OAKLAND UNIVERSITY WILLIAM BEAUMONT SCHOOL OF MEDICINE
PUBLICATION LIST
October - December 2021

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Abbas AE (2021). "From Killip to Forrester to echocardiography: Beyond myocardial infarction." Journal of the American Society of Echocardiography. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Abbas AE, Mando R, Kadri A, Khalili H, Hanzel G, **Shannon F**, Al-Azizi K, Waggoner T, Kassas S, Pilgrim T, Okuno T, Camacho A, Selberg A, Elmariah S, Bavry A, Ternacle J, Christensen J, Gheewala N, Pibarot P and Mack M (2021). "Comparison of transvalvular aortic mean gradients obtained by intraprocedural echocardiography and invasive measurement in balloon and selfexpanding transcatheter valves." Journal of the American Heart Association 10(19): e021014.
Full Text
Department of Internal Medicine/Cardiovascular Disease
Department of Surgery

Background: Concerns about discordance between echocardiographic and invasive mean gradients after transcatheter aortic valve replacement (TAVR) with balloon-expandable valves (BEVs) versus self-expanding valves (SEVs) exist. Methods and Results: In a multicenter study, direct-invasive and echocardiography-derived transvalvular mean gradients obtained before and after TAVR were compared as well as post-TAVR and discharge echocardiographic mean gradients in BEVs versus SEVs in 808 patients. Pre-TAVR, there was good correlation (R=0.614; P<0.0001) between direct-invasive and echocardiography-derived mean gradients and weak correlation (R=0.138; P<0.0001) post-TAVR. Compared with postTAVR echocardiographic mean gradients, both valves exhibit lower invasive and higher discharge echocardiographic mean gradients. Despite similar invasive mean gradients, a small BEV exhibits higher post-TAVR and discharge echocardiographic mean gradients than a large BEV, whereas small and large SEVs exhibit similar post-TAVR and discharge mean gradients. An ejection fraction <50% (P=0.028) and higher Society of Thoracic Surgeons predicted risk of mortality score (P=0.007), but not invasive or echocardiographic mean gradient ≥10 mm Hg (P=0.378 and P=0.341, respectively),

nor discharge echocardiographic mean gradient ≥20 mm Hg (P=0.393), were associated with increased 2-year mortality. Conclusions: Invasively measured and echocardiography-derived transvalvular mean gradients correlate well in aortic stenosis but weakly post-TAVR. Post-TAVR, echocardiography overestimates transvalvular mean gradients compared with invasive measurements, and poor correlation suggests these modalities cannot be used interchangeably. Moreover, echocardiographic mean gradients are higher on discharge than post-TAVR in all valves. Despite similar invasive mean gradients, a small BEV exhibits higher post-TAVR and discharge echocardiographic mean gradients than a large BEV, whereas small and large SEVs exhibit similar post-TAVR and discharge mean gradients. Immediately post-TAVR, elevated echocardiographic-derived mean gradients should be assessed with caution and compared with direct-invasive mean gradients. A low ejection fraction and higher Society of Thoracic Surgeons score, but not elevated mean gradients, are associated with increased 2-year mortality.

Abdu R, Vasyluk A, Reddy N, Huang LC, Halka JT, **DeMare A**, **Janczyk R** and **Iacco A** (2021). "Hybrid robotic transversus abdominis release versus open: Propensity-matched analysis of 30-day outcomes." Hernia 25(6): 1491-1497.
Full Text
OUWB Medical Student Author
Department of Surgery

Purpose: To examine the hospital length of stay (LOS) and 30 day outcomes of hybrid robotic transversus abdominis release (hrTAR) compared with open transversus abdominis release (oTAR). Methods: Patients receiving hrTAR were selected from the AHSQC database and propensity matched with a contemporary cohort of oTAR patients. Results: The cohort included 95 hrTAR and 285 oTAR patients. There was a significantly shorter median LOS in the hrTAR cohort (3 vs. 5 days, $p < 0.001$). The rate of surgical site occurrences in the hrTAR cohort was also lower than for oTAR (5% vs. 15%, $p = 0.015$). Readmission rates were not different between hrTAR and oTAR (6% vs. 8%, $p = 0.65$). Conclusion: hrTAR demonstrates improved LOS compared to oTAR as well as fewer surgical site related occurrences. Further studies are needed to investigate the etiology behind the improved LOS and to confirm appropriate long-term outcomes from hybrid robotic TAR.

Abrar M, Pindoria N, Malde S, **Chancellor M**, DeRidder D and Sahai A (2021). "Predictors of poor response and adverse events following botulinum toxin A for refractory idiopathic overactive bladder: A systematic review." European Urology Focus 7(6): 1448-1467.
Full Text
Department of Urology

Context: Botulinum toxin A (BTX-A) injections are effective in managing refractory overactive bladder (OAB). However, some patients exhibit a poor response and/or experience adverse events (AEs) such as voiding dysfunction necessitating clean intermittent self-catheterisation (CISC) and urinary tract infections (UTIs). OBJECTIVE: To systematically evaluate whether poor response/AEs to BTX-A for idiopathic OAB are predictable. Evidence Acquisition: MEDLINE, EMBASE, and Google Scholar database were searched in March 2020. Studies reporting predictive factors for poor response or AEs were included. Two reviewers independently screened articles, searched references, and extracted data. Risk of bias (Quality in Prognosis Studies [QUIPS]) and quality of evidence (Grading of Recommendations Assessment, Development and Evaluation [GRADE]) tools were utilised. Evidence Synthesis: Of 1579 articles, 17 met the inclusion criteria. These were cohort studies with predominantly level 3 evidence. Factors including male gender, frailty, comorbidity, increasing age, smoking, baseline leakage

episodes, and various urodynamic parameters (bladder outlet obstruction index [BOOI], high pretreatment maximum detrusor pressure, and poor bladder compliance) were proposed as predictors of nonresponse. In predicting CISC use, male gender, comorbidity, increasing age, number of vaginal deliveries, hysterectomy, and urodynamic parameters (bladder capacity, postvoid residual volume, projected isovolumetric pressure value, bladder contractility index, and BOOI) were implicated. Female gender, males with their prostates in situ, and CISC were suggested to increase UTIs after BTX-A. Conclusions: This review has identified factors that may predict poor response/AEs following bladder BTX-A and help in counselling of patients. Overall, the quality of individual studies included was poor, limiting the certainty of evidence reported. Larger-scale, better-designed trials with uniform definitions of poor response are required to confirm these preliminary findings. Patient Summary: This review assessed whether we could predict poor response or side effects to bladder botulinum toxin A injections in managing overactive bladder. Many different factors based on the patient, medical conditions, previous surgery, and pretreatment investigations were identified. However, the quality of included studies was generally poor, limiting their conclusions.

Agochukwu-Mmonu N, Qi J, Dunn RL, Montie J, Wittmann D, Miller D, Martin R, Kim T, **Johnston WK, 3rd** and Peabody J (2021). "Patient- and surgeon-level variation in patient-reported sexual function outcomes following radical prostatectomy over 2 years: Results from a Statewide Surgical Improvement Collaborative." JAMA Surgery. ePub Ahead of Print.

Full Text

Department of Urology

Importance: Of patient-reported outcomes for individuals undergoing radical prostatectomy, sexual function outcomes are among the most reported and the most detrimental to quality of life. Understanding variations at the patient and surgeon level may inform collaborative quality improvement. Objective: To describe patient- and surgeon-level sexual function outcomes for patients undergoing radical prostatectomy in the Michigan Urological Surgery Improvement Collaborative (MUSIC) and to examine the correlation between surgeon case volume and sexual function outcomes. Design, Setting, and Participants: This is a prospective cohort study using the MUSIC registry and patient-reported sexual function outcome data. Patient- and surgeon-level variation in sexual function outcomes were examined among patients undergoing radical prostatectomy from May 2014 to August 2019. Sexual function outcome data were collected using validated questionnaires, which were completed before surgery and at 3, 6, 12, and 24 months' follow-up following surgery. All participants were male. Race and ethnicity data were self-reported and were included to examine potential variation in outcomes by race and/or ethnicity. Data were analyzed from January 2021 to March 2021. Main Outcomes and Measures: There were 4 outcomes in this study, including the 26-item Expanded Prostate Cancer Index Composite (EPIC-26) sexual function scores at 3, 6, 12, and 24 months' follow-up; patient-level sexual function recovery at 12- and 24-month follow-up; surgeon-level variation in sexual function outcomes at 12- and 24-month follow-up; and correlation between surgeon case volume and sexual function outcomes. Results: A total of 1426 male patients met inclusion criteria for this study. The median (IQR) age was 64 (58-68) years. A total of 115 participants (8%) were Black, 1197 (84%) were White, 25 (2%) were of another race or ethnicity (consolidated owing to low numbers), and 89 (6%) were of unknown race or ethnicity. Among patients undergoing bilateral nerve-sparing radical prostatectomy, mean (SD) EPIC-26 sexual function scores at 12- and 24-month follow-up (12 months, 39 [28]; 24 months, 63 [29]) did not return to baseline levels. There was wide variation in EPIC-26 sexual function scores at both 12-month follow-up (range, 23-69; $P < .001$) and 24-month follow-up (range, 27-64; $P < .001$).

Similar variations were found in EPIC-26 sexual function scores and recovery of sexual function by surgeon. Recovery rates ranged from 0% to 40% of patients at 12-month follow-up (18 surgeons; P < .001) and 3% to 44% of patients at 24-month follow-up (12 surgeons; P < .001). Surgeon case volume and sexual function outcomes were not significantly correlated. On multivariable analysis, the following variables were associated with better recovery at 24-month follow-up: younger age (P < .001), lower baseline EPIC-26 sexual function score (P < .001), lower Gleason score (P = .05), and nonobesity (P = .03). Conclusions and Relevance: In this study, there was significant patient- and surgeon-level variation in sexual function recovery over 2 years following radical prostatectomy. Variation in surgeon-level sexual function outcomes presents an opportunity and model for surgical collaborative quality improvement.

Al Natour RH, He C, Clark MJ, **Welsh R**, Chang AC and Adams KN (2021). "The influence of tobacco load versus smoking status on outcomes following lobectomy for lung cancer in a statewide quality collaborative." Journal of Thoracic Cardiovascular Surgery 162(5): 1375-1385.e1371.
Full Text
Department of Surgery

Background: Collaborative quality consortia can facilitate implementation of quality measures arising from clinical databases. Our statewide general thoracic surgery (GTS) collaborative investigated the influences of cigarette smoking status on mortality and major morbidity following lobectomy for lung cancer. Methods: Society of Thoracic Surgeons General Thoracic Surgery Database records were identified from 14 institutions participating in a statewide thoracic surgical quality collaborative between 2012 and 2017. We excluded patients with nonelective procedures, stage 0 tumors, American Society of Anesthesiologists class VI disease, and missing clinical characteristics. Outcomes analysis included the combined mortality and major postoperative morbidity rates and the influence of patient characteristics, including smoking status, on composite rate and on postoperative complications. Results: The study cohort included 2267 patient records for analysis. Overall combined mortality and major morbidity rate was 10.2% (n = 231). Postoperative 30-day mortality was 1.5%, and major morbidity 9.6%. Significant predictors of the combined outcome included male sex (P = .004), body mass index (P < .001), Zubrod score (P = .02), smoking pack-years (P = .03), and thoracotomy (P < .001). Higher American Society of Anesthesiologists disease class and advanced tumor stage were marginally associated with worse combined outcome (P = .06). Smoking status; that is, current, past (no smoking within 30 days), or never smoked, was not associated with worse combined outcome (P = .56) and had no significant influence on major complications. Conclusions: Smoking status was not associated with worse outcomes; however, smoking dose (pack-years) was associated with worse combined mortality and major morbidity. A statewide quality collaborative provides constructive feedback for participating institutions and surgeons, promoting quality improvement in perioperative patient care strategies and improved outcomes.

Al-Othman Y, **Li W**, **Kanaan H** and **Zhang P** (2021). "Weakened IgG4 staining and positive PLA2R staining Indicate resolving primary Membranous Glomerulopathy (MGN)." American Journal of Clinical Pathology 156: S154-S155.
Full Text
Department of Pathology

Al-Othman Y, **Qu Z** and **Zhang P** (2021). "Case report. Cryoglobulin hyaline-thrombi associated acute jejunitis in A patient with type 2 cryoglobulinemic glomerulonephritis." American Journal of Clinical

Pathology 156: S153-S153.
Full Text
Department of Pathology

Allam S, McDowell E, Heard B, Kim T, Luu E, Muto C, Mazimba S and **Mehta N** (2021). "A novel disinfection protocol using ATP testing for lead garments in the electrophysiology lab." Journal of Interventional Cardiac Electrophysiology 62(3): 565-568.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Purpose: Electrophysiology procedures pose infection risk and require surgical room sterility. Currently, there is no universally approved protocol for disinfecting lead garments in the electrophysiology laboratory. This study explores the feasibility of using ATP testing to assess the microbial burden of lead aprons and evaluates the impact of a sanitary intervention. Methods: Adenosine triphosphate (ATP) testing is a well-established hospital standard to quantify biological matter on a surface and, by proxy, the microbial burden. It is measured in RLU (relative light units). Pre-intervention ATP testing was performed on 34 lead garments after use for electrophysiology procedures. The thyroid collar, mid-chest vest, and left axillary areas of the garments were swabbed using a Hygiena SystemSure II luminometer with ATP swabs (Hygiena, Camarillo, CA). These sites were then disinfected with disinfectant wipes (PDI Super Sani-cloth Germicidal Disposable Wipe) and ATP testing was repeated. Results: The mean duration of garment wear was 213 min. The thyroid collars had the highest mean RLU before intervention, followed by the mid-chest vest and the left axillary areas. The intervention was found to significantly decrease ATP readings for all three sites ($p = 0.0002$, $p = 0.0001$, $p = 0.0002$ respectively). Linear regression modeling to assess the impact of intervention showed a significant correlation with pre-intervention ATP values for all three sites but no correlation with fluoroscopy time, fluoroscopy dose, or total time spent within the procedure. Conclusions: Lead garments harbor microbial contamination after use according to ATP testing. A sanitary intervention can decontaminate lead garments and potentially reduce rates of hospital infection.

Almahariq MF, Parzen JS, **Quinn TJ**, **Lee KC**, Guckenberger M, Klement RJ, Belderbos J, Sonke JJ, Hope AJ, Giuliani ME, Werner-Wasik M, Ye H, **Grills IS** and Lee KC, Jr. (2021). "Stereotactic body radiotherapy (SBRT) with biologically equivalent dose > 150 Gy is associated with improved local control in patients with squamous but not non-squamous cell carcinoma of the lung: A multi-institutional analysis." International Journal of Radiation Oncology, Biology, Physics 111(3): S127-S127.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): Recent studies suggest improved local control (LC) of early-stage non-small cell lung cancer (NSCLC) treated with SBRT regimens with biologically equivalent dose (BED10) > 150 Gy. It is unclear if this association is histology dependent. Multiple groups have shown lower LC rates after SBRT for squamous cell carcinoma (SCC), compared to non-SCC NSCLC. We compared LC between BEDlow and BEDhigh SBRT schemes, stratified by histology. Materials/Methods: As part of an IRB approved collaborative, we retrospectively analyzed 684 patients with cT1-2, cN0, cM0 NSCLC, treated with definitive SBRT to a minimum BED of 100 Gy at five international centers. Patients were grouped into SCC and non-SCC, then divided into BEDhigh (BED10 ≥150 Gy) or BEDlow (BED10 < 150 Gy) based on prescription dose, and propensity-score matched for age, sex, smoking history, performance status, T-stage, tumor grade and location, mediastinal staging, and receipt of chemotherapy. LC was estimated by

Kaplan-Meier. Univariate (UVA) and multivariable analyses (MVA) were used to correlate BED with clinical outcomes. We also compared BED groups based on dose to planning and gross target volumes (PTVmean, GTVmean) to account for plan heterogeneity among institutions. Results: Of 684 eligible tumors, 457 were non-SCC and 227 SCC. Median follow-up was 30 months. Of non-SCC patients, 262 (57%) were BEDlow and 195 (43%) BEDhigh. Of SCC patients, 144 (63%) were BEDlow and 83 (37%) BEDhigh. BEDhigh SBRT included those treated with 54 Gy in 3 fractions (54/3). BEDlow included 60/5, 50/5, 48/4, or 60/8. Baseline characteristics, including T-stage and max tumor dimension, were similar between BED groups after matching. MVA including T-stage, tumor grade, and tumor location, showed BEDlow regimens were associated with higher rates of local failure for SCC (HR 9.8, 95% CI 1.9-25.1, P = 0.007), but not for non-SCC (HR 1.2, 95% CI 0.6-2.5, P = 0.6). Three-year LC rates for BEDlow and BEDhigh were 70% and 97%, respectively for SCC, and 91% and 92%, respectively, for non-SCC. Similarly, there were higher rates of failure with BEDlow PTVmean (3 yr LC 94 vs 69%, MVA HR 6.4, 95% CI 1.9-22.2, P = 0.003) and BEDlow GTVmean (3 yr LC 87 vs 68%, MVA HR 7.6, 95% CI 2.7-21.6, P = 0.001) in SCC patients. In non-SCC patients, LC was similar between BED groups for PTVmean (3 yr LC 92% vs 93%, MVA HR 1.1, 95% CI 0.5-2.8, P = 0.8) and GTVmean (3 yr LC 94 vs 90%, MVA HR 0.8, 95% CI 0.3-2.6, P = 0.8). There was a trend of worse survival in BEDlow SCC patients (MVA HR 1.3, 95% CI 0.9-1.9, P = 0.1), but survival was similar in non-SCC patients (MVA HR 1.02, 95% CI 0.8-1.3, P = 0.9). There were no differences in regional recurrence or distant metastases between BED groups in either histology. Conclusion: This multi-institutional analysis shows improved LC in early-stage SCC NSCLC treated with SBRT regimens with BED10 > 150 Gy. No difference was observed in LC between BED groups for non-SCC patients. Our results suggest BEDhigh SBRT should be strongly considered for early-stage non-central SCC NSCLC.

Almutairi MM, Sivandzade F, Albekairi TH, Alqahtani F and **Cucullo L** (2021). "Neuroinflammation and its impact on the pathogenesis of COVID-19." Frontiers in Medicine 8: 745789.
Full Text
Department of Foundational Medical Studies (OU)

Coronavirus Disease 2019 (COVID-19) is an infectious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). The clinical manifestations of COVID-19 include dry cough, difficult breathing, fever, fatigue, and may lead to pneumonia and respiratory failure. There are significant gaps in the current understanding of whether SARS-CoV-2 attacks the CNS directly or through activation of the peripheral immune system and immune cell infiltration. Although the modality of neurological impairments associated with COVID-19 has not been thoroughly investigated, the latest studies have observed that SARS-CoV-2 induces neuroinflammation and may have severe long-term consequences. Here we review the literature on possible cellular and molecular mechanisms of SARS-CoV-2 induced-neuroinflammation. Activation of the innate immune system is associated with increased cytokine levels, chemokines, and free radicals in the SARS-CoV-2-induced pathogenic response at the blood-brain barrier (BBB). BBB disruption allows immune/inflammatory cell infiltration into the CNS activating immune resident cells (such as microglia and astrocytes). This review highlights the molecular and cellular mechanisms involved in COVID-19-induced neuroinflammation, which may lead to neuronal death. A better understanding of these mechanisms will help gain substantial knowledge about the potential role of SARS-CoV-2 in neurological changes and plan possible therapeutic intervention strategies.

Aneese A, Edhi A, Imam Z and Schoenfeld P (2021). "Adherence to guideline-appropriate recommendations after normal CRC screening colonoscopy in average-risk individuals." American

Journal of Gastroenterology 116: S133-S133.
Full Text
OUWB Medical Student Author

Archie SR, Al Shoyaib A and **Cucullo L** (2021). "Blood-brain barrier dysfunction in CNS disorders and putative therapeutic targets: An overview." Pharmaceutics 13(11): 1779.
Full Text
Department of Foundational Medical Studies (OU)

The blood-brain barrier (BBB) is a fundamental component of the central nervous system (CNS). Its functional and structural integrity is vital to maintain the homeostasis of the brain microenvironment by controlling the passage of substances and regulating the trafficking of immune cells between the blood and the brain. The BBB is primarily composed of highly specialized microvascular endothelial cells. These cells' special features and physiological properties are acquired and maintained through the concerted effort of hemodynamic and cellular cues from the surrounding environment. This complex multicellular system, comprising endothelial cells, astrocytes, pericytes, and neurons, is known as the neurovascular unit (NVU). The BBB strictly controls the transport of nutrients and metabolites into brain parenchyma through a tightly regulated transport system while limiting the access of potentially harmful substances via efflux transcytosis and metabolic mechanisms. Not surprisingly, a disruption of the BBB has been associated with the onset and/or progression of major neurological disorders. Although the association between disease and BBB disruption is clear, its nature is not always evident, specifically with regard to whether an impaired BBB function results from the pathological condition or whether the BBB damage is the primary pathogenic factor prodromal to the onset of the disease. In either case, repairing the barrier could be a viable option for treating and/or reducing the effects of CNS disorders. In this review, we describe the fundamental structure and function of the BBB in both healthy and altered/diseased conditions. Additionally, we provide an overview of the potential therapeutic targets that could be leveraged to restore the integrity of the BBB concomitant to the treatment of these brain disorders.

Arden JD, **Dokter J**, **Almahariq MF**, Marvin K, **Nandalur SR**, **Al-Wahab Z**, **Gadzinski J**, **Rosen B** and **Jawad MS** (2021). "Toxicity and efficacy after adjuvant vaginal brachytherapy using 30 Gy in 6 fractions for stages I and II endometrial cancer." Advances in Radiation Oncology 6(6): 100773.
Full Text
OUWB Medical Student Author
Department of Radiation Oncology
Department of Diagnostic Radiology and Molecular Imaging
Department of Obstetrics & Gynecology

Purpose: This study aimed to evaluate outcomes and toxicity in patients with endometrial cancer per our institutional adjuvant vaginal cuff brachytherapy (VBT) fractionation scheme. Methods and Materials: We identified women with International Federation of Gynecology and Oncology stages I and II endometrial cancer who underwent surgical staging and adjuvant high-dose-rate VBT without external beam radiation. All patients received 30 Gy in 6 fractions to the upper one-third of the vagina, prescribed to a depth of 5 mm and delivered twice weekly. Toxicities were prospectively elicited at each follow up, and rates of recurrence and survival were retrospectively assessed. Results: We identified 247 eligible patients treated between 1992 and 2018 with a median follow up of 5.8 years (range, 0.1-24.7 years). Most patients had stage I disease (52% stage IA; 37% stage IB), and 11% of patients were stage II. Deep myometrial

invasion was predictive of local recurrence (P = .002). The 5-year rates of local recurrence, regional recurrence, and distant metastases were 5%, 5%, and 7%, respectively. Five-year overall and disease-free survival were 91% and 83%, respectively. The most common grade 1 toxicities were acute fatigue (11% crude rate), urinary frequency (11%), chronic (>6 months) urinary frequency (13%), urinary incontinence (13%), and vaginal stenosis (21%). There were few grade 2 toxicities (all <5%) and no grade 3 to 5 toxicities. Conclusions: The adjuvant VBT fractionation scheme of 30 Gy in 6 fractions results in low rates of toxicity, with no grade ≥3 adverse events, and local control rates comparable with those from other published series using different fractionation schemes.

Attardi SM, **Gould DJ**, **Pratt RL** and **Roach VA** (2021). "YouTube-based course orientation videos delivered prior to matriculation fail to alleviate medical student anxiety about anatomy." Anatomical Sciences Education. ePub ahead of Print.
Full Text
Department of Foundational Medical Studies (OU)

Gross anatomy is a source of anxiety for matriculating medical students due to the large volume of information presented in a truncated timeline, and because it may be their first exposure to human cadavers. This study aimed to assess if video-based resources would affect matriculating medical students' anatomy state anxiety levels. Videos were designed to be short, YouTube-based units that served to provide orientation information about the anatomy course, dissection facilities, and available study resources to dispel anxiety around beginning their anatomy studies. To evaluate the impact of the videos, students in two consecutive matriculating years (2018 and 2019) completed the validated State-Trait Anxiety Inventory and a demographic questionnaire. The 2019 cohort (n = 118) served as the experimental group with access to the videos; while the 2018 cohort (n = 120) without video access served as a historical control. Analyses revealed that the groups were equivalent in terms of trait anxiety (P = 0.854) and anatomy state anxiety even when student video exposure was controlled (P = 0.495). Anatomy state anxiety was only significantly lower in students with prior formal anatomy exposure (P = 0.006). Further inquiry into students' prior anatomy experience identified that individuals with post-secondary dissection experience were significantly less anxious than those without formal anatomical experience (P = 0.023). These results may serve as a cautionary tale to educators; while preference for video-based instructional materials is prevalent in the literature, videos delivered on public social media platforms fail to prepare students for the psychological impact of studying human anatomy.

