between treatment groups. We included patients undergoing nonemergent single-PCI procedures with either Impella or IABP support and excluded patients presenting with acute ST-elevation myocardial infarction or cardiogenic shock or requiring >1 mechanical support devices during index hospitalization. Outcomes included in-hospital survival, myocardial infarction (MI), cardiogenic shock, stroke, bleeding requiring transfusion, acute kidney injury, index hospitalization length of stay, and costs. From April 2016 to June 2019, a total of 48,179 patients were treated with Impella or IABP mechanical circulatory support at 304 hospitals in the United States. Among these, we identified 2,156 patients undergoing nonemergent high-risk PCI treated with Impella (n = 1,447) or IABP (n = 709). After propensity adjustment, Impella use was associated with improved survival (odds ratio [OR] 1.55, 95% confidence interval [CI] 1.02 to 2.36) and less MI (OR 0.29, 95% CI 0.18 to 0.46) and cardiogenic shock (OR 0.54, 95% CI 0.39 to 0.74). Stroke, bleeding requiring transfusion, and acute kidney injury were similar between groups. In conclusion, this Premier Healthcare Database propensity-adjusted analysis, Impella use during nonemergent high-risk PCI was associated with improved survival and reduced in-hospital MI and cardiogenic shock compared with IABP.

Cardiology/Cardiovascular Research

Ortega-Paz L, Talasaz AH, Sadeghipour P, Potpara TS, **Aronow HD**, Jara-Palomares L, Sholzberg M, Angiolillo DJ, Lip GYH, and Bikdeli B. COVID-19-Associated Pulmonary Embolism: Review of the Pathophysiology, Epidemiology, Prevention, Diagnosis, and Treatment. *Semin Thromb Hemost* 2022; Epub ahead of print. PMID: 36223804. Full Text

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Respiratory Unit, Hospital Universitario Virgen del Rocio, Sevilla, Spain.
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Department of Clinical Medicine, Aalborg University, Aalborg, Denmark.
Division of Cardiovascular Medicine, Brigham and Women's Hospital, Boston, Massachusetts.
Thrombosis Research Group, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts.
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COVID-19 is associated with endothelial activation in the setting of a potent inflammatory reaction and a hypercoagulable state. The end result of this thromboinflammatory state is an excess in thrombotic events, in particular venous thromboembolism. Pulmonary embolism (PE) has been of special interest in patients with COVID-19 given its association with respiratory deterioration, increased risk of intensive care unit admission, and prolonged hospital stay. The pathophysiology and clinical characteristics of COVID-19-associated PE may differ from the conventional non-COVID-19-associated PE. In addition to embolic events from deep vein thrombi, in situ pulmonary thrombosis, particularly in smaller vascular beds, may be relevant in patients with COVID-19. Appropriate prevention of thrombotic events in COVID-19 has therefore become of critical interest. Several changes in viral biology, vaccination, and treatment management during the pandemic may have resulted in changes in incidence trends. This review provides an overview of the pathophysiology, epidemiology, clinical characteristics, and risk factors of COVID-19-associated PE. Furthermore, we briefly summarize the results from randomized controlled trials of preventive antithrombotic therapies in COVID-19, focusing on their findings related to PE. We discuss the acute treatment of COVID-19-associated PE, which is substantially similar to the management of conventional non-COVID-19 PE. Ultimately, we comment on the current knowledge gaps in the evidence and the future directions in the treatment and follow-up of COVID-19-associated PE, including long-term management, and its possible association with long-COVID.

Cardiology/Cardiovascular Research

Sedhom R, **Megaly M**, Elbadawi A, Yassa G, Weinberg I, Gulati M, and Elgendy IY. Sex Differences in Management and Outcomes Among Patients With High-Risk Pulmonary Embolism: A Nationwide Analysis. *Mayo Clin Proc* 2022; 97(10):1872-1882. PMID: 36202496. Full Text

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OBJECTIVE: To examine the sex differences in management and outcomes among patients with high-risk acute pulmonary embolism (PE). PATIENTS AND METHODS: The Nationwide Readmissions Database was used to identify hospitalizations with high-risk PE from January 1, 2016, to December 31,

2018. Differences in use of advanced therapies, in-hospital mortality, and bleeding events were compared between men and women. RESULTS: A total of 125,901 weighted hospitalizations with high-risk PE were identified during the study period; 46.3% were women (n=58,253). Women were older and had a higher prevalence of several comorbidities and risk factors of PE such as morbid obesity, diabetes mellitus, chronic pulmonary disease, heart failure, and metastatic cancer. Systemic thrombolysis and catheter-directed interventions were more commonly used among women; however, mechanical circulatory support was less frequently used. In-hospital mortality was higher among women in the unadjusted analysis (30.7% vs 27.8%, P<.001) and after propensity score matching (odds ratio [OR], 1.16; 95% confidence interval [CI], 1.08 to 1.25; P<.001), whereas the rates of intracranial hemorrhage and non-intracranial hemorrhage were not different. On multivariate regression analysis, female sex (OR, 1.18; 95% CI, 1.15 to 1.21; P<.001) was independently associated with increased odds of in-hospital mortality. CONCLUSION: In this contemporary observational cohort of patients admitted with high-risk PE, women had higher rates of in-hospital mortality despite receiving advanced therapies more frequently, whereas the rate of major bleeding events was not different from men. Efforts are needed to minimize the excess mortality observed among women.

Cardiology/Cardiovascular Research

Spehar SM, Seth M, Henke P, **Alaswad K**, Schreiber T, Berman A, Syrjamaki J, Ali OE, Bader Y, **Nerenz D**, Gurm H, and Sukul D. Race and Outcomes after Percutaneous Coronary Intervention: Insights from the Michigan Blue Cross Blue Shield Cardiovascular Consortium. *Am Heart J* 2022; Epub ahead of print. PMID: 36216076. Full Text

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BACKGROUND: Current studies show similar in-hospital outcomes following percutaneous coronary intervention (PCI) between Black and White patients. Long-term outcomes and the role of individual and community-level socioeconomic factors in differential risk are less understood. METHODS: We linked clinical registry data from PCIs performed between 1/2013 and 3/2018 at 48 Michigan hospitals to Medicare Fee-for-service claims. We analyzed patients of Black and White race. We used propensity score matching and logistic regression models to estimate the odds of 90-day readmission and Cox regression to evaluate the risk of post-discharge mortality. We used mediation analysis to evaluate the proportion of association mediated by socioeconomic factors. RESULTS: Of the 29,317 patients included in this study, 10.28% were Black and 89.72% were White. There were minimal differences between groups regarding post-PCI in-hospital outcomes. Compared with White patients, Black patients were more likely to be readmitted within 90-days of discharge (adjusted OR 1.62, 95% CI [1.32-2.00]) and had significantly higher risk of all-cause mortality (adjusted HR 1.45, 95% CI 1.30-1.61) when adjusting for age and gender. These associations were significantly mediated by dual eligibility (proportion mediated [PM] for readmission: 11.0%; mortality: 21.1%); dual eligibility and economic well-being of the patient's community (PM for readmission: 22.3%; mortality: 43.0%); and dual eligibility, economic well-being of the community, and baseline clinical characteristics (PM for readmission: 45.0%; mortality: 87.8%). CONCLUSIONS: Black patients had a higher risk of 90-day readmission and cumulative mortality following PCI compared with White patients. Associations were mediated by dual eligibility, community economic well-being, and traditional cardiovascular risk factors. Our study highlights the need for

improved upstream care and streamlined post-discharge care pathways as potential strategies to improve health care disparities in cardiovascular disease.

Cardiology/Cardiovascular Research
Varghese MS, Beatty A, Song Y, Xu J, Sperling LS, Fonarow GC, **Keteyian SJ**, McConeghy KW, Penko J, Yeh RW, Figueroa JF, Wu WC, and Kazi DS. Cardiac Rehabilitation and the COVID-19 Pandemic: Persistent Declines in CR Participation and Access Among US Medicare Beneficiaries. *Circ Cardiovasc Qual Outcomes* 2022; Epub ahead of print. PMID: 36314139. Full Text

Richard A. and Susan F. Smith Center for Outcomes Research in Cardiology, Beth Israel Deaconess Medical Center, Boston, MA; Harvard Medical School, Boston, MA.
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Background: The impact of the COVID-19 pandemic on participation in and availability of cardiac rehabilitation (CR) is unknown. Methods: Among eligible Medicare fee-for-service beneficiaries, we evaluated, by month, the number of CR sessions attended per 100,000 beneficiaries, individuals eligible to initiate CR, and centers offering in-person CR between January 2019 and December 2021. We compared these outcomes between two periods: December 1, 2019 through February 28, 2020 (period 1, prior to declaration of the pandemic-related national emergency) and October 1, 2021 through December 31, 2021 (period 2, the latest period for which data are currently available). Results: In period 1, Medicare beneficiaries participated in (mean ± SD) 895 ± 84 CR sessions per 100,000 beneficiaries each month. After the national emergency was declared, CR participation sharply declined to 56 CR sessions per 100,000 beneficiaries in April 2020. CR participation recovered gradually through December 2021, but remained lower than pre-pandemic levels (Period 2: 698 ± 29 CR sessions per month per 100,000 beneficiaries, p=.02). Declines in CR participation were most marked among dual Medicare and Medicaid enrollees, and patients residing in rural areas or socially vulnerable communities. There was no statistically significant change in CR eligibility between the two periods. Compared with 2,618 ± 5 CR centers in period 1, there were 2,464 ± 7 in period 2 (p<0.01). Compared with CR centers that survived the pandemic, 220 CR centers that closed were more likely to be affiliated with public hospitals, located in rural areas, and serve the most socially vulnerable communities. Conclusions: The COVID-19 pandemic was associated with a persistent decline in CR participation and the closure of CR centers, which disproportionately affected rural and low-income patients and the most socially vulnerable communities. Innovation in CR financing and delivery is urgently needed to equitably enhance CR participation among Medicare beneficiaries.

Cardiology/Cardiovascular Research
Villablanca PA, **Al-Darzi W**, **Boshara A**, **Hana A**, **Basir M**, **O'Neill B**, **Frisoli T**, **Lee J**, **Wang DD**, and **O'Neill WW**. Left Atrial Venoarterial Extracorporeal Membrane Oxygenation for Patients in Cardiogenic

Shock and Acute Aortic Regurgitation. *JACC Cardiovasc Interv* 2022; 15(20):2112-2114. PMID: 36265949. Full Text

Center for Health Policy and Health Services Research
Jones-Hepler B, Silva S, Elmore K, **Vance A**, Harney J, and Brandon D. Exploring Environmental Factors Contributing to Fluid Loss in Diapers Placed in Neonatal Incubators. *Adv Neonatal Care* 2022; Epub ahead of print. PMID: 36191332. Full Text

Duke University School of Nursing, Durham, North Carolina (Ms Jones-Hepler and Drs Silva and Brandon); Medical University of South Carolina Health, Charleston (Ms Elmore); Center for Health Policy and Health Services Research, Henry Ford Health System, Detroit, Michigan (Dr Vance); and University of Wisconsin Madison School of Nursing, Madison (Dr Harney).

PURPOSE: Assessing fluid output for infants in the neonatal intensive care unit is essential to understanding fluid and electrolyte balance. Wet diaper weights are used as standard practice to quantify fluid output; yet, diaper changes are intrusive and physiologically distressing. Less frequent diaper changes may have physiologic benefits but could alter diaper weights following extended intervals. METHODS: This pilot study examined the impact of initial diaper fluid volume, incubator air temperature and humidity, and diaper brand on wet diaper weight over time. Baseline fluid volume was instilled, and then diapers were placed in a neonatal incubator. Wet diaper weight was assessed longitudinally to determine changes in fluid volume over time. A factorial design with repeated measures (baseline, 3 hours, and 6 hours) was used to explore the effects of diaper brand (brand 1 vs brand 2), baseline fluid volume (3 mL vs 5 mL), and incubator temperature (28°C vs 36°C) and humidity (40% vs 80%) on the trajectory of weight in 80 diapers. RESULTS: Wet diaper weight was significantly reduced over 6 hours ($P < .005$). However, wet diaper weight increased in 80% humidity, but decreased in the 40% humidity over time ($P < .0001$). Baseline fluid volume, incubator temperature, and diaper brand did not influence wet diaper weight over time (all $P > .05$). IMPLICATIONS: Understanding environmental factors that influence the trajectory of wet diaper weight may support clinicians in optimizing the interval for neonatal diaper changes to balance the impact of intrusive care with need to understand fluid volume loss.

Center for Health Policy and Health Services Research
Kalmbach DA, **Cheng P**, **Ahmedani BK**, **Peterson EL**, **Reffi AN**, **Sagong C**, **Seymour GM**, **Ruprich MK**, and **Drake CL**. Cognitive-behavioral therapy for insomnia prevents and alleviates suicidal ideation: Insomnia remission is a suicidolytic mechanism. *Sleep* 2022; Epub ahead of print. PMID: 36242607. Full Text

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STUDY OBJECTIVES: Insomnia is associated with elevated levels of suicidal thoughts and behaviors. Emerging evidence suggests that cognitive behavioral therapy for insomnia (CBTI) may reduce suicidal ideation (SI). However, the role of digital therapeutics in both the alleviation and prevention of SI remains unclear, and treatment mechanisms facilitating SI reductions have not been clearly identified. METHOD: 658 adults with DSM-5 insomnia disorder enrolled into a single-site randomized controlled trial evaluating the efficacy of digital CBTI relative to attention control. Outcomes were measured at pretreatment, posttreatment, and 1-year follow-up. RESULTS: Before treatment, 126 patients endorsed SI (19.1% prevalence). Among those with baseline SI, CBTI patients reported lower SI rates at posttreatment (30.0% vs 54.5%, p=.005) and 1-year follow-up (29.6% vs 46.8%, p=.042) relative to control. PRODCLIN analysis estimated that half of suicidolytic effects of CBTI were mediated through insomnia remission. Among those without baseline SI, CBTI did not directly prevent new onset SI. However, insomnia remitters reported lower rates of new onset SI at posttreatment relative to non-remitters (1.5% vs 6.5%, p=.009). Mediation analysis supported a significant indirect effect wherein CBTI increased likelihood of insomnia remission, which was associated with SI prevention ($\alpha\beta$=-3.13=5, 95%CI=-5.28, -0.96). CONCLUSION: Digital CBTI reduces insomnia symptoms, which promotes SI alleviation and prevention.

For non-suicidal patients, digital CBTI may serve as a highly accessible monotherapy for improving sleep, thereby reducing risk for SI. For suicidal patients, digital CBTI may be appropriately administered as an adjunct treatment to support mainline intervention more directly targeting suicidogenic thoughts.

Center for Health Policy and Health Services Research
Lim S, **Yeh HH**, **Macki M**, **Haider S**, **Hamilton T**, **Mansour TR**, **Telemi E**, **Schultz L**, **Nerenz DR**, **Schwalb JM**, **Abdulhak M**, Park P, Aleem I, Easton R, Khalil JG, Perez-Cruet M, and **Chang V**. Postoperative opioid prescription and patient-reported outcomes after elective spine surgery: a Michigan Spine Surgery Improvement Collaborative study. *J Neurosurg Spine* 2022; 1-7. Epub ahead of print. PMID: 36208431. Full Text

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OBJECTIVE: This study was designed to assess how postoperative opioid prescription dosage could affect patient-reported outcomes after elective spine surgery. METHODS: Patients enrolled in the Michigan Spine Surgery Improvement Collaborative (MSSIC) from January 2020 to September 2021 were included in this study. Opioid prescriptions at discharge were converted to total morphine milligram equivalents (MME). A reference value of 225 MME per week was used as a cutoff. Patients were divided into two cohorts based on prescribed total MME: ≤ 225 MME and > 225 MME. Primary outcomes included patient satisfaction, return to work status after surgery, and whether improvement of the minimal clinically important difference (MCID) of the Patient-Reported Outcomes Measurement Information System 4-question short form for physical function (PROMIS PF) and EQ-5D was met. Generalized estimated equations were used for multivariate analysis. RESULTS: Regression analysis revealed that patients who had postoperative opioids prescribed with > 225 MME were less likely to be satisfied with surgery (adjusted OR [aOR] 0.81) and achieve PROMIS PF MCID (aOR 0.88). They were also more likely to be opioid dependent at 90 days after elective spine surgery (aOR 1.56). CONCLUSIONS: The opioid epidemic is a serious threat to national public health, and spine surgeons must practice conscientious postoperative opioid prescribing to achieve adequate pain control. The authors' analysis illustrates that a postoperative opioid prescription of 225 MME or less is associated with improved patient satisfaction, greater improvement in physical function, and decreased opioid dependence compared with those who had > 225 MME prescribed.

Center for Health Policy and Health Services Research
Lockhart E, Turner D, Galea JT, and Marhefka SL. Considerations for partnering with Ryan White Case Managers to create equitable opportunities for people with HIV to participate in research. *PLoS One* 2022; 17(10):e0276057. PMID: 36260624. Full Text

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Many research studies focus on recruitment from one or few HIV clinics or internet-engaged populations, but this may result in inequitable representation of people with HIV (PWH), across the rural/urban/suburban continuum. Ryan White Case Managers (RWCM) meet regularly with PWH, potentially positioning them as partners in gathering research-related data from diverse groups of low-

income, marginalized, PWH. Yet, data collection in partnership with RWCM, particularly over large geographic areas, has been under-explored. We partnered with RWCM and their organizations throughout Florida to administer a 10-item technology use and willingness survey to clients living with HIV; RWCMs provided process-oriented feedback. Among 382 approached RWCM, 71% completed human subjects and survey administration training; 48% gathered data on 10 predetermined survey administration days; and 68% administered at least one survey during the entire period for survey administration. Altogether, 1,268 client surveys were completed, 2.7% by rural participants. Stigma, privacy concerns, and disinterest reportedly inhibited client participation; competing obligations, policies, and narrow recruitment windows prevented some RWCM from offering the survey to clients. Research should further explore strategies and best practices to ensure equitable access to participate in research among PWH.

Center for Health Policy and Health Services Research

Sadler RC, **Felton JW**, Rabinowitz JA, Powell TW, Latimore A, and Tandon D. Inequitable Housing Practices and Youth Internalizing Symptoms: Mediation Via Perceptions of Neighborhood Cohesion. *Urban Plan* 2022; 7(4):153-166. PMID: Not assigned. Full Text

Disordered urban environments negatively impact mental health symptoms and disorders. While many aspects of the built environment have been studied, one influence may come from inequitable, discriminatory housing practices such as redlining, blockbusting, and gentrification. The patterns of disinvestment and reinvestment that follow may be an underlying mechanism predicting poor mental health. In this study, we examine pathways between such practices and internalizing symptoms (i.e., anxiety and depression) among a sample of African American youth in Baltimore, Maryland, considering moderation and mediation pathways including neighborhood social cohesion and sex. In our direct models, the inequitable housing practices were not significant predictors of social cohesion. In our sex moderation model, however, we find negative influences on social cohesion: for girls from gentrification, and for boys from blockbusting. Our moderated mediation model shows that girls in gentrifying neighborhoods who experience lower social cohesion have higher levels of internalizing symptoms. Likewise for boys, living in a formerly blockbusted neighborhood generates poorer social cohesion, which in turn drives higher rates of internalizing symptoms. A key implication of this work is that, in addition to standard measures of the contemporary built environment, considering other invisible patterns related to discriminatory and inequitable housing practices is important in understanding the types of neighborhoods where anxiety and depression are more prevalent. And while some recent work has discussed the importance of considering phenomena like redlining in considering long-term trajectories of neighborhoods, other patterns such as blockbusting and gentrification may be equally important.

Center for Health Policy and Health Services Research

Spehar SM, Seth M, Henke P, **Alaswad K**, Schreiber T, Berman A, Syrjamaki J, Ali OE, Bader Y, **Nerenz D**, Gurm H, and Sukul D. Race and Outcomes after Percutaneous Coronary Intervention: Insights from the Michigan Blue Cross Blue Shield Cardiovascular Consortium. *Am Heart J* 2022; Epub ahead of print. PMID: 36216076. Full Text

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BACKGROUND: Current studies show similar in-hospital outcomes following percutaneous coronary intervention (PCI) between Black and White patients. Long-term outcomes and the role of individual and community-level socioeconomic factors in differential risk are less understood. METHODS: We linked clinical registry data from PCIs performed between 1/2013 and 3/2018 at 48 Michigan hospitals to Medicare Fee-for-service claims. We analyzed patients of Black and White race. We used propensity score matching and logistic regression models to estimate the odds of 90-day readmission and Cox regression to evaluate the risk of post-discharge mortality. We used mediation analysis to evaluate the proportion of association mediated by socioeconomic factors. RESULTS: Of the 29,317 patients included in this study, 10.28% were Black and 89.72% were White. There were minimal differences between groups regarding post-PCI in-hospital outcomes. Compared with White patients, Black patients were more likely to be readmitted within 90-days of discharge (adjusted OR 1.62, 95% CI [1.32-2.00]) and had significantly higher risk of all-cause mortality (adjusted HR 1.45, 95% CI 1.30-1.61) when adjusting for age and gender. These associations were significantly mediated by dual eligibility (proportion mediated [PM] for readmission: 11.0%; mortality: 21.1%); dual eligibility and economic well-being of the patient's community (PM for readmission: 22.3%; mortality: 43.0%); and dual eligibility, economic well-being of the community, and baseline clinical characteristics (PM for readmission: 45.0%; mortality: 87.8%). CONCLUSIONS: Black patients had a higher risk of 90-day readmission and cumulative mortality following PCI compared with White patients. Associations were mediated by dual eligibility, community economic well-being, and traditional cardiovascular risk factors. Our study highlights the need for improved upstream care and streamlined post-discharge care pathways as potential strategies to improve health care disparities in cardiovascular disease.

Dermatology
Boothby-Shoemaker W, Khanna R, Khanna R, Milburn A, Walia S, and **Huggins RH**. Social Media Platforms as a Resource for Vitiligo Support. *J Drugs Dermatol* 2022; 21(10):1135-1136. PMID: 36219048. Request Article

Social media use among dermatology patients is ubiquitous, with estimates of over 80% of patients using social media to learn about their dermatologic conditions. Vitiligo is an autoimmune disease leading to depigmentation with an estimated prevalence of 0.5%–2% globally. Vitiligo has been implicated in a decreased quality of life (QoL), particularly in females, individuals with darker complexions, and those from South Asian cultures.

Dermatology
Ceresnie MS, Mohney L, **Ko D**, **Lim HW**, and **Mohammad TF**. Association of quality of life measures with afamelanotide treatment in patients with erythropoietic protoporphyria and x-linked protoporphyria: a retrospective cohort study. *J Am Acad Dermatol* 2022; Epub ahead of print. PMID: 36244556. Full Text

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Dermatology
Ceresnie MS, Patel J, **Lim HW**, and **Kohli I**. The cutaneous effects of blue light from electronic devices: a systematic review with health hazard identification. *Photochem Photobiol Sci* 2022; Epub ahead of print. PMID: 36245016. Full Text

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The biologic effects of visible light, particularly blue light, on the skin at doses and irradiances representative of sunlight have been established. Recent research studies investigated the effects of blue light (BL) from electronic screen devices; however, it is unclear if the evidence can be generalized to real life. The aim of this systematic review was to evaluate available evidence regarding clinical effects of BL emitted from electronic devices on human skin using the framework established by the Office of Health Assessment and Translation (OHAT). A systematic literature search was conducted by two librarians in Ovid MEDLINE, Embase.com, and Web of Science for relevant articles published from 1946 to March 2022. In vitro and in vivo studies that investigated the effects of BL from electronic devices on skin were included. From the 87 articles gathered from database searches and 1 article identified from citation search, only 9 met the inclusion criteria (6 in vitro and 3 in vivo studies). Human and animal literature with the highest level of evidence ratings were considered with mechanistic data to form one of five human hazard identifications for each outcome category using the OHAT protocol: (1) known, (2) presumed, (3) suspected, (4) not classifiable, or (5) not identified to be a hazard to humans. Literature-based evidence integration did not identify exposure to BL from electronic devices as a hazard to skin pigmentation, redness, yellowness, or melasma exacerbation. Exposure to BL from electronic devices was not classified as a skin photoaging hazard. Low confidence in representative exposure characterization drove high OHAT risk-of-bias ratings for the majority of included studies. While these conclusions hold true for the limited existing data, a larger number of future studies with high-confidence evidence are needed to verify and strengthen hazard identification conclusions.