Attardi SM, Harmon DJ, **Barremkala M**, Bentley DC, Brown KM, Dennis JF, Goldman HM, Harrell KM, Klein BA, Ramnanan CJ and Farkas GJ (2021). "An analysis of anatomy education before and during COVID-19: August-December 2020." Anatomical Sciences Education. ePub Ahead of Print.
Full Text
Department of Foundational Medical Studies (OU)

COVID-19 disrupted the in-person teaching format of anatomy. To study changes in gross anatomy education that occurred August-December, 2020 compared to before the pandemic, an online survey was distributed to anatomy educators. The 191 responses received were analyzed in total and by academic program, geographic region, and institution type. Cadaver use decreased overall (before: 74.1 ± 34.1%, during: 50.3 ± 43.0%, P < 0.0001), as well as across allopathic and osteopathic medicine, therapy, undergraduate, and veterinary programs (P < 0.05), but remained unchanged for other programs (P > 0.05). Cadaver use decreased internationally and in the US (P < 0.0001), at public and private (P < 0.0001) institutions, and

among allopathic medical programs in Northeastern, Central, and Southern (P < 0.05), but not Western, US geographical regions. Laboratories during Covid-19 were delivered through synchronous (59%), asynchronous (4%), or mixed (37%) formats (P < 0.0001) and utilized digital resources (47%), dissection (32%), and/or prosection (21%) (P < 0.0001). The practical laboratory examination persisted during Covid-19 (P = 0.419); however, the setting and materials shifted to computer-based (P < 0.0001) and image-based (P < 0.0001), respectively. In-person lecture decreased during Covid-19 (before: 88%, during: 24%, P = 0.003). When anatomy digital resources were categorized, dissection media, interactive software, and open-access content increased (P ≤ 0.008), with specific increases in BlueLink, Acland's Videos, and Complete Anatomy (P < 0.05). This study provided evidence of how gross anatomy educators continued to adapt their courses past the early stages of the pandemic.

Auguste B, Teakell J, Ullur AR, **Topf JM** and Hiremath S (2021). "Voclosporin for lupus nephritis: A #NephJC editorial on AURORA." Kidney Medicine 3(6): 889-892.
Full Text
Department of Internal Medicine/Nephrology

Bahl A, Diloreto E, Jankowski D, **Hijazi M** and Chen NW (2021). "Comparison of 2 midline catheter devices with differing antithrombogenic mechanisms for catheter-related thrombosis: A randomized clinical trial." JAMA Network Open 4(10): e2127836.
Full Text
Department of Emergency Medicine
OUWB Medical Student Author

Importance: Data regarding upper extremity midline catheter (MC)-related thrombosis (CRT) are sparse, with some evidence indicating that MCs have a high rate of CRT. Objective: To compare 2 MCs with differing antithrombogenic mechanisms for this outcome. Design, Setting, and Participants: In this parallel, 2-arm randomized clinical trial, 496 adult patients hospitalized at a tertiary care suburban academic medical center who received an MC were assessed for eligibility between January 1, 2019, and October 31, 2020, and 212 were randomized. Interventions: Inpatients were randomized to receive a 4F antithrombotic MC (MC-AT) or a 4.5F antithrombotic and antimicrobial MC (MC-AT-AM). Main Outcomes and Measures: The primary outcome was symptomatic midline CRT inclusive of deep vein thrombosis or superficial venous thrombophlebitis within 30 days after insertion. Secondary outcomes included catheter-associated bloodstream infection and catheter failure. Results: A total of 191 patients (mean [SD] age, 60.2 [16.7] years; 114 [59.7%] female) were included in the final analysis: 94 patients in the MC-AT group and 97 in the MC-AT-AM group. Symptomatic midline CRT occurred in 7 patients (7.5%) in the MC-AT group and 11 (11.3%) in the MC-AT-AM group (P = .46). Deep vein thrombosis occurred in 5 patients (5.3%) in the MC-AT group and 5 patients (5.2%) in the MC-AT-AM group (P > .99). Pulmonary embolism occurred in 1 patient in the MC-AT group. No catheter-associated bloodstream infection occurred in either group. Premature catheter failure occurred in 22 patients (23.4%) in the MC-AT group and 20 (20.6%) in the MC-AT-AM group (P = .64). In Cox proportional hazards regression analysis, no statistically significant difference was found between groups for the risk of catheter failure (hazard ratio, 1.27; 95% CI, 0.67-2.43; P = .46). Conclusions and Relevance: No difference was found in thrombosis in MCs with 2 distinct antithrombogenic mechanisms; however, the risk of CRT in both groups was high. Practitioners should strongly consider the safety risks associated with MCs when determining the appropriate vascular access device.

Bahl A, Johnson S, Alsbrooks K, Mares A, Gala S and Hoerauf K (2021). "Defining difficult intravenous access (DIVA): A systematic review." Journal of Vascular Access. ePub Ahead of Print.
Request Form
Department of Emergency Medicine

Background: The term "difficult intravenous access" (DIVA) is commonly used but not clearly defined. Repeated attempts at peripheral intravenous catheter (PIVC) insertion can be a traumatic experience for patients, leading to sub-optimal clinical and economic outcomes. We conducted a systematic literature review (SLR) to collate literature definitions of DIVA, with the aim of arriving at an evidence-driven definition. Methods: The SLR was designed to identify clinical, cost, and quality of life publications in patients requiring the insertion of a PIVC in any setting, including studies on US-guidance and/or guidewire, and studies with no specific intervention. The search was restricted to English language studies published between 1st January 2010 and 30th July 2020, and the Ovid platform was used to search several electronic databases, in addition to hand searching of clinical trial registries. Results: About 121 studies were included in the SLR, of which 64 reported on the objectives relevant to this manuscript. Prevalence estimates varied widely from 6% to 87.7% across 19 publications, reflecting differences in definitions used. Of 43 publications which provided a definition of DIVA, six key themes emerged. Of these, themes 1-3 (failed attempts at PIV access using traditional technique; based on physical examination findings for example no visible or palpable veins; and personal history of DIVA) were covered by all but one publication. Following a failed insertion attempt, the most common number of subsequent attempts was 3, and it was frequently reported that a more experienced clinician would attempt to gain access after multiple failed attempts. Conclusions: Considering the themes identified, an evidence-driven definition of DIVA is proposed: "when a clinician has two or more failed attempts at PIV access using traditional techniques, physical examination findings are suggestive of DIVA (e.g. no visible or palpable veins) or the patient has a stated or documented history of DIVA."

Bahl A, Johnson S, Altwail M, Brackney A, Xiao J, Price J, Shotkin P and Chen N-W (2021). "Left ventricular ejection fraction assessment by emergency physician-performed bedside echocardiography: A prospective comparative evaluation of multiple modalities." Journal of Emergency Medicine 61(6): 711-719.
Full Text
Department of Emergency Medicine

Background: Although there is some support for visual estimation (VE) as an accurate method to estimate left ventricular ejection fraction (LVEF), it is also scrutinized for its subjectivity. Therefore, more objective assessments, such as fractional shortening (FS) or e-point septal separation (EPSS), may be useful in estimating LVEF among patients in the emergency department (ED).Objective: Our aim was to compare the real-world accuracy of VE, FS, and EPSS using a sample of point-of-care cardiac ultrasound transthoracic echocardiography (POC-TTE) images acquired by emergency physicians (EPs) with the gold standard of Simpson's method of discs, as measured by comprehensive cardiology-performed echocardiography. Methods: We conducted a single-site prospective observational study comparing VE, FS, and EPSS to assess LVEF. Adult patients in the ED receiving both POC-TTE and comprehensive cardiology TTE were included. EPs acquired POC-TTE images and videos that were then interpreted by 2 blinded EPs who were fellowship-trained in emergency ultrasound. EPs estimated LVEF using VE, FS, and EPSS. The primary outcome was accuracy. Results: Between April and May 2018, 125 patients were enrolled and 113 were included in the final analysis. EP1 and EP2 had a κ of 0.94 (95% confidence interval [CI] 0.87-1.00) and 0.97 (95% CI 0.91-1.00), respectively, for VE compared

with gold standard, a κ of 0.40 (95% CI 0.23-0.57) and 0.38 (95% CI 0.18-0.57), respectively, for EPSS compared with gold standard, and a κ of 0.70 (95% CI 0.54-0.85) and 0.66 (95% CI 0.50-0.81), respectively, for FS compared with gold standard. Sensitivity of severe dysfunction was moderate to high in VE (EP1 85% and EP2 93%), poor to moderate in FS (EP1 73% and EP2 50%), and poor in EPSS (EP1 11% and EP2 18%). Conclusions: Using a real-world sample of POC-TTE images, the quantitative measurements of EPSS and FS demonstrated poor accuracy in estimating LVEF, even among experienced sonographers. These methods should not be used to determine cardiac function in the ED. VE by experienced physicians demonstrated reliable accuracy for estimating LVEF compared with the gold standard of cardiology-performed TTE.

Bahl A, Johnson S, **Maine G**, Garcia MH, Nimmagadda S, **Qu L** and Chen NW (2021). "Vaccination reduces need for emergency care in breakthrough COVID-19 infections: A multicenter cohort study." Lancet 4: 100065.
Full Text
Department of Emergency Medicine
Department of Pathology
Department of Foundational Medical Studies (BH)

Background: While recent literature has shown the efficacy of the SARS-CoV-2 vaccine in preventing infection, it's impact on need for emergency care/hospitalization in breakthrough infections remain unclear, particularly in regions with a high rate of variant viral strains. We aimed to determine if vaccination reduces hospital visits in breakthrough COVID-19. Methods: This observational cohort analysis compared unvaccinated (UV), partially vaccinated (PV), and fully vaccinated (FV) adult patients with SARS-CoV-2 infection requiring emergency care(EC)/hospitalization within an eight-hospital system in Michigan. Demographic and clinical variables were obtained from the electronic record. Vaccination data was obtained from the Michigan Care Improvement Registry and Centers for Disease Control vaccine tracker. Primary endpoint was rate of emergency care/hospitalization encounters among patients diagnosed with COVID-19. Secondary outcome was severe disease-composite outcome (ICU, mechanical ventilation, or in-hospital death). Findings: Between December 15,2020 and April 30,2021, 11,834 EC encounters were included:10,880 (91.9%) UV, 825 (7%) PV, 129 (1.1%) FV. Average age was 53.0 ± 18.2 and 52.8% were female. Accounting for the SARS-CoV-2 vaccination population groups in Michigan, the ED encounters/hospitalizations rate relevant to COVID-19 was 96% lower in FV versus UV (multiplicative effect:0.04, 95% CI 0.03 to 0.06, $p < 0.001$) in negative binomial regression. COVID-19 EC visits rate peaked at 22.61, 12.88, and 1.29 visits per 100000 for the UV, PV, and FV groups, respectively. In the propensity-score matching weights analysis, FV had a lower risk of composite disease compared to UV but statistically insignificant (HR 0.84, 95% CI 0.52 to 1.38). Interpretation: The need for emergency care/hospitalization due to breakthrough COVID-19 is an exceedingly rare event in fully vaccinated patients. As vaccination has increased regionally, EC visits amongst fully vaccinated individuals have remained low and occur much less frequently than unvaccinated individuals. If hospital-based treatment is required, elderly patients with significant comorbidities are at high-risk for severe outcomes regardless of vaccination status.

Bansal P, Maini A, **Abbas A**, Pibarot P, Maini B and Khalili H (2021). "Transaortic flow in aortic stenosis: Stroke volume index versus transaortic flow rate." Journal of the American Society of Echocardiography 34(12): 1317-1320.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Bansal S, Tokman S, Fleming T, **Maine GN**, Sanborn K, Hachem R, Bharat A, Smith MA, Bremner RM and Mohanakumar T (2021). "SARS-CoV-2 infection in lung transplant recipients induces circulating exosomes with SARS-CoV-2 spike protein S2." Clinical and Translational Medicine 11(11): e576.
Full Text
Department of Pathology

Barker M, **Abbas AE**, Webb JG, Pibarot P, Sathananthan J, Brunner N, Wang DD, Wang J, Leon MB and Wood DA (2021). "Standardized invasive hemodynamics for management of patients with elevated echocardiographic gradients post-transcatheter aortic valve replacement at midterm follow-up." Circulation: Cardiovascular Interventions. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Bartolone SN, **Sharma P**, **Chancellor MB** and **Lamb LE** (2021). "Urinary incontinence and Alzheimer's disease: Insights from patients and preclinical m0odels." Fronters in Aging Neuroscience 13: 777819.
Full Text
OUWB Medical Student Author
Department of Urology

> Alzheimer's disease effects a large percentage of elderly dementia patients and is diagnosed on the basis of amyloid plaques and neurofibrillary tangles (NFTs) present in the brain. Urinary incontinence (UI) is often found in the elderly populations and multiple studies have shown that it is more common in Alzheimer's disease patients than those with normal cognitive function. However, the link between increased UI and Alzheimer's disease is still unclear. Amyloid plaques and NFTs present in micturition centers of the brain could cause a loss of signal to the bladder, resulting in the inability to properly void. Additionally, as Alzheimer's disease progresses, patients become less likely to recognize the need or understand the appropriate time and place to void. There are several treatments for UI targeting the muscarinic and β3 adrenergic receptors, which are present in the bladder and the brain. While these treatments may aid in UI, they often have effects on the brain with cognitive impairment side-effects. Acetylcholine esterase inhibitors are often used in treatment of Alzheimer's disease and directly oppose effects of anti-muscarinics used for UI, making UI management in Alzheimer's disease patients difficult. There are currently over 200 pre-clinical models of Alzheimer's disease, however, little research has been done on voiding disfunction in these models. There is preliminary data suggesting these models have similar voiding behavior to Alzheimer's disease patients but much more research is needed to understand the link between UI and Alzheimer's disease and discover better treatment options for managing both simultaneously.

Bax AM, Yoon YE, Gianni U, Ma X, Lu Y, Lee BC, Goebel B, Han D, Lee SE, Sung JM, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Chun EJ, Conte E, Gottlieb I, Hadamitzky M, Kim YJ, Lee BK, Leipsic JA, Maffei E, Marques H, Gonçalves PA, Pontone G, Shin S, Narula J, Lin FY, Shaw LJ and Chang HJ (2021). "Plaque character and progression according to the location of coronary atherosclerotic plaque." American Journal of Cardiology 158: 15-22.
Full Text
Department of Internal Medicine/Cardiovascular Disease

> Although acute coronary syndrome culprit lesions occur more frequently in the proximal coronary artery, whether the proximal clustering of high-risk plaque is reflected in earlier-stage atherosclerosis remains unclarified. We evaluated the longitudinal distribution of stable

atherosclerotic lesions on coronary computed tomography angiography (CCTA) in 1,478 patients (mean age, 61 years; men, 58%) enrolled from a prospective multinational registry of consecutive patients undergoing serial CCTA. Of 3,202 coronary artery lesions identified, 2,140 left lesions were classified (based on the minimal lumen diameter location) into left main (LM, n = 128), proximal (n = 739), and other (n = 1,273), and 1,062 right lesions were classified into proximal (n = 355) and other (n = 707). Plaque volume (PV) was the highest in proximal lesions (median, 26.1 mm(3)), followed by LM (20.6 mm(3)) and other lesions (15.0 mm(3), p <0.001), for left lesions, and was lager in proximal (25.8 mm(3)) than in other lesions (15.2 mm(3), p <0.001) for right lesions. On both sides, proximally located lesions tended to have greater necrotic core and fibrofatty components than other lesions (left: LM, 10.6%; proximal, 5.8%; other, 3.4% of the total PV, p <0.001; right: proximal, 8.4%; other 3.1%, p <0.001), with less calcified plaque component (left: LM, 18.3%; proximal, 30.3%; other, 37.7%, p <0.001; right: proximal, 23.3%, other, 36.6%, p <0.001), and tended to progress rapidly (adjusted odds ratios: left: LM, reference; proximal, 0.95, p = 0.803; other, 0.64, p = 0.017; right: proximal, reference; other, 0.52, p <0.001). Proximally located plaques were larger, with more risky composition, and progressed more rapidly.

Bentley DC, **Attardi SM**, Faul J, Melo V and Palmer C (2021). "Two-stage collaborative group testing does not improve retention of anatomy among students studying medical radiation technology." Journal of Medical Imaging and Radiation Sciences 52(4s): S96-s109.

Full Text

Department of Foundational Medical Studies (OU)

Introduction: Two-stage collaborative group testing is an assessment format where students first complete a summative assessment independently, and then immediately convene in a small group to complete the same assessment again. Research on two-stage collaborative group testing has shown that it increases immediate learning, improves communication and teamwork, and can lead to enhanced retention of course material; the latter of which is especially important for basic anatomical concepts among health care professionals such as medical radiation technologists. However, such previous research has often employed quasi-experimental designs that may limit both internal and external validity. Methods: Using a randomized crossover design with both quantitative and qualitative data analyses including robust intra-individual statistical comparisons, this research compared the educational impact of the two-stage collaborative group testing format (the COL condition) to traditional independent testing (the IND condition). Students (n=196) from two successive renditions of an introductory anatomy course were randomly assigned into groups of 3-5 students. Groups worked together throughout the term on various course elements, including three in-class, non-cumulative term tests (TTs). After practicing the collaborative format during TT1, during TT2 half the groups were assigned to the COL condition while the other half were assigned to the IND condition. Groups crossed over for TT3. All students completed a cumulative final examination independently, with performance data from that examination coded and extracted according to previous TT condition. Educational impact was evaluated as both immediate learning (by comparing IND and COL performance on the associated TT) as well as retention (by comparing final examination performance for topics previously IND tested versus previously COL tested). Students' qualitative reflections were coded into categories and juxtaposed against quantitative Likert-style feedback to comprehensively explore students' perception of the testing format for evidence of enjoyment, acceptability, and influence on relevant CAMRT professional competencies. Results: 167 students (85%) consented to data inclusion, with a final course grade of 75.5 ± 10.0%. On average, TT performance was 13.6 ± 11.6% greater on the COL test

(90.4 ± 7.6%) than the IND test (76.7 ± 14.3%) ($p<0.01$, $r = 0.76$), results that support immediate learning. Contrary to expectations, final examination performance specific to the two experimental conditions was similar, with students earning an average of 69.6 ± 18.3% on questions that pertained to material they were previously IND tested on, and 67.4 ± 19.1% on questions they were previously COL tested on (ns). Students' overall perceptions of the two-stage collaborative group testing format were overwhelmingly positive, with 84% indicating a belief that the format was a constructive learning opportunity and 74% recommending continued use. Written reflections revealed that students believed that collaborative testing enhanced their learning by both clarifying previous mistakes and reinforcing correct knowledge. Relevant CAMRT professional competencies included oral communication and interprofessional skills, capacity for productive teamwork, and collaborative practice. Significance: Although the results of this study do not support the use of two-stage collaborative group testing for retention of course material, they simultaneously reveal how the testing structure may be uniquely beneficial to students studying within the field of medical radiation sciences while also presenting a pragmatic example of how to implement this unique testing format.

Bhalerao A, Raut S, Noorani B, Mancuso S and **Cucullo L** (2021). "Molecular mechanisms of multi-organ failure in COVID-19 and potential of stem cell therapy." Cells 10(11): 2878.
Full Text
Department of Foundational Medical Studies (OU)

As the number of confirmed cases and deaths occurring from Coronavirus disease 2019 (COVID-19) surges worldwide, health experts are striving hard to fully comprehend the extent of damage caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). Although COVID-19 primarily manifests itself in the form of severe respiratory distress, it is also known to cause systemic damage to almost all major organs and organ systems within the body. In this review, we discuss the molecular mechanisms leading to multi-organ failure seen in COVID-19 patients. We also examine the potential of stem cell therapy in treating COVID-19 multi-organ failure cases.

Boulom V, Hasanadka R, Ochoa L, **Brown OW**, McDevitt D and Singh TM (2021). "Importance of diversity, equity, and inclusion in the community practice setting." Journal of Vascular Surgery 74(2): 118S-124S.
Full Text
Department of Surgery

Vascular surgeons of all backgrounds play an important role in providing high quality vascular surgical care in their communities. In America, with our diverse population and communities, patients presenting with vascular disease are very common and could pattern the community demographic. Often faced with the challenges of community hospital politics and demand, the vascular surgical workforce has continued to be active members in their communities, focusing on their strengths to lead vascular surgery healthcare in an environment of high patient demand. Having a varied vascular surgery workforce provides all patients afflicted by vascular disease a comfortable opportunity for compassionate and empathic vascular care. This is a significant strength of vascular care when diversity, equity, and inclusion are supported by the leadership.

Boyanton BL, Boamah H and **Lauter CB** (2021). "Native vs prosthetic valve histoplasma capsulatum infective endocarditis: A case report and systemic literature review comparing patient presentation, treatment modalities, clinical outcomes, and diagnostic laboratory testing." Open Forum Infectious

Diseases 8(8): ofab360.
Full Text
Department of Internal Medicine/Allergy-Immunology

Histoplasma capsulatum is a rare cause of fungal endocarditis that affects both native and prosthetic valves. It is associated with a high mortality rate if not diagnosed early and treated with a combination of antifungal therapy and surgical intervention. We present a case of a 47-year-old man with histoplasmosis infective endocarditis. He was successfully treated with antifungal therapy and surgical replacement of the infected bioprosthetic aortic valve. Our systemic literature review includes 52 articles encompassing 60 individual cases of H. capsulatum infective endocarditis from 1940 to 2020. Patient presentations, diagnostic laboratory testing accuracy, treatment modalities, and patient outcomes comparing and contrasting native and prosthetic valve infection are described.

Brescia AA, Clark MJ, Theurer PF, Lall SC, Nemeh HW, Downey RS, Martin DE, Dabir RR, Asfaw ZE, **Robinson PL**, Harrington SD, Gandhi DB, Waljee JF, Englesbe MJ, Brummett CM, Prager RL, Likosky DS, Kim KM and Lagisetty KH (2021). "Establishment and implementation of evidence-based opioid prescribing guidelines in cardiac surgery." Annals of Thoracic Surgery 112(4): 1176-1185.
Full Text
Department of Surgery

Background: Despite the risk of new persistent opioid use after cardiac surgery, postdischarge opioid use has not been quantified and evidence-based prescribing guidelines have not been established. Methods: Opioid-naive patients undergoing primary cardiac surgery via median sternotomy between January and December 2019 at 10 hospitals participating in a statewide collaborative were selected. Clinical data were linked to patient-reported outcomes collected at 30-day follow-up. An opioid prescribing recommendation stratified by inpatient opioid use on the day before discharge (0, 1-3, or ≥4 pills) was implemented in July 2019. Interrupted time-series analyses were performed for prescription size and postdischarge opioid use before (January to June) and after (July to December) guideline implementation. Results: Among 1495 patients (729 prerecommendation and 766 postrecommendation), median prescription size decreased from 20 pills to 12 pills after recommendation release (P <.001), while opioid use decreased from 3 pills to 0 pills (P <.001). Change in prescription size over time was +0.6 pill/month before and -0.8 pill/month after the recommendation (difference = -1.4 pills/month; P =.036). Change in patient use was +0.6 pill/month before and -0.4 pill/month after the recommendation (difference = -1.0 pills/month; P =.017). Pain levels during the first week after surgery and refills were unchanged. Patients using 0 pills before discharge (n = 710) were prescribed a median of 0 pills and used 0 pills, while those using 1 to 3 pills (n = 536) were prescribed 20 pills and used 7 pills, and those using greater than or equal to 4 pills (n = 249) were prescribed 32 pills and used 24 pills. Conclusions: An opioid prescribing recommendation was effective, and prescribing after cardiac surgery should be guided by inpatient use. © 2021 The Society of Thoracic Surgeons

Brown C, McKee C, Halassy S, **Kojan S**, Feinstein DL and Chaudhry GR (2021). "Neural stem cells derived from primitive mesenchymal stem cells reversed disease symptoms and promoted neurogenesis in an experimental autoimmune encephalomyelitis mouse model of multiple sclerosis." Stem Cell Research and Therapy 12(1): 499.
Full Text
Department of Neurology

Background: Multiple sclerosis (MS) is an autoimmune inflammatory disease of the central

nervous system (CNS). MS affects millions of people and causes a great economic and societal burden. There is no cure for MS. We used a novel approach to investigate the therapeutic potential of neural stem cells (NSCs) derived from human primitive mesenchymal stem cells (MSCs) in an experimental autoimmune encephalomyelitis (EAE) mouse model of MS. Methods: MSCs were differentiated into NSCs, labeled with PKH26, and injected into the tail vein of EAE mice. Neurobehavioral changes in the mice assessed the effect of transplanted cells on the disease process. The animals were sacrificed two weeks following cell transplantation to collect blood, lymphatic, and CNS tissues for analysis. Transplanted cells were tracked in various tissues by flow cytometry. Immune infiltrates were determined and characterized by H&E and immunohistochemical staining, respectively. Levels of immune regulatory cells, Treg and Th17, were analyzed by flow cytometry. Myelination was determined by Luxol fast blue staining and immunostaining. In vivo fate of transplanted cells and expression of inflammation, astrogliosis, myelination, neural, neuroprotection, and neurogenesis markers were investigated by using immunohistochemical and qRT-PCR analysis. Results: MSC-derived NSCs expressed specific neural markers, NESTIN, TUJ1, VIMENTIN, and PAX6. NSCs improved EAE symptoms more than MSCs when transplanted in EAE mice. Post-transplantation analyses also showed homing of MSCs and NSCs into the CNS with concomitant induction of an anti-inflammatory response, resulting in reducing immune infiltrates. NSCs also modulated Treg and Th17 cell levels in EAE mice comparable to healthy controls. Luxol fast blue staining showed significant improvement in myelination in treated mice. Further analysis showed that NSCs upregulated genes involved in myelination and neuroprotection but downregulated inflammatory and astrogliosis genes more significantly than MSCs. Importantly, NSCs differentiated into neural derivatives and promoted neurogenesis, possibly by modulating BDNF and FGF signaling pathways. Conclusions: NSC transplantation reversed the disease process by inducing an anti-inflammatory response and promoting myelination, neuroprotection, and neurogenesis in EAE disease animals. These promising results provide a basis for clinical studies to treat MS using NSCs derived from primitive MSCs.