Dermatology

Del Rosso J, **Stein Gold L**, Tyring S, Zeichner J, Callender V, Draelos Z, Werschler W, Cook-Bolden F, and Guenin E. Efficacy and Safety of Tazarotene 0.045% Lotion in Caucasian Adults With Moderate-to-Severe Acne. *J Drugs Dermatol* 2022; 21(10):1061-1069. PMID: 36219057. Request Article

BACKGROUND: While topical retinoids are a mainstay of acne treatment, acne can manifest differently in various skin types. The objective of these post hoc analyses from two pooled phase 3 studies was to examine efficacy and safety of tazarotene 0.045% and quality of life improvements in self-identified Caucasian adults with moderate-to-severe acne. METHODS: In two phase 3, double-blind, 12-week studies (NCT03168334; NCT03168321), participants aged ≥9 years with moderate-to-severe acne were randomized (1:1) to tazarotene 0.045% lotion or vehicle lotion (N=1,614); a subset of adults (≥18 years) who self-reported Caucasian (White) race (n=645) were examined. Coprimary endpoints were inflammatory/noninflammatory lesion counts and treatment (endpoint) success (≥2-grade reduction from baseline in Evaluator's Global Severity Score and a score of 0 [clear] or 1 [almost clear]). Quality of life, treatment-emergent adverse events (TEAEs), and cutaneous safety/tolerability were also assessed. RESULTS: At week 12, tazarotene lotion significantly reduced lesion counts by ~60% (least-squares mean percent changes from baseline, tazarotene vs vehicle: inflammatory, -61.2% vs -51.1%; noninflammatory, -59.7% vs -49.3%; P<0.001, both). Significantly more participants achieved treatment success with tazarotene lotion versus vehicle (P<0.001). Numerical improvements in quality-of-life domains were observed from baseline to week 12. Most TEAEs were unrelated to treatment, and rates of moderate-to-severe erythema decreased from baseline to week 12 with tazarotene treatment. CONCLUSIONS: Tazarotene 0.045% lotion was efficacious and well tolerated over 12 weeks and led to quality-of-life improvements in Caucasian adults with moderate-to-severe acne. These results, along with those from patients with skin of color, demonstrate that once daily tazarotene 0.045% lotion is an effective and well-tolerated treatment option regardless of race or skin color.J Drugs Dermatol. 2022;21(10):1061-1069. doi:10.36849/JDD.6834.

Dermatology

Escobar K, **Pandher K**, and **Jahnke MN**. Capillary Malformations. *Dermatol Clin* 2022; 40(4):425-433. PMID: 36243429. Full Text

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Capillary malformations (CMs) are the most common vascular anomalies, composed of enlarged capillaries and venules with thickened perivascular cell coverage in skin and mucous membranes. These congenital anomalies represent an error in vascular development during embryogenesis. Most of the CMs occur without any syndromic findings; the association between CMs systemic anomalies in some patients, however, makes the recognition of additional syndrome features critical. Some genetic disorders discussed, which feature CMs, include Sturge-Weber syndrome, diffuse CMs with overgrowth, Klippel-Trenaunay syndrome, CLOVES syndrome, among others. This article can aid clinicians in better identifying CMs and associated syndromes and provide consistent terminology to facilitate interdisciplinary management.

Dermatology
Oska S, **Arora H**, and **Zarbo A**. Scaly plaques in a malnourished patient. *Cleve Clin J Med* 2022; 89(10):551-552. PMID: 36192020. Full Text

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Dermatology
Seck S, **Hamad J**, Schalka S, and **Lim HW**. Photoprotection in skin of color. *Photochem Photobiol Sci* 2022; Epub ahead of print. PMID: 36227521. Full Text

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As populations in many parts of the world are projected to become more racially diverse over the coming decades, we must better understand the unique characteristics of the skin of populations with skin of color (SOC). This review aims to highlight important physiologic and clinical considerations of photoprotection in SOC. Ultraviolet radiation and visible light affect dark and light skin differently. SOC populations have historically not been informed on photoprotection to the same degree as their light skinned counterparts. This has exacerbated dermatologic conditions in which SOC populations are disproportionately affected, such as hyperpigmentary disorders. Patients should be encouraged to utilize multiple methods of photoprotection, ranging from avoidance of sunlight during peak intensity hours, seeking shade, wearing sun-protective clothing and wide-brimmed hat, and applying sunscreen. Ideal sunscreens for SOC populations include those with UVA-PF/SPF ratios ≥ 2/3 and tinted sunscreens to protect against VL. Although there have been increased efforts recently, more research into photoprotection for SOC and targeted public education are required to disseminate photoprotection resources that are patient-centered and evidence-based.

Dermatology
Strober B, **Stein Gold L**, Bissonnette R, Armstrong AW, Kircik L, Tyring SK, Piscitelli SC, Brown PM, Rubenstein DS, Tallman AM, and Lebwohl MG. One-year safety and efficacy of tapinarof cream for the treatment of plaque psoriasis: Results from the PSOARING 3 trial. *J Am Acad Dermatol* 2022; 87(4):800-806. PMID: 35772599. Full Text

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BACKGROUND: Tapinarof cream 1% once daily, an aryl hydrocarbon receptor-modulating agent, was significantly more efficacious than vehicle and well tolerated in two 12-week phase 3 trials in adults with mild to severe plaque psoriasis. OBJECTIVE: To assess long-term safety, efficacy, remittive effect, durability of response, and tolerability of tapinarof. METHODS: Patients completing the 12-week trials were eligible for 40-weeks' open-label treatment and 4-weeks' follow-up. Treatment was based on the Physician Global Assessment (PGA) score. Patients entering with PGA≥1 received tapinarof until PGA = 0. Patients with PGA = 0 discontinued tapinarof and were monitored for remittive effect. Patients with PGA≥2 were re-treated until PGA = 0. RESULTS: Overall, 91.6% (n = 763) of eligible patients enrolled; 40.9% of patients achieved complete disease clearance (PGA = 0), and 58.2% entering with PGA≥2 achieved PGA = 0 or 1. Mean duration of off therapy remittive effect for patients achieving PGA = 0 was 130.1 days. No new safety signals were observed. Most frequent adverse events were folliculitis (22.7%), contact dermatitis (5.5%), and upper respiratory tract infection (4.7%). LIMITATIONS: Open-label; no control; may not be generalizable to all forms of psoriasis; remittive effect/response rate potentially underestimated. CONCLUSIONS: Efficacy improved beyond the 12-week trials, with a 40.9% complete disease clearance rate, ~4-month off therapy remittive effect, durability on therapy, and consistent safety.

Diagnostic Radiology

Lawrence RL, **Veluswamy B**, **Dobben EA**, **Klochko CL**, and **Soliman SB**. Predictors of infraspinatus muscle degeneration in individuals with an isolated supraspinatus tendon tear. *Skeletal Radiol* 2022; Epub ahead of print. PMID: 36195776. Full Text

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OBJECTIVE: Determine the demographic and clinical factors that predict infraspinatus muscle degeneration in individuals with an isolated supraspinatus tendon tear. MATERIALS AND METHODS: A retrospective analysis was performed using the medical records of patients who had a shoulder MRI interpreted by 1 of 3 fellowship-trained musculoskeletal radiologists since the implementation of a standardized MRI 3 T protocol within our healthcare system. Demographic (e.g., age, sex) and clinical data (e.g., tear size, muscle degeneration, co-morbidities) were collected. Patients with an isolated supraspinatus tendon tear (n = 121) were assigned to one of two groups based on whether any infraspinatus muscle degeneration was present. Logistic regression was used to assess the univariate relationships between infraspinatus muscle degeneration and patient and clinical data, while least absolute shrinkage and selector operator (LASSO) logistic regression was used to assess the multivariable relationship. RESULTS: Of the patients with an isolated supraspinatus tendon tear, 16.5% had evidence of infraspinatus muscle degeneration. The presence of infraspinatus muscle degeneration was independently associated with cardiovascular disease ($P = 0.01$), supraspinatus muscle degeneration ($P < 0.01$), and subscapularis muscle degeneration ($P = 0.01$). When the multivariable relationship is assessed, supraspinatus muscle degeneration emerged as the only variable of significant importance for detecting infraspinatus muscle degeneration (specificity: 87.1%, sensitivity: 80.0%). CONCLUSION: Infraspinatus muscle degeneration is not uncommon in individuals with an isolated supraspinatus tear and is most associated with concomitant supraspinatus muscle degeneration. These findings highlight the need for clinicians to specifically assess the status of each rotator cuff muscle, even when the tendon itself is intact.

Diagnostic Radiology

Oyedeji O, **Rodgers S**, **Wrubel A**, **Shah R**, and **Husain S**. Pancreatic lymphoepithelial cyst with concurrent HIV infection: A case report and review of the literature. *SAGE Open Med Case Rep* 2022; 10:2050313x221131166. PMID: 36274859. Full Text

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Pancreatic lymphoepithelial cysts are rare, benign, non-neoplastic unilocular or multilocular cystic lesions. These circumscribed pancreatic lesions are filled with keratinous material grossly and exhibit distinct microscopic features. Pancreatic lymphoepithelial cysts are like the more common lymphoepithelial cysts of the parotid glands, which have been associated with the diffuse infiltrative lymphocytosis syndrome often seen in patients with HIV infection. However, pancreatic lymphoepithelial cysts are rare and their association with HIV infection has not been established. The presence of secondary changes in non-neoplastic cysts such as goblet cell metaplasia that was present in our case is an important feature to be included in the differential diagnosis and not to be interpreted as a mucinous neoplasm, particularly on fine-needle aspiration specimen microscopic evaluation that would impact further management. Here we describe the diagnosis and treatment of lymphoepithelial cysts in a patient who was on highly active antiretroviral therapy for HIV infection and we provide a brief literature review. Defining the clinical characteristics of lymphoepithelial cysts in patients with HIV and determining accurate preoperative diagnostic procedures will be critical for establishing effective surgical and medical approaches to treating these cysts, which differ substantially from other more serious pancreatic cystic lesions.

Emergency Medicine

Peahl AF, Moniz MH, Heisler M, Doshi A, Daniels G, **Caldwell M**, Dalton VK, De Roo A, and Byrnes M. Experiences With Prenatal Care Delivery Reported by Black Patients With Low Income and by Health Care Workers in the US: A Qualitative Study. *JAMA Netw Open* 2022; 5(10):e2238161. PMID: 36279136. Full Text

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IMPORTANCE: Black pregnant people with low income face inequities in health care access and outcomes in the US, yet their voices have been largely absent from redesigning prenatal care. OBJECTIVE: To examine patients' and health care workers' experiences with prenatal care delivery in a largely low-income Black population to inform care innovations to improve care coordination, access, quality, and outcomes. DESIGN, SETTING, AND PARTICIPANTS: For this qualitative study, human-centered design-informed interviews were conducted at prenatal care clinics with 19 low-income Black patients who were currently pregnant or up to 1 year post partum and 19 health care workers (eg, physicians, nurses, and community health workers) in Detroit, Michigan, between October 14, 2019, and February 7, 2020. Questions focused on 2 human-centered design phases: observation (understanding problems from the end user's perspective) and ideation (generating novel potential solutions). Questions targeted participants' experiences with the 3 goals of prenatal care: medical care, anticipatory guidance, and social support. An eclectic analytic strategy, including inductive thematic analysis and matrix coding, was used to identify promising strategies for prenatal care redesign. MAIN OUTCOMES AND MEASURES: Preferences for prenatal care redesign. RESULTS: Nineteen Black patients (mean [SD] age, 28.4 [5.9] years; 19 [100%] female; and 17 [89.5%] with public insurance) and 17 of 19 health care workers (mean [SD] age, 47.9 [15.7] years; 15 female [88.2%]; and 13 [76.5%] Black) completed the

surveys. A range of health care workers were included (eg, physicians, doulas, and social workers). Although all affirmed the 3 prenatal care goals, participants reported failures and potential solutions for each area of prenatal care delivery. Themes also emerged in 2 cross-cutting areas: practitioners and care infrastructure. Participants reported that, ideally, care structure would enable strong ongoing relationships between patients and practitioners. Practitioners would coordinate all prenatal services, not just medical care. Finally, care would be tailored to individual patients by using care navigators, flexible models, and colocation of services to reduce barriers. CONCLUSIONS AND RELEVANCE: In this qualitative study of low-income, Black pregnant people in Detroit, Michigan, and the health care workers who care for them, prenatal care delivery failed to meet many patients' needs. Participants reported that an ideal care delivery model would include comprehensive, integrated services across the health care system, expanding beyond medical care to also include patients' social needs and preferences.

Emergency Medicine

Vogt EL, Jiang C, Jenkins Q, Millette MJ, **Caldwell MT**, Mehari KS, and Marsh EE. Trends in US Emergency Department Use After Sexual Assault, 2006-2019. *JAMA Netw Open* 2022; 5(10):e2236273. PMID: 36264580. Full Text

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IMPORTANCE: Adult sexual assault (SA) survivors experience numerous emergent health problems, yet few seek emergency medical care. Quantifying the number and types of survivors presenting to US emergency departments (EDs) after SA can inform health care delivery strategies to reduce survivor morbidity and mortality. OBJECTIVE: To quantify ED use and factors that influenced seeking ED care for adult SA from 2006 through 2019. DESIGN, SETTING, AND PARTICIPANTS: This cross-sectional study used SA data from the Nationwide Emergency Department Sample from 2006 through 2019, which includes more than 35.8 million observations of US ED visits from 989 hospitals, a 20% stratified sample of hospital-based EDs. The study also used the Federal Bureau of Investigation's Uniform Crime Reporting Program, which includes annual crime data from more than 18 000 law enforcement agencies representing more than 300 million US inhabitants. The study sample included any adult aged 18 to 65 years with an ED visit in the Nationwide Emergency Department Sample coded as SA. The data were analyzed between January 2020 and June 2022. MAIN OUTCOMES AND MEASURES: Annual SA-related ED visits, subsequent hospital admissions, and associated patient-related factors (age, sex, race and ethnicity, income quartile, and insurance) were analyzed using descriptive statistics. RESULTS: Data were from 120 to 143 million weighted ED visits reported annually from 2006 through 2019. Sexual assault-related ED visits increased more than 1533.0% from 3607 in 2006 to 55 296 in 2019. Concurrently, admission rates for these visits declined from 12.6% to 4.3%. Female, younger, and lower-income individuals were more likely to present to the ED after SA. Older and Medicaid-insured patients were more likely to be admitted. Overall, the rate of ED visits for SA outpaced law enforcement reporting. CONCLUSIONS AND RELEVANCE: This cross-sectional study found that US adult SA ED visits increased from 2006 through 2019 and highlighted the populations who access emergency care most frequently and who more likely need inpatient care. These data can inform policies and the programming needed to support this vulnerable population.

Endocrinology and Metabolism

Kruger D, Kass A, Lonier J, Pettus J, Raskin P, Salam M, Trikudanathan S, Zhou K, Russell SJ, Damiano ER, El-Khatib FH, Ruedy KJ, Balliro C, Li Z, Marak MC, Calhoun P, and Beck RW. A Multicenter Randomized Trial Evaluating the Insulin-Only Configuration of the Bionic Pancreas in Adults with Type 1 Diabetes. *Diabetes Technol Ther* 2022; 24(10):697-711. PMID: 36173236. Request Article

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Objective: To evaluate the insulin-only configuration of the iLet(®) bionic pancreas (BP) using insulin aspart or insulin lispro in adults with type 1 diabetes (T1D). Methods: In this multicenter, randomized, controlled trial, 161 adults with T1D (18-79 years old, baseline HbA1c 5.5%-13.1%, 32% using multiple daily injections, 27% using a pump without automation, 5% using a pump with predictive low glucose suspend, and 36% using a hybrid closed loop system before the study) were randomly assigned 2:1 to use the BP (N = 107) with insulin aspart or insulin lispro (BP group) or a standard-of-care (SC) control group (N = 54) using their usual insulin delivery plus continuous glucose monitoring (CGM). The primary outcome was HbA1c at 13 weeks. Results: Mean HbA1c decreased from 7.6% ± 1.2% at baseline to 7.1% ± 0.6% at 13 weeks with BP versus 7.6% ± 1.2% to 7.5% ± 0.9% with SC (adjusted difference = -0.5%, 95% confidence interval -0.6% to -0.3%, P < 0.001). Over 13 weeks, mean time in range 70-180 mg/dL (TIR) increased by 11% (2.6 h/d) and mean CGM glucose was reduced by 16 mg/dL with BP compared with SC (P < 0.001). Improvement in these metrics was seen during the first day of BP use and by the end of the first week reached levels that remained relatively stable through 13 weeks. Analyses of time >180 mg/dL, time >250 mg/dL, and standard deviation of CGM glucose all favored the BP group (P < 0.001). The CGM-measured hypoglycemia was low at baseline (median time <54 mg/dL of 0.21% [3 min/d] for the BP group and 0.11% [1.6 min/d] for the SC group) and not significantly different between groups over the 13 weeks (P = 0.51 for time <70 mg/dL and 0.33 for time <54 mg/dL). There were 7 (6.5% of 107 participants) severe hypoglycemic events in the BP group and 2 events in the SC group (1.9% of 54 participants, P = 0.40). Conclusions: In adults with T1D, use of the BP with insulin aspart or insulin lispro improved HbA1c, TIR, and hyperglycemic metrics without increasing CGM-measured hypoglycemia compared with standard of care. Clinical Trial Registry: clinicaltrials.gov; NCT04200313.

Family Medicine

Raleigh MF, **Stoddard J**, and Darrow HJ. Polymyalgia Rheumatica and Giant Cell Arteritis: Rapid Evidence Review. *Am Fam Physician* 2022; 106(4):420-426. PMID: 36260899. Full Text

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Polymyalgia rheumatica and giant cell arteritis are inflammatory conditions that occur predominantly in people 50 years and older, with peak incidence at 70 to 75 years of age. Polymyalgia rheumatica is more common and typically presents with constitutional symptoms, proximal muscle pain, and elevated inflammatory markers. Diagnosis of polymyalgia rheumatica is clinical, consisting of at least two weeks of proximal muscle pain, constitutional symptoms, and elevated erythrocyte sedimentation rate or C-reactive protein. Treatment of polymyalgia rheumatica includes moderate-dose glucocorticoids with a prolonged taper. Giant cell arteritis, also known as temporal arteritis, usually presents with new-onset headache, visual disturbances or changes, constitutional symptoms, scalp tenderness, and temporal artery symptoms. Inflammatory markers are markedly elevated. Temporal arterial biopsy should be used for diagnosis. However, color duplex ultrasonography, magnetic resonance imaging, and fluorodeoxyglucose

positron emission tomography may be helpful when biopsy is negative or unavailable. All patients with suspected giant cell arteritis should receive empiric high-dose glucocorticoids because the condition may lead to blindness if untreated. Tocilizumab is approved by the U.S. Food and Drug Administration for giant cell arteritis and should be considered in addition to glucocorticoids for initial therapy. Polymyalgia rheumatica and giant cell arteritis respond quickly to appropriate dosing of glucocorticoids but typically require prolonged treatment and have high rates of relapse; therefore, monitoring for glucocorticoid-related adverse effects and symptoms of relapse is necessary. Methotrexate may be considered as an adjunct to glucocorticoids in patients with polymyalgia rheumatica or giant cell arteritis who are at high risk of relapse.

Gastroenterology

Ghandour B, Keane MG, Shinn B, Dawod QM, Fansa S, El Chafic AH, Irani SS, Pawa R, Gutta A, **Ichkhanian Y**, Paranandi B, Pawa S, Al-Haddad MA, **Zuchelli T**, Huggett MT, Sharaiha RZ, Kowalski TE, and Khashab MA. Factors predictive of persistent fistulas in EUS-Directed transgastric ERCP: A multicenter matched case-control study. *Gastrointest Endosc* 2022; Epub ahead of print. PMID: 36228699. Full Text

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BACKGROUND: EUS-directed transgastric ERCP (EDGE) is an established method for managing pancreaticobiliary pathology in Roux-en-Y gastric bypass patients, with high rates of technical success and low rates of serious adverse events (AEs). However widespread adoption of the technique has been limited due to concerns about the development of persistent gastrogastric (GG) or jejunogastric (JG) fistulas. GG/GJ fistulas have been reported in up to 20% of cases in some series, but predictive risk factors and long-term management/outcomes are lacking. AIMS: To assess (1) factors associated with the development of persistent fistulas; (2) technical success of endoscopic fistula closure. PATIENTS AND METHODS: This is a case-control study involving 9 centers (8 USA, 1 Europe) from 02/2015 to 09/2021. Cases of persistent fistulas were defined as endoscopic or imaging evidence of fistula more than 8 weeks after lumen-apposing metal stent (LAMS) removal. Controls were defined as endoscopic or imaging confirmation of no fistula more than 8 weeks after LAMS removal. AEs were defined/graded according to ASGE lexicon. RESULTS: 25 patients identified to have evidence of a persistent fistula on follow-up surveillance (cases) were matched with 50 patients with no evidence of a persistent fistula on follow-up surveillance (controls) based on age and sex. Mean LAMS dwell time was 74.7±106.2d. Following LAMS removal, argon plasma coagulation (APC) ablation of the fistula was performed in 46 (61.3%). Primary closure of the fistula was performed in 26.7% (n=20, endoscopic suturing in 17, endoscopic tacking in 2 and over-the-scope clips + endoscopic suturing in 1). When comparing cases to controls, there was no difference in baseline demographics, fistula site, LAMS size, or primary closure frequency between the two groups (p>0.05). However, in the persistent fistula group, the mean LAMS dwell time was significantly longer (127 d vs 48 d, p=0.02), and more patients had ≥5% total body weight gain (33.3% vs 10.3%; p=0.03). LAMS dwell time was a significant predictor of persistent fistula (OR=4.5 after >40 days in situ, p=0.01). The odds of developing a persistent fistula increased by 9.5% for every 7 days that the LAMS was left in situ. In patients with a persistent fistula, endoscopic closure was attempted in 76% (n=19) with successful resolution in 14 (73.7%). CONCLUSIONS: Longer LAMS dwell time was found to be associated with a higher risk of persistent fistulas in EDGE patients. APC or primary closure of the fistula on LAMS removal was not found to be protective against developing a persistent fistula, which if present, can be effectively managed through endoscopic closure in most cases.

Gastroenterology

Schairer J, and **Fahad H**. Endoscopy in the Surgically Altered Bowel. *Gastrointest Endosc Clin N Am* 2022; 32(4):777-799. PMID: 36202516. Full Text

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Improved utilization of surgical interventions to improve patient outcomes has led to an increased need to endoscopically evaluate and treat the bowel after surgery. The best outcomes are attained when the endoscopist coordinates with the surgeon, and in some cases the pathologist or radiologist to plan the procedure. Understanding the anatomy and pathology anticipated can allow planning for sedation, bowel cleanse and equipment needed. Surgically altered anatomy can create challenges that with planning can be overcome. This article will review how to prepare and navigate several of the most commonly encountered surgical interventions.