Brummett A and Crutchfield P (2021). "Two internal critiques for theists who oppose moral enhancement on a process virtue basis." Bioethics. ePub Ahead of Print.
Full Text
Department of Foundational Medical Studies (OU)

Some bioconservatives reject the use of biotechnology for moral enhancement while simultaneously purporting to accept standard theism and process virtue. Standard theism holds that God is a personal, omniscient, omnibenevolent, omnipotent, transcendent being. Process virtue holds that virtue can only be obtained through a specific process and not by means of biotechnological shortcuts. For example, proponents of the view may claim that the virtue of compassion cannot be achieved by taking a pill but must come about from organic life experience that involves suffering, and reflection. We describe two internal critiques that arise by combining standard theism and process virtue. The first critique arises when the process virtue view is applied to the concept of God himself. Because God is thought to have always been perfectly virtuous, it follows he did not obtain his virtue through a process. Theistic bioconservatives must either give up the notion that God has always been perfectly virtuous or give up their claim that virtue must be obtained through a particular kind of process. The second critique argues that rejecting moral enhancement on the basis of process virtue is selfish, which is a vice by the lights of all mainstream manifestations of standard theism. Process virtue is selfish because it requires prioritizing the development of one's own personal virtue over moral enhancement that will improve one's other-regarding virtues. We conclude that the

combination of standard theism and process virtue does not serve as a strong basis from which to oppose moral enhancement.

Burk-Rafel J, Reinstein I, **Feng J**, Kim MB, Miller LH, Cocks PM, Marin M and Aphinyanaphongs Y (2021). "Development and validation of a machine learning-based decision support tool for residency applicant screening and review." Academic Medicine 96(11s): S54-s61.
Full Text
Department of Pathology

Purpose: Residency programs face overwhelming numbers of residency applications, limiting holistic review. Artificial intelligence techniques have been proposed to address this challenge but have not been created. Here, a multidisciplinary team sought to develop and validate a machine learning (ML)-based decision support tool (DST) for residency applicant screening and review. Method: Categorical applicant data from the 2018, 2019, and 2020 residency application cycles (n = 8,243 applicants) at one large internal medicine residency program were downloaded from the Electronic Residency Application Service and linked to the outcome measure: interview invitation by human reviewers (n = 1,235 invites). An ML model using gradient boosting was designed using training data (80% of applicants) with over 60 applicant features (e.g., demographics, experiences, academic metrics). Model performance was validated on held-out data (20% of applicants). Sensitivity analysis was conducted without United States Medical Licensing Examination (USMLE) scores. An interactive DST incorporating the ML model was designed and deployed that provided applicant- and cohort-level visualizations. Results: The ML model areas under the receiver operating characteristic and precision recall curves were 0.95 and 0.76, respectively; these changed to 0.94 and 0.72, respectively, with removal of USMLE scores. Applicants' medical school information was an important driver of predictions-which had face validity based on the local selection process-but numerous predictors contributed. Program directors used the DST in the 2021 application cycle to select 20 applicants for interview that had been initially screened out during human review. Conclusions: The authors developed and validated an ML algorithm for predicting residency interview offers from numerous application elements with high performance-even when USMLE scores were removed. Model deployment in a DST highlighted its potential for screening candidates and helped quantify and mitigate biases existing in the selection process. Further work will incorporate unstructured textual data through natural language processing methods.

Burke RM, Chen CJ, Ding D, Buell TJ, Sokolowski J, Sheehan KA, Lee CC, Sheehan DE, Kano H, Kearns KN, Tzeng SW, Yang HC, Huang PP, Kondziolka D, Ironside N, Mathieu D, Iorio-Morin C, **Grills IS**, Feliciano C, Barnett G, Starke RM, Lunsford LD and Sheehan JP (2021). "Effect of prior embolization on outcomes after stereotactic radiosurgery for pediatric brain arteriovenous malformations: An international multicenter study." Neurosurgery 89(4): 672-679.
Full Text
Department of Radiation Oncology

Background: Pediatric brain arteriovenous malformations (AVMs) are a significant cause of morbidity but the role of multimodal therapy in the treatment of these lesions is not well understood. Objective: To compare the outcomes of stereotactic radiosurgery (SRS) with and without prior embolization for pediatric AVMs. Methods: We retrospectively evaluated the International Radiosurgery Research Foundation pediatric AVM database. AVMs were categorized, based on use of pre-embolization (E + SRS) or lack thereof (SRS-only). Outcomes were compared in unadjusted and inverse probability weight (IPW)-adjusted models. Favorable outcome was defined as obliteration without post-SRS hemorrhage or permanent radiation-

induced changes (RIC). Results: The E + SRS and SRS-only cohorts comprised 91 and 448 patients, respectively. In unadjusted models, the SRS-only cohort had higher rates of obliteration (68.5% vs 43.3%, <. 001) and favorable outcome (61.2% vs 36.3%, P <. 001) but a lower rate of symptomatic RIC (9.0% vs 16.7%, P =. 031). The IPW-adjusted rates of every outcome were similar between the 2 cohorts. However, cumulative obliteration rates at 3, 5, 8, and 10 yr remained higher in the absence of prior embolization (46.3%, 64.6%, 72.6%, and 77.4% for SRS-only vs 24.4%, 37.2%, 44.1%, and 48.7% for E + SRS cohorts, respectively; SHR = 0.449 [0.238-0.846], P =. 013). Conclusion: Embolization appears to decrease cumulative obliteration rates after SRS for pediatric AVMs without affecting the risk of post-treatment hemorrhage or adverse radiation effects arguing against the routine use of pre-SRS embolization. While endovascular therapy can be considered for occlusion of high-risk angioarchitectural features prior to SRS, future studies are necessary to clarify its role.

Burwick RM, Yawetz S, Stephenson KE, Collier ARY, Sen P, Blackburn BG, Kojic EM, Hirshberg A, Suarez JF, Sobieszczyk ME, Marks KM, Mazur S, Big C, Manuel O, Morlin G, Rose SJ, Naqvi M, Goldfarb IT, DeZure A, Telep L, Tan SK, Zhao Y, Hahambis T, Hindman J, Chokkalingam AP, Carter C, Das M, Osinusi AO, Brainard DM, Varughese TA, Kovalenko O, **Sims MD**, Desai S, Swamy G, Sheffield JS, Zash R and Short WR (2021). "Compassionate use of Remdesivir in pregnant women with severe Coronavirus Disease 2019." Clinical Infectious Diseases 73(11): E3996-E4004.
Full Text
Department of Internal Medicine/Infectious Disease

Background: Remdesivir is efficacious for severe coronavirus disease 2019 (COVID-19) in adults, but data in pregnant women are limited. We describe outcomes in the first 86 pregnant women with severe COVID-19 who were treated with remdesivir. Methods: The reported data span 21 March to 16 June 2020 for hospitalized pregnant women with polymerase chain reaction-confirmed severe acute respiratory syndrome coronavirus 2 infection and room air oxygen saturation <= 94% whose clinicians requested remdesivir through the compassionate use program. The intended remdesivir treatment course was 10 days (200 mg on day 1, followed by 100 mg for days 2-10, given intravenously). Results: Nineteen of 86 women delivered before their first dose and were reclassified as immediate "postpartum" (median postpartum day 1 [range, 0-3]). At baseline, 40% of pregnant women (median gestational age, 28 weeks) required invasive ventilation, in contrast to 95% of postpartum women (median gestational age at delivery 30 weeks). By day 28 of follow-up, the level of oxygen requirement decreased in 96% and 89% of pregnant and postpartum women, respectively. Among pregnant women, 93% of those on mechanical ventilation were extubated, 93% recovered, and 90% were discharged. Among postpartum women, 89% were extubated, 89% recovered, and 84% were discharged. Remdesivir was well tolerated, with a low incidence of serious adverse events (AEs) (16%). Most AEs were related to pregnancy and underlying disease; most laboratory abnormalities were grade 1 or 2. There was 1 maternal death attributed to underlying disease and no neonatal deaths. Conclusions: Among 86 pregnant and postpartum women with severe COVID-19 who received compassionate-use remdesivir, recovery rates were high, with a low rate of serious AEs.

Buxbaum JL, Buitrago C, Lee A, Elmunzer BJ, Riaz A, Ceppa EP, Al-Haddad M, Amateau SK, Calderwood AH, Fishman DS, Fujii-Lau LL, **Jamil LH**, Jue TL, Kwon RS, Law JK, Lee JK, Naveed M, Pawa S, Sawhney MS, Schilperoort H, Storm AC, Thosani NC, Qumseya BJ and Wani S (2021). "ASGE guideline on the management of cholangitis." Gastrointestinal Endoscopy 94(2): 207-221.e214.
Full Text

Department of Internal Medicine/Gastroenterology

Cholangitis is a GI emergency requiring prompt recognition and treatment. The purpose of this document from the American Society for Gastrointestinal Endoscopy's (ASGE) Standards of Practice Committee is to provide an evidence-based approach for management of cholangitis. This document addresses the modality of drainage (endoscopic vs percutaneous), timing of intervention (<48 hours vs >48 hours), and extent of initial intervention (comprehensive therapy vs decompression alone). Grading of Recommendations, Assessment, Development, and Evaluation methodology was used to formulate recommendations on these topics. The ASGE suggests endoscopic rather than percutaneous drainage and biliary decompression within 48 hours. Additionally, the panel suggests that sphincterotomy and stone removal be combined with drainage rather than decompression alone, unless patients are too unstable to tolerate more extensive endoscopic treatment.

Cai LZ, Lin J, Starr MR, Obeid A, Ryan EH, Ryan C, Forbes NJ, Arias D, Ammar MJ, Patel LG, **Capone A**, Emerson GG, Joseph DP, Eliott D, Gupta OP, Regillo CD, Hsu J, Yonekawa Y and Primary Retinal Detachment O (2021). "PRO score: Predictive scoring system for visual outcomes after rhegmatogenous retinal detachment repair." British Journal of Ophthalmology. ePub Ahead of Print.
Full Text

Department of Ophthalmology

Background/Aims: To compare risk factors for poor visual outcomes in patients undergoing primary rhegmatogenous retinal detachment (RRD) repair and to develop a scoring system. Methods: Analysis of the Primary Retinal detachment Outcomes (PRO) study, a multicentre interventional cohort of consecutive primary RRD surgeries performed in 2015. The main outcome measure was a poor visual outcome (Snellen VA <= 20/200). Results: A total of 1178 cases were included. The mean preoperative and postoperative logMARs were 1.1 +/- 1.1 (20/250) and 0.5 +/- 0.7 (20/63), respectively. Multivariable logistic regression identified preoperative risk factors predictive of poor visual outcomes (<= 20/200), including proliferative vitreoretinopathy (PVR) (OR 1.26; 95% CI 1.13 to 1.40), history of antivascular endothelial growth factor (VEGF) injections (1.38; 1.11 to 1.71), >1-week vision loss (1.17; 1.08 to 1.27), ocular comorbidities (1.18; 1.00 to 1.38), poor presenting VA (1.06 per initial logMAR unit; 1.02 to 1.10) and age >70 (1.13; 1.04 to 1.23). The data were split into training (75%) and validation (25%) and a scoring system was developed and validated. The risk for poor visual outcomes was 8% with a total score of 0, 17% with 1, 29% with 2, 47% with 3, and 71% with 4 or higher. Conclusions: Independent risk factors were compared for poor visual outcomes after RRD surgery, which included PVR, anti-VEGF injections, vision loss >1 week, ocular comorbidities, presenting VA and older age. The PRO score was developed to provide a scoring system that may be useful in clinical practice.

Cakmak AS, Alday EAP, Da Poian G, Rad AB, Metzler TJ, Neylan TC, House SL, Beaudoin FL, An X, Stevens JS, Zeng D, Linnstaedt SD, Jovanovic T, Germine LT, Bollen KA, Rauch SL, Lewandowski CA, Hendry PL, Sheikh S, Storrow AB, Musey PI, Haran JP, Jones CW, Punches BE, **Swor RA**, Gentile NT, McGrath ME, Seamon MJ, Mohiuddin K, Chang AM, Pearson C, Domeier RM, Bruce SE, O'Neil BJ, Rathlev NK, Sanchez LD, Pietrzak RH, Joormann J, Barch DM, Pizzagalli DA, Harte SE, Elliott JM, Kessler RC, Koenen KC, Ressler KJ, McLean SA, Li Q and Clifford GD (2021). "Classification and prediction of post-trauma outcomes related to PTSD using circadian rhythm changes measured via wrist-worn research watch in a large longitudinal cohort." IEEE Journal of Biomedical and Health Informatics 25(8): 2866-2876.
Full Text

Department of Emergency Medicine

Post-Traumatic Stress Disorder (PTSD) is a psychiatric condition resulting from threatening or horrifying events. We hypothesized that circadian rhythm changes, measured by a wrist-worn research watch are predictive of post-trauma outcomes. Approach: 1618 post-trauma patients were enrolled after admission to emergency departments (ED). Three standardized questionnaires were administered at week eight to measure post-trauma outcomes related to PTSD, sleep disturbance, and pain interference with daily life. Pulse activity and movement data were captured from a research watch for eight weeks. Standard and novel movement and cardiovascular metrics that reflect circadian rhythms were derived using this data. These features were used to train different classifiers to predict the three outcomes derived from week-eight surveys. Clinical surveys administered at ED were also used as features in the baseline models. Results: The highest cross-validated performance of research watch-based features was achieved for classifying participants with pain interference by a logistic regression model, with an area under the receiver operating characteristic curve (AUC) of 0.70. The ED survey-based model achieved an AUC of 0.77, and the fusion of research watch and ED survey metrics improved the AUC to 0.79. Significance: This work represents the first attempt to predict and classify post-trauma symptoms from passive wearable data using machine learning approaches that leverage the circadian desynchrony in a potential PTSD population.

Calvo-Ayala E, Procopio V, Papukhyan H and **Nair GB** (2021). "Performance of automated telemetry in diagnosing QT prolongation in critically ill patients." American Journal of Critical Care 30(6): 466-470.
Full Text
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Background: QT prolongation increases the risk of ventricular arrhythmia and is common among critically ill patients. The gold standard for QT measurement is electrocardiography. Automated measurement of corrected QT (QTc) by cardiac telemetry has been developed, but this method has not been compared with electrocardiography in critically ill patients. Objective: To compare the diagnostic performance of QTc values obtained with cardiac telemetry versus electrocardiography. Methods: This prospective observational study included patients admitted to intensive care who had an electrocardiogram ordered simultaneously with cardiac telemetry. Demographic data and QTc determined by electrocardiography and telemetry were recorded. Bland-Altman analysis was done, and correlation coefficient and receiver operating characteristic (ROC) coefficient were calculated. Results: Fifty-one data points were obtained from 43 patients (65% men). Bland-Altman analysis revealed poor agreement between telemetry and electrocardiography and evidence of fixed and proportional bias. Area under the ROC curve for QTc determined by telemetry was 0.9 ($P < .001$) for a definition of prolonged QT as QTc ≥ 450 milliseconds in electrocardiography (sensitivity, 88.89%; specificity, 83.33%; cutoff of 464 milliseconds used). Correlation between the 2 methods was only moderate ($r = 0.6$, $P < .001$). Conclusions: QTc determination by telemetry has poor agreement and moderate correlation with electrocardiography. However, telemetry has an acceptable area under the curve in ROC analysis with tolerable sensitivity and specificity depending on the cutoff used to define prolonged QT. Cardiac telemetry should be used with caution in critically ill patients.

Campbell KC, Rehemtulla A, Sunkara P, **Hamstra D**, Buhnerkempe M and Ross B (2021). "Oral D-methionine protects against cisplatin-induced hearing loss in humans: Phase 2 randomized clinical trial in India." International Journal of Audiology. ePub Ahead of Print.
Full Text
Department of Radiation Oncology

Objective: This exploratory Phase 2 clinical trial is the first determining safety and efficacy of oral

D-methionine (D-met) in reducing cisplatin-induced ototoxicity. Design: Randomised parallel double-blind placebo-controlled exploratory Phase 2 study. Study Samples: Fifty adult cancer patients received oral D-met or placebo before each cisplatin dose. Physical examination, blood collection and audiometry occurred at baseline and subsequent visits plus post-treatment audiometry. After attrition, final analysis included 27 patients. Results: Significant treatment group by ear and time (baseline vs. post-treatment) interactions occurred at 10 kHz and 11.2 kHz. Placebo and D-met groups differed in threshold shift for left ear at 11.2 kHz (mean difference = 22.97 dB [9.59, 36.35]). Averaging across ears, placebo group showed significant threshold shifts from baseline to post-treatment at 10 kHz (mean shift= -13.65 dB [-21.32,-5.98]), 11.2 kHz (-16.15 dB [-25.19,-7.12]), and 12.5 kHz (-11.46 dB [-19.18,-3.74]) but not 8 kHz (-8.65 dB [-17.86, 0.55]). The D-met group showed no significant threshold shifts (8 kHz: -1.25 dB [-7.75, 5.25]; 10 kHz:-3.93 dB [-8.89, 1.03]; 11.2 kHz:-4.82 dB [-11.21, 1.57]; 12.5 kHz:-3.68 dB [-11.57, 4.21]). Side effects did not significantly differ between groups. Conclusion: Oral D-met reduces cisplatin-induced ototoxicity in humans.

Cappell MS (2021). "Local COVID-19 epicenter in Detroit metropolitan area causing profound and pervasive reorganization of clinical, educational, research, and financial programs of a large academic gastroenterology division with a GI fellowship and primary medical school affiliation." Digestive Diseases and Sciences 66(11): 3635-3658.
Full Text
Department of Internal Medicine/Gastroenterology

Aim: To report revolutionary reorganization of academic gastroenterology division from COVID-19 pandemic surge at metropolitan Detroit epicenter from 0 infected patients on March 9, 2020, to > 300 infected patients in hospital census in April 2020 and > 200 infected patients in April 2021. Setting: GI Division, William Beaumont Hospital, Royal Oak, has 36 GI clinical faculty; performs > 23,000 endoscopies annually; fully accredited GI fellowship since 1973; employs > 400 house staff annually since 1995; tertiary academic hospital; predominantly voluntary attendings; and primary teaching hospital, Oakland-University-Medical-School. Methods: This was a prospective study. Expert opinion. Personal experience includes Hospital GI chief > 14 years until 2020; GI fellowship program director, several hospitals > 20 years; author of > 300 publications in peer-reviewed GI journals; committee-member, Food-and-Drug-Administration-GI-Advisory Committee > 5 years; and key hospital/medical school committee memberships. Computerized PubMed literature review was performed on hospital changes and pandemic. Study was exempted/approved by Hospital IRB, April 14, 2020. Results: Division reorganized patient care to add clinical capacity and minimize risks to staff of contracting COVID-19 infection. Affiliated medical school changes included: changing "live" to virtual lectures; canceling medical student GI electives; exempting medical students from treating COVID-19-infected patients; and graduating medical students on time despite partly missing clinical electives. Division was reorganized by changing "live" GI lectures to virtual lectures; four GI fellows temporarily reassigned as medical attendings supervising COVID-19-infected patients; temporarily mandated intubation of COVID-19-infected patients for esophagogastroduodenoscopy; postponing elective GI endoscopies; and reducing average number of endoscopies from 100 to 4 per weekday during pandemic peak! GI clinic visits reduced by half (postponing non-urgent visits), and physical visits replaced by virtual visits. Economic pandemic impact included temporary, hospital deficit subsequently relieved by federal grants; hospital employee terminations/furloughs; and severe temporary decline in GI practitioner's income during surge. Hospital temporarily enhanced security and gradually ameliorated facemask shortage. GI program director contacted GI fellows twice weekly to

ameliorate pandemic-induced stress. Divisional parties held virtually. GI fellowship applicants interviewed virtually. Graduate medical education changes included weekly committee meetings to monitor pandemic-induced changes; program managers working from home; canceling ACGME annual fellowship survey, changing ACGME physical to virtual site visits; and changing national conventions from physical to virtual. Conclusion: Reports profound and pervasive GI divisional changes to maximize clinical resources devoted to COVID-19-infected patients and minimize risks of transmitting infection.

Carsen S, Grammatopoulos G, **Zaltz I**, Ward L, Smit K and Beaulé PE (2021). "The effects of physical activity on physeal and skeletal development." JBJS Reviews 9(10): e21.00060.
Full Text
Department of Orthopaedic Surgery

There is increasing evidence in the literature regarding the important health impact of and risk factors for injury in youth sport. Increasing pediatric and adolescent activity intensity, such as is seen in earlier single-sport focus and specialization, may be associated with morphological changes in the growing skeleton. Chronic subacute injury to the developing physes in the active child can lead to stress on the growth plate and surrounding tissues that induces developmental morphological changes in the joint. There is evidence to suggest that frequent participation in sports that place particular stress across the physes of the proximal humerus, the proximal femur, and the distal radius can be associated with an increased risk of inducing developmental and morphological changes that could lead to future joint dysfunction and premature degeneration. Additional research is necessary to better define the pathoetiology of activity-mediated morphological changes, as well as to create and validate parameters for safe involvement in competitive physical activities.

Cash RE, **Swor RA**, Samuels-Kalow M, Eisenbrey D, Kaimal AJ and Camargo CA, Jr. (2021). "Frequency and severity of prehospital obstetric events encountered by emergency medical services in the United States." BMC Pregnancy and Childbirth 21(1): 655.
Full Text
Department of Emergency Medicine

Background: Prehospital obstetric events encountered by emergency medical services (EMS) can be high-risk patient presentations for which suboptimal care can cause substantial morbidity and mortality. The frequency of prehospital obstetric events is unclear because existing descriptions have reported obstetric and gynecological conditions together, without delineating specific patient presentations. Our objective was to identify the types, frequency, and acuity of prehospital obstetric events treated by EMS personnel in the US. Methods: We conducted a cross-sectional analysis of EMS patient care records in the 2018 National EMS Information System dataset (n=22,532,890). We focused on EMS activations (i.e., calls for service) for an emergency scene response for patients aged 12-50 years with evidence of an obstetric event. Type of obstetric event was determined by examining patient symptoms, the treating EMS provider's impression (i.e., field diagnosis), and procedures performed. High patient acuity was ascertained by EMS documentation of patient status and application of the modified early obstetric warning system (MEOWS) criteria, with concordance assessed using Cohen's kappa. Descriptive statistics were calculated to describe the primary symptoms, impressions, and frequency of each type of obstetric event among these activations. Results: A total of 107,771 (0.6%) of EMS emergency activations were identified as involving an obstetric event. The most common presentation was early or threatened labor (15%). Abdominal complaints, including pain and other digestive/abdomen signs and symptoms, was the most common primary

symptom (29%) and primary impression (18%). We identified 3,489 (3%) out-of-hospital deliveries, of which 1,504 were preterm. Overall, EMS providers documented 34% of patients as being high acuity, similar to the MEOWS criteria (35%); however, there were high rates of missing data for EMS documented acuity (19%), poor concordance between the two measures (Cohen's kappa=0.12), and acuity differences for specific conditions (e.g., high acuity of non-cephalic presentations, 77% in EMS documentation versus 53% identified by MEOWS). Conclusion: Prehospital obstetric events were infrequently encountered by EMS personnel, and about one-third were high acuity. Additional work to understand the epidemiology and clinical care of these patients by EMS would help to optimize prehospital care and outcomes.

Chagpar AB, Dupont E, Chiba A, Levine EA, Gass JS, Lum S, **Brown E**, Fenton A, Solomon NL, Ollila DW, Murray M, Gallagher K, Howard-McNatt M, Lazar M, Garcia-Cantu C, Walters L, Pandya S, Mendiola A and Namm JP (2021). "Are we choosing wisely? Drivers of preoperative MRI use in breast cancer patients." American Journal of Surgery. ePub Ahead of Print.
Full Text
Department of Surgery

Introduction: Factors contributing to the use of preoperative MRI remain poorly understood. Methods: Data from a randomized controlled trial of stage 0-3 breast cancer patients undergoing breast conserving surgery between 2016 and 2018 were analyzed. Results: Of the 396 patients in this trial, 32.6% had a preoperative MRI. Patient age, race, ethnicity, tumor histology, and use of neoadjuvant therapy were significant predictors of MRI use. On multivariate analysis, younger patients with invasive lobular tumors were more likely to have a preoperative MRI. Rates also varied significantly by individual surgeon ($p < 0.001$); in particular, female surgeons (39.9% vs. 24.0% for male surgeons, $p = 0.001$) and those in community practice (58.9% vs. 14.2% for academic, $p < 0.001$) were more likely to order preoperative MRI. Rates declined over the two years of the study, particularly among female surgeons. Conclusions: Preoperative MRI varies with patient age and tumor histology; however, there remains variability by individual surgeon.