Hematology-Oncology

Tan L, Tondo-Steele K, Foster C, McIlwain C, Bolland DE, **Crawford HC**, Sciallis A, and McLean K. Inhibition of Tumor Microenvironment Cytokine Signaling Sensitizes Ovarian Cancer Cells to Antiestrogen Therapy. *Cancers (Basel)* 2022; 14(19). PMID: 36230597. Full Text

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Antiestrogen therapy (AET) is an alternative to cytotoxic chemotherapy for recurrent ovarian cancer, yet the often short duration of response suggests mechanisms of resistance. We previously demonstrated that tumor microenvironment interleukin-6/leukemia inhibitory factor (IL6/LIF) cytokines induce tumor cell JAK-STAT signaling to promote cancer growth. Crosstalk between estrogen signaling and cytokine signaling has been reported. Therefore, we sought to characterize the impact of IL6/LIF signaling on estrogen signaling in epithelial ovarian cancer and investigate the efficacy of combination therapy. We first assessed patient tumors for cytokine expression and compared it with response to AET to determine clinical relevance. In vitro, we determined the effect of IL6/LIF on estrogen receptor expression and signaling. Cell viability assays were used to determine the efficacy and potential synergy of cytokine blockade and AET. We then extended studies to animal models, incorporating patient-derived stromal cells. Our results demonstrated shorter progression-free interval on AET in patients with stromal IL6/LIF expression. In vitro, IL6/LIF increased tumor cell estrogen receptor expression and signaling, and combination cytokine blockade and AET resulted in synergistic inhibition of tumor cell growth. The anticancer effect was verified in a mouse model. In conclusion, due to crosstalk between IL6/LIF cytokine signaling and estrogen signaling, dual blockade is a potential new treatment approach for ovarian cancer.

Hematology-Oncology

Uddin MH, Mohammad RM, **Philip PA**, Azmi AS, and Muqbil I. Role of Non-Coding RNAs in Pancreatic Ductal Adenocarcinoma Associated Cachexia. *Am J Physiol Cell Physiol* 2022; Epub ahead of print. PMID: 36280389. Full Text

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Cachexia is an acute syndrome that is very commonly observed in patients with cancer. Cachexia is the number one cause of death in patients with metastatic disease and is also the major factor for physical toxicity and financial burden. More importantly, the majority of advanced stage pancreatic ductal adenocarcinoma (PDAC) cancer patients undergo cachexia. Pancreatic cancer causes deaths of 50,000 Americans and about 400,000 people worldwide every year. The high mortality rates in metastatic PDAC is due to systemic pathologies and cachexia which quickens death in these patients. About 90% of all PDAC patients undergo wasting of muscle causing mobility loss leading to a number of additional pathological conditions. PDAC associated cancer cachexia emanates from complex signaling cues involving both mechanical and biological signals. Tumor invasion associated with the loss of pancreatic function induced digestive disorders, malabsorption which causes subsequent weight loss and eventually promotes cachexia. Besides, systemic inflammation of PDAC patients could release chemical cues (e.g. cytokine mediated Atrogin-1 and MAFbx expression) that participate in muscle wasting. Our understanding of genes, proteins and cytokines involved in promoting cancer cachexia has evolved considerably. However, the role of epigenetic factors, particularly the role of non-coding RNAs (ncRNAs) in regulating PDAC associated cachexia is less studied. In this review article, the most updated knowledge on the various ncRNAs including microRNAs (miRs), long non-coding RNA (lncRNAs), piwi interacting RNAs (PiwiRNAs), snoRNAs and circular RNAs (circRNA) and their roles in cancer cachexia are described.

Hematology-Oncology

Yang J, Jin L, Kim HS, Tian F, Yi Z, Bedi K, Ljungman M, Pasca di Magliano M, **Crawford H**, and Shi J. KDM6A Loss Recruits Tumor-Associated Neutrophils and Promotes Neutrophil Extracellular Trap Formation in Pancreatic Cancer. *Cancer Res* 2022; Epub ahead of print. PMID: 36306422. Full Text

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Lysine (K)-specific demethylase 6A (KDM6A) is a frequently mutated tumor suppressor gene in pancreatic ductal adenocarcinoma (PDAC). However, the impact of KDM6A loss on the PDAC tumor immune microenvironment is not known. This study used a genetically engineered, pancreas-specific Kdm6a knockout (KO) PDAC mouse model and human PDAC tissue samples to demonstrate that KDM6A loss correlates with increased tumor-associated neutrophils and neutrophil extracellular traps (NET) formation, which are known to contribute to PDAC progression. Genome-wide bromouridine sequencing analysis to evaluate nascent RNA synthesis showed that the expression of many chemotactic cytokines, especially CXC motif chemokine ligand 1 (CXCL1), was upregulated in KDM6A KO PDAC cells. KDM6A-deficient PDAC cells secreted higher levels of CXCL1 protein, which in turn recruited neutrophils. Furthermore, in a syngeneic orthotopic mouse model, treatment with a CXCL1 neutralizing antibody blocked the chemotactic and NET-promoting properties of KDM6A-deficient PDAC cells and suppressed tumor growth, confirming CXCL1 as a key mediator of chemotaxis and PDAC growth driven by KDM6A loss. These findings shed light on how KDM6A regulates the tumor immune microenvironment and PDAC progression and suggests that the CXCL1-CXCR2 axis may be a candidate target in PDAC with KDM6A loss. SIGNIFICANCE: KDM6A loss in pancreatic cancer cells alters the immune

microenvironment by increasing CXCL1 secretion and neutrophil recruitment, providing a rationale for targeting the CXCL1-CXCR2 signaling axis in tumors with low KDM6A.

Hospital Medicine

Joyce E, Haymart B, Kong X, Ali MA, Carrigan M, **Kaatz S**, **Shah V**, Kline-Rogers E, Kozlowski J, Froehlich JB, and Barnes GD. Length of Anticoagulation in Provoked Venous Thromboembolism: A Multicenter Study of How Real-World Practice Mirrors Guideline Recommendations. *J Am Heart Assoc* 2022;e025471. Epub ahead of print. PMID: 36285782. Full Text

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Background For more than a decade, guidelines have recommended a limited 3 months of anticoagulation for the treatment of provoked venous thromboembolism (VTE). How closely real-world practice follows guideline recommendations is not well described. Methods and Results In our multicenter, retrospective cohort study, we evaluated trends in anticoagulation duration for patients enrolled in the MAQI(2) (Michigan Anticoagulation Quality Improvement Initiative) registry who were receiving anticoagulation for a provoked VTE. The MAQI(2) registry comprises 6 centers in Michigan that manage patients' long-term anticoagulation. We identified 474 patients on warfarin and 302 patients on direct oral anticoagulants who were receiving anticoagulation for a primary indication of provoked VTE between 2008 and 2020. Using a predefined threshold of 120 days (3 months plus a buffer period), predictors of extended anticoagulant use were identified using multivariable logistic regression. Most patients received >120 days of anticoagulation, regardless of which medication was used. The median (25th-75th percentile) length of treatment for patients taking warfarin was 142 (91-234) days and for direct oral anticoagulants was 180 (101-360) days. Recurrent VTE (odds ratio [OR], 2.75 [95% CI, 1.67-4.53]), history of myocardial infarction (OR, 3.92 [95% CI, 1.32-11.7]), and direct oral anticoagulant rather than warfarin use (OR, 2.22 [95% CI, 1.59-3.08]) were independently associated with prolonged anticoagulation. Conclusions In our cohort of patients with provoked VTE, most patients received anticoagulation for longer than the guideline-recommended 3 months. This demonstrates a potential opportunity to improve care delivery and reduce anticoagulant-associated bleeding risk.

Infectious Diseases

Anderson EJ, Creech CB, Berthaud V, Piramzadian A, Johnson KA, **Zervos M**, Garner F, Griffin C, Palanpurwala K, Turner M, Gerber J, Bennett RL, Ali K, Ampajwala M, Berman G, Nayak J, Chronis C, Rizzardi B, Muller WJ, Smith CA, Fuchs G, Hsia D, Tomassini JE, DeLucia D, Reuter C, Kuter B, Zhao X, Deng W, Zhou H, Ramirez Schrempp D, Hautzinger K, Girard B, Slobod K, McPhee R, Pajon R, Aunins A, Das R, Miller JM, and Schnyder Ghamloush S. Evaluation of mRNA-1273 Vaccine in Children 6 Months to 5 Years of Age. *N Engl J Med* 2022; Epub ahead of print. PMID: 36260859. Full Text

From the Center for Childhood Infections and Vaccines, Children's Healthcare of Atlanta, and the Department of Pediatrics, Emory University School of Medicine, Atlanta (E.J.A.), and IResearch Atlanta, Decatur (K.A.J.) - all in Georgia; the Vanderbilt Vaccine Research Program, Department of Pediatrics, Vanderbilt University Medical Center (C.B.C.), and Meharry Medical College (V.B.) - both in Nashville; OnSite Clinical Solutions, Charlotte, NC (A.P.); the Henry Ford Health System, Detroit (M.Z.); Pi-Coor Clinical Research, Burke, VA (F.G.); the Lynn Health Science Institute, Oklahoma City (C.G.); the Cyfair Clinical Research Center (K.P.) and the Texas Center for Drug Development (K.A.), Houston, and ACRC Trials, Frisco (M.A.) - all in Texas; Velocity Clinical Research, Meridian, ID (M.T.); Children's Hospital of Philadelphia Clinical Research Partners, Philadelphia (J.G.); Clinical Research Partners, Richmond, VA (R.L.B.); Clinical Research Institute, Minneapolis (G.B.); the University of Rochester Medical Center, Rochester (J.N.), and Certified Research Associates, Cortland (C.A.S.) - both in New York; Pediatric, Infant, and Adolescent Medicine, Ventura, CA (C.C.); Velocity Clinical Research, West Jordan, UT (B.R.); Ann and Robert H. Lurie Children's Hospital, Chicago (W.J.M.); the University of Kentucky, Lexington (G.F.); the Pennington Biomedical Research Center, Baton Rouge, LA (D.H.); and Moderna, Cambridge,

MA (J.E.T., D.D., C.R., B.K., X.Z., W.D., H.Z., D.R.S., K.H., B.G., K.S., R.M., R.P., A.A., R.D., J.M.M., S.S.G.).

BACKGROUND: The safety, reactogenicity, immunogenicity, and efficacy of the mRNA-1273 coronavirus disease 2019 (Covid-19) vaccine in young children are unknown. METHODS: Part 1 of this ongoing phase 2-3 trial was open label for dose selection; part 2 was an observer-blinded, placebo-controlled evaluation of the selected dose. In part 2, we randomly assigned young children (6 months to 5 years of age) in a 3:1 ratio to receive two 25-μg injections of mRNA-1273 or placebo, administered 28 days apart. The primary objectives were to evaluate the safety and reactogenicity of the vaccine and to determine whether the immune response in these children was noninferior to that in young adults (18 to 25 years of age) in a related phase 3 trial. Secondary objectives were to determine the incidences of Covid-19 and severe acute respiratory syndrome coronavirus 2 infection after administration of mRNA-1273 or placebo. RESULTS: On the basis of safety and immunogenicity results in part 1 of the trial, the 25-μg dose was evaluated in part 2. In part 2, 3040 children 2 to 5 years of age and 1762 children 6 to 23 months of age were randomly assigned to receive two 25-μg injections of mRNA-1273; 1008 children 2 to 5 years of age and 593 children 6 to 23 months of age were randomly assigned to receive placebo. The median duration of follow-up after the second injection was 71 days in the 2-to-5-year-old cohort and 68 days in the 6-to-23-month-old cohort. Adverse events were mainly low-grade and transient, and no new safety concerns were identified. At day 57, neutralizing antibody geometric mean concentrations were 1410 (95% confidence interval [CI], 1272 to 1563) among 2-to-5-year-olds and 1781 (95% CI, 1616 to 1962) among 6-to-23-month-olds, as compared with 1391 (95% CI, 1263 to 1531) among young adults, who had received 100-μg injections of mRNA-1273, findings that met the noninferiority criteria for immune responses for both age cohorts. The estimated vaccine efficacy against Covid-19 was 36.8% (95% CI, 12.5 to 54.0) among 2-to-5-year-olds and 50.6% (95% CI, 21.4 to 68.6) among 6-to-23-month-olds, at a time when B.1.1.529 (omicron) was the predominant circulating variant. CONCLUSIONS: Two 25-μg doses of the mRNA-1273 vaccine were found to be safe in children 6 months to 5 years of age and elicited immune responses that were noninferior to those in young adults. (Funded by the Biomedical Advanced Research and Development Authority and National Institute of Allergy and Infectious Diseases; KidCOVE ClinicalTrials.gov number, NCT04796896.).

Infectious Diseases

Craig JR, **Dai X**, **Bellemore S**, **Woodcroft KJ**, **Wilson C**, **Keller C**, **Bobbitt KR**, and **Ramesh M**. Inflammatory endotype of odontogenic sinusitis. *Int Forum Allergy Rhinol* 2022; Epub ahead of print. PMID: 36308740. Full Text

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BACKGROUND: Odontogenic sinusitis (ODS) is distinct from nonodontogenic rhinosinusitis with regard to clinical features as well as diagnostic and therapeutic approaches. While numerous studies have explored immune profiles of chronic rhinosinusitis, very few studies have explored the inflammatory endotype of ODS. METHODS: Odontogenic sinusitis was diagnosed by confirming infectious sinusitis adjacent to infectious maxillary odontogenic pathology. Maxillary sinus cultures and mucosal biopsies were obtained during endoscopic endonasal surgery in ODS and control patients. Controls were patients undergoing endoscopic skull base surgery with no sinus disease. Specimens were snap frozen in liquid nitrogen and stored at -80°C. Analysis was performed using a multiplex assay to measure Th-1 (TNFα, IFNγ, IL-2,12,18), Th-2 (IL-4,5,9,13), Th-17 (IL-17A,17F,22), and innate (CCL5,CXCL9,CXCL10, IL-6,8,10,12,23,27) immune pathways. Groups were compared via independent sample t-tests; if assumptions were violated, nonparametric Wilcoxon ranked sum tests were performed. RESULTS: Specimens from 22 ODS patients were compared to nine controls. ODS mucosal tissue was sampled in the setting of the following dental pathologies: post-dental extraction (n = 15), untreated apical periodontitis (n = 2), apical periodontitis after root canal therapy (n = 2), and maxillary sinus bone grafting with or without dental implantation (n = 3). The following cytokines were significantly elevated in ODS compared with controls: IFNγ, TNFα, IL-6, 8, 10, 27, and CXCL9. ODS, therefore, demonstrated

heightened innate and Th1 immune activity. IL-17 levels were similar in both ODS and controls. CONCLUSION: ODS demonstrated both innate immune and Th1 inflammatory endotypes. Further studies are needed to explore ODS immunopathobiology and its potential impact on ODS management.

Infectious Diseases

Greenlee SB, **Acosta TJP**, **Makowski CT**, **Kenney RM**, **Ramesh M**, **Williams JD**, and **Alangaden GJ**. Bridging the gap: An approach to reporting antimicrobial stewardship metrics specific to solid organ transplant recipients. *Transpl Infect Dis* 2022; 24(5):e13944. PMID: 36254520. Full Text

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BACKGROUND: This study seeks to describe inpatient antimicrobial use (AU) utilizing the National Healthcare Safety Network-AU (NHSN-AU) framework among solid organ transplant recipients (SOTr) within 12 months after transplant. METHODS: This cross-sectional study included SOTr ≥ 18 years of age who underwent transplantation from January 2015 to December 2016 at a Midwestern US transplant center. Inpatient AU was followed for 12 months post-transplant. Hospital days present up to 12 months post-transplant, AU variables, and Clostridioides difficile infection (CDI) occurrences were analyzed. RESULTS: The cohort of 530 SOTr included 225 kidney (42.5%), 171 liver (32.3%), 45 lung (8.5%), 40 heart (7.5%), 39 multivisceral (7.4%), seven small bowel (1.3%), and three pancreas (0.6%) transplants. Total days of therapy (DOT) were 22 782 among the cohort, with a median of 5 days [interquartile range [IQR], 1-12]. Lung and liver transplants had the most total DOT (6571 vs. 5569 days), while lungs and small bowels had the highest median DOT (13 [IQR, 2-56] vs. 12 [IQR, 2-31]). The facility-wide DOT/1000 days were lowest in pancreas and highest in lung transplants (5.3 vs. 428.1). Small bowel transplants received the most resistant-Gram-positive infection and hospital-onset infection agents for facility-wide DOT/1000 days present. Pancreas and kidney transplants accounted for the most high-risk CDI agents. CDI occurred in 34 patients, with kidney and liver transplants experiencing 13 each. CONCLUSION: This study represents one of the first reports of AU in SOTr utilizing the NHSN-AU framework. More studies are needed for further peer-to-peer comparison of AU in this complex patient population.

Internal Medicine

Ghandour B, Keane MG, Shinn B, Dawod QM, Fansa S, El Chafic AH, Irani SS, Pawa R, Gutta A, **Ichkhanian Y**, Paranandi B, Pawa S, Al-Haddad MA, **Zuchelli T**, Huggett MT, Sharaiha RZ, Kowalski TE, and Khashab MA. Factors predictive of persistent fistulas in EUS-Directed transgastric ERCP: A multicenter matched case-control study. *Gastrointest Endosc* 2022; Epub ahead of print. PMID: 36228699. Full Text

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BACKGROUND: EUS-directed transgastric ERCP (EDGE) is an established method for managing pancreaticobiliary pathology in Roux-en-Y gastric bypass patients, with high rates of technical success and low rates of serious adverse events (AEs). However widespread adoption of the technique has been

limited due to concerns about the development of persistent gastrogastric (GG) or jejunogastric (JG) fistulas. GG/GJ fistulas have been reported in up to 20% of cases in some series, but predictive risk factors and long-term management/outcomes are lacking. AIMS: To assess (1) factors associated with the development of persistent fistulas; (2) technical success of endoscopic fistula closure. PATIENTS AND METHODS: This is a case-control study involving 9 centers (8 USA, 1 Europe) from 02/2015 to 09/2021. Cases of persistent fistulas were defined as endoscopic or imaging evidence of fistula more than 8 weeks after lumen-apposing metal stent (LAMS) removal. Controls were defined as endoscopic or imaging confirmation of no fistula more than 8 weeks after LAMS removal. AEs were defined/graded according to ASGE lexicon. RESULTS: 25 patients identified to have evidence of a persistent fistula on follow-up surveillance (cases) were matched with 50 patients with no evidence of a persistent fistula on follow-up surveillance (controls) based on age and sex. Mean LAMS dwell time was 74.7±106.2d. Following LAMS removal, argon plasma coagulation (APC) ablation of the fistula was performed in 46 (61.3%). Primary closure of the fistula was performed in 26.7% (n=20, endoscopic suturing in 17, endoscopic tacking in 2 and over-the-scope clips + endoscopic suturing in 1). When comparing cases to controls, there was no difference in baseline demographics, fistula site, LAMS size, or primary closure frequency between the two groups (p>0.05). However, in the persistent fistula group, the mean LAMS dwell time was significantly longer (127 d vs 48 d, p=0.02), and more patients had ≥5% total body weight gain (33.3% vs 10.3%; p=0.03). LAMS dwell time was a significant predictor of persistent fistula (OR=4.5 after >40 days in situ, p=0.01). The odds of developing a persistent fistula increased by 9.5% for every 7 days that the LAMS was left in situ. In patients with a persistent fistula, endoscopic closure was attempted in 76% (n=19) with successful resolution in 14 (73.7%). CONCLUSIONS: Longer LAMS dwell time was found to be associated with a higher risk of persistent fistulas in EDGE patients. APC or primary closure of the fistula on LAMS removal was not found to be protective against developing a persistent fistula, which if present, can be effectively managed through endoscopic closure in most cases.

Internal Medicine

Gupta K, Al Rifai M, Hussain A, Minhas AMK, Patel J, Kalra D, Samad Z, and Virani SS. South Asian ethnicity: What can we do to make this risk enhancer a risk equivalent? *Prog Cardiovasc Dis* 2022; Epub ahead of print. PMID: 36279943. Full Text

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South Asians account for around 25% of the global population and are the fastest-growing ethnicity in the US. This population has an increasing burden of atherosclerotic cardiovascular disease (ASCVD) which is also seen in the diaspora. Current risk prediction equations underestimate this risk and consider the South Asian ethnicity as a risk-enhancer among those with borderline-intermediate risk. In this review, we discuss why the South Asian population is at a higher risk of ASCVD and strategies to mitigate this increased risk.

Internal Medicine

Jain V, **Gupta K**, Bhatia K, Rajapreyar I, Singh A, Zhou W, **Klein A**, Nanda NC, Prabhu SD, and Bajaj NS. Coronary flow abnormalities in chronic kidney disease: A systematic review and meta-analysis. *Echocardiography* 2022; Epub ahead of print. PMID: 36198077. Full Text

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BACKGROUND: Coronary vasomotion abnormalities have been described in small studies but not studied systematically. We aimed to review the present literature and analyze it to improve our understanding of chronic kidney disease (CKD) related-coronary microvascular dysfunction. OBJECTIVE: Coronary flow reserve (CFR) is a well-known measure of coronary vasomotion. We aimed to assess the difference in CFR among participants with and without CKD. METHODS: PubMed, Embase, and Cochrane CENTRAL were systematically reviewed to identify studies that compared CFR in participants with and without CKD. We estimated standardized mean differences in mean CFR reported in these studies. We performed subgroup analyses according to imaging modality, and the presence of significant epicardial coronary artery disease. RESULTS: In 14 observational studies with 5966 and 1410 patients with and without CKD, the mean estimated glomerular filtration rate (eGFR) was 29 ± 04 and 87 ± 25 ml/min/1.73 m(2) , respectively. Mean CFR was consistently lower in patients with CKD in all studies and the cumulative mean difference was statistically significant (2.1 ± .3 vs. 2.7 ± .5, standardized mean difference -.8, 95% CI -1.1, -.6, $p < .05$). The lower mean CFR was driven by both significantly higher mean resting flow velocity (.58 cm/s, 95% CI .17, .98) and lower mean stress flow velocity (-.94 cm/s, 95% CI -1.75, -.13) in studies with CKD. This difference remained significant across diagnostic modalities and even in absence of epicardial coronary artery disease. In meta-regression, there was a significant positive relationship between mean eGFR and mean CFR ($p < .05$). CONCLUSION: Patients with CKD have a significantly lower CFR versus those without CKD, even in absence of epicardial coronary artery disease. There is a linear association between eGFR and CFR. Future studies are required to understand the mechanisms and therapeutic implications of these findings. KEY POINTS: In this meta-analysis of observational studies, there was a significant reduction in coronary flow reserve in studies with chronic kidney disease versus those without. This difference was seen even in absence of epicardial coronary artery disease. In meta-regression, a lower estimate glomerular filtration rate was a significant predictor of lower coronary flow reserve. Coronary microvascular dysfunction, rather than atherosclerosis-related epicardial disease may underly increase cardiovascular risk in a patient with chronic kidney disease.

Internal Medicine

Joyce E, Haymart B, Kong X, Ali MA, Carrigan M, **Kaatz S**, **Shah V**, Kline-Rogers E, Kozlowski J, Froehlich JB, and Barnes GD. Length of Anticoagulation in Provoked Venous Thromboembolism: A Multicenter Study of How Real-World Practice Mirrors Guideline Recommendations. *J Am Heart Assoc* 2022;e025471. Epub ahead of print. PMID: 36285782. Full Text

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Background For more than a decade, guidelines have recommended a limited 3 months of anticoagulation for the treatment of provoked venous thromboembolism (VTE). How closely real-world practice follows guideline recommendations is not well described. Methods and Results In our multicenter, retrospective cohort study, we evaluated trends in anticoagulation duration for patients enrolled in the MAQI(2) (Michigan Anticoagulation Quality Improvement Initiative) registry who were

receiving anticoagulation for a provoked VTE. The MAQI(2) registry comprises 6 centers in Michigan that manage patients' long-term anticoagulation. We identified 474 patients on warfarin and 302 patients on direct oral anticoagulants who were receiving anticoagulation for a primary indication of provoked VTE between 2008 and 2020. Using a predefined threshold of 120 days (3 months plus a buffer period), predictors of extended anticoagulant use were identified using multivariable logistic regression. Most patients received >120 days of anticoagulation, regardless of which medication was used. The median (25th-75th percentile) length of treatment for patients taking warfarin was 142 (91-234) days and for direct oral anticoagulants was 180 (101-360) days. Recurrent VTE (odds ratio [OR], 2.75 [95% CI, 1.67-4.53]), history of myocardial infarction (OR, 3.92 [95% CI, 1.32-11.7]), and direct oral anticoagulant rather than warfarin use (OR, 2.22 [95% CI, 1.59-3.08]) were independently associated with prolonged anticoagulation. Conclusions In our cohort of patients with provoked VTE, most patients received anticoagulation for longer than the guideline-recommended 3 months. This demonstrates a potential opportunity to improve care delivery and reduce anticoagulant-associated bleeding risk.