Chagpar AB, Howard-McNatt M, Chiba A, Levine EA, Gass JS, Gallagher K, Lum S, Martinez R, Willis AI, Fenton A, Solomon NL, Senthil M, Edmonson D, Namm JP, **Walters L**, Brown E, Murray M, Ollila D, Dupont E and Garcia-Cantu C (2021). "Factors affecting time to surgery in breast cancer patients." American Surgeon. ePub Ahead of Print.
Full Text
Department of Pathology

Background: We sought to determine factors affecting time to surgery (TTS) to identify potential modifiable factors to improve timeliness of care. Methods: Patients with clinical stage 0-3 breast cancer undergoing partial mastectomy in 2 clinical trials, conducted in ten centers across the US, were analyzed. No preoperative workup was mandated by the study; those receiving neoadjuvant therapy were excluded. Results: The median TTS among the 583 patients in this cohort was 34 days (range: 1-289). Patient age, race, tumor palpability, and genomic subtype did not influence timeliness of care defined as TTS <= 30 days. Hispanic patients less likely to have a TTS <= 30 days ($P = .001$). There was significant variation in TTS by surgeon ($P < .001$); those practicing in an academic center more likely to have TTS <= 30 days than those in a community setting (55.1% vs 19.3%, $P < .001$). Patients who had a preoperative ultrasound had a similar TTS to those who did not (TTS <= 30 days 41.9% vs 51.9%, respectively, $P = .109$), but those who had a preoperative MRI had a significantly increased TTS (TTS <= 30 days 25.0% vs 50.9%, $P < .001$). On multivariate analysis, patient ethnicity was no longer significantly associated with TTS <= 30

(P = .150). Rather, use of MRI (OR: .438; 95% CI: .287-.668, P < .001) and community practice type (OR: .324; 95% CI: .194-.541, P < .001) remained independent predictors of lower likelihood of TTS <= 30 days. Conclusions: Preoperative MRI significantly increases time to surgery; surgeons should consider this in deciding on its use.

Chao J, **Rao R** and **Gupta C** (2021). "Gómez-López-Hernández syndrome: a case report on pediatric neurotrophic corneal ulcers and review of the literature." Journal of American Association for Pediatric Ophthalmology and Strabismus 25(6): 373-375.
Full Text
OUWB Medical Student Author
Department of Ophthalmology

We present a case of Gómez-López-Hernández syndrome (GLHS), a rare neurocutaneous syndrome, in a 10-month-old girl with neurotrophic keratopathy secondary to trigeminal anesthesia.

Chapman D, **Quinn TJ** and **Hamstra DA** (2021). "Validation of the combination Gleason Score as an independent favorable orognostic factor in prostate cancer treated with dose-escalated radiotherapy." International Journal of Radiation Oncology Biology Physics 111(3): E267-E267.
Full Text
Department of Radiation Oncology

Chapman J, **Al-Katib S** and **Palamara E** (2021). "Small bowel diverticulitis: Spectrum of CT findings and review of the literature." Clinical Imaging 78: 240-246.
Full Text
OUWB Medical Student Author
Department of Diagnostic Radiology and Molecular Imaging

Purpose: To review the CT findings and complications of small bowel diverticulitis (SBD) and discuss clinical presentations and outcomes. Methods: A text search of radiology reports within our health system for cases of small bowel diverticulitis yielded 95 cases. All cases were reviewed by an abdominal radiologist with equivocal cases reviewed by a second abdominal radiologist for consensus. Retrospective analysis of CT imaging findings was performed on 67 convincing cases of SBD. Results: Small bowel diverticulitis most often affected the jejunum (58%) and the duodenum (26%). The most common imaging feature was peridiverticular inflammation manifested by peridiverticular edema, diverticular wall thickening, bowel wall thickening, and fascial thickening. Edema was typically seen along the mesenteric border of the bowel with relative sparing of the anti-mesenteric side. When a prior CT was available, the affected diverticulum was identified in 95% of cases. Fecalized content within the affected diverticulum was observed in 51% of cases. Perforation (6%) and abscess (6%) were the most common complications. Conclusion: Small bowel diverticulitis is an uncommon cause of abdominal pain which can mimic an array of abdominal pathologies, although the reported mortality rate of 40-50% may no longer be accurate. The "fecalized diverticulum" sign can be helpful in identifying the culprit diverticulum and aid diagnosing SBD. Findings of perforation and or abscess formation are critical as they may impact management.

Chen S, **Yan D** and **Qin A** (2021). "Predictive capability and dynamic characteristic of tumor voxel dose-response assessed using 18F-FDG PET/CT imaging feedback." International Journal of Radiation Oncology, Biology, Physics 111(3): S97-S97.
Full Text

Department of Radiation Oncology

Purpose/Objective(s): To effectively implement FDG-PET/CT imaging feedback for tumor voxel treatment response assessment and treatment adaptation, this study investigated the predictive capability and the dynamic characteristic of tumor voxel treatment response with respect to the timing of imaging feedback.Materials/Methods: Serial FDG-PET/CT images were obtained at pretreatment and weekly during the standard chemoradiotherapy with treatment dose of 2Gy × 35 from 33 head and neck cancer patients. Reference of tumor voxel dose-response matrix (DRMref) was constructed for each patient using the average slope of tumor voxel PET intensity change ratio obtained from the first 4 weekly PET feedback images following deformable PET/CT image registration. The predictive capability of tumor voxel DRM assessed using 1 or 2 PET feedback images obtained during the first 4 treatment weeks was evaluated. The evaluation included the tumor voxel DRM correlation and the voxel DRM discrepancy between the predictions and the reference. The dynamic characteristics of DRM were studied by comparing the DRM assessed at different treatment weeks. The dynamic characteristics were also correlated to the tumor volume and tumor voxel location with respect to the human papillomavirus (HPV) status. Results: The correlation coefficient between the DRMref and the DRMs predicted using a single feedback image increased from 0.82±0.2 for DRM2 at the 2nd treatment week to 0.95±0.03 for DRM4 at the 4th treatment week. The deviation between the tumor voxel DRMref and the predicted DRMs was (4.7±53.9)% for DRM2, (-7.3±21.1)% for DRM3, and (6.2±15.6)% for DRM4. The deviation reduced to (4.4±8.4)% or (1.1±7.8)% when using the week 2&4 or 3&4 feedback images. Tumor voxel improved its response significantly after 2nd treatment week in both HPV+ and HPV- tumors. In HPV- tumors, the magnitude of tumor voxel DRM reduction was correlated with the distance from the tumor surface to the voxels with a Spearman correlation coefficient = 1, P = 0.017. Conclusion: Tumor voxel treatment response showed large improvement after the 2nd treatment week with the delivered dose of 2Gy × 10 and got relatively stabilized after 2Gy × 15. FDG-PET/CT imaging acquired in the 3rd treatment week is recommended if single image feedback is selected. Feedback images obtained in the 2nd and 4th treatment weeks will additionally improve predictive capability and provide guidance for early treatment dose adjustment.

Chiang MF, Quinn GE, Fielder AR, Ostmo SR, Paul Chan RV, Berrocal A, Binenbaum G, Blair M, Peter Campbell J, **Capone A, Jr.**, Chen Y, Dai S, Ells A, Fleck BW, Good WV, Elizabeth Hartnett M, Holmstrom G, Kusaka S, Kychenthal A, Lepore D, Lorenz B, Martinez-Castellanos MA, Özdek Ş, Ademola-Popoola D, Reynolds JD, Shah PK, Shapiro M, Stahl A, Toth C, Vinekar A, Visser L, Wallace DK, Wu WC, Zhao P and Zin A (2021). "International classification of retinopathy of prematurity, third edition." Ophthalmology 128(10): e51-e68.

Full Text

Department of Ophthalmology

Purpose: The International Classification of Retinopathy of Prematurity is a consensus statement that creates a standard nomenclature for classification of retinopathy of prematurity (ROP). It was initially published in 1984, expanded in 1987, and revisited in 2005. This article presents a third revision, the International Classification of Retinopathy of Prematurity, Third Edition (ICROP3), which is now required because of challenges such as: (1) concerns about subjectivity in critical elements of disease classification; (2) innovations in ophthalmic imaging; (3) novel pharmacologic therapies (e.g., anti-vascular endothelial growth factor agents) with unique regression and reactivation features after treatment compared with ablative therapies; and (4) recognition that patterns of ROP in some regions of the world do not fit neatly into the current classification system. Design: Review of evidence-based literature, along with expert consensus

opinion. Participants: International ROP expert committee assembled in March 2019 representing 17 countries and comprising 14 pediatric ophthalmologists and 20 retinal specialists, as well as 12 women and 22 men. Methods: The committee was initially divided into 3 subcommittees-acute phase, regression or reactivation, and imaging-each of which used iterative videoconferences and an online message board to identify key challenges and approaches. Subsequently, the entire committee used iterative videoconferences, 2 in-person multiday meetings, and an online message board to develop consensus on classification. Main Outcome Measures: Consensus statement. Results: The ICROP3 retains current definitions such as zone (location of disease), stage (appearance of disease at the avascular-vascular junction), and circumferential extent of disease. Major updates in the ICROP3 include refined classification metrics (e.g., posterior zone II, notch, subcategorization of stage 5, and recognition that a continuous spectrum of vascular abnormality exists from normal to plus disease). Updates also include the definition of aggressive ROP to replace aggressive-posterior ROP because of increasing recognition that aggressive disease may occur in larger preterm infants and beyond the posterior retina, particularly in regions of the world with limited resources. ROP regression and reactivation are described in detail, with additional description of long-term sequelae. Conclusions: These principles may improve the quality and standardization of ROP care worldwide and may provide a foundation to improve research and clinical care.

Chiari EF, Weiss W, **Simon MR**, Kiessig ST, Pulse M, Brown SC, Gerding HR, Mandago M, Gisch K, Eichel-Streiber Cv and von Eichel-Streiber C (2021). "Oral immunotherapy with human secretory immunoglobulin A improves survival in the hamster model of clostridioides difficile infection." Journal of Infectious Diseases 224(8): 1394-1397.
Full Text
Department of Internal Medicine/Allergy-Immunology

Coadministration of human secretory IgA (sIgA) together with subtherapeutic vancomycin enhanced survival in the Clostridioides difficile infection (CDI) hamster model. Vancomycin (5 or 10 mg/kg × 5 days) plus healthy donor plasma sIgA/monomeric IgA (TID × 21 days) or hyperimmune sIgA/monomeric IgA (BID × 13 days) enhanced survival. Survival was improved compared to vancomycin alone, P = .018 and .039 by log-rank Mantel-Cox, for healthy and hyperimmune sIgA, respectively. Passive immunization with sIgA (recombinant human secretory component plus IgA dimer/polymer from pooled human plasma) can be administered orally and prevents death in a partially treated CDI hamster model.

Chinnaiyan K, Januzzi JL and Januzzi JL, Jr. (2021). "Biomarkers and imaging in chest pain: The iceberg beneath the waterline." Journal of the American College of Cardiology 78(14): 1418-1420.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Cholack G, Garfein J, Errickson J, Krallman R, Montgomery D, Kline-Rogers E, Eagle K, Rubenfire M, Bumpus S and Barnes GD (2021). "Early (0-7 day) and late (8-30 day) readmission predictors in acute coronary syndrome, atrial fibrillation, and congestive heart failure patients." Hospital Practice 49(5): 364-370.
Full Text
OUWB Medical Student Author

Objectives: Thirty-day readmission following hospitalization for acute coronary syndrome (ACS), atrial fibrillation (AF), or congestive heart failure (CHF) is common, and many occur within one week of discharge. Using a cohort of patients hospitalized for ACS, AF, or CHF, we sought to

identify predictors of 30-day, early (0-7 day), and late (8-30 day) all-cause readmission. Methods: We identified 3531 hospitalizations for ACS, AF, or CHF at a large academic medical center between 2008 and 2018. Multivariable logistic regression models were created to identify predictors of 30-day, early, and late unplanned, all-cause readmission, adjusting for discharge diagnosis and other demographics and comorbidities. Results: Of 3531 patients hospitalized for ACS, AF, or CHF, 700 (19.8%) were readmitted within 30 days, and 205 (29.3%) readmissions were early. Of all 30-day readmissions, 34.8% of ACS, 16.8% of AF, and 26.0% of the CHF cohorts' readmissions occurred early. Higher hemoglobin was associated with lower 30-day readmission [adjusted (adj) OR 0.92, 95% CI 0.88-0.97] while patients requiring intensive care unit (ICU) admission were more likely readmitted within 30 days (adj OR 1.31, 95% CI 1.03-1.67). Among patients with a 30-day readmission, females (adj OR 1.73, 95% CI 1.22, 2.47) and patients requiring ICU admission (adj OR 2.03, 95% CI 1.27, 3.26) were more likely readmitted early than late. Readmission predictors did not vary substantively by discharge diagnosis. Conclusion: Patients admitted to the ICU were more likely readmitted in the early and 30-day periods. Other predictors varied between readmission groups. Since outpatient follow-up often occurs beyond 1 week of discharge, early readmission predictors can help healthcare providers identify patients who may benefit from particular post-discharge services.

Cholack G, Garfein J, Krallman R, Montgomery D, Kline-Rogers E, Rubenfire M, Bumpus S, Md TC and Barnes GD (2021). "Trends in calcium channel blocker use in patients with heart failure with reduced ejection fraction and comorbid atrial fibrillation." American Journal of Medicine 134(11): 1413-1418.e1411.

Full Text

OUWB Medical Student Author

Background: Heart failure with reduced ejection fraction and atrial fibrillation commonly coexist. Most calcium channel blockers are not recommended in heart failure with reduced ejection fraction, but their use has been seldom evaluated. For patients with heart failure with reduced ejection fraction and comorbid atrial fibrillation, we sought to 1) determine the proportion discharged on contraindicated calcium channel blockers, 2) describe how clinicians' use of these medications at discharge have changed over time, and 3) identify predictors for contraindicated calcium channel blocker prescription at discharge. Methods: We analyzed 395 patients discharged with heart failure with reduced ejection fraction and atrial fibrillation between 2008 and 2018. Discharge on a contraindicated calcium channel blocker (any calcium channel blocker except amlodipine) was the primary outcome. Changes in calcium channel blocker prescription over time were evaluated with a Cochran-Armitage trend test. Multivariable logistic regression was used to identify predictors of calcium channel blocker prescription at discharge. Results: Twenty-nine (7.3%) patients were discharged on a contraindicated calcium channel blocker without change over time (P(trend) = .38). Of these, 26 (86.7%) were discharged on multiple atrioventricular nodal blocking medications. Hypertension (odds ratio [OR] 7.87; 95% confidence interval [CI], 1.04-59.40) and female sex (OR 3.01; 95% CI, 1.36-6.67) were both associated with contraindicated calcium channel blocker prescription at discharge while diabetes mellitus was negatively associated with this outcome (OR 0.34; 95% CI, 0.14-0.88). Conclusion: One in 14 patients with heart failure with reduced ejection fraction and comorbid atrial fibrillation were discharged on a contraindicated calcium channel blocker, without change over time. Most patients were discharged on multiple atrioventricular nodal blockers, highlighting potential need for greater coordination between discharging physicians, pharmacists, and electrophysiology.

Clark-Sienkiewicz SM, Caño A, **Zeman LL**, Lumley MA and Gothe N (2021). "Development of a

multicomponent intervention to initiate health behavior change in primary care: The Kickstart Health Program." Journal of Clinical Psychology in Medical Settings 28(4): 694-705.
Full Text
Department of Family Medicine and Community Health

There is a growing movement to integrate behavioral health specialists into primary care settings in order to better manage patients' health behaviors. Group interventions in healthcare settings can provide services to multiple individuals simultaneously; however, the participants' experiences taking part in these activities and the logistics of integrating them into clinical settings are largely under-studied. This article describes the development and implementation of a novel group intervention for health behavior change, The Kickstart Health Program, which integrates components of cognitive, behavioral, acceptance, and experiential therapies. Participant feasibility, acceptability, experiences, and treatment course were assessed. Acceptability among a small sample of attendees was high, and initial data on behavior change suggest there were benefits to patients who attended the program. Increases in mindfulness practice and decreases in exercise barriers from baseline to 10-week follow-up were detected as were improvements in overall perceived health and well-being. Participants expressed that the program was acceptable and successful at helping them reach their individual health goals; however, enrollment barriers negatively impacted the feasibility of the program in regard to attendance. Modification to the enrollment process such as embedding referrals into the electronic medical record, encouraging spouse or family co-enrollment, and peer coaching may address these barriers. The Kickstart Health Program has the potential to improve health behaviors and paves the way for unique studies of dissemination and implementation of efficacious behavioral health interventions into real-world healthcare settings.

Cowan B, **Brackney A** and **Barremkala M** (2021). "Ultrasound in medical education: Can students teach themselves?" Medical Science Educator 31(5): 1663-1668.
Full Text
OUWB Medical Student Author
Department of Foundational Medical Studies (OU)

Introduction: A new technology in medical education is ultrasound simulation, which has been shown to help students learn while reducing load on clinical instructors. The goal of this study is to compare the efficacy of teaching using ultrasound simulators versus more traditional instructor-led sessions with ultrasound machines. Methods: Ultrasound was used to teach cardiac anatomy and physiology to medical students. Volunteers in one group were instructed using an ultrasound simulator (SonoSim) with built-in lessons; the other group received a traditional instructor-led session with an ultrasound machine. Efficacy of each type of teaching was assessed by measuring improvement from a pre-session test to a post-session test, using a one-sample paired t-test to compare averages between groups. Participants were given a survey to solicit opinions of the lessons. Results: Twenty-one medical students participated, with 12 in the instructor-led group and 9 in the simulator group. Both groups increased their test scores from pre-session to post-session; the average increase was 5% in the instructor-led and 10% in the simulator group ($p = 0.437$). There was no statistically significant difference between groups in how effective or enjoyable the lesson felt. Participants from either group who tried both methods were likely to prefer the traditional ultrasound teaching. Conclusion: Self-guided learning with simulators and traditional instructor-led lectures are both effective for teaching basic cardiac anatomy and physiology via ultrasound. However, most students prefer learning with instructors if given the opportunity. Self-guided ultrasound simulators may serve as an effective standalone learning method or an adjunct to instructor-led sessions.

Curran D, Patterson B, Carrico J, Salem A, La E, Lorenc S, Hicks K, Poston S and Carpenter C (2021). "Cost-effectiveness analysis of recombinant zoster vaccine for the prevention of herpes zoster in immunocompromised adults diagnosed with select cancers in the United States." American Journal of Hematology 96: S26-S26.
Full Text
Department of Internal Medicine/Infectious Disease

Dabrowski E, Chambers HG, Gaebler-Spira D, Banach M, Kaňovský P, Dersch H, Althaus M, Geister TL and Heinen F (2021). "IncobotulinumtoxinA efficacy/safety in upper-limb spasticity in pediatric cerebral palsy: Randomized controlled trial." Pediatric Neurology 123: 10-20.
Full Text
Department of Physical Medicine and Rehabilitation

Background: This randomized phase 3 study with double-blind main period (MP) and open-label extension (OLEX; NCT02002884) assessed incobotulinumtoxinA safety and efficacy for pediatric upper-limb spasticity treatment in ambulant/nonambulant (Gross Motor Function Classification System [GMFCS] I-V) patients, with the option of combined upper- and lower-limb treatment. Methods: Patients were aged two to 17 years with unilateral or bilateral spastic cerebral palsy (CP) and Ashworth Scale (AS) score ≥2 in treatment-selected clinical patterns. In the MP, patients were randomized (2:1:1) to incobotulinumtoxinA 8, 6, or 2 U/kg body weight (maximum 200, 150, 50 U/upper limb), with optional lower-limb injections in one of five topographical distributions (total body dose ≤16 to 20 U/kg, maximum 400 to 500 U, depending on body weight and GMFCS level). In the OLEX, patients received three further treatment cycles, at the highest MP doses (8 U/kg/upper limb group). Outcomes included AS, Global Impression of Change Scale (GICS), and adverse events (AEs). Results: AS scores improved from baseline to week 4 in all MP dose groups (n = 350); patients in the incobotulinumtoxinA 8 U/kg group had significantly greater spasticity improvements versus the 2 U/kg group (least-squares mean [standard error] for upper-limb main clinical target pattern -1.15 [0.06] versus -0.93 [0.08]; P = 0.017). Investigator's, child/adolescent's, and parent/caregiver's GICS scores showed improvements in all groups. Treatment benefits were sustained over further treatment cycles. AE incidence did not increase with dose or repeated treatment across GMFCS levels. Conclusions: Data provide evidence for sustained efficacy and safety of multipattern incobotulinumtoxinA treatment in children and adolescents with upper-limb spasticity.

Dean J, Shah AA and **Dean S** (2021). "Parasitic leiomyoma: A rare occurrence following robotic hysterectomy." Journal of Minimally Invasive Gynecology 28(11): S128-S129.
Full Text
Department of Obstetrics & Gynecology

Deebajah M, **Qu Z** and **Zhang P** (2021). "GATA3 Is a useful immunohistochemical marker to differentiate variants of renal tubular lesions from different segments of renal tubules." American Journal of Clinical Pathology 156: S152-S153.
Full Text
Department of Pathology

DeJonckheere M, McKee MM, Guetterman TC, Schleicher LS, **Mulhem E**, Panzer K, Bradley K, Plegue MA, Rapai ME, Green LA and Zazove P (2021). "Implementation of a hearing loss screening intervention in primary care." Annals of Family Medicine 19(5): 388-395.

Full Text

Department of Family Medicine and Community Health

Purpose: Hearing loss (HL) is underdiagnosed and often unaddressed. A recent study of screening for HL using an electronic prompt showed efficacy in increasing appropriate referrals for subsequent testing. We build on the results of this study using a qualitative lens to explore implementation processes through the perspectives of family medicine clinicians. Methods: We collected clinic observations and semistructured interviews of family medicine clinicians and residents who interacted with the HL prompt. All data were analyzed using thematic, framework, and mixed methods integration strategies. Results: We interviewed 27 clinicians and conducted 10 observations. Thematic analysis resulted in 6 themes: (1) the prompt was overwhelmingly viewed as easy, simple to use, accurate; (2) clinicians considered prompt as an effective way to increase awareness and conversations with patients about HL; (3) clinician and staff buy-in played a vital role in implementation; (4) clinicians prioritized prompt during annual visits; (5) medical assistant involvement in prompt workflow varied by health system, clinic, and clinician; (6) prompt resulted in more conversations about HL, but uncertain impact on patient outcomes. Themes are presented alongside constructs of normalization process theory and intervention outcomes. Conclusion: Integration of a HL screening prompt into clinical practice varied by clinician buy-in and beliefs about the impact on patient outcomes, involvement of medical assistants, and prioritization during clinical visits. Further research is needed to understand how to leverage clinician and staff buy-in and whether implementation of a new clinical prompt has sustained impact on HL screening and patient outcomes.

Dekhou A, **Jahshan A**, **Aoun M** and **Folbe A** (2021). "The representation of women and ethnic minorities among integrated plastic surgery trainees: A persistent need for diversification." Journal of the National Medical Association 113(5): 576-579.

Full Text

OUWB Medical Student Author

Department of Surgery

Background: Diversity in the workplace is crucial. As the United States population continues to diversify, the composition of graduate medical trainees (GMTs) among various medical specialties is not diversifying at nearly the same rate. This study aims to identify gender and ethnic minority disparities present in medicine, specifically among GMTs in the field of plastic surgery. Purpose: The field of plastic surgery is vast, with the patient population ranging from newborns to elders of all different races, religions, and ethnicities. However, the representation of women and minorities among the current plastic surgery trainees is not equivalent to the population they serve. Methods: Data from the Graduate Medical Education (GME) census published in the Journal of the American Medical Association (JAMA) was analyzed to compare trends of female and underrepresented ethnic minorities over the academic period from 2015 through 2019. Data regarding all GMTs and specifically those in the integrated plastic surgery (IPS) program was collected. Results: Over the five-year study period, females were consistently underrepresented in plastic surgery when compared to the total number of female medical trainees. Currently, females represent 42.7% of GMTs in IPS, a small increase from 40.9% in 2015. Furthermore, Whites and Asians encompassed 87.7% (65.6% and 22.1%, respectively) of plastic surgery GMTs in 2019-2020. In the same academic year, Blacks and Hispanics together made up only 9.1% (2.5% and 6.6%, respectively) of GMTs in plastic surgery. Conclusion: This study portrays the importance of highlighting gender and ethnic minority disparities in the field of plastic surgery, thereby promoting initiatives for change in the coming future.

Dekhou AS, Morrison RJ and **Gemechu JM** (2021). "The superior laryngeal nerve and its vulnerability in surgeries of the neck." Diagnostics 11(7): 1243.
Full Text
OUWB Medical Student Author
Department of Foundational Medical Studies (OU)

Anatomical considerations of the superior laryngeal nerve (SLN), a branch of the vagus, provides information to minimize the potential for iatrogenic intraoperative injury, thereby prevent-ing motor and sensory dysfunctions of the larynx. The present study aims to assess the variation of the SLN and its relationship to the superior thyroid artery (STA) and superior laryngeal artery (SLA). The study was done on 35 formalin-fixed cadavers at Oakland University in 2018–2019. In our study, we found that out of 21 cadavers, 52.4% of the external laryngeal branches (ebSLN) are related posteromedial to the STA, while 47.6% are related anteromedial to it. Out of 14 cadavers, 64.3% of the internal laryngeal branches (ibSLN) are related superoposterior to the SLA, while 35.7% are inferoposterior to it. In most cases, the SLA crosses above the ebSLN while traveling to pierce the thyrohyoid membrane to reach the larynx. The data demonstrate that both the ebSLN and ibSLN display variation in their relationship with the STA and the SLA, respectively. Awareness of these variable relationships is critical for identification and isolation of these structures in order to prevent consequences of nerve injury, primarily a reduction in the highest attainable frequency of the voice and aspiration pneumonia.