Neurology

Chen Y, Li S, Ge W, Jing J, Chen HY, Doherty D, Herman A, Kaleem S, Ding K, **Osman G**, Swisher CB, Smith C, Maciel CB, Alkhachroum A, Lee JW, Dhakar MB, Gilmore EJ, Sivaraju A, Hirsch LJ, Omay SB, Blumenfeld H, Sheth KN, Struck AF, Edlow BL, Westover MB, and Kim JA. Quantitative epileptiform burden and electroencephalography background features predict post-traumatic epilepsy. *J Neurol Neurosurg Psychiatry* 2022; Epub ahead of print. PMID: 36241423. Full Text

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BACKGROUND: Post-traumatic epilepsy (PTE) is a severe complication of traumatic brain injury (TBI). Electroencephalography aids early post-traumatic seizure diagnosis, but its optimal utility for PTE prediction remains unknown. We aim to evaluate the contribution of quantitative electroencephalograms to predict first-year PTE (PTE(1)). METHODS: We performed a multicentre, retrospective case-control study of patients with TBI. 63 PTE(1) patients were matched with 63 non-PTE(1) patients by admission Glasgow Coma Scale score, age and sex. We evaluated the association of quantitative electroencephalography features with PTE(1) using logistic regressions and examined their predictive value relative to TBI mechanism and CT abnormalities. RESULTS: In the matched cohort (n=126), greater epileptiform burden, suppression burden and beta variability were associated with 4.6 times higher PTE(1) risk based on multivariable logistic regression analysis (area under the receiver operating characteristic curve, AUC (95% CI) 0.69 (0.60 to 0.78)). Among 116 (92%) patients with available CT reports, adding quantitative electroencephalography features to a combined mechanism and CT model improved performance (AUC (95% CI), 0.71 (0.61 to 0.80) vs 0.61 (0.51 to 0.72)). CONCLUSIONS: Epileptiform and spectral characteristics enhance covariates identified on TBI admission and CT abnormalities in PTE(1) prediction. Future trials should incorporate quantitative electroencephalography features to validate this enhancement of PTE risk stratification models.

Neurology

Elzanaty AM, Saeyeldin A, Royfman R, Maraey A, Khalil M, **Aboulnour H**, Elsheikh E, Meenakshisundaram C, Siragy HM, and Grubb B. Short-term Outcomes of Hypertensive Crises in Patients with Orthostatic Hypotension. *Curr Probl Cardiol* 2022; 101455. Epub ahead of print. PMID: 36280124. Full Text

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INTRODUCTION: Supine hypertension-orthostatic hypotension disease (SH-OH) poses a management challenge to clinicians. Data on short term outcomes of patients with OH who are hospitalized with hypertensive (HTN) crises is lacking METHODS: The Nationwide Readmission Database 2016-2019 was queried for all hospitalizations of HTN crises. Hospitalizations were stratified according to whether OH was present or not. We employed propensity score to match hospitalizations for patients with OH to those without, at 1:1 ratio. Outcomes evaluated were 30-days readmission with HTN crises or falls, as well as hospital outcomes of in-hospital mortality, acute kidney injury (AKI), acute congestive heart failure (CHF), acute coronary syndrome (ACS), type 2 myocardial infarction (T2MI), aortic dissection, stroke, length of stay (LOS), discharge to nursing home and hospitalization costs. RESULTS: We included a total of 9,451 hospitalization (4,735 in the OH group vs 4,716 in the control group). OH group was more likely to be readmitted with falls (Odds ratio [OR]:3.27, p<0.01) but not with HTN crises(p=0.05). Both groups had similar likelihood of developing AKI (p=0.08), stroke/TIA (p=0.52), and aortic dissection(p=0.66). Alternatively, OH group were less likely to develop acute HF (OR:0.54, p<0.01) or ACS (OR:0.39, p<0.01) in the setting of HTN crises than non-OH group. OH group were more likely to have longer LOS and have higher hospitalization costs. CONCLUSION: Patients with OH who are admitted with HTN crises tend to have similar or lower HTN-related complications to non-OH group while having higher likelihood of readmission with falls, LOS and hospitalization costs. Further studies are needed to confirm such findings.

Neurology

Nguyen TN, Qureshi MM, **Chebl A**, et al. Global Impact of the COVID-19 Pandemic on Stroke Volumes and Cerebrovascular Events: One-Year Follow-up. *Neurology* 2022; Epub ahead of print. PMID: 36257718. Full Text

BACKGROUND AND OBJECTIVES: Declines in stroke admission, intravenous thrombolysis, and mechanical thrombectomy volumes were reported during the first wave of the COVID-19 pandemic. There is a paucity of data on the longer-term effect of the pandemic on stroke volumes over the course of a year and through the second wave of the pandemic. We sought to measure the impact of the COVID-19 pandemic on the volumes of stroke admissions, intracranial hemorrhage (ICH), intravenous thrombolysis (IVT), and mechanical thrombectomy over a one-year period at the onset of the pandemic (March 1, 2020, to February 28, 2021) compared with the immediately preceding year (March 1, 2019, to February 29, 2020). METHODS: We conducted a longitudinal retrospective study across 6 continents, 56 countries, and 275 stroke centers. We collected volume data for COVID-19 admissions and 4 stroke metrics: ischemic stroke admissions, ICH admissions, intravenous thrombolysis treatments, and mechanical thrombectomy procedures. Diagnoses were identified by their ICD-10 codes or classifications in stroke databases. RESULTS: There were 148,895 stroke admissions in the one-year immediately before compared to 138,453 admissions during the one-year pandemic, representing a 7% decline (95% confidence interval [95% CI 7.1, 6.9]; p<0.0001). ICH volumes declined from 29,585 to 28,156 (4.8%,

[5.1, 4.6]; p<0.0001) and IVT volume from 24,584 to 23,077 (6.1%, [6.4, 5.8]; p<0.0001). Larger declines were observed at high volume compared to low volume centers (all p<0.0001). There was no significant change in mechanical thrombectomy volumes (0.7%, [0.6,0.9]; p=0.49). Stroke was diagnosed in 1.3% [1.31,1.38] of 406,792 COVID-19 hospitalizations. SARS-CoV-2 infection was present in 2.9% ([2.82,2.97], 5,656/195,539) of all stroke hospitalizations. DISCUSSION: There was a global decline and shift to lower volume centers of stroke admission volumes, ICH volumes, and IVT volumes during the 1st year of the COVID-19 pandemic compared to the prior year. Mechanical thrombectomy volumes were preserved. These results suggest preservation in the stroke care of higher severity of disease through the first pandemic year. TRIAL REGISTRATION INFORMATION: This study is registered under NCT04934020.

Neurosurgery

Koekkoek JAF, van der Meer PB, Pace A, Hertler C, Harrison R, Leeper HE, Forst DA, Jalali R, Oliver K, Philip J, Taphoorn MJB, Dirven L, and **Walbert T**. Palliative care and end-of-life care in adults with malignant brain tumors. *Neuro Oncol* 2022; Epub ahead of print. PMID: 36271873. Full Text

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BACKGROUND: This systematic review provides updated insights, from the published literature in the past 5 years, based on the 2017 European Association of Neuro-Oncology (EANO) guidelines for palliative care in adults with malignant brain tumors. It provides an overview of palliative care options, including during the end-of-life phase for patients with malignant brain tumors. METHODS: A systematic literature search was conducted from 2016 to 2021 focusing on four main topics: (1) symptom management, (2) caregiver needs, (3) early palliative care, and (4) care in the end-of-life phase. An international panel of palliative care experts in neuro-oncology synthesized the literature and reported the most relevant updates. A total of 140 articles were included. RESULTS: New insights include that: Hippocampal avoidance and stereotactic radiosurgery results in a lower risk of neurocognitive decline in patients with brain metastases; levetiracetam is more efficacious in reducing seizures than valproic acid as first-line monotherapy antiseizure drug (ASD) in glioma patients; lacosamide and perampanel seem well-tolerated and efficacious add-on ASDs; and a comprehensive framework of palliative and supportive care for high-grade glioma patients and their caregivers was proposed. No pharmacological agents have been shown in randomized controlled trials to significantly improve fatigue or neurocognition. CONCLUSIONS: Since the 2017 EANO palliative care guidelines, new insights have been reported regarding symptom management and end-of-life care, however, most recommendations remain unchanged. Early palliative care interventions are essential to define goals of care and minimize symptom burden in a timely fashion. Interventional studies that address pain, fatigue, and psychiatric symptoms as well as (the timing of) early palliative care are urgently needed.

Neurosurgery

Lim S, **Yeh HH**, **Macki M**, **Haider S**, **Hamilton T**, **Mansour TR**, **Telemi E**, **Schultz L**, **Nerenz DR**, **Schwalb JM**, **Abdulhak M**, Park P, Aleem I, Easton R, Khalil JG, Perez-Cruet M, and **Chang V**. Postoperative opioid prescription and patient-reported outcomes after elective spine surgery: a Michigan

Spine Surgery Improvement Collaborative study. *J Neurosurg Spine* 2022; 1-7. Epub ahead of print. PMID: 36208431. Full Text

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OBJECTIVE: This study was designed to assess how postoperative opioid prescription dosage could affect patient-reported outcomes after elective spine surgery. METHODS: Patients enrolled in the Michigan Spine Surgery Improvement Collaborative (MSSIC) from January 2020 to September 2021 were included in this study. Opioid prescriptions at discharge were converted to total morphine milligram equivalents (MME). A reference value of 225 MME per week was used as a cutoff. Patients were divided into two cohorts based on prescribed total MME: ≤ 225 MME and > 225 MME. Primary outcomes included patient satisfaction, return to work status after surgery, and whether improvement of the minimal clinically important difference (MCID) of the Patient-Reported Outcomes Measurement Information System 4-question short form for physical function (PROMIS PF) and EQ-5D was met. Generalized estimated equations were used for multivariate analysis. RESULTS: Regression analysis revealed that patients who had postoperative opioids prescribed with > 225 MME were less likely to be satisfied with surgery (adjusted OR [aOR] 0.81) and achieve PROMIS PF MCID (aOR 0.88). They were also more likely to be opioid dependent at 90 days after elective spine surgery (aOR 1.56). CONCLUSIONS: The opioid epidemic is a serious threat to national public health, and spine surgeons must practice conscientious postoperative opioid prescribing to achieve adequate pain control. The authors' analysis illustrates that a postoperative opioid prescription of 225 MME or less is associated with improved patient satisfaction, greater improvement in physical function, and decreased opioid dependence compared with those who had > 225 MME prescribed.

Neurosurgery

North RB, Lempka SF, Guan Y, **Air EL**, Poree LR, Shipley J, Arle J, Rigoard P, and Thomson S. Glossary of Neurostimulation Terminology: A Collaborative Neuromodulation Foundation, Institute of Neuromodulation, and International Neuromodulation Society Project. *Neuromodulation* 2022; 25(7):1050-1058. PMID: 35088746. Full Text

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OBJECTIVE: Consistent terminology is necessary to facilitate communication, but limited efforts have addressed this need in the neurostimulation community. We set out to provide a useful and updated glossary for our colleagues and prospective patients. MATERIALS AND METHODS: This collaborative effort of the Neuromodulation Foundation (NF), the Institute of Neuromodulation (IoN), and the International Neuromodulation Society (INS) expands a glossary first published in 2007 for spinal cord stimulation. Peripheral nerve, dorsal root ganglion, deep brain, and motor cortex stimulation have been added to our scope. Volunteers from the collaborating entities used a nominal group process, consensus development panels, and the Delphi technique to reach consensus on inclusion and definition of terms. We created a glossary suitable for print and for expansion on the websites of the collaborating entities, which will offer the possibility of explaining definitions for a general audience. We excluded proprietary and brand names but included terms that have attracted proprietary interest without becoming brands or trademarks. We made an effort to be inclusive while also being concise and economical with space. RESULTS: We identified and defined 91 terms for this print edition and created an accompanying list of acronyms. As appropriate, we provided figures to illustrate the definitions. CONCLUSIONS: Although we refer to the glossary presented herein as the print edition, it can of course be viewed and searched electronically. NF, IoN, and INS will continue to collaborate on expanded web editions that can include hyperlinks for internal and external navigation. We believe this glossary will benefit our growing field by facilitating communication and mitigating inappropriate use of neurostimulation terms.

Neurosurgery

Penning DH, Jones B, **Fayed M**, **Han X**, and **Brodie C**. Effect of cocaine on potassium-evoked release of glutamate from fetal rat brain synaptosomes. *Cureus* 2022; 14(10). PMID: Not assigned. Full Text

Introduction: Cocaine use during pregnancy can affect fetal brain development. A fetal brain injury could happen from the direct effect of cocaine on the developing brain or from the reduction of placental perfusion from vasoconstriction, which may lead to hypoxia-ischemia. A potential mechanism for brain injury could be due to a neurotransmitter imbalance within the brain, especially glutamate. In an immature rat brain synaptosome model, we explored the additive effect of cocaine alone on glutamate release and the effect of cocaine combined with simulated hypoxic depolarization using potassium as a surrogate. Method: Rat pups' brains were dissected and placed on a chilled petri dish. They then entered the experimental protocol. The suspended synaptosomes were divided equally into four experimental groups (control, high potassium "surrogate to hypoxic stimulation," cocaine, and cocaine + high K). Reversed-phase high-performance liquid chromatography analyzed glutamate with fluorescent detection. Results: The glutamate level was lowest in the cocaine-only group, with a level of 1.96 × 104, compared to the control and high potassium group. However, combining cocaine with high potassium seemed to generate a synergistic effect, achieving the highest glutamate level of all groups with a value of 5.31 × 104. Post hoc Conover's test for multiple pairwise-comparison between groups was done. In comparing various solutions to control, we did not find a statistically significant difference with the cocaine-only solution with a p-value of 0.074. Also, on comparing various other solutions to each other, there was no statistically significant difference between cocaine vs. cocaine + high potassium a p-value of 0.074. Conclusion: Our data support the conclusion that cocaine alone does not induce glutamate release from fetal rat brain synaptosomes. Exposure to high potassium does lead to glutamate release. However, cocaine greatly enhances glutamate release in the presence of high potassium levels. This could explain how cocaine affects brain maturation during pregnancy with a low oxygen tension environment in the placenta. This hypothesis should be tested in vivo.

Neurosurgery

Xu JC, **Haider SA**, Sharma A, Blumenfeld K, Cheng J, Mazzola CA, Orrico KO, Rosenow J, Stacy J, Stroink A, Tomei K, Tumialan L, Veeravagu A, Linskey ME, and **Schwalb J**. Telehealth in Neurosurgery: 2021 Council of State Neurosurgical Societies National Survey Results. *World Neurosurg* 2022; Epub ahead of print. PMID: 36202339. Full Text

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OBJECTIVE: Telehealth was rapidly adopted during the COVID-19 pandemic. A survey was distributed to neurosurgeons in the United States (US) to understand its use within neurosurgery, what barriers exist, unique issues related to neurosurgery, and opportunities for improvement. METHODS: A survey was distributed via email and used the SurveyMonkey platform. The survey was sent to 3,828 practicing neurosurgeons within the US 404 responses were collected between Oct. 30, 2021, through Dec. 4, 2021. RESULTS: During the pandemic, telehealth was used multiple times per week by 60.65% and used daily by an additional 12.78% of respondents. A supermajority (89.84%) of respondents felt that evaluating patients across state lines with telemedicine is beneficial. Most respondents (95.81%) believed that telehealth improves patient access to care. The major criticism of telehealth was the inability to perform a neurological exam. CONCLUSIONS: Telehealth has been widely implemented within the field of neurosurgery during the COVID-19 pandemic and has increased access to care. It has allowed patients to be evaluated remotely, including across state lines. While certain aspects of the neurological exam are suited for video evaluation, sensation and reflexes cannot be adequately assessed. Neurosurgeons believe that telehealth adds value to their ability to deliver care.

Neurosurgery
Yeni YN, **Azad S**, **Oravec D**, **Schildcrout A**, **Basheer A**, **Bey MJ**, **Bartol SW**, and **Chang V**. Intervertebral kinematics during neck motion 6.5 years after fusion and artificial disc replacement. *Clin Biomech (Bristol, Avon)* 2022; 99:105756. PMID: 36063742. Full Text

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BACKGROUND: Arthroplasty with artificial disc replacement for surgical treatment of cervical spine degeneration was introduced with the notion that motion-preserving approaches would prevent development of adjacent segment disease. Though clinical outcomes favor arthroplasty over the commonly used anterior cervical discectomy with fusion approach, clinical studies confirming the biomechanical basis of these results are lacking. The aim of this study was to compare intervertebral kinematics between arthroplasty and fusion patients 6.5 years post-surgery during physiological motion of the neck. METHODS: Using a biplane dynamic X-ray system, computed tomography imaging and model based tracking algorithms, three dimensional intervertebral kinematics were measured during neck axial rotation and extension in 14 patients treated for cervical radiculopathy with fusion (n = 8) or arthroplasty (n = 6). The measurements were performed at 2-year (baseline) and 6.5 year post-surgical time points, with the main interest being in the interaction between surgery types and time points. 3 translations and 3

rotations were investigated for the index (C5C6), and upper- (C4C5) and lower adjacent levels (C6C7). FINDINGS: Surgery-time interaction was significant for axial rotation ($P < 0.04$) and flexion-extension rotation ($P < 0.005$) in C4C5 during neck axial rotation, left-right translation ($P < 0.04$) in C5C6 and anterior-posterior translation in C6C7 ($P < 0.04$) during neck extension. In contrast with the expectations, axial rotation and flexion-extension decreased in C4C5 during neck rotation and anterior-posterior translation decreased in C6C7 during neck extension for fusion. INTERPRETATION: The findings do not support the notion that adjacent segment motion increases after fusion.

Ophthalmology and Eye Care Services
Troszak T. Ophthalmic Photographers' Society Exhibit, July 2021: Category: Optical Coherence Tomography, 1st Place. *J Cataract Refract Surg* 2022; 48(10):1202-1203. PMID: 36179350. Full Text

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Orthopedics/Bone and Joint Center
Braudy R, Atoms B, Coghlan J, Staples M, Moga D, Tollefsrud R, **Lawrence R**, Ludewig P, and Koehler L. Shoulder Kinematics of Axillary Web Syndrome in Women Treated for Breast Cancer. *Arch Phys Med Rehabil* 2022; Epub ahead of print. PMID: 36202228. Full Text

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OBJECTIVE: To better understand how the shoulder moves in breast cancer survivors with axillary web syndrome (AWS), we compared 3-dimensional (3D) shoulder kinematics during shoulder elevation among breast cancer survivors with and without AWS 5 years postoperatively. Although research consistently shows decreased shoulder range of motion with AWS, we do not understand the underlying biomechanics. DESIGN: Nested case control study SETTING: : University Academic Breast Center PARTICIPANTS: : Twenty-five women who had surgery 5 years previously for unilateral breast cancer with the removal of at least 1 lymph node participated in this study. Twelve participants had AWS; 13 women did not have AWS. INTERVENTIONS: Not Applicable. MAIN OUTCOME MEASURES: Three-dimensional shoulder kinematic data during shoulder forward flexion, scapular plane abduction, and coronal plane abduction were collected using 3D electromagnetic motion tracking. Kinematic data were extracted at 30°, 60°, 90°, and 120°of arm elevation for scapular upward rotation, internal rotation, and posterior tilt as well as for glenohumeral external rotation. RESULTS: Women with AWS demonstrated 15.2(0) less scapular upward rotation at 120(0) humerothoracic elevation (95% CI [-25.2, -5.2], $p = 0.005$), regardless of plane. No significant between-group differences were found for any other angle of scapular upward rotation, nor for scapular internal rotation, scapular posterior tilt, or glenohumeral axial rotation at any angle. CONCLUSIONS: Five years after surgery for breast cancer, women diagnosed with AWS have altered scapulohumeral kinematics that may place them at increased risk of shoulder pain based on existing kinematic literature in healthy cohorts. This information can help guide rehabilitation programs for breast cancer survivors to facilitate pain free upper extremity function following treatment.

Orthopedics/Bone and Joint Center
Jiang EX, **Tang X**, **Korn MA**, Fore J, Yoshida M, Kalkman J, and **Day CS**. What are the Minimum Clinically Important Difference Values for the PROMIS and QuickDASH After Carpal Tunnel Release? A Prospective Cohort Study. *Clin Orthop Relat Res* 2022; Epub ahead of print. PMID: 36190518. Full Text

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BACKGROUND: To better define the clinical significance of patient-reported outcomes, the concept of a minimum clinically important difference (MCID) exists. The MCID is the minimum change that a patient will perceive as meaningful. Prior attempts to determine the MCID after carpal tunnel release are limited by methodologic concerns, including the lack of a true anchor-based MCID calculation. QUESTIONS/PURPOSES: To address previous methodologic concerns in existing studies, as well as establish a clinically useful value for clinicians, we asked: What are the MCID values for the Patient-Reported Outcomes Measurement Information System (PROMIS) Upper Extremity (UE), PROMIS Pain Interference (PI), and the QuickDASH after carpal tunnel release? METHODS: We conducted a prospective cohort study at an urban, Midwest, multihospital, academic health system. One hundred forty-seven adult patients undergoing unilateral carpal tunnel release between September 2020 and February 2022 were identified. PROMIS UE, PI, and QuickDASH scores were collected preoperatively and 3 months postoperatively. We also collected responses to an anchor-based question: "Since your treatment, how would you rate your overall function?" (much worse, worse, slightly worse, no change, slightly improved, improved, or much improved). Patients who did not respond to the 3-month postoperative surveys were excluded. A total of 122 patients were included in the final analysis (83% response proportion [122 of 147]). The mean age was 57 years (range 23 to 87 years), and 68% were women. The MCID was calculated using both anchor-based and distribution-based methods. Although anchor-based calculations are generally considered more clinically relevant because they consider patients' perceptions of improvement, an estimation of the minimum detectable change (which represents measurement error) relies on a distribution-based calculation. We determined a range of MCID values to propose a final MCID value for all three instruments. A negative MCID value for the PROMIS PI instrument represents a decrease in pain, whereas a positive value for the PROMIS UE instrument represents an improvement in function. A negative value for the QuickDASH instrument represents an increase in function. RESULTS: The final proposed MCID values were 6.2 (interquartile range [IQR] 5.4 to 9.0) for the PROMIS UE, -7.8 (IQR -6.1 to -8.5) for the PROMIS PI, and -18.2 (IQR -13.3 to -34.1) for the QuickDASH. CONCLUSION: We recommend that clinicians use the following values as the MCID after carpal tunnel release: 6 for the UE, -8 for the PI, and -18 for the QuickDASH. Surgeons may find these values useful when counseling patients postoperatively regarding improvement. Future studies could examine whether a single MCID (or small range) for PROMIS instruments is applicable to a variety of conditions and interventions. LEVEL OF EVIDENCE: Level II, therapeutic study.

Orthopedics/Bone and Joint Center

Lawrence RL, **Veluswamy B**, **Dobben EA**, **Klochko CL**, and **Soliman SB**. Predictors of infraspinatus muscle degeneration in individuals with an isolated supraspinatus tendon tear. *Skeletal Radiol* 2022; Epub ahead of print. PMID: 36195776. Full Text

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OBJECTIVE: Determine the demographic and clinical factors that predict infraspinatus muscle degeneration in individuals with an isolated supraspinatus tendon tear. MATERIALS AND METHODS: A retrospective analysis was performed using the medical records of patients who had a shoulder MRI interpreted by 1 of 3 fellowship-trained musculoskeletal radiologists since the implementation of a standardized MRI 3 T protocol within our healthcare system. Demographic (e.g., age, sex) and clinical data (e.g., tear size, muscle degeneration, co-morbidities) were collected. Patients with an isolated supraspinatus tendon tear (n = 121) were assigned to one of two groups based on whether any infraspinatus muscle degeneration was present. Logistic regression was used to assess the univariate relationships between infraspinatus muscle degeneration and patient and clinical data, while least absolute shrinkage and selector operator (LASSO) logistic regression was used to assess the multivariable relationship. RESULTS: Of the patients with an isolated supraspinatus tendon tear, 16.5% had evidence of infraspinatus muscle degeneration. The presence of infraspinatus muscle degeneration was independently associated with cardiovascular disease ($P = 0.01$), supraspinatus muscle degeneration ($P < 0.01$), and subscapularis muscle degeneration ($P = 0.01$). When the multivariable relationship is

assessed, supraspinatus muscle degeneration emerged as the only variable of significant importance for detecting infraspinatus muscle degeneration (specificity: 87.1%, sensitivity: 80.0%). CONCLUSION: Infraspinatus muscle degeneration is not uncommon in individuals with an isolated supraspinatus tear and is most associated with concomitant supraspinatus muscle degeneration. These findings highlight the need for clinicians to specifically assess the status of each rotator cuff muscle, even when the tendon itself is intact.

Orthopedics/Bone and Joint Center
Moeller JL, and Ciecko J, 3rd. Sports Medicine Health Care Access in Michigan High Schools: Access to Athletic Trainers. *Curr Sports Med Rep* 2022; 21(10):347-350. PMID: 36205423. Full Text

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Disparities in access to health care services may lead to poor health outcomes. Health care encounters in the adolescent age group are often due to sport participation. The presence of an athletic trainer in high schools can improve health outcomes in adolescent athletes, but not all student-athletes have access to an athletic trainer. In the state of Michigan, many high schools do not provide athletic trainer access to their student athletes. Our aim was to determine factors associated with the presence or absence of athletic trainer access in Michigan high schools. Disparities are associated with student body population, student-athlete population, and average household income in the zip code in which the school is located.

Orthopedics/Bone and Joint Center
Yeni YN, **Azad S**, **Oravec D**, **Schildcrout A**, **Basheer A**, **Bey MJ**, **Bartol SW**, and **Chang V**. Intervertebral kinematics during neck motion 6.5 years after fusion and artificial disc replacement. *Clin Biomech (Bristol, Avon)* 2022; 99:105756. PMID: 36063742. Full Text

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BACKGROUND: Arthroplasty with artificial disc replacement for surgical treatment of cervical spine degeneration was introduced with the notion that motion-preserving approaches would prevent development of adjacent segment disease. Though clinical outcomes favor arthroplasty over the commonly used anterior cervical discectomy with fusion approach, clinical studies confirming the biomechanical basis of these results are lacking. The aim of this study was to compare intervertebral kinematics between arthroplasty and fusion patients 6.5 years post-surgery during physiological motion of the neck. METHODS: Using a biplane dynamic X-ray system, computed tomography imaging and model based tracking algorithms, three dimensional intervertebral kinematics were measured during neck axial rotation and extension in 14 patients treated for cervical radiculopathy with fusion (n = 8) or arthroplasty (n = 6). The measurements were performed at 2-year (baseline) and 6.5 year post-surgical time points, with the main interest being in the interaction between surgery types and time points. 3 translations and 3 rotations were investigated for the index (C5C6), and upper- (C4C5) and lower adjacent levels (C6C7). FINDINGS: Surgery-time interaction was significant for axial rotation ($P < 0.04$) and flexion-extension rotation ($P < 0.005$) in C4C5 during neck axial rotation, left-right translation ($P < 0.04$) in C5C6 and anterior-posterior translation in C6C7 ($P < 0.04$) during neck extension. In contrast with the expectations, axial rotation and flexion-extension decreased in C4C5 during neck rotation and anterior-posterior translation decreased in C6C7 during neck extension for fusion. INTERPRETATION: The findings do not support the notion that adjacent segment motion increases after fusion.

Orthopedics/Bone and Joint Center

Ziedas AC, **Castle J**, **Abed V**, **Swantek AJ**, **Rahman TM**, **Chaides S**, and **Makhni EC**. Race and Socioeconomic Status are Associated with Inferior Patient Reported Outcome Measures Following Rotator Cuff Repair. *Arthroscopy* 2022; Epub ahead of print. PMID: 36208711. Full Text

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PURPOSE: To investigate the impact Social Determinants of Health (SDOH) have on National Institutes of Health (NIH) Patient-Reported Outcomes Measurement Information System (PROMIS) Computer Adaptive Test (CAT) scores and postoperative health care utilization in rotator cuff repair (RCR) patients. METHODS: All patients who underwent RCR surgery by 3 shoulder and/or sports medicine fellowship-trained orthopedic surgeons between July 2017 and January 2020 were included. The electronic medical record (EMR) was used to identify SDOH for each patient. PROMIS CAT measures of Upper Extremity function ("PROMIS UE"), Pain Interference ("PROMIS PI"), and Depression ("PROMIS D") were completed preoperatively and postoperatively (6-months and 1-year). Postoperative health care utilization (clinical visits, virtual encounters, imaging encounters and physical therapy visits) were recorded as well. Univariate associations, multiple linear regressions, and Wilcoxon rank-sum tests were used to analyze mean differences between patient groups based on SDOH. RESULTS: Three hundred thirty-eight RCR patients were included. Patients who were Black, in lower median household income (MHI) quartiles, had public insurance, and female reported lower PROMIS scores compared to their counterparts. Smokers and white patients attended fewer postoperative office visits while Black patients attended greater physical therapy (PT) and non-visit encounters compared to their respective counterparts. CONCLUSION: Black race and lower socioeconomic status are associated with worse function and pain outcomes post-RCR compared to whites. Similarly, Black race and positive smoking status are associated with differential utilization of health care following RCR. Further attention may be required for these patients to address healthcare disparities. LEVEL OF EVIDENCE: Level III, Retrospective Cohort Study.

Otolaryngology – Head and Neck Surgery

Burchell A, **Mansour Y**, and Kulesza R. Leveling up: a long-range olivary projection to the medial geniculate without collaterals to the central nucleus of the inferior colliculus in rats. *Exp Brain Res* 2022; Epub ahead of print. PMID: 36271940. Full Text

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The medial nucleus of the trapezoid body (MNTB) is one of the monaural cell groups situated within the superior olivary complex (SOC), a constellation of brainstem nuclei with numerous roles in hearing. Principal MNTB neurons are glycinergic and express the calcium-binding protein, calbindin (CB). The MNTB receives its main glutamatergic, excitatory input from the contralateral cochlear nucleus via the

calyx of Held and converts this into glycinergic inhibition directed toward nuclei in the SOC and the ventral and intermediate nuclei of the lateral lemniscus (VNLL and INLL). Through this inhibition, the MNTB plays essential roles in localization of sound sources and encoding spectral and temporal features of sound. In rats, very few MNTB neurons project to the inferior colliculus. However, our recent study of SOC projections to the auditory thalamus revealed a substantial number of retrogradely labeled MNTB neurons. This observation led us to examine whether the rat MNTB provides a long-range projection to the medial geniculate body (MGB). We examined this possible projection using retrograde and anterograde tract tracing and immunohistochemistry for CB and the glycine receptor. Our results demonstrate a significant projection to the MGB from the ipsilateral MNTB that does not involve a collateral projection to the inferior colliculus.

Otolaryngology – Head and Neck Surgery

Craig JR, **Dai X**, **Bellemore S**, **Woodcroft KJ**, **Wilson C**, **Keller C**, **Bobbitt KR**, and **Ramesh M**. Inflammatory endotype of odontogenic sinusitis. *Int Forum Allergy Rhinol* 2022; Epub ahead of print. PMID: 36308740. Full Text

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BACKGROUND: Odontogenic sinusitis (ODS) is distinct from nonodontogenic rhinosinusitis with regard to clinical features as well as diagnostic and therapeutic approaches. While numerous studies have explored immune profiles of chronic rhinosinusitis, very few studies have explored the inflammatory endotype of ODS. METHODS: Odontogenic sinusitis was diagnosed by confirming infectious sinusitis adjacent to infectious maxillary odontogenic pathology. Maxillary sinus cultures and mucosal biopsies were obtained during endoscopic endonasal surgery in ODS and control patients. Controls were patients undergoing endoscopic skull base surgery with no sinus disease. Specimens were snap frozen in liquid nitrogen and stored at -80°C. Analysis was performed using a multiplex assay to measure Th-1 (TNFα, IFNγ, IL-2,12,18), Th-2 (IL-4,5,9,13), Th-17 (IL-17A,17F,22), and innate (CCL5,CXCL9,CXCL10, IL-6,8,10,12,23,27) immune pathways. Groups were compared via independent sample t-tests; if assumptions were violated, nonparametric Wilcoxon ranked sum tests were performed. RESULTS: Specimens from 22 ODS patients were compared to nine controls. ODS mucosal tissue was sampled in the setting of the following dental pathologies: post-dental extraction (n = 15), untreated apical periodontitis (n = 2), apical periodontitis after root canal therapy (n = 2), and maxillary sinus bone grafting with or without dental implantation (n = 3). The following cytokines were significantly elevated in ODS compared with controls: IFNγ, TNFα, IL-6, 8, 10, 27, and CXCL9. ODS, therefore, demonstrated heightened innate and Th1 immune activity. IL-17 levels were similar in both ODS and controls. CONCLUSION: ODS demonstrated both innate immune and Th1 inflammatory endotypes. Further studies are needed to explore ODS immunopathobiology and its potential impact on ODS management.

Otolaryngology – Head and Neck Surgery

Sikorskii A, Given CW, **Chang S**, **Tam S**, **Movsas B**, and Given B. Patient reported outcomes and unscheduled health services use during oral anti-cancer treatment. *J Pain Symptom Manage* 2022; Epub ahead of print. PMID: 36244640. Full Text

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CONTEXT: People on oral anti-cancer agents must self-manage their symptoms with less interaction with oncology providers compared to infusion treatments. Symptoms and physical function are key patient-reported outcomes (PROs) and may lead to unscheduled health services uses (urgent care and emergency department [ED] visits, hospitalizations), which in turn lead to increased health care costs. OBJECTIVES: To evaluate the prediction of unscheduled health services uses using age, sex, and comorbidity, then determine the extent to which PRO data (symptoms and functioning) improve that prediction. METHODS: This post-hoc exploratory analysis was based on data from the control group of a trial of medication adherence reminder and symptom self-management intervention for people starting a new oral anti-cancer agent (n=117 analyzed). Severity and interference with daily life for 18 symptoms, physical function, and depressive symptoms were assessed at intake (oral agent start), and 4, 8, and 12 weeks later. Unscheduled health services use during three 4-week periods after the start of oral agents was analyzed using generalized mixed effects models in relation to age, sex, comorbidity, and PROs at the beginning of each time period. RESULTS: The summed severity index of 18 symptoms and physical function were significant predictors of hospitalizations in the 4 weeks following PRO assessment. The addition of PROs improved areas under the receiver operating characteristic curves to be over .70 in most time periods. CONCLUSION: Monitoring of PROs has the potential of reducing unscheduled health services use if supportive care interventions are deployed based on their levels.

Otolaryngology – Head and Neck Surgery

Tiu RA, Meyer TK, **Mayerhoff RM**, Ray JC, Kritek PA, Merati AL, and Sardesai MG. Tracheotomy care simulation training program for inpatient providers. *Laryngoscope Investig Otolaryngol* 2022; 7(5):1491-1498. PMID: 36258878. Full Text

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OBJECTIVES: Tracheotomy complications can be life-threatening. Many of these complications may be avoided with proper education of health care providers. Unfortunately, access to high-quality tracheotomy care curricula is limited. We developed a program to address this gap in tracheotomy care education for inpatient providers. This study aimed to assess the efficacy of this training program in improving trainee knowledge and comfort with tracheotomy care. METHODS: The curriculum includes asynchronous online modules coupled with a self-directed hands-on simulation activity using a low-cost tracheotomy care task trainer. The program was offered to inpatient providers including medical students, residents, medical assistants, nurses, and respiratory therapists. Efficacy of the training was assessed using pre-training and post-training surveys of learner comfort, knowledge, and qualitative feedback. RESULTS: Data was collected on 41 participants. After completing the program, participants exhibited significantly improved comfort in performing tracheotomy care activities and 15% improvement in knowledge scores, with large effect sizes respectively and greater gains among those with little prior tracheotomy care experience. CONCLUSION: This study has demonstrated that completion of this integrated online and hands-on tracheotomy simulation curriculum training increases comfort and knowledge, especially for less-experienced learners. This training addresses an important gap in tracheotomy care education among health care professionals with low levels of tracheotomy care experience and ultimately aims to improve patient safety and quality of care. This curriculum is easily transferrable as it requires only access to the online modules and low-cost simulation materials and could be used in other hospitals, long-term care facilities, outpatient clinics, and home settings. LEVEL OF EVIDENCE: 4.

Pathology and Laboratory Medicine

Craig JR, **Dai X**, **Bellemore S**, **Woodcroft KJ**, **Wilson C**, **Keller C**, **Bobbitt KR**, and **Ramesh M**. Inflammatory endotype of odontogenic sinusitis. *Int Forum Allergy Rhinol* 2022; Epub ahead of print. PMID: 36308740. Full Text

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BACKGROUND: Odontogenic sinusitis (ODS) is distinct from nonodontogenic rhinosinusitis with regard to clinical features as well as diagnostic and therapeutic approaches. While numerous studies have explored immune profiles of chronic rhinosinusitis, very few studies have explored the inflammatory endotype of ODS. METHODS: Odontogenic sinusitis was diagnosed by confirming infectious sinusitis adjacent to infectious maxillary odontogenic pathology. Maxillary sinus cultures and mucosal biopsies were obtained during endoscopic endonasal surgery in ODS and control patients. Controls were patients undergoing endoscopic skull base surgery with no sinus disease. Specimens were snap frozen in liquid nitrogen and stored at -80°C. Analysis was performed using a multiplex assay to measure Th-1 (TNFα, IFNγ, IL-2,12,18), Th-2 (IL-4,5,9,13), Th-17 (IL-17A,17F,22), and innate (CCL5,CXCL9,CXCL10, IL-6,8,10,12,23,27) immune pathways. Groups were compared via independent sample t-tests; if assumptions were violated, nonparametric Wilcoxon ranked sum tests were performed. RESULTS: Specimens from 22 ODS patients were compared to nine controls. ODS mucosal tissue was sampled in the setting of the following dental pathologies: post-dental extraction (n = 15), untreated apical periodontitis (n = 2), apical periodontitis after root canal therapy (n = 2), and maxillary sinus bone grafting with or without dental implantation (n = 3). The following cytokines were significantly elevated in ODS compared with controls: IFNγ, TNFα, IL-6, 8, 10, 27, and CXCL9. ODS, therefore, demonstrated heightened innate and Th1 immune activity. IL-17 levels were similar in both ODS and controls. CONCLUSION: ODS demonstrated both innate immune and Th1 inflammatory endotypes. Further studies are needed to explore ODS immunopathobiology and its potential impact on ODS management.

Pathology and Laboratory Medicine

Oyedeji O, **Rodgers S**, **Wrubel A**, **Shah R**, and **Husain S**. Pancreatic lymphoepithelial cyst with concurrent HIV infection: A case report and review of the literature. *SAGE Open Med Case Rep* 2022;10. PMID: 36274859. Full Text

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Pancreatic lymphoepithelial cysts are rare, benign, non-neoplastic unilocular or multilocular cystic lesions. These circumscribed pancreatic lesions are filled with keratinous material grossly and exhibit distinct microscopic features. Pancreatic lymphoepithelial cysts are like the more common lymphoepithelial cysts of the parotid glands, which have been associated with the diffuse infiltrative lymphocytosis syndrome often seen in patients with HIV infection. However, pancreatic lymphoepithelial cysts are rare and their association with HIV infection has not been established. The presence of secondary changes in non-neoplastic cysts such as goblet cell metaplasia that was present in our case is an important feature to be included in the differential diagnosis and not to be interpreted as a mucinous neoplasm, particularly on fine-needle aspiration specimen microscopic evaluation that would impact further management. Here we describe the diagnosis and treatment of lymphoepithelial cysts in a patient who was on highly active antiretroviral therapy for HIV infection and we provide a brief literature review. Defining the clinical characteristics of lymphoepithelial cysts in patients with HIV and determining accurate preoperative diagnostic procedures will be critical for establishing effective surgical and medical approaches to treating these cysts, which differ substantially from other more serious pancreatic cystic lesions.

Pathology and Laboratory Medicine

Velez Torres JM, Lora-Gonzalez M, Duarte EM, Zein-Sabatto B, Aron M, **Gupta NS**, Kerr DA, Netto GJ, Jorda M, and Kryvenko ON. Urine Cytology Findings in Cases of Pseudocarcinomatous Urothelial Hyperplasia of the Bladder Often Represent a Diagnostic Challenge. *Arch Pathol Lab Med* 2022; Epub ahead of print. PMID: 36191340. Full Text

From the Department of Pathology and Laboratory Medicine (Velez Torres, Jorda, Kryvenko), University of Miami Miller School of Medicine, Miami, Florida.
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CONTEXT.—: Pseudocarcinomatous urothelial hyperplasia (PCUH) architecturally and cytologically mimics cancer. The urine cytology features of PCUH have not been described. OBJECTIVE.—: To describe PCUH features in urine cytology. DESIGN.—: We reviewed urine cytology cases with concurrent PCUH tissue specimens from 5 academic institutions and classified them by using The Paris System criteria. RESULTS.—: Thirty-nine patients included 31 men and 8 women with a mean age of 67 years (range, 39-87 years). All patients had prior pelvic irradiation, and most presented with hematuria (n = 27). The specimens included voided urine (n = 16); bladder washing (n = 11); and urine, not otherwise specified (n = 12). The specimen preparation included cytospin (n = 29) and ThinPrep (n = 10). Original interpretations were negative for high-grade urothelial carcinoma (n = 28), atypical urothelial cells (AUCs; n = 10), and high-grade urothelial carcinoma (HGUC; n = 1). Twenty-five urine specimens (64%) had findings of PCUH. These specimens were moderately cellular and composed of sheets, cohesive groups, or isolated urothelial cells. Nucleoli were present in 23 cases. The nuclear membrane was smooth to irregular (n = 9), smooth (n = 8), and irregular (n = 8). The chromatin was glassy (n = 8), vesicular (n = 7), hyperchromatic (n = 7), and vesicular to finely granular (n = 3). The cytoplasm varied from dense squamoid, to finely vacuolated, to vacuolated. Nucleomegaly was observed in all 25 specimens, and nuclear-cytoplasmic ratio greater than 0.5 was seen in 11 of 25 cases (44%). The background contained acute inflammation (n = 14), was clean (n = 9), and contained red blood cells (n = 2). All cases originally interpreted as AUCs and HGUC had PCUH features. CONCLUSIONS.—: PCUH urine features can overlap with AUCs, HGUC, and other nonurothelial malignancies. In our cohort, 44% (11 of 25) of urine specimens with PCUH changes were initially misclassified. Recognition of cytologic features of PCUH is important to avoid overcalling reactive changes.

Pathology and Laboratory Medicine

Wheeler SE, Block DR, Bunch DR, Gramz J, Leung EKY, McClintock DS, and **Tuthill JM**. Clinical Laboratory Informatics and Analytics: Challenges and Opportunities. *Clin Chem* 2022; Epub ahead of print. PMID: 36264683. Full Text

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Pharmacy

Alosaimy S, Morrisette T, Lagnf AM, Rojas LM, King MA, Pullinger BM, Hobbs ALV, Perkins NB, 3rd, **Veve MP**, Bouchard J, Gore T, Jones B, Truong J, Andrade J, Huang G, Cosimi R, Kang-Birken SL, Molina KC, Biagi M, Pierce M, Scipione MR, Zhao JJ, **Davis SL**, and Rybak MJ. Clinical Outcomes of Eravacycline in Patients Treated Predominately for Carbapenem-Resistant Acinetobacter baumannii. *Microbiol Spectr* 2022;e0047922. Epub ahead of print. PMID: 36190427. Full Text

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Forty-six patients were treated with eravacycline (ERV) for Acinetobacter baumannii infections, where 69.5% of isolates were carbapenem resistant (CRAB). Infections were primarily pulmonary (58.3%), and most patients received combination therapy (84.4%). The median (IQR) ERV duration was 6.9 days (5.1 to 11.1). Thirty-day mortality was 23.9% in the cohort and 21.9% in CRAB patients. One patient experienced an ERV-possible adverse event. IMPORTANCE Acinetobacter baumannii, particularly when carbapenem resistant (CRAB), is one of the most challenging pathogens in the health care setting. This is complicated by the fact that there is no consensus guideline regarding management of A. baumannii infections. However, the recent Infectious Diseases Society of America guidelines for treatment of

resistant Gram-negative infections provided expert recommendations for CRAB management. The panel suggest using minocycline among tetracycline derivatives rather than eravacycline (ERV) until sufficient clinical data are available. Therefore, we present the largest multicenter real-world cohort in patients treated with ERV for A. baumannii, where the majority of isolates were CRAB (69.5%). Our analysis demonstrate that patients treated with ERV-based regimens achieved a 30-day mortality of 23.9% and had a low incidence of ERV-possible adverse events (2.1%). This study is important as it fills the gap in the literature regarding the use of a novel tetracycline (i.e., ERV) in the treatment of this challenging health care infection.

Pharmacy

Greenlee SB, **Acosta TJP**, **Makowski CT**, **Kenney RM**, **Ramesh M**, **Williams JD**, and **Alangaden GJ**. Bridging the gap: An approach to reporting antimicrobial stewardship metrics specific to solid organ transplant recipients. *Transpl Infect Dis* 2022; 24(5):e13944. PMID: 36254520. Full Text

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BACKGROUND: This study seeks to describe inpatient antimicrobial use (AU) utilizing the National Healthcare Safety Network-AU (NHSN-AU) framework among solid organ transplant recipients (SOTr) within 12 months after transplant. METHODS: This cross-sectional study included SOTr ≥ 18 years of age who underwent transplantation from January 2015 to December 2016 at a Midwestern US transplant center. Inpatient AU was followed for 12 months post-transplant. Hospital days present up to 12 months post-transplant, AU variables, and Clostridioides difficile infection (CDI) occurrences were analyzed. RESULTS: The cohort of 530 SOTr included 225 kidney (42.5%), 171 liver (32.3%), 45 lung (8.5%), 40 heart (7.5%), 39 multivisceral (7.4%), seven small bowel (1.3%), and three pancreas (0.6%) transplants. Total days of therapy (DOT) were 22 782 among the cohort, with a median of 5 days [interquartile range [IQR], 1-12]. Lung and liver transplants had the most total DOT (6571 vs. 5569 days), while lungs and small bowels had the highest median DOT (13 [IQR, 2-56] vs. 12 [IQR, 2-31]). The facility-wide DOT/1000 days were lowest in pancreas and highest in lung transplants (5.3 vs. 428.1). Small bowel transplants received the most resistant-Gram-positive infection and hospital-onset infection agents for facility-wide DOT/1000 days present. Pancreas and kidney transplants accounted for the most high-risk CDI agents. CDI occurred in 34 patients, with kidney and liver transplants experiencing 13 each. CONCLUSION: This study represents one of the first reports of AU in SOTr utilizing the NHSN-AU framework. More studies are needed for further peer-to-peer comparison of AU in this complex patient population.