Devine M, Merriott DJ, Say C, Yoo C, Yi E, Lau B, **Ko RB**, Shaheen S, Neal JW, Wakelee HA, Das M, Loo BW, Diehn M, Chin AL, Vitzthum L and Loo BW, Jr. (2021). "Patterns of care in patients with isolated nodal recurrence after definitive stereotactic ablative radiotherapy for non-small cell lung cancer." International Journal of Radiation Oncology, Biology, Physics 111(3): e435-e435.
Full Text
OUWB Medical Student Author

Purpose/Objective(s): Patients treated with stereotactic ablative radiotherapy (SABR) for early-stage non-small cell lung cancer (NSCLC) have high rates of local control but may be at increased risk of nodal recurrence compared to those who undergo surgical resection with more invasive nodal evaluation. The optimal treatment for patients with isolated nodal recurrence (INR) is unclear. The purpose of this study is to determine the rate of INR after SABR for early-stage NSCLC and describe patterns of care and treatment outcomes for patients that experience INR. Materials/Methods: This retrospective cohort study included 342 patients with stage T1-3N0 NSCLC treated with definitive SABR. We evaluated the estimated rate of INR using the cumulative incidence function with death as a competing risk and compared baseline factors among patients who did or did not experience INR. Among patients that experienced INR, we describe patterns of treatment and outcomes including overall (OS) and progression free survival (PFS) from the time of nodal failure using the Kaplan-Meier method. OS and PFS outcomes were compared between treatment groups using the log-rank test. Results: Of the 342 patients treated with SABR from 2003-2018, 34 developed INR and 19 developed any nodal recurrence. Patients were treated with definitive SABR for T1 (62.6%, n = 214), T2 (25.4%, n = 87) and T3 (12.0%, n = 41) NSCLC with a median BED10 of 87.5. The 3- and 5-year cumulative incidence of INR was 9.3 (95% CI 6.1 - 12.4) and 10.1 (6.8 -13.4) %, respectively. Pathologic nodal staging prior to SBRT was 9.1 and 13.3 % (P = 0.68) for patients who did or did not experience INR, respectively. The median number of involved nodes at the time of recurrence was one with a maximum of four. Among the 30 patients with a known treatment course after INR, patients were treated with RT alone (26.7 %, n = 8), chemotherapy and RT (CRT) (43.3 %, n = 13), chemotherapy alone (13.3%, n = 4) or observation (16.7%, n = 5). RT regimens included standard

fractionation (38.0%, n = 8), hypofractionation (52.4%, n = 11) or SABR (9.5%, n = 2). The estimated two-year OS and PFS for patients experiencing INR were 48.0 (32.6 - 70.7) % and 27.6 (14.7 - 52.8) %, respectively. Treatment with CRT was associated with improved OS (2 year est: 91.7 vs 16.7 %, P < 0.01) and PFS (2 year est: 63.9 vs 0 %, P < 0.01) over RT alone. Similarly, CRT was associated with improved OS (91.7 vs 25.0 %, P < 0.01) and PFS (63.9 vs 0%, P < 0.01) over chemotherapy alone. Median follow-up time after INR was 21.7 months. Conclusion: INR occurred in approximately 10% of patients treated for early-stage NSCLC with SABR. Treatment paradigms for post-SABR INR varied significantly at our institution and included combined chemotherapy and radiation, chemotherapy alone, SABR and hypofractionated RT. The highest rates of survival in patients with post-SABR INR were observed in those treated with combined chemotherapy and radiation.

Dioh W, Chabane M, Tourette C, Azbekyan A, Morelot-Panzini C, Hajjar LA, Lins M, **Nair GB**, Whitehouse T, Mariani J, Latil M, Camelo S, Lafont R, Dilda PJ, Veillet S and Agus S (2021). "Testing the efficacy and safety of BIO101, for the prevention of respiratory deterioration, in patients with COVID-19 pneumonia (COVA study): A structured summary of a study protocol for a randomised controlled trial." Trials 22(1): 42.
Full Text
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Diokno AC (2021). "Perioperative care of pelvic organ prolapse surgery." Urologic Nursing 41(6): 328-334.
Request Form
Department of Urology

Pelvic organ prolapse (POP) is defined as the descent of one or more of the anterior vaginal wall, posterior vaginal wall, the uterus (cervix), or the apex of the vagina. POP can be mild, moderate, or severe. There are many approaches to managing POP, including watchful waiting, non-surgical options, and surgical interventions. This article provides an overview of POP diagnosis, management, risk factors, complications, and postoperative follow up.

El-Zein ZS, Gehrke CK, Croley JS, Siljander MP, Mallow MA, **Flierl MA**, **Verner JJ** and **Baker EA** (2021). "Assessing taper geometry, head size, head material, and their interactions in taper fretting corrosion of retrieved total hip arthroplasty implants." Journal of Arthroplasty 36(7): S386-S394.e384.
Full Text
Department of Orthopaedic Surgery

Background: Decreased fretting and corrosion damage at the taper interface of retrieved ceramic-on-polyethylene total hip arthroplasty (THA) implants has been consistently reported; however, resultant fretting corrosion as a function of femoral head size and taper geometry has not been definitively explained. Methods: Eight cohorts were defined from 157 retrieved THA implants based on femoral head composition (n = 95, zirconia-toughened alumina, ZTA vs n = 62, cobalt-chromium alloy, CoCr), head size (n = 56, 32mm vs n = 101, 36mm), and taper geometry (n = 84, 12/14 vs n = 73, V40). THA implants were evaluated and graded for taper fretting and corrosion. Data were statistically analyzed, including via a 23 factorial modeling. Results: Factorial-based analysis indicated the significant factors related to both resultant (summed) fretting and corrosion damage were head material and taper geometry; head material–taper geometry interaction was also a significant factor in resultant corrosion damage. Lower rates of moderate-to-severe fretting and corrosion damage were exhibited on ZTA heads (ZTA = 13%, CoCr = 38%), smaller heads (32mm = 18%, 36mm = 26%), and 12/14 tapers (12/14 =

13%, V40 = 35%). ZTA+32mm heads demonstrated the lowest rates of moderate-to-severe fretting and corrosion damage (12/14 = 2%, V40 = 7%), whereas CoCr heads with V40 tapers demonstrated the greatest rates of moderate-to-severe damage (32mm = 47%, 36mm = 59%). Conclusion: In this series, retrieved implants with ZTA, 32-mm heads paired with 12/14 tapers exhibited lower rates of moderate-to-severe damage. Factorial analysis showed head material, taper geometry, and their interactions were the most significant factors associated with resultant damage grades. Isolating implant features may provide additional information regarding factors leading to fretting and corrosion damage in THA. Level of Evidence: IV (case series).

Elabd A, Khalifa R, Alam Z, **Saleh ES**, Thabet AM and Abdelgawad A (2021). "Operative fixation of pediatric forearm fractures: Does the fracture location matter?" Advances in Orthopedics 2021: 9973449.
Full Text
Department of Orthopaedic Surgery

Background: Flexible intramedullary nails (FNs) are successfully used to treat pediatric forearm fractures, especially midshaft fractures. Distal forearm fractures have been described as "difficult to manage" with FN insertion. The purpose of this study was to report the clinical and radiographic outcomes of using flexible nails in pediatric forearm fractures and the impact of fracture location on the outcome of the procedure. Methods: This is a retrospective review of pediatric patients who presented with forearm fractures that were surgically treated with flexible nails between 2009 and 2018. Patient demographics, fracture location, and classification were reported. Intraoperative and postoperative complications were reported. The primary outcomes were fracture radiographic union, intraop and postop complications, and the need for additional surgical procedures. Results: Fifty-nine patients were included, with a mean age of 11 years. All fractures healed with patients regaining full range of motion. The authors were able to use flexible nails successfully in 48/59 (81%) patients. In eleven cases (19%), FN fixation was not able to provide adequate fixation to maintain reduction. The method of fixation was changed from FN insertion to another method in nine cases. In two cases, FN fixation was augmented with another fixation method. Fractures within 3 inches of the distal articular surface were at a higher risk of intraoperative change/augmentation of the fixation method (29%) compared with fractures that occurred more than 3 inches from the distal articular surface (11%). Conclusion: The majority of pediatric forearm fractures can be treated successfully with flexible nails. Surgeons involved in treating these fractures should pay attention to distal third fractures. Stabilizing the distally located fractures using FN fixation can be challenging. Surgeons should be prepared to use an alternative fixation method when needed.

Elassar H, Reilly J, Lapkus M, **Pastewski J**, Studzinski D, **Sun F**, **Faridmoayer E**, **Czako PF** and **Nagar S** (2021). "An institutional summary of incidence and risk of Second Primary Cancer (SPC) after treatment for Papillary Thyroid Carcinoma (PTC)." Journal of the American College of Surgeons 233(5): E39-E39.
Full Text
OUWB Medical Student Author
Department of Surgery

Eng MH, **Abbas AE**, Hahn RT, Lee J, Wang DD, Eleid MF and O'Neill WW (2021). "Real world outcomes using 20 mm balloon expandable SAPIEN 3/ultra valves compared to larger valves (23, 26, and 29 mm)–a propensity matched analysis." Catheterization and Cardiovascular Interventions 98(6): 1185-1192.
Full Text

Department of Internal Medicine/Cardiovascular Disease

Objective/Background: Small balloon expandable valves have higher echocardiographic transvalvular gradients and rates of prosthesis-patient mismatch (PPM) compared to larger valves. However, the impact of these echocardiographic findings on clinical outcomes is unknown. We sought to determine the clinical outcomes of 20 mm SAPIEN 3 (S3 BEV) compared to larger S3 BEV in relation to echocardiographic hemodynamics. Methods: Using the STS/ACC transcatheter valve registry, we performed a propensity-matched comparison of patients undergoing treatment of native aortic valve stenosis using transfemoral, balloon-expandable implantation of 20 mm and ≥ 23 mm S3 BEVs. Baseline and procedure characteristics, echocardiographic variables and survival were analyzed. Multivariable logistic regression was used to identify predictors of 1-year mortality. Results: After propensity matching of the 20 mm and ≥ 23 mm SAPIEN 3 valves, 3,931 pairs with comparable baseline characteristics were identified. Small valves were associated with significantly higher echocardiographic gradients at discharge (15.7 ± 7.1 mmHg vs. 11.7 ± 5.5 mmHg, $p < 0.0001$) and severe PPM rates (21.5% vs. 9.7%, $p < 0.0001$). There was no significant difference in 1-year all-cause mortality (20 mm: 13.0% vs. ≥23 mm: 12.7%, $p = 0.72$) or other major adverse event rates and outcomes between the two cohorts. Based on a multivariable analysis, elevated discharge mean gradient (>20 mmHg), severe PPM and the use of 20 mm versus ≥23 mm were not independent predictors of 1-year mortality. Conclusion: SAPIEN 3 20 mm valves were associated with higher echocardiographic gradients, and severe PPM rates compared to larger valves but these factors were not associated with significant differences in 1-year all-cause mortality or rehospitalization.

Evans MG, Medeiros LJ, Marques-Piubelli ML, Wang H-Y, Ortiz-Hidalgo C, Pina-Oviedo S, Morine A, Clemens MW, Hunt KK, Iyer S, Hu Q, Recavarren C, Demichelis R, Romero M, Sohani AR, Misialek M, **Amin MB**, Bueso-Ramos CE, Carballo-Zarate AA and Lee HJ (2021). "Breast implant-associated anaplastic large cell lymphoma: Clinical follow-up and analysis of sequential pathologic specimens of untreated patients shows persistent or progressive disease." Modern Pathology 34(12): 2148-2153.
Request Form

Department of Pathology

Breast implant-associated anaplastic large cell lymphoma (ALCL) is a distinctive type of T-cell lymphoma that arises around textured-surface breast implants. In a subset of patients, this disease can involve surrounding tissues, spread to regional lymph nodes, and rarely metastasize to distant sites. The aim of this study was to assess sequential pathologic specimens from patients with breast implant-associated ALCL to better understand the natural history of early-stage disease. To achieve this goal, we searched our files for patients who had breast implant-associated ALCL and who had undergone earlier surgical intervention with assessment of biopsy or cytologic specimens. We then focused on the patient subset in whom a definitive diagnosis was not established, and patients did not receive current standard-of-care therapy at that time. We identified a study group of ten patients with breast implant-associated ALCL in whom pathologic specimens were collected 0.5 to 4 years before a definitive diagnosis was established. A comparison of these serial biopsy specimens showed persistent disease without change in pathologic stage in three patients, progression in five patients, and persistence versus progression in two patients. Eventually, six patients underwent implant removal with complete capsulectomy and four underwent partial capsulectomy. Seven patients also received chemotherapy because of invasive disease, three of whom also received radiation therapy, two brentuximab vedotin after chemotherapy failure, and one allogeneic stem cell transplant. Eight patients achieved complete remission and two had partial remission after definitive therapy. At

time of last follow-up, six patients were alive without disease, one had evidence of disease, one died of disease, and two patients died of unrelated cancers. In summary, this analysis of sequential specimens from patients with breast implant-associated ALCL suggests these neoplasms persist or progress over time if not treated with standard-of-care therapy.

Faia LJ (2021). "Three pearls for surgery in uveitis patients." Retina Today 2021: 42-43.
Full Text
Department of Ophthalmology

Fiani B, **Sekhon M**, Doan T, Bowers B, Covarrubias C, Barthelmass M, De Stefano F and Kondilis A (2021). "Sacroiliac joint and pelvic dysfunction due to symphysiolysis in postpartum women." Cureus 13(10): e18619.
Full Text
OUWB Medical Student Author

Pregnancy-related pain in the sacroiliac joint (SIJ), lumbosacral region, pubic symphysis, or in any combination of these joints has been coined as pelvic girdle pain (PGP) and has been estimated to affect almost half of all pregnant women. SIJ dysfunction in pregnancy is due to multiple biomechanical mechanisms, such as increased weight, change in posture, increased abdominal and intrauterine pressure, and laxity of the spine and pelvic structures. Moreover, when compared to men, women have increased SIJ mobility due to increased pubic angle and decreased SIJ curvature. These differences may assist in parturition where hormones, such as relaxin and estrogen, cause symphysiolysis. A retrospective review of the literature was conducted in the PubMed database using the search term "pregnancy-related sacroiliac joint pain." All peer-reviewed studies were included. Around 8%-10% of women with PGP continue to have pain for one to two years postpartum. Patients that were treated with SIJ fusion show statistically significant improvement in pain scores when compared to patients that had non-operative treatment. Although we have a number of studies following patients after sacroiliac (SI) joint fusion for pelvic pain with SI joint dysfunction, further research is needed to study sacroiliac fusion for SI joint dysfunction in postpartum women to better tailor and optimize surgical outcomes for this patient population.

Finch A, Metcalfe K, Akbari M, Friedman E, Tung N, **Rosen B**, Eisen A, Karlan B, Foulkes W, Neuhausen SL, Senter L, McKinnon W, Elser C, Sun P and Narod SA (2021). "The risks of breast and ovarian cancer associated with the Ashkenazi Jewish founder Allele BRCA2 6174delT." Clinical Genetics. ePub Ahead of Print.
Full Text
Department of Obstetrics & Gynecology

Approximately one percent of the Ashkenazi Jewish population carries the BRCA2 6174delT (c.5946del) pathogenic variant. It is important to have accurate knowledge of the risks of breast and ovarian cancer associated with this specific variant so that women may be counselled accordingly. In this prospective study, we estimated the risks of breast and ovarian cancer associated with the 6174delT variant compared with the risks for other pathogenic variants in the BRCA2 gene. The annual risk for developing breast cancer was significantly lower in 246 women who carried the 6174delT variant compared with 721 non-Jewish women who carried a variant at any other locus in BRCA2 (1.2% per year vs. 2.4% per year, p=0.003). We estimated the cumulative risk of breast cancer from age 30 to 70 to be 39% for carriers of the BRCA2 6174delT variant and 61% for carriers of other BRCA2 variants. The annual risk for ovarian or fallopian tube cancer was 0.51% per year for the 233 women who carried the 6174delT variant

compared to 0.22% per year for the 1128 carriers of other BRCA2 variants; the difference was not significant. Lower risks for breast cancer associated with 6174delT may not impact screening and prevention choices, however, the discussion should be based on accurate risk assessment.

Fishbane S, Clegg DJ, Lerma EV, Rastogi A, Budden JJ, Morin I, Wen W, Menzaghi F and **Topf JM** (2021). "Safety and efficacy of difelikefalin in black or African American patients on hemodialysis with CKD-associated pruritus: Pooled analysis of KALM-1 and KALM-2." Journal of the American Society of Nephrology 32: 281.
Full Text
Department of Internal Medicine/Nephrology

Background: Difelikefalin (DFK) is an investigational, peripherally restricted, selective kappa-opioid receptor agonist that significantly reduced itch intensity in hemodialysis (HD) pts with CKD-associated pruritus (CKD-aP) in the Phase 3 KALM-1 and KALM-2 trials. People of Black or African American (AA) race were well represented in these studies. This pooled analysis reports efficacy and safety of DFK in Black or AA pts. Methods: HD pts with moderate-to-severe CKD-aP were randomized to intravenous DFK 0.5 mcg/kg or placebo (PBO) 3 times/wk for 12 wks. The primary endpoint was the proportion of pts achieving a clinically meaningful ≥3-point improvement from baseline (BL) in the weekly mean of 24-hr daily Worst Itching Intensity Numerical Rating Scale (WI-NRS) scores at wk 12. Secondary endpoints included proportion of pts achieving ≥4-point improvement in WI-NRS score and change in itch-related QoL score (5-D Itch and Skindex-10) from BL to wk 12. Adverse events (AE) through wk 12 were collected. Results: Of 851 pts randomized in KALM-1 and KALM-2, 249 (29%) pts selfidentified as Black or AA (DFK: 135; PBO: 114). Mean BL WI-NRS score was 7.2 and 7.3 in the DFK and PBO groups. A greater proportion of pts who received DFK vs PBO achieved clinically meaningful improvements in itch intensity and itch-related QoL (Figure). Most common treatment-emergent AEs (≥5%) with DFK occurring at ≥1% higher incidence vs PBO were diarrhea (10.4% vs 6.2%), dizziness (10.4% vs 2.7%), vomiting (7.4% vs 4.4%), headache (5.2% vs 0.9%), and hyperkalemia (5.2% vs 2.7%). Serious AE incidence was similar between groups. Conclusions: DFK significantly reduced pruritus intensity and improved itch-related QoL in Black or AA HD pts with moderate-to-severe CKD-aP. DFK was well tolerated with an acceptable safety profile. The safety and efficacy of DFK in Black or AA pts was similar to the overall population. (Figure Presented) .

Forghani F, Castillo R, **Castillo E**, Jones BL, Rusthoven CG, Kwak J, **Grills IS**, **Guerrero TM**, Miften M and Vinogradskiy Y (2021). "Is perfusion dose-response different than ventilation dose-response for lung cancer patients treated with radiotherapy?" International Journal of Radiation Oncology Biology Physics 111(3): S15-S15.
Full Text
Department of Radiation Oncology

Franklin BA and Quindry J (2021). "High level physical activity in cardiac rehabilitation: Implications for exercise training and leisure-time pursuits." Progress in Cardiovascular Diseases. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Importance: Regular moderate-to-vigorous physical activity and increased levels of cardiorespiratory fitness (CRF) are widely promoted as cardioprotective measures in secondary prevention interventions. Observations: A low level of CRF increases the risk of cardiovascular disease (CVD) to a greater extent than merely being physically inactive. An exercise capacity <5 metabolic equivalents (METs), generally corresponding to the bottom 20% of the fitness

continuum, indicates a higher mortality group. Accordingly, a key objective in early cardiac rehabilitation (CR) is to increase the intensity of training to >3 METs, to empower patients to vacate this "high risk" group. Moreover, a "good" exercise capacity, expressed as peak METs, identifies individuals with a favorable long-term prognosis, regardless of the underlying extent of coronary disease. On the other hand, vigorous-to-high intensity physical activity, particularly when unaccustomed, and some competitive sports are associated with a greater incidence of acute cardiovascular events. Marathon and triathlon training/competition also have limited applicability and value in CR, are associated with acute cardiac events each year, and do not necessarily provide immunity to the development of or the progression of CVD. Furthermore, extreme endurance exercise regimens are associated with an increased incidence of atrial fibrillation and accelerated coronary artery calcification. Conclusions and Relevance: High-intensity training offers a time-saving alternative to moderate intensity continuous training, as well as other potential advantages. Additional long-term studies assessing safety, adherence, and morbidity and mortality are required before high-intensity CR training can be more widely recommended, especially in previously sedentary patients with known or suspected CVD exercising in non-medically supervised settings.

Fung MA, Vidal CI, Armbrecht EA, Andea AA, Cassarino DS, Comfere NI, Emanuel PO, Ferringer T, Hristov AC, Kim J, Lauer SR, Linos K, Missall TA, Motaparthi K, Novoa RA, Patel R, Shalin SC, **Sundram U**, Calame A, Bennett DD, Duncan LM, Elston DM, Hosler GA, Hurley YM, Lazar AJ, Lowe L, Messina J, Myles J, Plaza JA, Prieto VG, Reddy V, Schaffer A and Subtil A (2021). "Appropriate use criteria for ancillary diagnostic testing in dermatopathology: New recommendations for 11 tests and 220 clinical scenarios from the American Society of Dermatopathology Appropriate Use Criteria Committee." Journal of Cutaneous Pathology. ePub Ahead of Print.

Full Text

Department of Pathology

Background: Appropriate use criteria (AUC) provide patient-centered physician guidance in test selection. An initial set of AUC was reported by the American Society of Dermatopathology (ASDP) in 2018. AUC reflect evidence collected at single timepoints and may be affected by evolving evidence and experience. The objective of this study was to update and expand AUC for selected tests. Methods: RAND/UCLA (RAND Corporation [Santa Monica, CA]/University of California Los Angeles) methodology used includes the following: (a) literature review; (b) review of previously rated tests and previously employed clinical scenarios; (c) selection of previously rated tests for new ratings; (d) development of new clinical scenarios; (e) selection of additional tests; (f) three rating rounds with feedback and group discussion after rounds 1 and 2. Results: For 220 clinical scenarios comprising lymphoproliferative (light chain clonality), melanocytic (comparative genomic hybridization, fluorescence in situ hybridization, reverse transcription polymerase chain reaction, telomerase reverse transcriptase promoter), vascular disorders (MYC), and inflammatory dermatoses (periodic acid-Schiff, Gomori methenamine silver), consensus by panel raters was reached in 172 of 220 (78%) scenarios, with 103 of 148 (70%) rated "usually appropriate" or "rarely appropriate" and 45 of 148 (30%), "appropriateness uncertain." Limitations: The study design only measures appropriateness. Cost, availability, test comparison, and additional clinical considerations are not measured. The possibility that the findings of this study may be influenced by the inherent biases of the dermatopathologists involved in the study cannot be excluded. Conclusions: AUC are reported for selected diagnostic tests in clinical scenarios that occur in dermatopathology practice. Adhering to AUC may reduce inappropriate test utilization and improve healthcare delivery.

Ganganna ST and **Obeid R** (2021). "Amplitude of care for the neonatal brain." Indian Pediatrics 58(10): 913-914.
Full Text
Department of Pediatrics

Garfein J, **Cholack G**, Krallman R, Feldeisen D, Montgomery D, Kline-Rogers E, Eagle K, Rubenfire M and Bumpus S (2021). "Cardiac transitional care effectiveness: Does overall comorbidity burden matter?" American Journal of Medicine 134(12): 1506-1513.
Full Text
OUWB Medical Student Author

Background: Cardiovascular disease is the most common cause of mortality and hospitalization in the United States. Transitional care initiatives can improve outcomes for cardiac patients, but it is unclear whether patients with different baseline comorbidity burden benefit equally. We evaluated the effectiveness of the Bridging the Discharge Gap Effectively (BRIDGE) program, a nurse-practitioner-led transitional care clinic, in mitigating adverse clinical outcomes in cardiac patients with varying Charlson comorbidity index (CCI). Methods: We studied patients referred to BRIDGE between 2008 and 2017 postdischarge for a cardiac condition. Using proportional hazards regression models, we evaluated associations between attendance at BRIDGE and hospital readmission, emergency department (ED) visit, and a composite outcome consisting of readmission, ED visit, or mortality, and assessed interaction between BRIDGE attendance and CCI. Results: Of 4559 patients, 3256 (71.4%) attended BRIDGE. In patients with low CCI, attendance at BRIDGE was inversely associated with hospital readmission (adjusted hazard ratio = 0.82, 95% confidence interval [CI]: 0.69, 0.97, P = .02) and the composite endpoint (adjusted hazard ratio = 0.84, 95% CI: 0.72, 0.98, P = .02). Associations of BRIDGE attendance with both readmission and ED visit were significantly weaker in patients with high CCI (adjusted P, interaction = .007 and .03, respectively). Overall, BRIDGE attendance was associated with an 11% lower hazard of developing the composite endpoint (95% CI: 2%, 19%, P = .01). Conclusions: Attendance at a transitional care clinic is inversely associated with risk of readmission and a composite endpoint in cardiac patients with low CCI. Future research should investigate modified transitional care programs in patients with varying comorbidity burden.