Public Health Sciences

Craig JR, **Dai X**, **Bellemore S**, **Woodcroft KJ**, **Wilson C**, **Keller C**, **Bobbitt KR**, and **Ramesh M**. Inflammatory endotype of odontogenic sinusitis. *Int Forum Allergy Rhinol* 2022; Epub ahead of print. PMID: 36308740. Full Text

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BACKGROUND: Odontogenic sinusitis (ODS) is distinct from nonodontogenic rhinosinusitis with regard to clinical features as well as diagnostic and therapeutic approaches. While numerous studies have explored immune profiles of chronic rhinosinusitis, very few studies have explored the inflammatory endotype of ODS. METHODS: Odontogenic sinusitis was diagnosed by confirming infectious sinusitis adjacent to infectious maxillary odontogenic pathology. Maxillary sinus cultures and mucosal biopsies were obtained during endoscopic endonasal surgery in ODS and control patients. Controls were patients undergoing endoscopic skull base surgery with no sinus disease. Specimens were snap frozen in liquid nitrogen and stored at -80°C. Analysis was performed using a multiplex assay to measure Th-1 (TNFα,

IFNγ, IL-2,12,18), Th-2 (IL-4,5,9,13), Th-17 (IL-17A,17F,22), and innate (CCL5,CXCL9,CXCL10, IL-6,8,10,12,23,27) immune pathways. Groups were compared via independent sample t-tests; if assumptions were violated, nonparametric Wilcoxon ranked sum tests were performed. RESULTS: Specimens from 22 ODS patients were compared to nine controls. ODS mucosal tissue was sampled in the setting of the following dental pathologies: post-dental extraction (n = 15), untreated apical periodontitis (n = 2), apical periodontitis after root canal therapy (n = 2), and maxillary sinus bone grafting with or without dental implantation (n = 3). The following cytokines were significantly elevated in ODS compared with controls: IFNγ, TNFα, IL-6, 8, 10, 27, and CXCL9. ODS, therefore, demonstrated heightened innate and Th1 immune activity. IL-17 levels were similar in both ODS and controls. CONCLUSION: ODS demonstrated both innate immune and Th1 inflammatory endotypes. Further studies are needed to explore ODS immunopathobiology and its potential impact on ODS management.

Public Health Sciences

Eapen AA, **Sitarik AR**, **Cheema G**, **Kim H**, Ownby D, **Johnson CC**, and **Zoratti E**. Effect of prenatal dog exposure on eczema development in early and late childhood. *J Allergy Clin Immunol Pract* 2022; Epub ahead of print. PMID: 36229332. Full Text

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Public Health Sciences

Jiang EX, **Tang X**, **Korn MA**, Fore J, Yoshida M, Kalkman J, and **Day CS**. What are the Minimum Clinically Important Difference Values for the PROMIS and QuickDASH After Carpal Tunnel Release? A Prospective Cohort Study. *Clin Orthop Relat Res* 2022; Epub ahead of print. PMID: 36190518. Full Text

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BACKGROUND: To better define the clinical significance of patient-reported outcomes, the concept of a minimum clinically important difference (MCID) exists. The MCID is the minimum change that a patient will perceive as meaningful. Prior attempts to determine the MCID after carpal tunnel release are limited by methodologic concerns, including the lack of a true anchor-based MCID calculation. QUESTIONS/PURPOSES: To address previous methodologic concerns in existing studies, as well as establish a clinically useful value for clinicians, we asked: What are the MCID values for the Patient-Reported Outcomes Measurement Information System (PROMIS) Upper Extremity (UE), PROMIS Pain Interference (PI), and the QuickDASH after carpal tunnel release? METHODS: We conducted a prospective cohort study at an urban, Midwest, multihospital, academic health system. One hundred forty-seven adult patients undergoing unilateral carpal tunnel release between September 2020 and February 2022 were identified. PROMIS UE, PI, and QuickDASH scores were collected preoperatively and 3 months postoperatively. We also collected responses to an anchor-based question: "Since your treatment, how would you rate your overall function?" (much worse, worse, slightly worse, no change, slightly improved, improved, or much improved). Patients who did not respond to the 3-month postoperative surveys were excluded. A total of 122 patients were included in the final analysis (83% response proportion [122 of 147]). The mean age was 57 years (range 23 to 87 years), and 68% were women. The MCID was calculated using both anchor-based and distribution-based methods. Although anchor-based calculations are generally considered more clinically relevant because they consider patients' perceptions of improvement, an estimation of the minimum detectable change (which represents measurement error) relies on a distribution-based calculation. We determined a range of MCID values to propose a final MCID value for all three instruments. A negative MCID value for the PROMIS PI instrument represents a decrease in pain, whereas a positive value for the PROMIS UE instrument

represents an improvement in function. A negative value for the QuickDASH instrument represents an increase in function. RESULTS: The final proposed MCID values were 6.2 (interquartile range [IQR] 5.4 to 9.0) for the PROMIS UE, -7.8 (IQR -6.1 to -8.5) for the PROMIS PI, and -18.2 (IQR -13.3 to -34.1) for the QuickDASH. CONCLUSION: We recommend that clinicians use the following values as the MCID after carpal tunnel release: 6 for the UE, -8 for the PI, and -18 for the QuickDASH. Surgeons may find these values useful when counseling patients postoperatively regarding improvement. Future studies could examine whether a single MCID (or small range) for PROMIS instruments is applicable to a variety of conditions and interventions. LEVEL OF EVIDENCE: Level II, therapeutic study.

Public Health Sciences

Kalmbach DA, **Cheng P**, **Ahmedani BK**, **Peterson EL**, **Reffi AN**, **Sagong C**, **Seymour GM**, **Ruprich MK**, and **Drake CL**. Cognitive-behavioral therapy for insomnia prevents and alleviates suicidal ideation: Insomnia remission is a suicidolytic mechanism. *Sleep* 2022; Epub ahead of print. PMID: 36242607. Full Text

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STUDY OBJECTIVES: Insomnia is associated with elevated levels of suicidal thoughts and behaviors. Emerging evidence suggests that cognitive behavioral therapy for insomnia (CBTI) may reduce suicidal ideation (SI). However, the role of digital therapeutics in both the alleviation and prevention of SI remains unclear, and treatment mechanisms facilitating SI reductions have not been clearly identified. METHOD: 658 adults with DSM-5 insomnia disorder enrolled into a single-site randomized controlled trial evaluating the efficacy of digital CBTI relative to attention control. Outcomes were measured at pretreatment, posttreatment, and 1-year follow-up. RESULTS: Before treatment, 126 patients endorsed SI (19.1% prevalence). Among those with baseline SI, CBTI patients reported lower SI rates at posttreatment (30.0% vs 54.5%, p=.005) and 1-year follow-up (29.6% vs 46.8%, p=.042) relative to control. PRODCLIN analysis estimated that half of suicidolytic effects of CBTI were mediated through insomnia remission. Among those without baseline SI, CBTI did not directly prevent new onset SI. However, insomnia remitters reported lower rates of new onset SI at posttreatment relative to non-remitters (1.5% vs 6.5%, p=.009). Mediation analysis supported a significant indirect effect wherein CBTI increased likelihood of insomnia remission, which was associated with SI prevention (αβ=-3.13=5, 95%CI=-5.28, -0.96). CONCLUSION: Digital CBTI reduces insomnia symptoms, which promotes SI alleviation and prevention. For non-suicidal patients, digital CBTI may serve as a highly accessible monotherapy for improving sleep, thereby reducing risk for SI. For suicidal patients, digital CBTI may be appropriately administered as an adjunct treatment to support mainline intervention more directly targeting suicidogenic thoughts.

Public Health Sciences

Kim RY, Rendle KA, Mitra N, Saia CA, **Neslund-Dudas C**, Greenlee RT, Burnett-Hartman AN, Honda SA, **Simoff MJ**, Schapira MM, Croswell JM, Meza R, Ritzwoller DP, and Vachani A. Socioeconomic Status as a Mediator of Racial Disparity in Annual Lung Cancer Screening Adherence. *Am J Respir Crit Care Med* 2022; Epub ahead of print. PMID: 36306485. Full Text

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Public Health Sciences

Lim S, **Yeh HH**, **Macki M**, **Haider S**, **Hamilton T**, **Mansour TR**, **Telemi E**, **Schultz L**, **Nerenz DR**, **Schwalb JM**, **Abdulhak M**, Park P, Aleem I, Easton R, Khalil JG, Perez-Cruet M, and **Chang V**. Postoperative opioid prescription and patient-reported outcomes after elective spine surgery: a Michigan Spine Surgery Improvement Collaborative study. *J Neurosurg Spine* 2022; 1-7. Epub ahead of print. PMID: 36208431. Full Text

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OBJECTIVE: This study was designed to assess how postoperative opioid prescription dosage could affect patient-reported outcomes after elective spine surgery. METHODS: Patients enrolled in the Michigan Spine Surgery Improvement Collaborative (MSSIC) from January 2020 to September 2021 were included in this study. Opioid prescriptions at discharge were converted to total morphine milligram equivalents (MME). A reference value of 225 MME per week was used as a cutoff. Patients were divided into two cohorts based on prescribed total MME: ≤ 225 MME and > 225 MME. Primary outcomes included patient satisfaction, return to work status after surgery, and whether improvement of the minimal clinically important difference (MCID) of the Patient-Reported Outcomes Measurement Information System 4-question short form for physical function (PROMIS PF) and EQ-5D was met. Generalized estimated equations were used for multivariate analysis. RESULTS: Regression analysis revealed that patients who had postoperative opioids prescribed with > 225 MME were less likely to be satisfied with surgery (adjusted OR [aOR] 0.81) and achieve PROMIS PF MCID (aOR 0.88). They were also more likely to be opioid dependent at 90 days after elective spine surgery (aOR 1.56). CONCLUSIONS: The opioid epidemic is a serious threat to national public health, and spine surgeons must practice conscientious postoperative opioid prescribing to achieve adequate pain control. The authors' analysis illustrates that a postoperative opioid prescription of 225 MME or less is associated with improved patient satisfaction, greater improvement in physical function, and decreased opioid dependence compared with those who had > 225 MME prescribed.

Public Health Sciences

Ogbolu Y, Dudding R, Fiori K, North-Kabore J, **Parke D**, Plum RA, Shin S, and Rowthorn V. Global Learning for Health Equity: A Literature Review. *Ann Glob Health* 2022; 88(1):1-15. PMID: Not assigned. Full Text

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Background: In high income countries struggling with escalating health care costs and persistent lack of equity, there is growing interest in searching for innovative solutions developed outside national borders, particularly in low-and middle-income countries (LMICs). Engaging with global ideas to apply them to local health equity challenges is becoming increasingly recognized as an approach to shift the health equity landscape in the United States (US) in a significant way. No single name or set of practices yet defines the process of identifying LMIC interventions for adaptation; implementing interventions in high-income countries (HIC) settings; or evaluating the implementation of such projects. Objectives: This paper presents a review of the literature describing the practice of adapting global ideas for use in the US, particularly in the area of health equity. Specifically, the authors sought to examine; (i) the literature that advocates for, or describes, adaption of health-related innovations from LMICs to HICs, both generally and for health equity specifically, and (ii) implementation practices, strategies, and evidence-based outcomes in this field, generally and in the area of health equity specifically. The authors also propose terminology and a definition to describe the practice. Methods: The literature search included two main concepts: global learning and health equity (using these and related terms). The search consisted of text-words and database-specific terminology (e.g., MeSH, Emtree) using PubMed, Embase (Elsevier), CINAHL (Ebsco), and Scopus in March 2021. The authors also contacted relevant experts to identify grey literature. Identified sources were categorized according to theme to facilitate analysis. In addition, five key interviews with experts engaged with global ideas to promote health equity in the United States were conducted to develop additional data. Results: The literature review yielded over ninety (n = 92) sources relating to the adaptation of global ideas from low resource to higher resource settings to promote health equity (and related concepts). Identified sources range from those providing general commentaries about the value of seeking health-related innovations outside the US border to sources describing global projects implemented in the US, most without implementation or outcome measures. Other identified sources provide frameworks or guidance to help identify and/or implement global ideas in the US, and some describe the role of the World Health Organization and other international consortia in promoting a global approach to solving domestic health equity and related challenges. Conclusions: The literature review demonstrates that there are resources and commentary describing potential benefits of identifying and adapting novel global ideas to address health equity in the US, but there is a dearth of implementation and evaluation data. Terminology is required to define and frame the field. Additional research, particularly in the area of implementation science and evidence-based frameworks to support the practice of what we define as ‘global learning’ for health equity, is necessary to advance the practice.

Public Health Sciences

Penning DH, Jones B, **Fayed M**, **Han X**, and **Brodie C**. Effect of cocaine on potassium-evoked release of glutamate from fetal rat brain synaptosomes. *Cureus* 2022; 14(10). PMID: Not assigned. Full Text

Introduction: Cocaine use during pregnancy can affect fetal brain development. A fetal brain injury could happen from the direct effect of cocaine on the developing brain or from the reduction of placental perfusion from vasoconstriction, which may lead to hypoxia-ischemia. A potential mechanism for brain injury could be due to a neurotransmitter imbalance within the brain, especially glutamate. In an immature rat brain synaptosome model, we explored the additive effect of cocaine alone on glutamate release and the effect of cocaine combined with simulated hypoxic depolarization using potassium as a surrogate. Method: Rat pups' brains were dissected and placed on a chilled petri dish. They then entered the experimental protocol. The suspended synaptosomes were divided equally into four experimental groups (control, high potassium "surrogate to hypoxic stimulation," cocaine, and cocaine + high K). Reversed-phase high-performance liquid chromatography analyzed glutamate with fluorescent detection. Results: The glutamate level was lowest in the cocaine-only group, with a level of 1.96 × 104, compared to the control and high potassium group. However, combining cocaine with high potassium seemed to generate a synergistic effect, achieving the highest glutamate level of all groups with a value of 5.31 × 104. Post hoc Conover's test for multiple pairwise-comparison between groups was done. In comparing various solutions to control, we did not find a statistically significant difference with the cocaine-only solution with a p-value of 0.074. Also, on comparing various other solutions to each other, there was no statistically significant difference between cocaine vs. cocaine + high potassium a p-value of 0.074. Conclusion: Our

data support the conclusion that cocaine alone does not induce glutamate release from fetal rat brain synaptosomes. Exposure to high potassium does lead to glutamate release. However, cocaine greatly enhances glutamate release in the presence of high potassium levels. This could explain how cocaine affects brain maturation during pregnancy with a low oxygen tension environment in the placenta. This hypothesis should be tested in vivo.

Public Health Sciences

Tao MH, Liu JL, and Nguyen UDT. Trends in Diet Quality by Race/Ethnicity among Adults in the United States for 2011-2018. *Nutrients* 2022; 14(19). PMID: 36235830. Full Text

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This study aimed to investigate time trends in diet quality and the consumption of major food groups and nutrients by race/ethnicity among adults in the United States. Dietary data from 19,192 adults aged ≥ 20 years from four National Health and Nutrition Survey (NHANES) cycles (2011-2018) were included. The Healthy Eating Index (HEI) 2015 scores (range: 0-100; higher scores indicate better diet quality) and dietary consumption of food groups and nutrients were estimated for each cycle. Linear regression was used to test trends. For the overall population, the estimated overall HEI-2015 scores significantly decreased (p for trend = 0.011). However, decreases were observed in the estimated consumption of added sugars and total carbohydrates, while the estimated consumption of soy products and polyunsaturated fatty acids was significantly increased. A significant decrease in overall HEI-2015 score was observed in the non-Hispanic white group, but not in other racial/ethnic groups. Decreases in added sugar intake were found in the non-Hispanic black and Hispanic groups; sodium intake significantly decreased in the non-Hispanic Asian group. From 2011 to 2018, there was a decrease in estimated overall diet quality in US adults; however, there were improvements in certain nutrients and dietary components. Nevertheless, disparities in diet quality exist among racial/ethnic groups.

Public Health Sciences

Williamson SR, Hes O, Trpkov K, Aggarwal A, Satapathy A, Mishra S, Sharma S, Sangoi A, Cheng L, Akgul M, Idrees M, **Levin A**, **Sadasivan S**, San Miguel Fraile P, Rogala J, Comperat E, Berney DM, Bulimbasic S, McKenney JK, Jha S, Sampat NY, and Mohanty SK. Low-grade oncocytic tumour of the kidney is characterised by genetic alterations of TSC1, TSC2, MTOR or PIK3CA and consistent GATA3 positivity. *Histopathology* 2022; Epub ahead of print. PMID: 36208048. Full Text

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Low-grade oncocytic tumour (LOT) of the kidney has recently emerged as a potential novel tumour type. Despite similarity to oncocytoma or eosinophilic chromophobe renal cell carcinoma, it shows diffuse keratin 7 immunohistochemistry (IHC) and negative KIT (CD117), which differs from both. We aimed to identify the molecular characteristics of these tumours. Seventeen tumours (one male, 16 female, nine previously published) fitting the original description of this entity (solid eosinophilic cell morphology, often with areas of tumour cells loosely stretched in oedematous stroma, and the above IHC features) were analysed with a next-generation sequencing panel of 324 cancer-associated genes from formalin-fixed, paraffin-embedded tissue. All tumours harboured at least one alteration in either TSC1 (n = 7, 41%), TSC2 (n = 2, 12%), MTOR (n = 5, 29%) or PIK3CA (n = 4, 24%). Four tumours harboured a second alteration, including two NF2, one each in conjunction with MTOR and TSC2 alterations, one PTEN with TSC1 alteration and one tumour with both MTOR and TSC1 alterations. No other renal cancer-related or recurring gene alterations were identified. In addition to the previously described IHC findings, 16 of 16 were positive for GATA3. Eleven patients with follow-up had no metastases or recurrent tumours. Recurrent tuberous sclerosis/MTOR pathway gene alterations in LOT support its consideration as a distinct morphological, immunohistochemical and genetic entity. PIK3CA is another pathway member that may be altered in these tumours. Further study will be necessary to determine whether tumour behaviour or syndromic associations differ from those of oncocytoma and chromophobe carcinoma, warranting different clinical consideration.

Pulmonary and Critical Care Medicine

Kim RY, Rendle KA, Mitra N, Saia CA, **Neslund-Dudas C**, Greenlee RT, Burnett-Hartman AN, Honda SA, **Simoff MJ**, Schapira MM, Croswell JM, Meza R, Ritzwoller DP, and Vachani A. Socioeconomic Status as a Mediator of Racial Disparity in Annual Lung Cancer Screening Adherence. *Am J Respir Crit Care Med* 2022; Epub ahead of print. PMID: 36306485. Full Text

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Radiation Oncology

Harkenrider MM, Abu-Rustum N, Albuquerque K, Bradfield L, Bradley K, Dolinar E, Doll CM, **Elshaikh M**, Frick MA, Gehrig PA, Han K, Hathout L, Jones E, Klopp A, Mourtada F, Suneja G, Wright AA, Yashar C, and Erickson BA. Radiation Therapy for Endometrial Cancer: An ASTRO Clinical Practice Guideline. *Pract Radiat Oncol* 2022; Epub ahead of print. PMID: 36280107. Full Text

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PURPOSE: With the results of several recently published clinical trials, this guideline informs on the use of adjuvant radiation therapy (RT) and systemic therapy in the treatment of endometrial cancer. Updated evidence-based recommendations provide indications for adjuvant RT and the associated techniques, the utilization and sequencing of adjuvant systemic therapies, as well as the impact of surgical staging techniques and molecular tumor profiling. METHODS: The American Society for Radiation Oncology (ASTRO) convened a multidisciplinary task force to address 6 key questions that focused on the adjuvant management of patients with endometrial cancer. The key questions emphasized the 1) indications for adjuvant RT, 2) RT techniques, target volumes, dose-fractionation, and treatment planning aims, 3) indications for systemic therapy, 4) sequencing of systemic therapy with RT, 5) impact of lymph node assessment on utilization of adjuvant therapy, and 6) impact of molecular tumor profiling on utilization of adjuvant therapy. Recommendations were based on a systematic literature review and created using consensus-building and ASTRO's Guideline Methodology for quality of evidence grading and strength of recommendation. RESULTS: The task force recommends RT (either vaginal brachytherapy or external beam radiation therapy [EBRT]) be given based on the patient's clinical-pathologic risk factors to reduce risk of vaginal and/or pelvic recurrence. When EBRT is delivered, intensity modulated radiation therapy with daily image guided radiation therapy is recommended to reduce acute and late toxicity. Chemotherapy is recommended for patients with FIGO stage I-II with high-risk histologies and those with FIGO stage III-IVA with any histology. When sequencing chemotherapy and RT, there is limited data and no prospective data to support an optimal sequence. Sentinel lymph node mapping is recommended over pelvic lymphadenectomy for surgical nodal staging, and use of adjuvant therapy should be based on the pathologic ultrastaging status with isolated tumor cells treated as node negative and micrometastasis treated as node positive. The available data on molecular characterization of endometrial cancer is compelling and should be increasingly considered when making recommendations for adjuvant therapy. CONCLUSIONS: These recommendations guide evidence-based best clinical practices on the use of adjuvant therapy for endometrial cancer.

Radiation Oncology

Kim JP, **Dewalt J**, **Feldman A**, **Adil K**, **Movsas B**, and **Chetty IJ**. Feasibility of radical cardiac-sparing, treatment planning strategies for patients with locally advanced, non-small cell lung cancer. *J Appl Clin Med Phys* 2022; e13784. Epub ahead of print. PMID: 36237114. Full Text

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PURPOSE: A set of treatment planning strategies were designed and retrospectively implemented for locally advanced, non-small cell lung cancer (NSCLC) patients in order to minimize cardiac dose without compromising target coverage goals. METHODS: Retrospective analysis was performed for 20 NSCLC patients prescribed to 60-66 Gy that received a mean heart dose (MHD) ≥10 Gy. Three planning approaches were designed and implemented. The first was a multi-isocentric (MI) volume-modulated arc therapy (VMAT) approach (HEART_MI) with one isocenter located within the tumor and the second chosen up to 10 cm away longitudinally. The second was a noncoplanar (NCP) VMAT approach (HEART_NCP) utilizing up to three large couch angles and a standard arc at couch 0. The final planning strategy took a mixed approach (HEART_HYBRID) utilizing the HEART_NCP strategy for two thirds of the treatment combined with a plan utilizing a pair of opposite-opposed gantry angles for the remaining treatments. Investigational plans were compared to original plans using dose-volume histogram metrics such as organ volume receiving greater than x Gy (Vx) or mean dose (Dmean). RESULTS: Although there was a small but statistically significant decrease in internal target volume coverage for HEART_MI plans and, conversely, a statistically significant increase for HEART_NCP plans, all generated plans met physician-prescribed target constraints. For heart dose, there were statistically significant decreases in all heart metrics and particularly MHD for the HEART_MI (9.8 vs. 15.4 Gy [$p < 0.001$], respectively), HEART_NCP (9.2 vs. 15.4 Gy [$p < 0.001$]), respectively), and HEART_HYBRID (7.9 vs. 15.4 Gy [$p < 0.001$], respectively) strategies. CONCLUSIONS: The strategy providing the best compromise between plan quality and cardiac dose reduction was HEART_NCP, which produced MHD reductions of 37.6% ± 12.9% (6.2 ± 3.4 Gy) relative to original plans. This strategy could potentially reduce adverse cardiac events, leading to improved quality of life for these patients.