Gasteratos K, Spyropoulou GA, **Chaiyasate K**, Siotos C, Vlachopoulos N and Friedstat J (2021). "Microsurgical techniques and postoperative outcomes after total and subtotal nasal reconstruction: A systematic review." Annals of Plastic Surgery. ePub Ahead of Print.
Full Text
Department of Surgery

Background: Multiple microsurgical techniques for nasal reconstruction have been described in the literature. Given the gaps in the literature regarding evidence-based reviews for total and subtotal nasal reconstruction using microsurgical techniques, the purpose of this study was to provide a thorough presentation of the most popular microvascular techniques and their outcomes (functional and aesthetic) for total or subtotal nasal defects. Methods: A systematic search was performed using PubMed, Google Scholar, and Cochrane Library on free flap techniques for restoration of nasectomy defects. The keywords were "nasal reconstruction," "nose," "nasectomy," "rhinectomy," and "microvascular." Inclusion criteria for analysis in the study were the largest clinical case series published in English within the past 15 years with more than 8 patients. Studies were analyzed for patient demographics, etiology of nasal loss, surgical approaches to reconstruction, outcomes, and complications. The current study was registered at the International Prospective Register of Systematic Reviews and conducted based

on the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines. Results: The initial search yielded 302 results. Eleven articles with a total of 232 patients met the inclusion criteria. The radial (n = 85) and ulnar forearm flaps (n = 20), auricular helical rim (n = 87), and anterolateral thigh flap (n = 30) were the most commonly reported free flaps in nasal reconstruction. The main etiologic factors were malignancy and trauma. The most common complication was partial flap necrosis. Conclusions: The auricular helical and radial forearm flaps represent the most used free flaps for total and/or subtotal nasal defects with satisfactory patient outcomes.

Gil RM, Freeman TL, **Mathew T**, Kullar R, Fekete T, Ovalle A, Nguyen D, Kottkamp A, Poon J, Marcelin JR and Swartz TH (2021). "Corrigendum to: Lesbian, gay, bisexual, transgender, and queer (LGBTQ+) communities and the Coronavirus Disease 2019 pandemic: A call to break the cycle of structural barriers." Journal of Infectious Diseases 224(11): 1990-1992.
Full Text
Department of Internal Medicine/Infectious Disease

Gil RM, Freeman TL, **Mathew T**, Kullar R, Fekete T, Ovalle A, Nguyen D, Kottkamp A, Poon J, Marcelin JR and Swartz TH (2021). "Lesbian, gay, bisexual, transgender, and queer (LGBTQ plus) communities and the Coronavirus Disease 2019 pandemic: A call to break the cycle of structural barriers." Journal of Infectious Diseases 224(11): 1810-1820.
Full Text
Department of Internal Medicine/Infectious Disease

The coronavirus disease 2019 (COVID-19) pandemic has disproportionately impacted lesbian, gay, bisexual, transgender, and queer (LGBTQ+) communities. Many disparities mirror those of the human immunodeficiency virus (HIV)/AIDS epidemic. These health inequities have repeated throughout history due to the structural oppression of LGBTQ+ people. We aim to demonstrate that the familiar patterns of LGBTQ+ health disparities reflect a perpetuating, deeply rooted cycle of injustice imposed on LGBTQ+ people. Here, we contextualize COVID-19 inequities through the history of the HIV/AIDS crisis, describe manifestations of LGBTQ+ structural oppression exacerbated by the pandemic, and provide recommendations for medical professionals and institutions seeking to reduce health inequities.

Gill I, Edhi A and **Rana K** (2021). "Dieulafoy's Lesion: An unforeseen catastrophe." American Journal of Gastroenterology 116: S1478-S1478.
Full Text
Department of Internal Medicine/Gastroenterology

Gill I, Imam Z, Orosey M, **Bedi DS**, **Al Sibae MR** and **Jamil LH** (2021). "Bile leak from the duct of Luschka following liver transplantation." American Journal of Gastroenterology 116: S1072-S1073.
Full Text
Department of Internal Medicine/Gastroenterology
Department of Surgery

Gill I, Shaheen AA, Edhi AI, **Amin M**, **Rana K** and **Cappell MS** (2021). "Novel case report: A previously reported, but pathophysiologically unexplained, association between collagenous colitis and protein-losing enteropathy may be explained by an undetected link with collagenous duodenitis." Digestive Diseases and Sciences 66(12): 4557-4564.
Full Text

Collagenous colitis (CC) is associated with non-bloody, watery diarrhea, which is pathophysiologically reasonable because normal colonic absorption (or excretion) of water and electrolytes can be blocked by the abnormally thick collagen layer in CC. However, CC has also been associated with six previous cases of protein-losing enteropathy (PLE), with no pathophysiologic explanation. The colon does not normally absorb (or excrete) amino acids/proteins, which is primarily the function of the small bowel. Collagenous duodenitis (CD) has not been associated with PLE. This work reports a novel case of CD (and CC) associated with PLE; a pathophysiologically reasonable mechanism for CD causing PLE (by the thick collagen layer of CD blocking normal intestinal amino acid absorption); and a novel association of PLE with severe COVID-19 infection (attributed to relative immunosuppression from hypoproteinemia, hypoalbuminemia, hypogammaglobulinemia, and malnutrition from PLE).

Gill I, **Shams C**, Hanna A, George J, **Jamil LH** and **Patel A** (2021). "Role of demographics in non-invasive testing for colorectal cancer screening: Do targeted cut-off values improve detection?" American Journal of Gastroenterology 116: S117-S117.
Full Text
Department of Internal Medicine/Gastroenterology
OUWB Medical Student Author

Gill I, **Shams C** and **Patel A** (2021). "Propofol-induced mania during a routine colonoscopy." American Journal of Gastroenterology 116: S965-S965.
Full Text
Department of Internal Medicine/Gastroenterology
OUWB Medical Student Author

Gilleran J, **Diokno AC**, Ward E, **Sirls L**, Hasenau D, Giordano J, Shea E, Bartolone SN, **Lamb LE** and **Chancellor MB** (2021). "Improved global response outcome after intradetrusor injection of adult muscle-derived cells for the treatment of underactive bladder." International Urology and Nephrology 53(7): 1331-1338.
Full Text
Department of Urology

We report on the first regulatory approved clinical trial of a prospective open-label physician-initiated study assessing the safety and efficacy of intradetrusor injected Autologous Muscle Derived Cells (AMDC) treatment for underactive bladder (UAB). 20 non-neurogenic UAB patients were treated. Approximately 50–250 mg of quadriceps femoris muscle was collected using a spirotome 8-gauge needle. The muscle biopsy samples were sent to Cook MyoSite (Pittsburgh, PA) for processing, isolation, and propagation of cells. Research patients received approximately 30 intradetrusor injections of 0.5 mL delivered to the bladder, for a total of 15 mL and 125 million AMDC, performed utilizing a flexible cystoscope under direct vision using topical local anesthesia. Follow-up assessments included adverse events and efficacy via voiding diary and urodynamic testing at 1, 3, 6 and 12 months post-injection. An optional second injection was offered at the end of the 6 months visit. 20 patients received the first injection and all 20 patients requested and received a second injection. Median patient age was 65 years old (range 41–82 years). There were 16 male (80%) and 4 female (20%) patients. Etiology included 7 men (35%) with persistent urinary retention after transurethral resection of the prostate for benign prostatic hyperplasia and 13 patients (65%) with idiopathic chronic urinary retention. At the primary outcome time point of 12 months, 11/19 patients (58%) reported a global response

assessment (GRA) ≥ 5, showing slight to marked improvement in their UAB symptoms, compared to 6/20 (30%) patients at 3 months post-injection. No serious procedure or treatment-related adverse events occurred. Noted improvements included: decreased post void residual urine volume, increased voiding efficiency, and decreased catheter use. Intradetrusor-injected AMDC as a treatment for UAB was successfully completed in a 20-patient trial without serious adverse event and with signal of efficacy. Cellular therapy may be a promising novel treatment for catheter-dependent chronic urinary retention. A multicenter controlled trial is needed to further assess the promise of regenerative medicine in the treatment of lower urinary tract dysfunction.

Ginsburg KB, Johnson K, Moldovan T, Peabody H, Qi J, Dunn RL, Rogers C, Weizer A, **Kaul S**, Johnson A, Traver M, Lane BR and Michigan Urological Surgery Improvement C (2021). "A Statewide Quality Improvement Collaborative's Adherence to the 2017 American Urological Association Guidelines regarding initial evaluation of patients with clinical T1 renal masses." Urology 158: 117-124.
Full Text
Department of Urology

Objective: To evaluate MUSIC-KIDNEY's adherence to the American Urological Association (AUA) guidelines regarding the initial evaluation of patient's with clinical T1 (cT1) renal masses. Methods: We reviewed MUSIC-KIDNEY registry data for patients with newly diagnosed cT1 renal masses to assess for adherence with the 2017 AUA guideline statements regarding recommendations to obtain (1) CMP, (2) CBC, (3) UA, (4) abdominal cross-sectional imaging, and (5) chest imaging. An evaluation consisting of all 5 guideline measures was considered “complete compliance.” Variation with guideline adherence was assessed by contributing practice, management strategy, and renal mass size. Results: We identified 1808 patients with cT1 renal masses in the MUSIC-KIDNEY registry, of which 30% met the definition of complete compliance. Most patients received care that was compliant with recommendations to obtain laboratory testing with 1448 (80%), 1545 (85%), and 1472 (81%) patients obtaining a CMP, CBC, and UA respectively. Only 862 (48%) patients underwent chest imaging. Significant variation exists in complete guideline compliance for contributing practices, ranging from 0% to 45% as well as for patients which underwent immediate intervention compared with initial observation (37% vs 23%) and patients with cT1b masses compared with cT1a masses (36% vs 28%). Conclusion: Complete guideline compliance in the initial evaluation of patients with cT1 renal masses is poor, which is mainly driven by omission of chest imaging. Significant variation in guideline adherence is seen across practices, as well as patients undergoing an intervention vs observation, and cT1a vs cT1b masses. There are ample quality improvement opportunities to increase adherence and decrease variability with guideline recommendations.

Giovanatti A, **Elassar H**, Karabon P, Wunderlich-Barillas T and **Halalau A** (2021). "Social determinants of health correlating with mechanical ventilation of COVID-19 patients: A multi-center observational study." International Journal of General Medicine 14: 8521-8526.
Full Text
OUWB Medical Student Author
Department of Internal Medicine

Importance: Several studies have relayed the disproportionate impact of COVID-19 on marginalized communities; however, few have specifically examined the association between social determinants of health and mechanical ventilation (MV). Objective: To determine which demographics impact MV rates among COVID-19 patients. DESIGN: This observational study included COVID-19 patient data from eight hospitals' electronic medical records (EMR) between

February 25, 2020, to December 31, 2020. Associations between demographic data and MV rates were evaluated using uni- and multivariate analyses. Setting: Multicenter (eight hospitals), largest health system in Southeast Michigan. Participants: Inpatients with a positive RT-PCR for SARS-CoV-2 on nasopharyngeal swab. Exclusion criteria were missing demographic data or non-permanent Michigan residents. Exposure: Patients were divided into two groups: MV and non-MV. Main Outcome and Measures: The primary outcome was MV rate per demographic. A multivariate model then predicted the odds of MV per demographic descriptor. Hypotheses were formulated prior to data collection. Results: Among 11,304 COVID-19 inpatients investigated, 1621 (14.34%) were MV, and 49.96% were male with a mean age of 63.37 years (17.79). Significant social determinants for MV included Black race (40.19% MV vs 31.31% non-MV, p<0.01), poverty (14.60% vs. 13.21%, p<0.01), and disability (12.65% vs 9.14%; p<0.01). Black race (AOR 1.61 (CI 1.41-1.83; p<0.01)), median income (AOR 0.99 (CI 0.99-0.99; p<0.01)), disability (AOR 1.55 (CI 1.26, 1.90; p<0.01)), and non-English-speaking status (AOR 1.26 (CI 1.05, 1.53)) had significantly higher odds of MV. Conclusions and Relevance: Black race, low socioeconomic status, disability, and non-English-speaking status were significant risk factors for MV from COVID-19. An urgent need remains for a pandemic response program that strategizes care for marginalized communities.

Gjeorgjievski M, Imam Z, **Cappell MS**, **Jamil LH** and Kahaleh M (2021). "A comprehensive review of endoscopic management of sleeve gastrectomy leaks." Journal of Clinical Gastroenterology 55(7): 551-576.

Full Text

Department of Internal Medicine/Gastroenterology

Background: Bariatric surgery leaks result in significant morbidity and mortality. Experts report variable therapeutic approaches, without uniform guidelines or consensus. Objective: To review the pathogenesis, risk factors, prevention, and treatment of gastric sleeve leaks, with a focus on endoscopic approaches. In addition, the efficacy and success rates of different treatment modalities are assessed. Design: A comprehensive review was conducted using a thorough literature search of 5 online electronic databases (PubMed, PubMed Central, Cochrane, EMBASE, and Web of Science) from the time of their inception through March 2020. Studies evaluating gastric sleeve leaks were included. MeSH terms related to "endoscopic," "leak," "sleeve," "gastrectomy," "anastomotic," and "bariatric" were applied to a highly sensitive search strategy. The main outcomes were epidemiology, pathophysiology, diagnosis, treatment, and outcomes. Results: Literature search yielded 2418 studies of which 438 were incorporated into the review. Shock and peritonitis necessitate early surgical intervention for leaks. Endoscopic therapies in acute and early leaks involve modalities with a focus on one of: (i) defect closure, (ii) wall diversion, or (iii) wall exclusion. Surgical revision is required if endoscopic therapies fail to control leaks after 6 months. Chronic leaks require one or more endoscopic, radiologic, or surgical approaches for fluid collection drainage to facilitate adequate healing. Success rates depend on provider and center expertise. Conclusion: Endoscopic management of leaks post sleeve gastrectomy is a minimally invasive and effective alternative to surgery. Their effect may vary based on clinical presentation, timing or leak morphology, and should be tailored to the appropriate endoscopic modality of treatment.

Goldberg EM, Hasegawa K, Lawrence A, Kline JA, Camargo CA, Jr., Aufderheide T, Beiser D, Bennett C, Bledsoe J, Caputo N, Carpenter C, Chang AM, Chisolm-Straker M, Courtney DM, Mycyk M, Del Rios M, Delgado MK, Peter J, D'Etienne J, Dezman Z, Guirgis F, Headden G, House H, Huebinger R, Jang T, Kabrhel C, Lim S, Limkakeng A, Madsen T, McCarthy D, Meltzer A, Moore S, Newgard C, Nordenholz K,

Pagenhardt J, Platts-Mills T, Pulia M, Puskarich M, Southerland L, Sparks S, Swoboda H, Taylor L, Tomaszewski C, **Turner-Lawrence D**, Vrablik M, Weekes A, Westafer L, Whittle J, Wilburn J and Recover (2021). "Viral coinfection is associated with improved outcomes in emergency department patients with SARS-CoV-2." Western Journal of Emergency Medicine 22(6): 1262-1269.
Full Text
Department of Emergency Medicine

Introduction: Coinfection with severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) and another virus may influence the clinical trajectory of emergency department (ED) patients. However, little empirical data exists on the clinical outcomes of coinfection with SARS-CoV-2 Methods: In this retrospective cohort analysis, we included adults presenting to the ED with confirmed, symptomatic coronavirus 2019 who also underwent testing for additional viral pathogens within 24 hours. To investigate the association between coinfection status with each of the outcomes, we performed logistic regression. Results: Of 6,913 ED patients, 5.7% had coinfection. Coinfected individuals were less likely to experience index visit or 30-day hospitalization (odds ratio [OR] 0.57; 95% confidence interval [CI], 0.36-0.90 and OR 0.39; 95% CI, 0.25-0.62, respectively). Conclusion: Coinfection is relatively uncommon in symptomatic ED patients with SARS-CoV-2 and the clinical short- and long-term outcomes are more favorable in coinfected individuals.

Goyal VK, **Spillinger A**, Peterson EI and Craig JR (2021). "Odontogenic sinusitis publication trends from 1990 to 2019: A systematic review." European Archives of Otorhinolaryngology 278(10): 3857-3865.
Full Text
OUWB Medical Student Author

Purpose: Odontogenic sinusitis (ODS) is underrepresented in the literature compared to other forms of rhinosinusitis, specifically in sinusitis guidelines and position statements. ODS publication characteristics could help explain why ODS has received less attention in sinusitis guidelines and position statements. The purpose of this study was to explore trends in the quantity and quality of ODS studies over 3 decades from 1990 to 2019. Methods: A systematic review was performed to identify all ODS studies from 1990 to 2019. The following variables from all ODS studies were compared between and across the 3 decades: authors' specialties, journal specialties, authors' geographic origins (continents), study topics, study designs, and evidence levels. Results: From 1990 to 2019, there were 254 ODS studies that met inclusion criteria. Numbers of publications increased each decade, with 161 being published from 2010 to 2019. Otolaryngologists and dental authors published over 75% of ODS studies each decade, with 60-75% of ODS articles being published in otolaryngology or dental journals. European and Asian authors published the most ODS studies each decade. Overall, 92-100% of ODS publications per decade were level 4 and 5 evidence, with no significant changes between or across decades. Conclusion1: While numbers of ODS publications increased each decade from 1990 to 2019, evidence levels remained low without significant changes over time. Otolaryngologists and dental authors published the majority of ODS studies each decade, with a minority of these studies being multidisciplinary. More ODS studies are needed across all aspects of the condition, and future projects would benefit from improved study designs and multidisciplinary collaboration.

Gresham G, Placencio-Hickok VR, Lauzon M, Nguyen T, Kim H, Mehta S, Paski S, Pandol SJ, Osipov A, Gong J, **Jamil LH**, Nissen N, Lo SK and Hendifar AE (2021). "Feasibility and efficacy of enteral tube feeding on weight stability, lean body mass, and patient-reported outcomes in pancreatic cancer cachexia." Journal of Cachexia Sarcopenia and Muscle 12(6): 1959-1968.

Full Text

Department of Internal Medicine/Gastroenterology

Background: Advanced pancreatic ductal adenocarcinoma (PDAC) is characterized by progressive weight loss and nutritional deterioration. This wasting has been linked to poor survival outcomes, alterations in host defenses, decreased functional ability, and diminished health-related quality of life (HRQOL) in pancreatic cancer patients. There are currently no standardized approaches to the management of pancreatic cancer cachexia. This study explores the feasibility and efficacy of enteral tube feeding of a peptide-based formula to improve weight stability and patient-reported outcomes (PROs) in advanced PDAC patients with cachexia. Methods: This was a single-institution, single-arm prospective trial conducted between April 2015 and March 2019. Eligible patients were adults (>18 years) diagnosed with advanced or locally advanced PDAC and cachexia, defined as greater than 5% unexplained weight loss within 6 months from screening. The study intervention included three 28 day cycles of a semi-elemental peptide-based formula, administered through a jejunal or gastrojejunal feeding tube. The primary outcome was weight stability at 3 months (Cycle 3), defined as weight change less than 0.1 kg/baseline BMI unit from baseline. Secondary outcomes included changes in lean body mass, appendicular lean mass, bone mineral density, fat mass, and percent body fat, as measured with a DEXA scan, HRQOL (EORTC QLQC30) and NIH PROMIS PROs assessed at each cycle. Daily activity (steps, distance, active minutes, heart rate, and sleep) were remotely monitored using a wearable activity monitor (Fitbit) over the 3 month study period. Results: Thirty-six patients were screened for eligibility, 31 patients consented onto study and underwent jejunal tube placement, and 16 patients completed treatment: mean age 67 years (SD 9.3), 43.8% male. Among evaluable patients (n = 16), weight stability was achieved in 10 patients (62.5%), thus completing the trial early. Increases in lean body mass (1273.1, SD: 4078, P = 0.01) and appendicular lean mass (0.45, SD: 0.6, P = 0.02) were observed. Statistically significant improvements at Cycle 3 from baseline were also observed for QLQC30 role function [mean difference (MD): 20.1, P = 0.03], appetite (MD: 27.4, P = 0.02), and global health scores (MD: 13.3, P = 0.05) as well as for NIH PROMIS t-scores for depression (MD: -10.4, P = 0.006) and pain interference (MD: -7.5, P = 0.05). Objectively monitored (Fitbit) activity levels increased, although statistical significance was not reached. Conclusions: Our findings suggest that enteral nutrition support may improve weight stability, lean body mass, appendicular lean mass and PROs in PDAC patients with cachexia who completed treatment, representing a subsample of the study population. The feasibility and role of enteral feeding in routine care remain unclear, and larger and randomized controlled trials are warranted.

Grzywacz Ii VP, Lehrberg AV, **Quinn TJ**, **Dekhne NS**, **Dilworth JT** and Grzywacz VP, 2nd (2021). "Outcomes of patients with prior breast augmentation treated with breast conserving therapy." International Journal of Radiation Oncology, Biology, Physics 111(3): e222-e222.

Full Text

Department of Radiation Oncology

Department of Surgery

Purpose/Objective(s): There is a paucity of data regarding the use of whole breast irradiation (WBI) as part of breast conserving therapy (BCT) in women diagnosed with breast cancer who had undergone prior breast implant-based augmentation. In this population, we investigated various factors that impact radiation related toxicities, including the need for additional cosmetic surgery. Materials/Methods: A retrospective review was performed for a single institution, with queries done on health-system medical records, radiation therapy medical records, radiology mammography studies, and internal radiation therapy and toxicity databases.

We included patients with a prior history of breast implant-based augmentation who subsequently underwent BCT and WBI. Patient and treatment characteristics were collected and reported, and univariate analyses comparing factors correlating with toxicity endpoints were performed. Long-term cosmesis was assessed by the patient's radiation oncologist during routine follow-up visits via the Harvard grading criteria. Results: 35 patients treated at our institution between 2006 and 2020 were included in our analyses, with a median follow up time of 2.4 years. Of these, 28 were treated with conventionally fractionated WBI (1.8-2 Gy/Fx) and 7 were treated with hypofractionated WBI (2.66 Gy/Fx). Good/excellent long-term cosmesis was observed in 94% of all patients. 44% of patients ultimately needed additional cosmetic surgery at some point after radiation. Indications for additional surgery included capsular contracture (10), wound complications (2), implant rupture (1), volume loss (1), and asymmetry (1). Fourteen patients (50%) treated with conventionally fractionated WBI and one patient (14%) patient treated with hypofractionated WBI required additional surgery, but this difference was not significant on UVA (P = 0.12). Other factors found not to be significantly associated with rates of additional surgery included BMI, stage, the volume of the breast receiving 105% or 110% of the prescription dose, and presence or absence of bolus during treatment. No patients experienced local or regional recurrence. Conclusion: Patients with a prior history of breast implantation often experience good long-term cosmesis with a moderate risk of needing additional future surgery. The use of hypofractionated WBI was not associated with worse cosmetic outcome or an increase in need for additional cosmetic surgery.

Grzywacz VP, **Yan D**, Chen S, **Krauss DJ**, **Chen PY** and **Deraniyagala RL** (2021). "A novel approach to dose de-escalation in HPV-positive oropharyngeal chemoradiotherapy utilizing adaptive planning based on voxel-level FDG response." International Journal of Radiation Oncology Biology Physics 111(3): E404-E404.
Full Text
Department of Radiation Oncology

Guglielmo FF, Wells ML, Bruining DH, Strate LL, Huete Á, Gupta A, Soto JA, Allen BC, Anderson MA, Brook OR, Gee MS, Grand DJ, Gunn ML, Khandelwal A, Park SH, Ramalingam V, **Sokhandon F**, Yoo DC and Fidler JL (2021). "Gastrointestinal bleeding at CT angiography and CT enterography: Imaging atlas and glossary of terms." Radiographics 41(6): 1632-1656.
Full Text
Department of Diagnostic Radiology and Molecular Imaging

Gastrointestinal (GI) bleeding is a common potentially life-threatening medical condition frequently requiring multidisciplinary collaboration to reach the proper diagnosis and guide management. GI bleeding can be overt (eg, visible hemorrhage such as hematemesis, hematochezia, or melena) or occult (eg, positive fecal occult blood test or iron deficiency anemia). Upper GI bleeding, which originates proximal to the ligament of Treitz, is more common than lower GI bleeding, which arises distal to the ligament of Treitz. Small bowel bleeding accounts for 5-10% of GI bleeding cases commonly manifesting as obscure GI bleeding, where the source remains unknown after complete GI tract endoscopic and imaging evaluation. CT can aid in identifying the location and cause of bleeding and is an important complementary tool to endoscopy, nuclear medicine, and angiography in evaluating patients with GI bleeding. For radiologists, interpreting CT scans in patients with GI bleeding can be challenging owing to the large number of images and the diverse potential causes of bleeding. The purpose of this pictorial review by the Society of Abdominal Radiology GI Bleeding Disease-Focused Panel is to provide a practical resource for radiologists interpreting GI bleeding CT studies that reviews the

proper GI bleeding terminology, the most common causes of GI bleeding, key patient history and risk factors, the optimal CT imaging technique, and guidelines for case interpretation and illustrates many common causes of GI bleeding. A CT reporting template is included to help generate radiology reports that can add value to patient care. An invited commentary by Al Hawary is available online. Online supplemental material is available for this article.

Gulsin G, Tzimas G, Takagi H, Eddy R, Blanke P, Park P, Koweek L, Norgaard B, Rabbat M, Fairbairn T, **Chinnaiyan K**, Douglas P, Huey W, Matsuo H, Rønnow Sand NP, Nieman K, Bax J, Amano T, Kawasaki T and Akasaka T (2021). "Relationship between coronary CT angiography–derived fractional flow reserve and clinical outcomes in patients with and without diabetes." Journal of the American College of Cardiology 78(19): B164-B164.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Gulsin G, Tzimas G, Takagi H, Eddy R, Blanke P, Park P, Koweek L, Norgaard B, Rabbat M, Fairbairn T, **Chinnaiyan K**, Douglas P, Huey W, Matsuo H, Sand NPR, Nieman K, Bax J, Amano T, Kawasaki T, Akasaka T, Rogers C, Berman D, Patel M, De Bruyne B, Mullen S and Leipsic J (2021). "Relationship between coronary CT angiography-derived fractional flow reserve and clinical outcomes in patients with and without diabetes." Journal of the American College of Cardiology 78(19): B164-B164.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Haight MA, Bahner I, Belovich AN, Bonaminio G, Brenneman A, Brooks WS, Chinn C, El-Sawi N, Haudek SB, Ikonne U, **McAuley RJ**, McKell D, Rowe R, Slivkoff M, Taylor TAH and Vari RC (2021). "Strategies for promoting inclusivity in health sciences education." Medical Science Educator 31(6): 2121-2124.
Full Text
Department of Foundational Medical Studies (OU)

Halalau A, Imam Z, Karabon P, **Mankuzhy N**, Shaheen A, **Tu J** and **Carpenter C** (2021). "External validation of a clinical risk score to predict hospital admission and in-hospital mortality in COVID-19 patients." Annals of Medicine 53(1): 78-86.
Full Text
Department of Internal Medicine
OUWB Medical Student Author
Department of Internal Medicine/Infectious Disease

Background: Identification of patients with novel coronavirus disease 2019 (COVID-19) requiring hospital admission or at high-risk of in-hospital mortality is essential to guide patient triage and to provide timely treatment for higher risk hospitalized patients. Methods: A retrospective multi-centre (8 hospital) cohort at Beaumont Health, Michigan, USA, reporting on COVID-19 patients diagnosed between 1 March and 1 April 2020 was used for score validation. The COVID-19 Risk of Complications Score was automatically computed by the EHR. Multivariate logistic regression models were built to predict hospital admission and in-hospital mortality using individual variables constituting the score. Validation was performed using both discrimination and calibration. Results: Compared to Green scores, Yellow Scores (OR: 5.72) and Red Scores (OR: 19.1) had significantly higher odds of admission (both $p < .0001$). Similarly, Yellow Scores (OR: 4.73) and Red Scores (OR: 13.3) had significantly higher odds of in-hospital mortality than Green Scores (both $p < .0001$). The cross-validated C-Statistics for the external validation cohort showed good discrimination for both hospital admission (C = 0.79 (95% CI: 0.77-0.81)) and in-

hospital mortality (C = 0.75 (95% CI: 0.71-0.78)). Conclusions: The COVID-19 Risk of Complications Score predicts the need for hospital admission and in-hospital mortality patients with COVID-19. Key points: Can an electronic health record generated risk score predict the risk of hospital admission and in-hospital mortality in patients diagnosed with coronavirus disease 2019 (COVID-19)? In both validation cohorts of 2,025 and 1,290 COVID-19, the cross-validated C-Statistics showed good discrimination for both hospital admission (C = 0.79 (95% CI: 0.77-0.81)) and in-hospital mortality (C = 0.75 (95% CI: 0.71-0.78)), respectively. The COVID-19 Risk of Complications Score may help predict the need for hospital admission if a patient contracts SARS-CoV-2 infection and in-hospital mortality for a hospitalized patient with COVID-19.

Hamilton T, Macki M, Oh SY, Bazydlo M, Schultz L, Zakaria HM, Khalil JG, **Perez-Cruet M**, Aleem I, Park P, **Easton R**, Nerenz DR, Schwalb J, Abdulhak M and Chang V (2021). "The association of patient education level with outcomes after elective lumbar surgery: A Michigan Spine Surgery Improvement Collaborative study." Journal of Neurosurgery. ePub Ahead of Print.

Full Text

Department of Neurosurgery

Department of Orthopaedic Surgery

Objective: Socioeconomic factors have been shown to impact a host of healthcare-related outcomes. Level of education is a marker of socioeconomic status. This study aimed to investigate the relationship between patient education level and outcomes after elective lumbar surgery and to characterize any education-related disparities. Methods: The Michigan Spine Surgery Improvement Collaborative registry was queried for all lumbar spine operations. Primary outcomes included patient satisfaction determined by the North American Spine Society patient satisfaction index, and reaching the minimum clinically important difference of Patient-Reported Outcomes Measurement Information System Physical Function score and return to work up to 2 years after surgery. Multivariate Poisson generalized estimating equation models reported adjusted risk ratios. Results: A total of 26,229 lumbar spine patients had data available for inclusion in this study. On multivariate generalized estimating equation analysis all comparisons were done versus the high school (HS)/general equivalency development (GED)-level cohort. For North American Spine Society satisfaction scores after surgery the authors observed the following: at 90 days the likelihood of satisfaction significantly decreased by 11% ($p < 0.001$) among < HS, but increased by 1% ($p = 0.52$) among college-educated and 3% ($p = 0.011$) among postcollege-educated cohorts compared to the HS/GED cohort; at 1 year there was a decrease of 9% ($p = 0.02$) among < HS and increases of 3% ($p = 0.02$) among college-educated and 9% ($p < 0.001$) among postcollege-educated patients; and at 2 years, there was an increase of 5% ($p = 0.001$) among postcollege-educated patients compared to the < HS group. The likelihood of reaching a minimum clinically important difference of Patient-Reported Outcomes Measurement Information System Physical Function score at 90 days increased by 5% ($p = 0.005$) among college-educated and 9% ($p < 0.001$) among postcollege-educated cohorts; at 1 year, all comparison cohorts demonstrated significance, with a decrease of 12% ($p = 0.007$) among < HS, but an increase by 6% ($p < 0.001$) among college-educated patients and 14% ($p < 0.001$) among postcollege-educated compared to the HS/GED cohort; at 2 years, there was a significant decrease by 19% ($p = 0.003$) among the < HS cohort, an increase by 8% ($p = 0.001$) among the college-educated group, and an increase by 16% ($p < 0.001$) among the postcollege-educated group. For return to work, a significant increase was demonstrated at 90 days and 1 year when comparing the HS or less group with college or postcollege cohorts. Conclusions: This study demonstrated negative associations on all primary outcomes with lower levels of education. This finding suggests a potential disparity linked to education in elective spine

surgery.

Han D, Chen B, Gransar H, Achenbach S, Al-Mallah MH, Budoff MJ, Cademartiri F, Maffei E, Callister TQ, **Chinnaiyan K**, Chow BJW, DeLago A, Hadamitzky M, Hausleiter J, Kaufmann PA, Villines TC, Kim YJ, Leipsic J, Feuchtner G, Cury RC, Pontone G, Andreini D, Marques H, Rubinshtein R, Chang HJ, Lin FY, Shaw LJ, Min JK and Berman DS (2021). "Prognostic significance of plaque location in non-obstructive coronary artery disease: From the CONFIRM registry." European Heart Journal of Cardiovascular Imaging. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Aim: Obstructive coronary artery disease (CAD) in proximal coronary segments is associated with a poor prognosis. However, the relative importance of plaque location regarding the risk for major adverse cardiovascular events (MACE) in patients with non-obstructive CAD has not been well defined. Methods and Results: From the Coronary CT Angiography Evaluation for Clinical Outcomes: An International Multicenter (CONFIRM) registry, 4644 patients without obstructive CAD were included in this study. The degree of stenosis was classified as 0 (no) and 1-49% (non-obstructive). Proximal involvement was defined as any plaque present in the left main or the proximal segment of the left anterior descending artery, left circumflex artery, and right coronary artery. Extensive CAD was defined as segment involvement score of >4. During a median follow-up of 5.2 years (interquartile range 4.1-6.0), 340 (7.3%) MACE occurred. Within the non-obstructive CAD group (n = 2065), proximal involvement was observed in 1767 (85.6%) cases. When compared to non-obstructive CAD patients without proximal involvement, those with proximal involvement had an increased MACE risk (log-rank P = 0.033). Multivariate Cox analysis showed when compared to patients with no CAD, proximal non-obstructive CAD was associated with increased MACE risk [hazard ratio (HR) 1.90, 95% confidence interval (CI) 1.47-2.45, P < 0.001] after adjusting for extensive CAD and conventional cardiovascular risk factors; however, non-proximal non-obstructive CAD did not increase MACE risk (HR 1.26, 95% CI 0.79-2.01, P = 0.339). Conclusions: Independent of plaque extent, proximal coronary involvement was associated with increased MACE risk in patients with non-obstructive CAD. The plaque location information by coronary computed tomography angiography may provide additional risk prediction over CAD extent in patients with non-obstructive CAD.

Handelsman Y, Anderson JE, Bakris GL, Ballantyne CM, Beckman JA, Bhatt DL, Bloomgarden ZT, Bozkurt B, Budoff MJ, Butler J, Dagogo-Jack S, de Boer IH, DeFronzo RA, Eckel RH, Einhorn D, Fonseca VA, Green JB, **Grunberger G**, Guerin C, Inzucchi SE, Jellinger PS, Kosiborod MN, Kushner P, Lepor N, Mende CW, Michos ED, Plutzky J, Taub PR, Umpierrez GE, Vaduganathan M and Weir MR (2021). "DCRM multispecialty practice recommendations for the management of diabetes, cardiorenal, and metabolic diseases." Journal of Diabetes and its Complications: 108101.
Full Text
Department of Internal Medicine

Type 2 diabetes (T2D), chronic kidney disease (CKD), atherosclerotic cardiovascular disease (ASCVD), and heart failure (HF)-along with their associated risk factors-have overlapping etiologies, and two or more of these conditions frequently occur in the same patient. Many recent cardiovascular outcome trials (CVOTs) have demonstrated the benefits of agents originally developed to control T2D, ASCVD, or CKD risk factors, and these agents have transcended their primary indications to confer benefits across a range of conditions. This evolution in CVOT evidence calls for practice recommendations that are not constrained by a single discipline to help clinicians manage patients with complex conditions involving diabetes,

cardiorenal, and/or metabolic (DCRM) diseases. The ultimate goal for these recommendations is to be comprehensive yet succinct and easy to follow by the nonexpert-whether a specialist or a primary care clinician. To meet this need, we formed a volunteer task force comprising leading cardiologists, nephrologists, endocrinologists, and primary care physicians to develop the DCRM Practice Recommendations, a multispecialty consensus on the comprehensive management of the patient with complicated metabolic disease. The task force recommendations are based on strong evidence and incorporate practical guidance that is clinically relevant and simple to implement, with the aim of improving outcomes in patients with DCRM. The recommendations are presented as 18 separate graphics covering lifestyle therapy, patient self-management education, technology for DCRM management, prediabetes, cognitive dysfunction, vaccinations, clinical tests, lipids, hypertension, anticoagulation and antiplatelet therapy, antihyperglycemic therapy, hypoglycemia, nonalcoholic fatty liver disease (NAFLD) and nonalcoholic steatohepatitis (NASH), ASCVD, HF, CKD, and comorbid HF and CKD, as well as a graphical summary of medications used for DCRM.

Hanigan S, Kong XW, Haymart B, Kline-Rogers E, Kaatz S, Krol G, Shah V, Ali MA, **Almany S**, Kozlowski J, Froehlich J and Barnes G (2021). "Standard versus higher intensity anticoagulation for patients with mechanical aortic valve replacement and additional risk factors for thromboembolism." American Journal of Cardiology 159: 100-106.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Current guidelines recommend targeting an international normalized ratio (INR) of 2.5 to 3.5 for patients with mechanical aortic valve replacement (AVR) and additional risk factors for thromboembolic events. Available literature supporting the higher intensity (INR) goal is lacking. We aimed to evaluate the association of standard and higher intensity anticoagulation on outcomes in this patient population. The Michigan Anticoagulation Quality Improvement Initiative database was used to identify patients with mechanical AVR and at least one additional risk factor. Patients were classified into 2 groups based on INR goal: standard-intensity (INR goal 2.5) or higher-intensity (INR goal 3.0). Cox-proportional hazard model was used to calculate adjusted hazard ratios. One hundred and fortysix patients were identified of whom 110 (75.3%) received standard-intensity anticoagulation and 36 (24.7%) received higher intensity anticoagulation. Standard-intensity patients were older and more likely to be on aspirin. Atrial fibrillation was the most common additional risk factor for inclusion. The primary outcome of thromboembolic events, bleeding, or all-cause death was 13.9 and 19.5/100-person-years in the standard-intensity and higher intensity groups, respectively (adjusted HR 2.58, 95% confidence interval 1.28 to 5.18). Higher-intensity anticoagulation was significantly associated with any bleeding (adjusted HR 2.52, 95% confidence interval 1.27 to 5.00) and there were few thromboembolic events across both groups (5 events total). These results challenge current guideline recommendations for anticoagulation management of mechanical AVR in patients with additional risk factors.

Harrison HF, Kinsella EA, DeLuca S and **Loftus S** (2021). ""We know what they're struggling with": Student peer mentors' embodied perceptions of teaching in a health professional education mentorship program." Advances in Health Sciences Education. ePub Ahead of Print.
Full Text
Department of Foundational Medical Studies (OU)

This paper reports on a study of student peer mentorship in the context of nursing education in a higher education program in Canada. The study used an embodied hermeneutic

phenomenological methodology to investigate student peer mentors' perceptions of teaching during peer mentorship. The data were collected over one calendar year (2019) and involved analysis of 10 participants' interview data and their 'body maps,' produced in response to guided questions. Through the data analysis a core theme of 'commitment to mentee growth' was identified, along with seven interrelated themes: sharing responsibility for learning, moderating stress, mediating power relations, navigating unknown processes, valuing creative approaches, offering generous acceptance, and facilitating confidence. Student peer mentorship has the potential to contribute to health professions education in a number of unique ways including through embodied attunement, trusting intersubjective relations, and dialogic education. This study is innovative in its purposeful design and aim to investigate both cognitive and embodied perceptions of student peer mentors. The findings point to the promise of student peer mentorship for advancing health sciences education. Implications for peer mentorship program development in health professions education are discussed.

Hart J, Lu SP, Gasteratos K and **Chaiyasate K** (2021). "An unoperated Crouzon family treated with monobloc distraction: Challenges and lessons." Plastic and Reconstructive Surgery-Global Open 9(11): e3869.
Full Text
Department of Surgery

Background: Crouzon syndrome (CS) is a rare form of craniosynostosis characterized by bicoronal craniosynostosis and facial features including severe midface hypoplasia, exophthalmos, and hypertelorism. Most patients are diagnosed and treated in early childhood; however, there are a few reports of Crouzon patients treated as adults with monobloc facial advancement. To our knowledge, this is the first report of a family affected by CS treated sequentially with monobloc facial advancement using combined internal and external distraction osteogenesis (rigid external distraction). Methods: We present a family from Jamaica (mother 47 years old, older daughter 17, and younger daughter 9) who were brought to our craniofacial clinic with stigmata of CS and no previous surgical intervention. Patients had bicoronal craniosynostosis and exorbitism, with varying severity, sequelae, and comorbidities. Here, we delineate our technique of monobloc distraction osteogenesis with advancement osteotomies using dual "push-pull" method, elevation of a split anteriorly based tunneled pericranial flap to seal off nasal cavity, and internal and external distraction. Results: Our patients had favorable outcomes after reconstruction to reduce ocular symptoms and improve midface hypoplasia and aesthetic appearance. No intracranial injury, hardware/soft-tissue infection, hardware failure, or (new) loss of vision were encountered in 10 months follow-up. Conclusions: Dual "push-pull" monobloc distraction is safe and effective for a range of ages in CS; it allows good vector control, accommodates patient compliance, and allows early rigid external distraction device removal with sufficient time for consolidation. This surgery can be performed with highly satisfactory results.

Hazy AJ, **Saadat S**, **Krauss DJ**, **Dilworth JT**, **Stevens CW**, **Dixon S**, **Safian RD** and **Lee KC** (2021). "Clinical outcomes in patients undergoing coronary brachytherapy for restenosis of coronary vessels previously treated with drug eluting stents." International Journal of Radiation Oncology Biology Physics 111(3): E41-E41.
Full Text
OUWB Medical Student Author
Department of Radiation Oncology
Department of Internal Medicine/Cardiovascular DIsease

Heiner SM, Keihani S, McCormick BJ, Fang E, Hagedorn JC, Voelzke B, Nocera AP, Selph JP, Arya CS, Sensenig RL, Rezaee ME, Moses RA, Dodgion CM, Higgins MM, Gupta S, Mukherjee K, Majercik S, Smith BP, Glavin K, Broghammer JA, Schwartz I, Elliott SP, Breyer BN, Becerra CMC, Baradaran N, DeSoucy E, Zakaluzny S, Erickson BA, Miller BD, Santucci RA, Askari R, Carrick MM, **Burks FN**, Norwood S, Nirula R and Myers JB (2021). "Nephrectomy after high-grade renal trauma is associated with higher mortality: Results from the Multi-Institutional Genitourinary Trauma Study (MiGUTS)." Urology 157: 246-252.
Full Text
Department of Urology

Objective: To test the hypothesis that undergoing nephrectomy after high-grade renal trauma is associated with higher mortality rates. Methods: We gathered data from 21 Level-1 trauma centers through the Multi-institutional Genito-Urinary Trauma Study. Patients with high-grade renal trauma were included. We assessed the association between nephrectomy and mortality in all patients and in subgroups of patients after excluding those who died within 24 hours of hospital arrival and those with GCS≤8. We controlled for age, injury severity score (ISS), shock (systolic blood pressure <90 mmHg), and Glasgow Coma Scale (GCS). Results: A total of 1181 high-grade renal trauma patients were included. Median age was 31 and trauma mechanism was blunt in 78%. Injuries were graded as III, IV, and V in 55%, 34%, and 11%, respectively. There were 96 (8%) mortalities and 129 (11%) nephrectomies. Mortality was higher in the nephrectomy group (21.7% vs 6.5%, P <.001). Those who died were older, had higher ISS, lower GCS, and higher rates of shock. After adjusting for patient and injury characteristics nephrectomy was still associated with higher risk of death (RR: 2.12, 95% CI: 1.26-2.55). Conclusion: Nephrectomy was associated with higher mortality in the acute trauma setting even when controlling for shock, overall injury severity, and head injury. These results may have implications in decision making in acute trauma management for patients not in extremis from renal hemorrhage.

Herr DJ, Hochstedler K, Yin H, Dess RT, Matuszak MM, Grubb M, Dominello MM, Movsas B, Kestin LL, Bergsma DP, Dragovic AF, **Grills IS**, Hayman JA, Paximadis PA, Schipper M and Jolly S (2021). "Effect of education and standardization of cardiac dose constraints on heart dose in lung cancer patients receiving definitive radiation therapy scross a statewide consortium." International Journal of Radiation Oncology Biology Physics 111(3): S126-S126.
Full Text
Department of Radiation Oncology

Hinckel BB, Thomas D, Vellios EE, Hancock KJ, Calcei JG, Sherman SL, Eliasberg CD, Fernandes TL, Farr J, Lattermann C and Gomoll AH (2021). "Algorithm for treatment of focal cartilage defects of the knee: Classic and new procedures." Cartilage 13(1_suppl): 473s-495s.
Full Text
Department of Orthopaedic Surgery

Objective: To create a treatment algorithm for focal grade 3 or 4 cartilage defects of the knee using both classic and novel cartilage restoration techniques. Design: A comprehensive review of the literature was performed highlighting classic as well as novel cartilage restoration techniques supported by clinical and/or basic science research and currently being employed by orthopedic surgeons. Results: There is a high level of evidence to support the treatment of small to medium size lesions (<2-4 cm(2)) without subchondral bone involvement with traditional techniques such as marrow stimulation, osteochondral autograft transplant (OAT), or osteochondral allograft transplant (OCA). Newer techniques such as autologous matrix-induced

chondrogenesis and bone marrow aspirate concentrate implantation have also been shown to be effective in select studies. If subchondral bone loss is present OAT or OCA should be performed. For large lesions (>4 cm(2)), OCA or matrix autologous chondrocyte implantation (MACI) may be performed. OCA is preferred over MACI in the setting of subchondral bone involvement while cell-based modalities such as MACI or particulated juvenile allograft cartilage are preferred in the patellofemoral joint. Conclusions: Numerous techniques exist for the orthopedic surgeon treating focal cartilage defects of the knee. Treatment strategies should be based on lesion size, lesion location, subchondral bone involvement, and the level of evidence supporting each technique in the literature.

Hite A and **Alpiner N** (2021). "Reporting of concussion symptoms in high school aged athletes." PM & R 13: S13-S14.
Full Text
OUWB Medical Student Author
Department of Physical Medicine & Rehabilitation

Objective: This study sought to ascertain the prevalence of reporting concussion symptoms and continuing to play while experiencing symptoms in high school aged athletes. Design: The study design was a retrospective crosssectional approach. Setting: The survey employed a six-question online questionnaire. Participants: The population surveyed was Oakland University undergraduate students. Interventions: There were no interventions. Main Outcome Measures: This survey used five major measures of concussion symptomology (dizziness, headaches, confusion, nausea, and blacking out) in order to examine whether high school athletes are reporting and continuing to play with concussion symptoms. Results: Of the 433 students surveyed, 299 reported experiencing one or multiple concussion symptoms. Of those who reported symptoms, 37.29% were not communicated to a supervising adult and 76.09% continued to play while experiencing symptoms. This contrast was largest in the confusion symptom category: 53.12% of students did not tell a supervising adult and 37.60% continued playing while experiencing confusion. Additionally, when stratifying the data by sport, football players were more likely to experience concussion symptoms than participants of any other sport. Conclusions: Our study reveals that many of the symptoms of concussion are not being recognized by high school student athletes. Additionally, these athletes returned to play in spite of symptoms that would require a non-return to play concern. Our study demonstrates the importance of educating students on concussion symptoms and publicizes the statistics on the current status of concussion symptoms reporting in high school athletes.

Hudson MF, Strassels SA, Durham DD, Siddique S, Adler D, Yeung SJ, Bernstein SL, Baugh CW, Coyne CJ, Grudzen CR, Henning DJ, Klotz A, Madsen TE, Pallin DJ, Rico JF, Ryan RJ, Shapiro NI, **Swor R**, Venkat A, Wilson J, Thomas CR, Bischof JJ, Lyman GH and Caterino JM (2021). "Examining pain among non-Hispanic Black and non-Hispanic White patients with cancer visiting emergency departments: CONCERN (Comprehensive Oncologic Emergencies Research Network)." Academic Emergency Medicine. ePub Ahead of Print.
Full Text
Department of Emergency Medicine

Hull B, Karabon P and **Alpiner N** (2021). "Insufficient sleep following pediatric mild traumatic brain injury correlates with neurocognitive dysfunction." Annals of Neurology 90: S245-S246.
Full Text
OUWB Medical Student Author

Department of Physical Medicine and Rehabilitation

Hurse D, **Kemp K**, **Grogan J** and **Taylor Tracey AH** (2021). "Using what's at hand: The creation of an online microbiology outreach program." Journal of Microbiology & Biology Education 0(0): e00201-00221.
Full Text
Department of Foundational Medical Studies (OU)

Hussain A, Han E, Colvin R and **Al-Katib S** (2021). "Anomalous circumrenal inferior vena cava associated with horseshoe kidney." Cureus 13(10): e18797.
Full Text
Department of Diagnostic Radiology and Molecular Imaging

A 69-year-old male presented with periumbilical pain radiating across his abdomen, with associated nausea and emesis. CT imaging of his abdomen and pelvis revealed calculi in the right and left ureterovesical junctions with hydroureteronephrosis bilaterally. Furthermore, the imaging revealed that the patient had a horseshoe kidney with an associated anomalous inferior vena cava (IVC) that split superiorly to the horseshoe kidney at the L1 level and rejoined inferior to the horseshoe kidney at the L5 level. The IVC took on a "circumrenal" course, as it traversed the right kidney with an anterior and posterior portion. Furthermore, the patient's right ureter was compressed between the anterior portion of the IVC and the right kidney. We hypothesize that the development of the horseshoe kidney around the 7 to 8th week of gestation created a path of resistance for the forming of IVC around the same time. While surgical correction is not warranted, recognition of this circumrenal IVC variant could have major implications for planning of procedures, such as IVC filter placement.