Radiation Oncology
Sikorskii A, Given CW, **Chang S**, **Tam S**, **Movsas B**, and Given B. Patient reported outcomes and unscheduled health services use during oral anti-cancer treatment. *J Pain Symptom Manage* 2022; Epub ahead of print. PMID: 36244640. Full Text

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CONTEXT: People on oral anti-cancer agents must self-manage their symptoms with less interaction with oncology providers compared to infusion treatments. Symptoms and physical function are key patient-reported outcomes (PROs) and may lead to unscheduled health services uses (urgent care and emergency department [ED] visits, hospitalizations), which in turn lead to increased health care costs. OBJECTIVES: To evaluate the prediction of unscheduled health services uses using age, sex, and comorbidity, then determine the extent to which PRO data (symptoms and functioning) improve that prediction. METHODS: This post-hoc exploratory analysis was based on data from the control group of a trial of medication adherence reminder and symptom self-management intervention for people starting a new oral anti-cancer agent (n=117 analyzed). Severity and interference with daily life for 18 symptoms, physical function, and depressive symptoms were assessed at intake (oral agent start), and 4, 8, and 12 weeks later. Unscheduled health services use during three 4-week periods after the start of oral agents was analyzed using generalized mixed effects models in relation to age, sex, comorbidity, and PROs at the beginning of each time period. RESULTS: The summed severity index of 18 symptoms and physical

function were significant predictors of hospitalizations in the 4 weeks following PRO assessment. The addition of PROs improved areas under the receiver operating characteristic curves to be over .70 in most time periods. CONCLUSION: Monitoring of PROs has the potential of reducing unscheduled health services use if supportive care interventions are deployed based on their levels.

Radiation Oncology
Xu L, **Zhu S**, and Wen N. Deep reinforcement learning and its applications in medical imaging and radiation therapy: a survey. *Phys Med Biol* 2022; Epub ahead of print. PMID: 36270582. Request Article

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Reinforcement learning takes sequential decision-making approaches by learning the policy through trial and error based on interaction with the environment. Combining deep learning and reinforcement learning can empower the agent to learn the interactions and the distribution of rewards from state-action pairs to achieve effective and efficient solutions in more complex and dynamic environments. Deep reinforcement learning (DRL) has demonstrated astonishing performance in surpassing the human-level performance in the game domain and many other simulated environments. This paper introduces the basics of reinforcement learning and reviews various categories of DRL algorithms and DRL models developed for medical image analysis and radiation treatment planning optimization. We will also discuss the current challenges of DRL and approaches proposed to make DRL more generalizable and robust in a real-world environment. DRL algorithms, by fostering the designs of reward function, agents interactions and environment models, can resolve the challenges from scarce and heterogeneous annotated medical image data, which has been a major obstacle to implementing deep learning models in the clinic. DRL is an active research area with enormous potential to improve deep learning applications in medical imaging and radiation therapy planning.

Sleep Medicine
Kalmbach DA, **Cheng P**, **Ahmedani BK**, **Peterson EL**, **Reffi AN**, **Sagong C**, **Seymour GM**, **Ruprich MK**, and **Drake CL**. Cognitive-behavioral therapy for insomnia prevents and alleviates suicidal ideation: Insomnia remission is a suicidolytic mechanism. *Sleep* 2022; Epub ahead of print. PMID: 36242607. Full Text

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STUDY OBJECTIVES: Insomnia is associated with elevated levels of suicidal thoughts and behaviors. Emerging evidence suggests that cognitive behavioral therapy for insomnia (CBTI) may reduce suicidal ideation (SI). However, the role of digital therapeutics in both the alleviation and prevention of SI remains unclear, and treatment mechanisms facilitating SI reductions have not been clearly identified. METHOD: 658 adults with DSM-5 insomnia disorder enrolled into a single-site randomized controlled trial evaluating the efficacy of digital CBTI relative to attention control. Outcomes were measured at pretreatment, posttreatment, and 1-year follow-up. RESULTS: Before treatment, 126 patients endorsed SI (19.1% prevalence). Among those with baseline SI, CBTI patients reported lower SI rates at posttreatment (30.0% vs 54.5%, p=.005) and 1-year follow-up (29.6% vs 46.8%, p=.042) relative to control. PRODCLIN analysis estimated that half of suicidolytic effects of CBTI were mediated through insomnia remission. Among those without baseline SI, CBTI did not directly prevent new onset SI. However, insomnia remitters reported lower rates of new onset SI at posttreatment relative to non-remitters (1.5% vs 6.5%, p=.009). Mediation analysis supported a significant indirect effect wherein CBTI increased likelihood of insomnia remission, which was associated with SI prevention (αβ=-3.13=5, 95%CI=-5.28, -0.96).

CONCLUSION: Digital CBTI reduces insomnia symptoms, which promotes SI alleviation and prevention. For non-suicidal patients, digital CBTI may serve as a highly accessible monotherapy for improving sleep, thereby reducing risk for SI. For suicidal patients, digital CBTI may be appropriately administered as an adjunct treatment to support mainline intervention more directly targeting suicidogenic thoughts.

Surgery

Bonner SN, He C, Clark M, Adams K, Orelaru F, **Popoff A**, Chang A, Wakeam E, and Lagisetty K. ASO Visual Abstract: Understanding Racial Differences in Lung Cancer Surgery Through a Statewide Quality Collaborative. *Ann Surg Oncol* 2022; Epub ahead of print. PMID: 36245051. Full Text

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Surgery

Holm AM, Fedson S, Courtwright A, Olland A, **Bryce K**, Kanwar M, Sweet S, Egan T, and Lavee J. International society for heart and lung transplantation statement on transplant ethics. *J Heart Lung Transplant* 2022; 41(10):1307-1308. PMID: 35871113. Full Text

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Surgery

Jamil ML, **Vercnocke J**, **Etta P**, **Mohamed A**, **Butaney M**, **Bazzi M**, **Zetuna S**, **Malinzak L**, and **Leavitt D**. Ex-vivo ureteroscopy for the treatment of nephrolithiasis in a deceased donor kidney prior to transplantation. *Urol Video J* 2022; 16. PMID: Not assigned. Full Text

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Background: There are over 100,000 adult patients awaiting renal transplantation in the United States, with less than 25% who undergo eventual transplantation [1]. This disparity has motivated providers to seek ways to increase the number of kidneys available for transplantation. Historically, the presence of kidney stones in a renal allograft was a relative contraindication for renal transplantation [2]. Ex-vivo ureteroscopy, or, “back-table ureteroscopy”, is a technique which has been employed as a potential

solution to increase the total number of available kidneys which were initially deemed ineligible [3,4]. Objective: To demonstrate our step by step technique for ex-vivo ureteroscopy and to demonstrate its safety and efficacy as a method of stone removal prior to transplantation. Methods: Following procurement and back table preparation of the donor kidney by the transplant surgery team, the kidney was replaced in an ice bath for ex-vivo ureteroscopy. A combination of holmium laser lithotripsy and stone basketing were used to extract the stone. Following complete removal of the renal calculus, the renal allograft was reprepared and the renal transplantation was carried forth in the standard fashion by the transplant surgery team. Results: The total operative time for the ex-vivo ureteroscopy was 70 min. No intra-operative complications were identified during ex-vivo ureteroscopy or during allograft transplantation. Six months following transplantation, the patients renal function remains normal. Conclusions: Ex-Vivo ureteroscopy can be a safe and effective treatment for the management of renal stones prior to transplantation. This method can be used with existing resources to increase the number of donor kidneys available for transplantation each year.

Surgery

Kraftson A, Cain-Nielsen AH, Lockwood A, Luo Y, Buda C, Lager C, Esfandiari NH, Oral E, and **Varban OA**. Predicting Early Weight Loss Failure Using a Bariatric Surgery Outcomes Calculator and Weight Loss Curves. *Obes Surg* 2022; Epub ahead of print. PMID: 36253661. Full Text

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CONTEXT: Weight loss after bariatric surgery can be accurately predicted using an outcomes calculator; however, outliers exist that do not meet the 1 year post-surgery weight projections. OBJECTIVE: Our goal was to determine how soon after surgery these outliers can be identified. DESIGN: We conducted a retrospective cohort study. SETTING, PATIENTS, AND INTERVENTION: Using a bariatric surgery outcomes calculator formulated by the Michigan Bariatric Surgery Collaborative (MBSC), predicted weight loss at 1 year post-surgery was calculated on all patients who underwent primary bariatric surgery at a single-center academic institution between 2006 and 2015 who also had a documented 1-year follow-up weight (n = 1050). MAIN OUTCOME MEASURES: Weight loss curves were compared between high, low, and non-outliers as defined by their observed-to-expected (O:E) weight loss ratio based on total body weight loss (TBWL) %. RESULTS: Mean predicted weight loss for the study group was 39.1 ± 9.9 kg, while mean actual weight loss was 39.7 ± 17.1 kg resulting in a mean O:E 1.01 (± 0.35). Based on analysis of the O:E ratios at 1 year post-surgery, the study group was sub-classified. Low outliers (n = 188, O:E 0.51) had significantly lower weight loss at 2 months (13.1% vs 15.6% and 16.5% TBWL, p < 0. 001) and at 6 months (19% vs 26% and 30% TBWL, p < 0.001) when compared to non-outliers (n = 638, O:E 1.00) and high outliers (n = 224, O:E 1.46), respectively. CONCLUSIONS: Weight loss curves based on individually calculated outcomes can help identify low outliers for additional interventions as early as 2 months after bariatric surgery.

Surgery

McCormick ME, and Pewitt EB. Careful consideration of sarcoidosis in diagnosis and staging of prostate cancer: A case report. *Urol Case Rep* 2022; 45:102255. PMID: 36262674. Full Text

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Osseous sarcoidosis can masquerade as metastatic prostate cancer. Awareness of this is helpful in the staging of prostate cancer in a patient with sarcoidosis.

Surgery

Murillo Perez CF, **Ivanics T**, Claasen M, Yoon P, Wallace D, Selzner N, Hirschfield GM, Hansen BE, and Sapisochin G. Trends in liver transplantation for autoimmune liver diseases: a Canadian study. *Can J Surg* 2022; 65(5):E665-e674. PMID: 36223935. Full Text

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BACKGROUND: To our knowledge, no analysis of data from liver transplantation registries exists in Canada. We aimed to describe temporal trends in the number of liver transplantation procedures, patient characteristics and posttransplantation outcomes for autoimmune liver diseases (AILDs) in Canada. METHODS: We used administrative data from the Canadian Organ Replacement Register, which contains liver transplantation information from 6 centres in Canada. This study included transplantation information from 5 of the centres, as liver transplantation procedures in children were not included. We included adult (age ≥ 18 yr) patients with a diagnosis of primary biliary cholangitis (PBC), primary sclerosing cholangitis (PSC), autoimmune hepatitis (AIH) or overlap syndrome (PBC-AIH or PSC-AIH) who received a liver transplant from 2000 to 2018. RESULTS: Of 5722 primary liver transplantation procedures performed over the study period, 1070 (18.7%) were for an AILD: 489 (45.7%) for PSC, 341 (31.9%) for PBC, 220 (20.6%) for AIH and 20 (1.9%) for overlap syndrome. There was a significant increase in the absolute number of procedures for PSC, with a yearly increase of 0.6 (95% confidence interval 0.1 to 1.2), whereas the absolute number of procedures for PBC and AIH remained stable. The proportion of transplantation procedures decreased for PBC and AIH but remained stable for PSC. Recipient age at transplantation increased over time for males with PBC (median 53 yr in 2000-2005 to 57 yr in 2012-2018, $p = 0.03$); whereas the median age among patients with AIH decreased, from 53 years in 2000-2005 to 44 years in 2006-2011 ($p = 0.03$). The Model for Endstage Liver Disease score at the time of transplantation increased over time for all AILDs, particularly AIH (median 16 in 2000-2005 v. 24 in 2012-2018, $p < 0.001$). There was a trend toward improved survival in the PBC group, with a 5-year survival rate of 81% in 2000-2005 and 90% in 2012-2018 ($p = 0.06$). CONCLUSION: Between 2000 and 2018, the absolute number of liver transplantation procedures in Canada increased for PSC but remained stable for PBC and AIH; proportionally, PBC and AIH decreased as indications for transplantation. Posttransplantation survival improved only for the PBC group. An improved understanding of trends and outcomes on a national scale among patients with AILD undergoing liver transplantation can identify disparities and areas for potential health care improvement.

Surgery

Oyedeji O, **Rodgers S**, **Wrubel A**, **Shah R**, and **Husain S**. Pancreatic lymphoepithelial cyst with concurrent HIV infection: A case report and review of the literature. *SAGE Open Med Case Rep* 2022;10. PMID: 36274859. Full Text

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Pancreatic lymphoepithelial cysts are rare, benign, non-neoplastic unilocular or multilocular cystic lesions. These circumscribed pancreatic lesions are filled with keratinous material grossly and exhibit distinct microscopic features. Pancreatic lymphoepithelial cysts are like the more common lymphoepithelial cysts of the parotid glands, which have been associated with the diffuse infiltrative lymphocytosis syndrome often seen in patients with HIV infection. However, pancreatic lymphoepithelial cysts are rare and their association with HIV infection has not been established. The presence of secondary changes in non-neoplastic cysts such as goblet cell metaplasia that was present in our case is an important feature to be included in the differential diagnosis and not to be interpreted as a mucinous neoplasm, particularly on fine-needle aspiration specimen microscopic evaluation that would impact further management. Here we describe the diagnosis and treatment of lymphoepithelial cysts in a patient who was on highly active antiretroviral therapy for HIV infection and we provide a brief literature review. Defining the clinical characteristics of lymphoepithelial cysts in patients with HIV and determining accurate preoperative diagnostic procedures will be critical for establishing effective surgical and medical approaches to treating these cysts, which differ substantially from other more serious pancreatic cystic lesions.

Surgery

Schwartz T, Marumoto AD, and Giuliano AE. Surgical Management of the Axilla in Breast Cancer: Evolving but Still Necessary. *Ann Surg Oncol* 2022; Epub ahead of print. PMID: 36194309. Full Text

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Surgery

Schwartz T, Marumoto AD, and Giuliano AE. ASO Author Reflections: The Evolution of Axillary Management in Breast Cancer. *Ann Surg Oncol* 2022; Epub ahead of print. PMID: 36245054. Full Text

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Surgery

Shamaa TM, **Kitajima T**, **Ivanics T**, **Shimada S**, **Yeddula S**, **Mohamed A**, **Rizzari M**, **Collins K**, **Yoshida A**, **Abouljoud M**, and **Nagai S**. Can Weather Be a Factor in Liver Transplant Waitlist and Posttransplant Outcomes? Analysis of United Network for Organ Sharing Registry. *Transplant Proc* 2022; Epub ahead of print. PMID: 36210193. Full Text

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BACKGROUND: Cold climate is known to affect the frequency and attributable mortality of various illnesses. This study aims to evaluate the effect of climate among regions on liver transplant (LT) outcomes. METHODS: We analyzed data from the United Network for Organ Sharing registry for 98,517 adult patients (aged ≥ 18 years) who were listed for LT between 2010 and 2019. During this period,

51,571 patients underwent single-organ, deceased LT. States were categorized based on their mean winter temperature: warm states (45°F-70°F), intermediate states (30°F-45°F), and cold states (0°F-30°F). Post-LT outcomes at 1 month, 1 year, and 3 years were compared using Cox proportional hazard models. Ninety-day and 1-year waitlist outcomes were compared among climate regions using Fine-Gray hazard regression model. RESULTS: After adjusting risks for recipient and donor characteristics, LT candidates in cold states had a significantly higher waitlist (90-day: subdistribution hazard ratio (HR) 1.46; 1-year: subdistribution HR 1.41; P < .001) and posttransplant mortality (30-day: subdistribution HR 1.23; P = .009, 1-year: subdistribution HR 1.16; P = .001; 3-year: subdistribution HR 1.08; P = .007). LT recipients in cold states had a higher proportion of deaths due to infections than warm states (cold states: 2.3%; intermediate states: 2.1%; and warm states: 1.7%; P < .001). CONCLUSIONS: Potential reasons include weather-related changes in the behavioral and physiological parameters of patients.

Urology

Agarwal A, Finelli R, Durairajanayagam D, Leisegang K, Henkel R, Salvio G, Aghamajidi A, Sengupta P, Crisóstomo L, Tsioulou PA, Roychoudhury S, Finocchi F, Darbandi M, Mottola F, Darbandi S, Iovine C, Santonastaso M, Zaker H, Kesari KK, Nomanzadeh A, Gugnani N, **Rambhatla A**, Duran MB, Ceyhan E, Kandil H, Arafa M, Saleh R, Shah R, Ko E, and Boitrelle F. Comprehensive Analysis of Global Research on Human Varicocele: A Scientometric Approach. *World J Mens Health* 2022; 40(4):636-652. PMID: 35118839. Full Text

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PURPOSE: This study provides a comprehensive analysis of research trends on the etiology, mechanisms, potential risk factors, diagnosis, prognosis, surgical and non-surgical treatment of varicocele, and clinical outcomes before and after varicocele repair. MATERIALS AND METHODS: Varicocele studies published between 1988 and 2020 were retrieved from the Scopus database on April 5, 2021. Original studies on human varicocele were included, irrespective of language. Retrieved articles were manually screened for inclusion in various sub-categories. Bibliometric data was subjected to scientometric analysis using descriptive statistics. Network, heat and geographic mapping were generated using relevant software. RESULTS: In total, 1,943 original human studies on varicocele were published. These were predominantly from the northern hemisphere and developed countries, and published in journals from the United States and Germany. Network map analysis for countries showed several interconnected nodal points, with the USA being the largest, and Agarwal A. from Cleveland Clinic, USA, being a center point of worldwide varicocele research collaborations. Studies of adolescents were underrepresented compared with studies of adults. Studies on diagnostic and prognostic aspects of varicocele were more numerous than studies on varicocele prevalence, mechanistic studies and studies focusing on etiological and risk factors. Varicocele surgery was more investigated than non-surgical approaches. To evaluate the impact of varicocele and its treatment, researchers mainly analyzed basic semen parameters, although markers of seminal oxidative stress are being increasingly investigated in the last decade, while reproductive outcomes such as live birth rate were under-reported in the literature. CONCLUSIONS: This study analyzes the publication trends in original research on human varicocele spanning over the last three decades. Our analysis emphasizes areas for further exploration to better understand varicocele's impact on men's health and male fertility.

Urology

Cannarella R, Gül M, **Rambhatla A**, and Agarwal A. Temporal decline of sperm concentration: role of endocrine disruptors. *Endocrine* 2022; Epub ahead of print. PMID: 36194343. Full Text

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INTRODUCTION: Male infertility is a widespread disease with an etiology that is not always clear. A number of studies have reported a decrease in sperm production in the last forty years. Although the reasons are still undefined, the change in environmental conditions and the higher exposure to endocrine-disrupting chemicals (EDCs), namely bisphenol A, phthalates, polychlorinated biphenyls, polybrominated diphenyl esters, dichlorodiphenyl-dichloroethylene, pesticides, and herbicides, organophosphates, and heavy metals, starting from prenatal life may represent a possible factor justifying the temporal decline in sperm count. AIM: The aim of this study is to provide a comprehensive description of the effects of the exposure to EDCs on testicular development, spermatogenesis, the prevalence of malformations of the male genital tract (cryptorchidism, testicular dysgenesis, and hypospadias), testicular tumor, and the mechanisms of testicular EDC-mediated damage. NARRATIVE REVIEW: Animal studies confirm the deleterious impact of EDCs on the male reproductive apparatus. EDCs can compromise male fertility by binding to hormone receptors, dysregulating the expression of receptors, disrupting steroidogenesis and hormonal metabolism, and altering the epigenetic mechanisms. In humans, exposure to EDCs has been associated with poor semen quality, increased sperm DNA fragmentation, increased gonadotropin levels, a slightly increased risk of structural abnormalities of the genital apparatus, such as cryptorchidism and

hypospadias, and development of testicular tumor. Finally, maternal exposure to EDCs seems to predispose to the risk of developing testicular tumors. CONCLUSION: EDCs negatively impact the testicular function, as suggested by evidence in both experimental animals and humans. A prenatal and postnatal increase to EDC exposure compared to the past may likely represent one of the factors leading to the temporal decline in sperm counts.

Urology
Canvasser NE, Rivera M, Bechis SK, Ingimarsson J, Knoedler J, Stern K, Stoughton CL, Wollin D, Borofsky M, Bhojani N, Tayeb ME, Kamphuis G, **Leavitt D**, Hsi RS, and Scotland KB. Author Reply. *Urology* 2022; 168:77-78. PMID: 36266028. Full Text

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Urology
Corsi N, Nguyen DD, **Butaney M**, **Majdalany SE**, Corsi MP, Malchow T, **Piontkowski AJ**, Trinh QD, Loeb S, and **Abdollah F**. Top 100 Urology Influencers on Twitter: Is Social Media Influence Associated with Academic Impact? *Eur Urol Focus* 2022; Epub ahead of print. PMID: 36210295. Full Text

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BACKGROUND: Social media use in medicine has exploded, with uptake by most physicians and patients. There is a risk of dissemination of inaccurate information about urological conditions on social media. Physicians, as key opinion leaders, must play a role in sharing evidence-based information through social media. OBJECTIVE: To identify and describe the top 100 urology influencers on the Twitter social media platform and to correlate Twitter influence with academic impact in urology. DESIGN, SETTING, AND PARTICIPANTS: Twitter influence scores for the search topic "urology" were collected in April 2022 using published methodology. The top 100 personal accounts with the highest computed scores were linked to individuals' names, all-time h index, geographic location, specialty, attributed sex, and board certification status in this cross-sectional study. OUTCOME MEASUREMENTS AND

STATISTICAL ANALYSIS: We examined the correlation between influence rank and h index. RESULTS AND LIMITATIONS: Of the top 100 Twitter influencers on the topic of urology, the majority are from the USA (64%), male (85%), and practicing urologists (91%). Some 93% of US urology influencers are board-certified. Only 22 of the 50 US states are represented. The second most frequent country is the UK, with ten urology influencers. The median all-time h index is 42 (interquartile range 28.25-58). There is a weak positive correlation between influence rank and h index (r = 0.23; p = 0.02). Limitations of the study include the inability to validate the accuracy of the proprietary ranking algorithm and investigation of just one social media platform. CONCLUSIONS: The top Twitter influencers in urology are mostly board-certified US urologists. Collectively, influencers have a relatively greater academic impact in comparison to the average urologist, although there is a weak positive correlation between Twitter influence and h index among top Twitter influencers. PATIENT SUMMARY: Given the explosion of medical information on Twitter, we report the personal accounts with the greatest impact for the topic of "urology". We found that most urology influencers on Twitter are US board-certified urologists with a strong research history.

Urology

Henderickx M, Hendriks N, Baard J, Wiseman OJ, Scotland KB, Somani BK, Şener TE, Emiliani E, Dragos LB, Villa L, Talso M, Bin Hamri S, Proietti S, Doizi S, Traxer O, Chew BH, Eisner BH, Monga M, Hsi RS, Stern KL, **Leavitt DA**, Rivera M, Wollin DA, Borofsky M, Canvasser NE, Ingimarsson JP, El Tayeb MM, Bhojani N, Gadzhiev N, Tailly T, Durutovic O, Nagele U, Skolarikos A, Schout BMA, Beerlage HP, Pelger RCM, and Kamphuis GM. The Uniform grading tooL for flexIble ureterorenoscoPes (TULIP-tool): a Delphi consensus project on standardized evaluation of flexible ureterorenoscopes. *BJU Int* 2022; Epub ahead of print. PMID: 36208033. Full Text

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OBJECTIVE: To develop a standardized tool to evaluate flexible ureterorenoscopes (fURS). MATERIAL & METHODS: A three-stage consensus building approach based on the modified Delphi technique was performed under guidance of a steering group. First, scope-related and user-related parameters used to evaluate fURS were identified through a systematic scoping review. Then, the main categories and subcategories were defined, and the expert panel was selected. Finally, a two-step modified Delphi consensus project was conducted to firstly obtain consensus on the relevance and exact definition of each (sub)category necessary to evaluate fURS, and secondly on the evaluation method (setting, used tools and unit of outcome) of those (sub)categories. Consensus was reached at a predefined threshold of 80% high agreement. RESULTS: The panel consisted of thirty experts in the field of endourology. The first step of the modified Delphi consensus project consisted of two questionnaires with a response rate of 97% (n=29) for both. Consensus was reached for the relevance and definition of six main categories and 12 subcategories. The second step consisted of three questionnaires (response rate of 90%, 97% and 100%, respectively). Consensus was reached on the method of measurement for all (sub)categories. CONCLUSION: This modified Delphi consensus project reached consensus on a standardized grading tool for the evaluation of fURS, the TULIP-tool. This is a first step in creating uniformity in this field of research to facilitate future comparison of outcomes of the functionality and handling of flexible ureterorenoscopes.

Urology
Houenstein HA, Jing Z, Elsayed AS, Ramahi YO, Stöckle M, Wijburg C, Hosseini A, Wiklund P, Kim E, Kaouk J, Dasgupta P, Khan MS, Wagner AA, **Syed JR**, **Peabody JO**, Badani K, Richstone L, Mottrie A, Maatman TJ, Balbay D, Redorta JP, Rha KH, Gaboardi F, Rouprêt M, Aboumohamed A, Hussein AA, and Guru KA. Analysis of Complications after Robot-Assisted Radical Cystectomy between 2002-2021. *Urology* 2022; Epub ahead of print. PMID: 36241062. Full Text

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OBJECTIVES: To identify trends in complications following robot-assisted radical cystectomy (RARC) using a multi-institutional database, the International Robotic Cystectomy Consortium (IRCC). METHODS: A retrospective review of the IRCC database was performed (2976 patients, 26 institutions

from 11 countries). Postoperative complications were categorized as overall or high grade (≥ Clavien Dindo III) and were further categorized based on type/organ site. Descriptive statistics was used to summarize the data. Multivariate analysis (MVA) was used to identify variables associated with overall and high-grade complications. Cochran-Armitage trend test was used to describe the trend of complications over time. RESULTS: 1777 (60%) patients developed postoperative complications following RARC, 51% of complications occurred within 30 days of RARC, 19% between 30-90 days, and 30% after 90 days. 835 patients (28%) experienced high-grade complications. Infectious complications (25%) were the most prevalent, while bleeding (1%) was the least. The incidence of complications was stable between 2002-2021. Gastrointestinal and neurologic postoperative complications increased significantly (p<0.01, for both) between 2005 and 2020 while thromboembolic (p=0.03) and wound complications (p<0.01) decreased. On MVA, BMI (OR 1.03, 95%CI 1.01-1.05, p<0.01), prior abdominal surgery (OR 1.26, 95%CI 1.03-1.56, p=0.03), receipt of neobladder (OR 1.52, 95%CI 1.17-1.99, p<0.01), positive nodal disease (OR 1.33, 95%CI 1.05-1.70, p=0.02), length of inpatient stay (OR 1.04, 95%CI 1.02-1.05, p<0.01) and ICU admission (OR 1.67, 95%CI 1.36-2.06, p<0.01) were associated with high-grade complications. CONCLUSIONS: Overall and high-grade complications after RARC remained stable between 2002-2021. GI and neurologic complications increased, while thromboembolic and wound complications decreased.

Urology
Jamil ML, **Vercnocke J**, **Etta P**, **Mohamed A**, **Butaney M**, **Bazzi M**, **Zetuna S**, **Malinzak L**, and **Leavitt D**. Ex-vivo ureteroscopy for the treatment of nephrolithiasis in a deceased donor kidney prior to transplantation. *Urol Video J* 2022; 16. PMID: Not assigned. Full Text

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Background: There are over 100,000 adult patients awaiting renal transplantation in the United States, with less than 25% who undergo eventual transplantation [1]. This disparity has motivated providers to seek ways to increase the number of kidneys available for transplantation. Historically, the presence of kidney stones in a renal allograft was a relative contraindication for renal transplantation [2]. Ex-vivo ureteroscopy, or, “back-table ureteroscopy”, is a technique which has been employed as a potential solution to increase the total number of available kidneys which were initially deemed ineligible [3,4]. Objective: To demonstrate our step by step technique for ex-vivo ureteroscopy and to demonstrate its safety and efficacy as a method of stone removal prior to transplantation. Methods: Following procurement and back table preparation of the donor kidney by the transplant surgery team, the kidney was replaced in an ice bath for ex-vivo ureteroscopy. A combination of holmium laser lithotripsy and stone basketing were used to extract the stone. Following complete removal of the renal calculus, the renal allograft was reprepared and the renal transplantation was carried forth in the standard fashion by the transplant surgery team. Results: The total operative time for the ex-vivo ureteroscopy was 70 min. No intra-operative complications were identified during ex-vivo ureteroscopy or during allograft transplantation. Six months following transplantation, the patients renal function remains normal. Conclusions: Ex-Vivo ureteroscopy can be a safe and effective treatment for the management of renal stones prior to transplantation. This method can be used with existing resources to increase the number of donor kidneys available for transplantation each year.

Urology
Sharma G, Shah M, Ahluwalia P, Dasgupta P, Challacombe BJ, **Bhandari M**, Ahlawat R, Rawal S, Buffi NM, Sivaraman A, Porter JR, **Rogers C**, Mottrie A, Abaza R, Rha KH, Moon D, Yuvaraja TB, Parekh DJ, Capitanio U, Maes KK, Porpiglia F, Turkeri L, and Gautam G. Perioperative outcomes following robot-assisted partial nephrectomy in elderly patients. *World J Urol* 2022; Epub ahead of print. PMID: 36203102. Full Text

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OBJECTIVE: To compare perioperative outcomes following robot-assisted partial nephrectomy (RAPN) in patients with age ≥ 70 years to age < 70 years. METHODS: Using Vattikuti Collective quality initiative (VCQI) database for RAPN we compared perioperative outcomes following RAPN between the two age groups. Primary outcome of the study was to compare trifecta outcomes between the two groups. Propensity matching using nearest neighbourhood method was performed with trifecta as primary outcome for sex, body mass index (BMI), solitary kidney, tumor size and Renal nephrometery score (RNS). RESULTS: Group A (age ≥ 70 years) included 461 patients whereas group B included 1932 patients. Before matching the two groups were statistically different for RNS and solitary kidney rates. After propensity matching, the two groups were comparable for baselines characteristics such as BMI, tumor size, clinical symptoms, tumor side, face of tumor, solitary kidney and tumor complexity. Among the perioperative outcome parameters there was no difference between two groups for operative time, blood loss, intraoperative transfusion, intraoperative complications, need for radical nephrectomy, positive margins and trifecta rates. Warm ischemia time was significantly longer in the younger age group (18.1 min vs. 16.3 min, p = 0.003). Perioperative complications were significantly higher in the older age group (11.8% vs. 7.7%, p = 0.041). However, there was no difference between the two groups for major complications. CONCLUSION: RAPN in well-selected elderly patients is associated with comparable trifecta outcomes with acceptable perioperative morbidity.

Urology

Sharma RK, Gupta S, Agarwal A, Finelli R, Kuroda S, Saleh R, Boitrelle F, Kavoussi P, Gül M, Tadros N, Ko E, Farkouh A, Henkel R, Arafa M, **Rambhatla A**, and Shah R. Role of Cytocentrifugation Combined with Nuclear Fast Picroindigocarmine Staining in Detecting Cryptozoospermia in Men Diagnosed with Azoospermia. *World J Mens Health* 2022; 40(4):627-635. PMID: 35118836. Full Text

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PURPOSE: Azoospermia is defined as the absence of spermatozoa in the pellet of a centrifuged semen sample. In fact, when a basic semen analysis fails to detect sperm in the ejaculate, there is still the possibility of detecting rare sperm after centrifugation of the sample and examination of the pellet. In this study, we assessed the role of Cytospin centrifugation in combination with the nuclear fast picroindigocarmine (NF-PIC) staining in identifying sperm in azoospermic samples. MATERIALS AND METHODS: Semen samples of 251 men diagnosed as having azoospermia after standard examination were further analyzed by Cytospin centrifugation in combination with NF-PIC staining. RESULTS: Sperm were detected in 60 men (23.9%), thus changing their diagnosis to cryptozoospermia. CONCLUSIONS: By identifying sperm in the semen of men who were thought to have total azoospermia, the Cytospin NF-PIC test can alter the diagnosis and further treatment of these men.

Conference Abstracts

Anesthesiology

Hunt R, **Nagaraja T**, **Ding G**, **Knight R**, **Lee I**, **Ewing J**, and **Penning D**. Deuterium Magnetic Resonance Imaging for Evaluation of Glymphatic Flow. *J Neurosurg Anesthesiol* 2022; 34(4):466-467. Full Text

R. Hunt, Henry Ford Health System, Detroit, MI, United States

Background: In the 1905s, intraventricular deuterium (D2O) was used to study the absorption of cerebrospinal fluid (CSF) into the venous system in hydrocephalic children. Studies were limited by the lack of available methods to image the movement of D2O in the brain. The exact route by which CSF returns to the venous system has not yet been fully elucidated. More recently, the role of the glymphatic system has been defined and explored using tracers such as gadolinium to track the movement of CSF through the perivascular spaces and into the brain interstitium. Mathe- matical models of CSF movement into and out of the brain interstitium have not been consistent with observed behavior. A recent study using an isotope of water (H2-170) showed significantly increased rate of CSF flow into the glymphatic system as compared to a traditional gadolinium tracer. This difference may reasonably be explained by the fact that gadolinium is not blood-brain-barrier (BBB) soluble. Because the primary component of CSF is water, CSF likely behaves quite differently than many of the tracers historically used to track its flow. Due to both expense and toxicity profile, H2-170 is not an ideal tracer for translational studies. Recently, D2O-labeled glucose has been shown to produce a detectable magnetic resonance (MR) signal, suggesting D2O may hold promise as an imageable tracer for glymphatic studies. We hypothesized that D2O would provide a traceable MR signal for tracking movement of water in the brain, allowing for more physiologically realistic models of CSF flow within the glymphatic system. Methods: Two adult male rats underwent deuterium enhanced MR imaging. Images were obtained using a custom-made RF transmit/receive coil from Rapid MR International that is dual tuned to both proton (1H, 300.3 MHz) and deuterium (2H, 46.1 MHz) resonant frequencies for use in a 7 Tesla Bruker MRI system. The coil itself consists of two separate resonant circuits with the proton coil using a butterfly design and the deuterium coil a 25 mm loop design with both circuits rated for 400 W maximum RF peak power. After prepping the animal, it was placed prone in a non-magnetic cradle, the 1H/2H coil was positioned over the head and entire setup will be moved into the MRI system. The proton coil was set first to set up for the proton frequency, adjusting magnetic field homogeneity, and to provide high-resolution reference images. Following the proton imaging, the system frequency was switched over for the deuterium coil before starting the D2O infusion. Images from the D20 signal were acquired 30 seconds after starting intravenous infusion of deuterated saline. Continuous infusion of deuterated saline was continued for 12 minutes with MRI images every two minutes to track the uptake and clearance of the deuterium signal. Results: Deuterium produced a traceable MR signal in the brain after intravenous injection (Figure 1 and 2). Conclusion: Deuterium MRI holds promise as a novel CSF tracer. Next steps include intrathecal infusion of D2O via spinal catheter with concurrent proton and deuterium MR imaging. (Figure Presented).

Neurosurgery

Hunt R, **Nagaraja T**, **Ding G**, **Knight R**, **Lee I**, **Ewing J**, and **Penning D**. Deuterium Magnetic Resonance Imaging for Evaluation of Glymphatic Flow. *J Neurosurg Anesthesiol* 2022; 34(4):466-467. Full Text

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using an isotope of water (H2-170) showed significantly increased rate of CSF flow into the glymphatic system as compared to a traditional gadolinium tracer. This difference may reasonably be explained by the fact that gadolinium is not blood-brain-barrier (BBB) soluble. Because the primary component of CSF is water, CSF likely behaves quite differently than many of the tracers historically used to track its flow. Due to both expense and toxicity profile, H2-170 is not an ideal tracer for translational studies. Recently, D2O-labeled glucose has been shown to produce a detectable magnetic resonance (MR) signal, suggesting D2O may hold promise as an imageable tracer for glymphatic studies. We hypothesized that D2O would provide a traceable MR signal for tracking movement of water in the brain, allowing for more physiologically realistic models of CSF flow within the glymphatic system. Methods: Two adult male rats underwent deuterium enhanced MR imaging. Images were obtained using a custom-made RF transmit/receive coil from Rapid MR International that is dual tuned to both proton (1H, 300.3 MHz) and deuterium (2H, 46.1 MHz) resonant frequencies for use in a 7 Tesla Bruker MRI system. The coil itself consists of two separate resonant circuits with the proton coil using a butterfly design and the deuterium coil a 25 mm loop design with both circuits rated for 400 W maximum RF peak power. After prepping the animal, it was placed prone in a non-magnetic cradle, the 1H/2H coil was positioned over the head and entire setup will be moved into the MRI system. The proton coil was set first to set up for the proton frequency, adjusting magnetic field homogeneity, and to provide high-resolution reference images. Following the proton imaging, the system frequency was switched over for the deuterium coil before starting the D2O infusion. Images from the D20 signal were acquired 30 seconds after starting intravenous infusion of deuterated saline. Continuous infusion of deuterated saline was continued for 12 minutes with MRI images every two minutes to track the uptake and clearance of the deuterium signal. Results: Deuterium produced a traceable MR signal in the brain after intravenous injection (Figure 1 and 2). Conclusion: Deuterium MRI holds promise as a novel CSF tracer. Next steps include intrathecal infusion of D2O via spinal catheter with concurrent proton and deuterium MR imaging. (Figure Presented).

Neurosurgery

North R, Lempka S, Guan Y, **Air E**, Poree L, Shipley J, Arle J, Rigoard P, and Thomson S. O129 / #846 GLOSSARY OF NEUROSTIMULATION TERMINOLOGY: A COLLABORATIVE NEUROMODULATION FOUNDATION, INSTITUTE OF NEUROMODULATION, AND INTERNATIONAL NEUROMODULATION SOCIETY PROJECT: TRACK 3: VAGUS NERVE STIMULATION / TOOLS TO INFORM PATIENT CARE. *Neuromodulation* 2022; 25(7):S154-S155. Request Abstract

Introduction: Consistent terminology is necessary to facilitate communication, but only limited efforts have addressed this need in the neurostimulation community. We set out to provide a useful and updated glossary for our colleagues and prospective patients. Materials / Methods: This collaborative effort of the Neuromodulation Foundation (NF), the Institute of Neuromodulation (IoN), and the International Neuromodulation Society (INS) expands a glossary first published in 2007 for spinal cord stimulation (1,2). Peripheral nerve, dorsal root ganglion, deep brain, and motor cortex stimulation have been added to our scope. Volunteers from the collaborating entities used a nominal group process, consensus development panels, and the Delphi technique to reach consensus on inclusion and definition of terms. We created a glossary suitable for print and for expansion on the websites of the collaborating entities, which will offer the possibility of explaining definitions for a general audience. We excluded proprietary and brand names but included terms that have attracted proprietary interest without becoming brands or trademarks. We made an effort to be inclusive while also being concise and economical with space. Results: We identified and defined 91 terms for a print edition of the glossary and created an accompanying list of acronyms. As appropriate, we provided figures to illustrate the definitions. Discussion: The field of neuromodulation requires a specialized vocabulary. Growth in the field, however, has led to inappropriate use of terminology. For example: 1) "tonic" refers to a continuous sequence of pulses with invariant amplitude, duration, and frequency/repetition rate and should not be used to distinguish between low and high frequency stimulation; 2) percutaneous trans-spinal placement of dorsal root ganglion stimulating electrodes does not result in "SCS of the DRG"; and 3) "nonlinear burst stimulation" is not useful in distinguishing between forms of burst stimulation. We excluded trademarked terms but included some ("central point of stimulation" "density" and "dose") that have received attention from proprietary interests. The need for a glossary to address misguided usage and spelling has long been apparent. An example is the awkward attempt to create a plural for "paresthesia" ("paresthesias" or

even “paresthesiae”). Like "anesthesia” (but unlike "data"), "paresthesia” is both singular and plural. Conclusions: The edition of our glossary soon to be published in the journal Neuromodulation can of course be viewed and searched electronically. NF, IoN, and INS will continue to collaborate on expanded Web editions, which can include hyperlinks for internal and external navigation. We believe this glossary will benefit our growing field by facilitating communication and mitigating inappropriate use of neurostimulation terms. Acknowledgements: The authors thank the following for their contributions to this project: Jeffrey Ardell, PhD Penney Cowan Pierre-François D’Haese, PhD Sam Eldabe, MD Robert D. Foreman, PhD Bert Joosten, PhD Robert M. Levy, MD, PhD Cameron McIntyre, PhD Kiran V. Patel, MD P. Hunter Peckham, PhD Marc Russo, MBBS DA (UK) FANZCA FFPMANZCA Learning Objectives: 1. This abstract alerts conference attendees to the recent creation of a glossary of neurostimulation terms that will be published in the journal Neuromodulation. 2. The abstract emphasizes the need for a glossary to facilitate and enhance communication among the various stakeholders in our field. 3. We seek to draw attention to the role of a glossary in promoting a better understanding of important concepts and how they relate to each other. Keyword: Glossary, terminology, taxonomy, vocabulary, neurostimulation, neuromodulation

Surgery

Natour AK, **Shepard AD**, **Nypaver T**, Cuff R, Mouawad NJ, Mattos M, Henke P, and **Kabbani L**. Utilization Of Preoperative Vein Mapping In Patients Undergoing Infra-inguinal Bypass Is Associated With Increased Use Of Venous Conduits. *J Vasc Surg* 2022; 76(4):e53-e54. Full Text

Objective: The objective of this study was to determine if preoperative vein mapping (PVM) was associated with increased use of autogenous venous conduits in a real-world registry of lower extremity infra inguinal bypass (IIB). Methods: A retrospective review of a statewide vascular surgery registry was queried for all patients between 2012 and 2020 who underwent IIB. We excluded trauma patients and patients with acute limb ischemia, and previous lower extremity bypasses. Preoperative and intraoperative variables were analyzed, and postoperative outcomes were correlated with the use of PVM. Results: A total of 5540 patients were included in the study. The average age was 67 years. Sixty-nine percent of the cohort were male, and 81% were white. PVM was performed on 2532 patients (45%). Patients who underwent PVM were more likely to be white (83% vs 79%; P <.001) and have commercial insurance (24% vs 21%; P =.001). A venous conduit was significantly more likely to be used in patients who underwent preoperative vein mapping (69% vs 28%; P <.001). When looking at patients who underwent IIB with a venous conduit, intraoperative blood loss was significantly less, and 30-day transfusion tended to be lower in patients who had PVM (290 vs 323 mL; P =.032; 30% vs 26%; P =.07, respectively), although no significant difference was seen with the length of procedure (P =.44). Intraoperative angiogram/duplex ultrasonography to establish technical adequacy was more commonly used in the PVM subgroup (39% vs 32%; P <.001) and was more likely to be reported as normal. No significant difference was found in terms of short-term outcomes (length of stay; neurologic, renal, or cardiac complications; 30-day patency; readmission; and death) or for surgical site infection variables (30-day readmission for wound infection, need to return to operating room for infection). Conclusions: Most patients do not have PVM before their IIB. Patients who undergo PVM are more than twice as likely to have a venous conduit used for their bypass. In patients who underwent autogenous venous conduit bypass, postoperative imaging to establish technical adequacy was performed more frequently in patients who underwent PVM and was more likely to be reported as normal. Despite no change in 30-day or 1-year patency, PVM may be a marker for physicians who are interested in best practices for IIB.

Surgery

Natour AK, **Shepard AD**, **Weaver M**, **Nypaver T**, Henke P, and **Kabbani L**. Impact Of Preoperative Hemoglobina1c In Patients Undergoing Open Distal Vascular Procedures. *J Vasc Surg* 2022; 76(4):e74. Full Text

Objective: The purpose of this study was to evaluate if preoperative hemoglobin (Hb) A1c levels was associated with worse outcomes in patients undergoing open lower extremity (LE) revascularization. Methods: A retrospective review of a statewide vascular surgery registry was queried for all patients who underwent open infrainguinal bypass or open LE thrombectomy procedures between January 2014 and June 2021. Patients were categorized into four groups depending on whether their plasma HbA1c was

≤6%, >6% to ≤8%, >8% to ≤10%, and >10%. Regression models were used to evaluate the association between preoperative HbA1c and postoperative major adverse limb events (MALE), major adverse cardiac events (MACE), mortality, and length of stay (LOS). Results: A total of 5388 patients were included in the study. The average age was 66 years. Sixty-six percent of the cohort were male, and 78% were white. Demographics and comorbidities were associated with the HbA1c level. Mean LOS was 7 days for HbA1c <6% and 10 days for HbA1c >10% (P <.001). No significant association was found when looking at perioperative MALE, MACE, 30-day mortality, or 1-year mortality. On multivariate analysis, only LOS remained significantly associated with the level of HbA1c (P <.001) (Table). Conclusions: Suboptimal preoperative glycemic control in patients undergoing open LE vascular procedures for ischemia is associated with an increased risk of LOS. HbA1c level was not predictive of worse perioperative MACE, MALE, or mortality in this cohort. The increased in LOS could be explained by unmeasured complications, frailty, or increased hospitalization time needed to optimize glycemic control before discharge. [Formula presented]

Surgery

Natour AK, **Shepard AD**, **Weaver M**, **Peshkepija A**, **Nypaver T**, and **Kabbani L**. Re-vascularization Of Left Subclavian Artery May Not Influence The Incidence Of Spinal Cord Injury After Endovascular Repair Of Acute Type B Aortic Dissection. *J Vasc Surg* 2022; 76(4):e56-e57. Full Text

Objective: The objective of this study was to analyze whether left subclavian artery (LSA) revascularization in patients undergoing thoracic endovascular aortic repair (TEVAR) for acute type B aortic dissection (TBAD) is associated with decreased spinal cord ischemia (SCI). Methods: The national Vascular Quality Initiative TEVAR module was queried for all procedures performed between 2014 and 2021. Patients presenting with aortic aneurysms or aortic ruptures were excluded from the analysis. Patients with therapeutic spinal drains were excluded as well. Patients were divided into two groups according to whether their left subclavian artery (LSA) was revascularized (prior to or during TEVAR) or not. A propensity score matching approach was used to account for possible confounders and evaluate the effect of LSA revascularization on the primary outcome of SCI. Results: Among patients who had TEVAR for acute TBAD, 852 patients had the LSA covered. The LSA was revascularized prior to or concomitant with TEVAR in 44% of these patients (n = 378). The incidence of LSA revascularization significantly increased over the study period (Fig) (P <.001). A total of 650 patients were split equally and matched between the two groups. Average age was 57 years, and 71% (n = 458) were male (Table). Spinal cord ischemia developed in 26 patients (4%), and cerebral stroke in 46 patients (7%). On univariate analysis, patients who had their LSA revascularized were significantly less likely to develop cerebral stroke (5% vs 9%; P =.03). However, this association dropped after accounting for preoperative and intraoperative variables (P =.14). No significant difference was seen when comparing SCI, 30-day mortality, or 1-year mortality between patients who had LSA revascularization and those who did not (Table). The average follow-up was 24 months (range, 0-99 months). Long-term survival did not differ between the two groups on Kaplan-Meier analysis. Conclusions: In patients with acute TBAD undergoing TEVAR requiring LSA coverage, an increasing percentage of patients underwent preoperative or concomitant LSA revascularization over the course of the study: 51% in 2021. In this study, LSA revascularization did not affect the incidence of postoperative SCI, cerebral stroke, or short or long-term mortality. LSA revascularization may carry its own morbidity in TEVAR requiring LSA coverage. [Formula presented] [Formula presented]