Huynh KA, Cho HE, Yue ML, Wang L, Chung KC and Waljee JF (2021). "Patterns of upper extremity reconstruction for patients with tetraplegia across the United States: A retrospective study." Journal of Hand Surgery-American Volume 46(11): 952-+.
Full Text
OUWB Medical Student Author

Purpose: The rates of upper extremity reconstruction for patients with tetraplegia remain low. We performed a retrospective study to assess recent reconstruction rates and delineate factors associated with the occurrence of reconstruction. Methods: We examined the National Inpatient Sample database (2012-2017) for the rate of reconstruction for patients with tetraplegia. The details of provider distribution characteristics and neighborhood attributes were obtained from the American Medical Association Physician Masterfile and based on the area deprivation index, respectively. We calculated the mean reconstruction rate per year and generated multivariable logistic regression models to examine the influence of patient factors, hospital characteristics, and provider distribution on the odds of undergoing functional reconstruction for tetraplegia patients. Results: Among 404,660 encounters with patients with tetraplegia, only 1,430 (0.4%) patients underwent upper extremity reconstruction from 2012 to 2017, with a mean rate of 238 procedures per year. We identified 5,450 hand surgeons, 12,751 physiatrists, and 444 spinal cord injury specialists, with variation in their national distribution. A greater number of surgeons near SCIS was associated with increased probability of reconstruction (odds ratio [OR] 1.07, 95% confidence interval [CI] 1.03-1.12). The odds of surgery were greater for patients receiving care at urban teaching (OR 5.00, 95% CI 3.35-7.47) or urban nonteaching (OR 1.71, 95% CI 1.11-2.63) hospitals, whereas those at private nonprofit (OR 0.67, 95% CI 0.58-0.78) or investor-owned (OR 0.65, 95% CI 0.52-0.82) hospitals had lower odds.

Although most patients had insurance coverage, patients with a higher income or those who received subsidized care had greater odds of undergoing reconstruction. Conclusions: Reconstruction rates remain low and are correlated with the environment of care, financial factors, and provider availability. Policies that focus on reducing these factors in addition to increasing interspecialty collaboration could improve access to surgery for patients with tetraplegia.

Hyer DE, **Ding XF** and Rong Y (2021). "Proton therapy needs further technological development to fulfill the promise of becoming a superior treatment modality (compared to photon therapy)." Journal of Applied Clinical Medical Physics 22(11): 4-11.
Full Text
Department of Radiation Oncology

Ionescu F, Zimmer MS, Anusim N, **Huben MT**, Ahaneku HO, **Stender M** and **Jaiyesimi I** (2021). "Trends of venous thromboembolism prophylaxis in hospitalized sickle cell patients." Blood 138: 3088.
Full Text
Department of Internal Medicine/Hematology-Oncology

Introduction: The presence of hetero- (sickle trait) or homozygous (sickle disease) hemoglobin S gene is associated with increased risk of venous thromboembolism (VTE). However, sickle disease patients in particular are relatively young, lack common comorbid conditions that would qualify them for inpatient VTE prophylaxis (VTEP) and there are limited published data on trends of VTEP use in these populations. Methods: This was a retrospective analysis of all hospitalizations of sickle trait or disease adult medical patients occurring between January 2013 and December 2018 at three hospitals in Southeast Michigan, USA. Admissions for bleeding or thrombosis, requirement of intensive care stay or surgery, those occurring within 45 days of orthopedic surgery, as well as all patients already on anticoagulation or with known hypercoagulable states were excluded. Hospitalized controls were matched for race, age, sex and length of stay. Trends of VTEP use and predictive patient factors over multiple admissions were modeled using generalized estimating equations. Results: There were 803 sickle trait (525 patients; mean age 43 ± 19; 85% female) and 1020 sickle disease admissions (262 patients; mean age 34 ± 13; 57% female); all patients were Black. The percentage of hospitalizations in which subjects were offered any VTEP was similar to that of controls in both groups of interest (Figure); however, there were more encounters in which patients received greater than 50% of expected VTEP doses in the sickle trait (80% vs 51%; p<0.01) and in the sickle disease group (57% vs 45%; p<0.01). In multivariate analysis, compared to controls, odds of being offered VTEP were similar with sickle trait genotype (adjusted odds ratio [aOR] 0.78; p=0.15), but were higher with sickle disease genotype (aOR 1.45; p=0.02). Increasing age and longer hospital stay were also positive predictors. Within the sickle disease hospitalizations, odds of VTEP use showed significant variability with treatment site (aOR 1.87; p<0.01), whereas comorbid conditions, including a history of VTE prior to admission, or hemoglobin measurement and platelet count on admission did not predict VTEP use. By contrast, in exploring sickle trait admissions, there was no impact of treatment site, but obesity (aOR 1.83; p<0.01), tobacco abuse (aOR 1.64; p=0.03), heart failure (aOR 2.17; p=0.01), prior VTE (aOR 2.22; p=0.07), as well as higher admission hemoglobin (aOR 1.18 per 1 g/dL increase; p<0.01) and platelet count (aOR 1.01 per 10 3 increase; p=0.03) raised the odds of VTEP being offered. Conclusions: VTEP is underused in sickle trait and disease patients. There may be a trend towards offering more VTEP in sickle disease, but not in sickle trait, where the decision is driven by comorbid conditions rather than hemoglobin genotype. Patient refusal does not appear to play a major role, but the finding of

significant inter-center variability suggests provider education may result in improved use as hemoglobin genotype is currently not part of risk stratification tools that help clinicians decide on inpatient VTEP.

Ionescu F, Zimmer MS, Petrescu I, **Castillo E**, **Bozyk P**, **Abbas A**, Abplanalp L, Dogra S and **Nair GB** (2021). "Extubation failure in critically ill COVID-19 patients: Risk factors and impact on in-hospital mortality." Journal of Intensive Care Medicine 36(9): 1018-1024.
Full Text
Department of Radiation Oncology
Department of Internal Medicine/Pulmonary & Critical Care Medicine
Department of Internal Medicine/Cardiovascular Disease

Purpose: We sought to identify clinical factors that predict extubation failure (reintubation) and its prognostic implications in critically ill COVID-19 patients. Materials and Methods: Retrospective, multi-center cohort study of hospitalized COVID-19 patients. Multivariate competing risk models were employed to explore the rate of reintubation and its determining factors. Results: Two hundred eighty-one extubated patients were included (mean age, 61.0 years [±13.9]; 54.8% male). Reintubation occurred in 93 (33.1%). In multivariate analysis accounting for death, reintubation risk increased with age (hazard ratio [HR] 1.04 per 1-year increase, 95% confidence interval [CI] 1.02 -1.06), vasopressors (HR 1.84, 95% CI 1.04-3.60), renal replacement (HR 2.01, 95% CI 1.22-3.29), maximum PEEP (HR 1.07 per 1-unit increase, 95% CI 1.02 -1.12), paralytics (HR 1.48, 95% CI 1.08-2.25) and requiring more than nasal cannula immediately post-extubation (HR 2.19, 95% CI 1.37-3.50). Reintubation was associated with higher mortality (36.6% vs 2.1%; P < 0.0001) and risk of inpatient death after adjusting for multiple factors (HR 23.2, 95% CI 6.45-83.33). Prone ventilation, corticosteroids, anticoagulation, remdesivir and tocilizumab did not impact the risk of reintubation or death. Conclusions: Up to 1 in 3 critically ill COVID-19 patients required reintubation. Older age, paralytics, high PEEP, need for greater respiratory support following extubation and non-pulmonary organ failure predicted reintubation. Extubation failure strongly predicted adverse outcomes.

Ivanic MG, Ahn GS, **Herndon P** and Wu JJ (2021). "Update on biologics for psoriasis in clinical practice." Cutis 108(2): 15-18.
Full Text
OUWB Medical Student Author

Biologics have impacted the clinical management of moderate to severe psoriasis. This review article highlights new data findings from phase 3 clinical trials (N=8) published between May 2020 and February 2021. Data on the efficacy of US Food and Drug Administration-approved biologics for treating psoriasis affirms durable skin clearance in the presence of comorbidities and after treatment gaps. This article aims to provide clinicians with up-to-date knowledge on biologic performance focusing on skin disease clearance, time to skin disease clearance, loss of response and relapse, and treatment-emergent adverse events (TEAEs). Recent trial data in this review focus on treatment with IL-17A inhibitors and IL-23 inhibitors.

Jagsi R, Griffith KA, Moran JM, Matuszak MM, Marsh R, Grubb M, Abu-Isa E, **Dilworth JT**, Dominello MM, Heimburger D, Lack D, Walker EM, Hayman JA, Vicini F and Pierce LJ (2021). "Comparative effectiveness analysis of 3D-conformal radiation therapy versus Intensity Modulated Radiation Therapy (IMRT) in a prospective multicenter cohort of patients with breast cancer." International Journal of Radiation Oncology Biology Physics. ePub Ahead of Print.
Full Text

Department of Radiation Oncology

Purpose: Simple intensity modulation of radiation therapy reduces acute toxicity compared with 2-dimensional techniques in adjuvant breast cancer treatment, but it remains unknown whether more complex or inverse-planned intensity modulated radiation therapy (IMRT) offers an advantage over forward-planned, 3-dimensional conformal radiation therapy (3DCRT). Methods and Materials: Using prospective data regarding patients receiving adjuvant whole breast radiation therapy without nodal irradiation at 23 institutions from 2011 to 2018, we compared the incidence of acute toxicity (moderate-severe pain or moist desquamation) in patients receiving 3DCRT versus IMRT (either inverse planned or, if forward-planned, using ≥5 segments per gantry angle). We evaluated associations between technique and toxicity using multivariable models with inverse-probability-of-treatment weighting, adjusting for treatment facility as a random effect. Results: Of 1185 patients treated with 3DCRT and conventional fractionation, 650 (54.9%) experienced acute toxicity; of 774 treated with highly segmented forward-planned IMRT, 458 (59.2%) did; and of 580 treated with inverse-planned IMRT, 245 (42.2%) did. Of 1296 patients treated with hypofractionation and 3DCRT, 432 (33.3%) experienced acute toxicity; of 709 treated with highly segmented forward-planned IMRT, 227 (32.0%) did; and of 623 treated with inverse-planned IMRT, 164 (26.3%) did. On multivariable analysis with inverse-probability-of-treatment weighting, the odds ratio for acute toxicity after inverse-planned IMRT versus 3DCRT was 0.64 (95% confidence interval, 0.45-0.91) with conventional fractionation and 0.41 (95% confidence interval, 0.26-0.65) with hypofractionation. Conclusions: This large, prospective, multicenter comparative effectiveness study found a significant benefit from inverse-planned IMRT compared with 3DCRT in reducing acute toxicity of breast radiation therapy. Future research should identify the dosimetric differences that mediate this association and evaluate cost-effectiveness.

Jagsi R, Griffith KA, Vicini FA, Abu-Isa E, Bergsma D, Bhatt A, **Dilworth JT**, Dominello M, Franklin S, Heimburger DK, Kaufman I, Kocheril PG, Kretzler AE, Paximadis P, Radawski JD, Walker EM and Pierce L (2021). "Disease control after hypofractionation versus conventional fractionation for triple negative breast cancer: Comparative effectiveness in a large observational cohort." International Journal of Radiation Oncology Biology Physics. ePub Ahead of Print.

Full Text

Department of Radiation Oncology

Purpose: Questions remain about whether moderately hypofractionated whole-breast irradiation is appropriate for patients with triple-negative breast cancer. Methods and Materials: Using the prospective database of a multicenter, collaborative quality improvement consortium, we identified patients with node-negative, triple-negative breast cancer who received whole-breast irradiation with either moderate hypofractionation or conventional fractionation. Using inverse probability of treatment weighting (IPTW), we compared outcomes using the Kaplan-Meier product-limit estimation method with Cox regression models estimating the hazard ratio for time-to-event endpoints between groups. Results: The sample included 538 patients treated at 18 centers in 1 state in the United States, of whom 307 received conventionally fractionated whole-breast irradiation and 231 received moderately hypofractionated whole-breast irradiation. The median follow-up time was 5.0 years (95% confidence interval [CI], 4.77-5.15 years). The 5-year IPTW estimates for freedom from local recurrence were 93.6% (95% CI, 87.8%-96.7%) in the moderate hypofractionation group and 94.4% (95% CI, 90.3%-96.8%) in the conventional fractionation group. The hazard ratio was 1.05 (95% CI, 0.51-2.17; P = .89). The 5-year IPTW estimates for recurrence-free survival were 87.8% (95% CI, 81.0%-92.4%) in the moderate hypofractionation group and 88.4% (95% CI 83.2%-92.1%) in the conventional

fractionation group. The hazard ratio was 1.02 (95% CI, 0.62-1.67; P = .95). The 5-year IPTW estimates for overall survival were 96.6% (95% CI, 92.0%-98.5%) in the moderate hypofractionation group and 93.4% (95% CI, 88.7%-96.1%) in the conventional fractionation group. The hazard ratio was 0.65 (95% CI, 0.30-1.42; P = .28). Conclusions: Analysis of outcomes in this large observational cohort of patients with triple-negative, node-negative breast cancer treated with whole-breast irradiation revealed no differences by dose fractionation. This adds evidence to support the use of moderate hypofractionation in patients with triple-negative disease.

Jahshan A, **Aoun M**, **Dekhou A** and **Folbe A** (2021). "The underrepresentation of women and ethnic minorities in anesthesiology." Journal of the National Medical Association. ePub Ahead of Print.
Full Text
OUWB Medical Student Author
Department of Surgery

Purpose: Diversity is crucial in the medical field, where patients have a significantly wide range of ethnic and racial backgrounds. With the increase in diversity in medical school and the growing list of subspecialties in medicine, we would expect to see a rise in diversity in the field of anesthesiology. The purpose of this study is to analyze the representation of gender and underrepresented minorities in anesthesiology residency programs from 2013 through 2019. Methods: To study the ethnic, racial and gender diversity in residents in the field of anesthesiology, data was analyzed from the self-reported data collected in the Journal of the American Medical Association annual report on Graduate Medical Education over the academic period from 2013 through 2019. Results: In 2013, female trainees made up 36.0% and Black trainees encompassed 5.9% whereas in 2019, female trainees comprised a mere 33.0% of total anesthesiology residents while Black trainees decreased to 5.5%. Conclusion: This study illustrates the disparity in the demographic composition of anesthesiology trainees and emphasizes the importance of having a more diverse workforce in the field of anesthesiology.

Jewulski J, Khanal S and Dahal K (2021). "Coronary vasospasm: A narrative review." World Journal of Cardiology 13(9): 456-463.
Full Text
OUWB Medical Student Author

Coronary artery vasospasm (CAVS) plays an important role in acute chest pain syndrome caused by transient and partial or complete occlusion of the coronary arteries. Pathophysiology of the disease remains incompletely understood, with autonomic and endothelial dysfunction thought to play an important role. Due to the dynamic nature of the disease, its exact prevalence is not entirely clear but is found to be more prevalent in East Asian and female population. Cigarette smoking remains a prominent risk factor, although CAVS does not follow traditional coronary artery disease risk factors. Many triggers continue to be identified, with recent findings identifying chemotherapeutics, allergens, and inflammatory mediators as playing some role in the exacerbation of CAVS. Provocative testing with direct visualization is currently the gold-standard for diagnosis, but non-invasive tests, including the use of biomarkers, are being increasingly studied to aid in the diagnosis. Treatment of the CAVS is an area of active research. Apart from risk factor modification, calcium channel blockers are currently the first line treatment, with nitrates playing an important adjunct role. High-risk patients with life-threatening complications should be considered for implantable cardioverter defibrillator (ICD), although timing criteria for escalated therapy require further investigation. The role of pharmaceuticals targeting oxidative stress remains incompletely understood.

Jianhui H, Bartels CM, Rovin RA, **Lamb LE**, Kind AJH and Nerenz DR (2021). "Race, ethnicity, neighborhood characteristics, and in-hospital Coronavirus Disease-2019 mortality." Medical Care 59(10): 888-892.
Full Text
Department of Urology

Jin ML, **Brown MM**, Patwa D, Nirmalan A and Edwards PA (2021). "In Brief." Current Problems in Surgery 58(12): 100987.
Full Text
OUWB Medical Student Author

Kahana A, Bartley K, Meyer CS, Seetasith A, Lee J and McKenna E (2021). "Healthcare resource utilization and cost of care in patients with periocular basal cell carcinoma: A real-world study." American Journal of Ophthalmology 236: 164-171.
Full Text
Department of Ophthalmology

Purpose: To date, there are no studies on healthcare resource utilization (HRU) and costs for treating periocular basal cell carcinoma (pBCC). We investigated real-world HRU and costs of patients with limited versus extensive pBCC. DESIGN: This was a retrospective cost analysis. Methods: Administrative claims database was mined for basal cell carcinoma (BCC)-related claims from January 2011 to December 2018. Patients had ≥1 inpatient or ≥2 outpatient nondiagnostic claims for pBCC ≥30 days apart, ≥6 months of continuous enrollment in a health plan before the index date, and ≥18 months of continuous enrollment after the index date. Patients were categorized by disease severity (limited or extensive) using Current Procedural Terminology codes. A total of 1368 patients were propensity matched 1:1 for limited and extensive pBCC (n = 684 each). Outcomes were cost and HRU measures during the 18-month follow-up period. Results: Patients with extensive disease had a higher number of outpatient visits (32.47 vs 28.81; P < .0001), radiation therapies (0.53 vs 0.17; P = .001), surgeries (1.82 vs 1.24; P < .001), days between first and last surgery (40.82 vs 16.51 days; P < .001), outpatient pBCC claims (3.89 vs 3.38; P < .001), and days between pBCC claims (170.43 vs 144.01 days; P < .001). Patients with extensive disease incurred higher total all-cause costs ($36,986.10 vs $31,893.13; P = .02), outpatient costs ($20,450.26 vs $16,885.87; P = .005), radiation therapy costs ($314.28 vs $89.81; P = .01), and surgery costs ($3,697.08 vs $2,585.80; P < .001) than patients with limited disease. Conclusions: Patients with extensive pBCC incurred higher costs, greater HRU, and longer time between first and last surgery versus patients with limited pBCC. Early diagnosis and early treatment of pBCC have economic benefits.

Kaňovský P, Heinen F, Schroeder AS, Chambers HG, **Dabrowski E**, Geister TL, Hanschmann A, Martinez-Torres FJ, Pulte I, Banach M and Gaebler-Spira D (2021). "Safety and efficacy of repeat long-term incobotulinumtoxinA treatment for lower limb or combined upper/lower limb spasticity in children with cerebral palsy." Journal of Pediatric Rehabilitation Medicine. ePub Ahead of Print.
Full Text
Department of Physical Medicine & Rehabilitation

Purpose: The open-label phase 3 'Treatment with IncobotulinumtoxinA in Movement Open-Label' (TIMO) study investigated longer-term safety and efficacy of incobotulinumtoxin A in children/adolescents with cerebral palsy (CP). Methods: Patients on standard treatment, with unilateral or bilateral lower limb (LL) or combined upper limb (UL)/LL spasticity received four

incobotulinumtoxinA injection cycles (16 or 20 Units/kg bodyweight total [maximum 400 or 500 Units] per cycle depending on ambulatory status/clinical pattern treated), each followed by 12-16 weeks' observation. Treatment for pes equinus was mandatory; flexed knee or adducted thigh were options for unilateral treatment and/or ULs for unilateral/bilateral treatment. The primary endpoint was safety; changes in Ashworth Scale and Gross Motor Function Measure-66 scores, and Global Impression of Change Scale scores at week 4 of each injection cycle were also evaluated. Results: IncobotulinumtoxinA (≤500 Units for ≤98 weeks) was safe, well-tolerated, and effective across all endpoints for multipattern treatment of LL and combined LL/UL spasticity in ambulant/nonambulant children/adolescents with CP. Treatment effects increased with each injection cycle. No new/unexpected safety concerns were identified. Conclusion: IncobotulinumtoxinA showed a good safety and tolerability profile, with efficacy over multiple clinical presentations. As an adjunct treatment, it offers an effective, individualized treatment option for pediatric CP-related spasticity.

Kassamali B, Desai S, Min MS, Mazori DR, Villa-Ruiz C, **Kus KJB**, Cobos GA, Merola J, LaChance A and Vleugels RA (2021). "OnabotulinumtoxinA for systemic sclerosis-associated Raynaud's Phenomenon: A multi-institutional study on accessibility and effectiveness." Journal of Drugs in Dermatology 20(11): 1257-1259.
Full Text
OUWB Medical Student Author

Kelsch R, **Saon M**, **Sutherland E**, **Tech K** and **Al-Katib S** (2021). "Discrepant reporting style preferences between clinicians and radiologists." Current Problems in Diagnostic Radiology 50(6): 779-783.
Full Text
OUWB Medical Student Author
Department of Diagnostic Radiology and Molecular Imaging

Rationale and Objectives: To compare preferences in reporting styles between radiologists and clinicians in structured vs unstructured reporting styles in order to facilitate better communication. Methods: An online survey was distributed to 5280 clinicians, radiologists, and physicians in training surveying respondent preference for three different reporting styles: expanded structured, minimized structured, and unstructured. Results: A 7.5% response rate was achieved. Overall, the expanded structured reporting style was the most preferred (47%, 186/394). This contrasted with radiologists who preferred the unstructured reporting style (41%), whereas nonradiologists preferred the expanded structured reporting style (51%; $P < 0.001$). There was significance in emergency medicine physicians preferring the minimized structured reporting style (51%, 27/43), whereas all other specialties preferred the expanded structured report (49%, 168/341; $P = 0.0038$). Discussion: There is a discrepant reporting style preference between clinicians and radiologists. A structured reporting style with expanded standard statements is preferred by most physicians. Radiologists could consider using a structured reporting style with minimized normal statements in the emergency room setting.

Kelsch RD, **Silbergleit R** and **Krishnan A** (2021). "Neuroimaging in the first 6 weeks of the COVID-19 pandemic in an 8-hospital campus: Observations and patterns in the brain, head and neck, and spine." Journal of Computer Assisted Tomography 45(4): 592-599.
Full Text
Department of Diagnostic Radiology and Molecular Imaging

Objective: The aim of the study was to aggregate neuroradiological findings in patients with coronavirus disease 2019 (COVID-19) in the brain, head and neck, and spine to identify trends

and unique patterns. Methods: A retrospective review of neuroimaged COVID-19 patients during a 6-week surge in our 8-hospital campus was performed. The brain imaging with reported acute or subacute infarction, intraparenchymal hemorrhage, and all neck examinations were reinterpreted by 2 reviewers. Results: Six hundred seventy-one patients met criteria and were reviewed. Acute or subacute infarction was seen in 39 (6%), intraparenchymal hemorrhage in 14 (2%), corpus callosum involvement in 7, and thalamus in 5 patients. In spine and neck studies, lung opacities and adenopathy were seen in 46 and 4 patients, respectively. Conclusions: Infarction followed by intraparenchymal hemorrhage was the most common acute findings in the brain with frequent involvement of the corpus callosum and thalami. In the neck, lung abnormalities were frequently present, and adenopathy was almost always associated with a second pathology.

Kemp K (2021). "Test corrections appear to benefit lower-achieving students in an introduction to biology major course: Results of a single-site, one-semester study." Journal of Microbiology & Biology Education 22(2).
Full Text
Department of Foundational Medical Studies (OU)

Student-performed assessment correction is a well-established practice in the field of teaching and learning. This practice engages students in the feedback process and promotes active learning, which may be particularly important when serving underrepresented minority students. There is a dearth of research into the role of assessment correction in student learning outcomes (SLOs) in science courses, particularly at minority-serving institutions. Students at a Native American-serving, primarily undergraduate rural institution were allowed to perform test corrections for each of the three exams given during the term in an undergraduate introductory biology course. Students received the graded test back and were given 1 week to answer the following questions: what was your original answer, why did you choose that answer/what were you thinking at the time, why is the answer wrong, what is the correct answer, why is it the correct answer, and what is your source of reference if different from the textbook? The students were administered a comprehensive final exam at the end of the course that determined the number of SLOs passed. A Pearson correlation and a bivariate regression analysis were performed to determine if the number of test corrections performed (TC) during the term influenced the number of SLOs passed for all students, lower-achieving students, and higher-achieving students in the study. The TC correlated with, and could predict, SLOs passed for lower-achieving students only. This preliminary analysis suggests that performing test corrections may benefit lower-achieving students.

Kemp K, Swanberg SM, **Kamel-Elsayed S**, **Grogan J**, Williams T and Reed-Hendon C (2021). "Addressing projected healthcare and STEM profession needs through a regional summer pipeline program." Journal of STEM Education: Innovations and Research 22(4): 2510.
Full Text
Department of Foundational Medical Studies (OU)

Pipeline programs in health and biomedical sciences have gained attention as students who engage in these programs are more likely to enter into associated fields. In 2012, in an effort to support the mission of [school name], the Future Physicians Summer Enrichment Program (FPSEP) was launched for regional high school students. Recently, a program review was performed to determine if the program was meeting its goals to: 1. increase diversity and inclusion in medicine; 2. serve the needs of the community; and 3. increase the number of students entering the medical and biomedical sciences pipeline. Program structure, participant

demographics and analysis of surveys administered to past participants indicate that the program is meeting its goals and supporting the mission of the medical school. The results of this analysis, areas for improvement, strengths of the program, and solutions to refine the program are presented in this article. Keywords: pipeline programs, high school students, medical schools, program evaluation

Kishan AU, Wong JK, Merrick GS, Tran PT, Demanes DJJ, Stish BJ, **Krauss DJ**, Wedde T, Lilleby W, Stock RG, Horwitz EM, Steinberg ML, Tendulkar RD, Moran BJ, Tward JD, Martinez-Monge R, Berlin A, Spratt DE, Dess RT and Romero T (2021). "The relationship between androgen deprivation therapy duration and external beam radiotherapy with or without a brachytherapy boost in high-risk prostate cancer." International Journal of Radiation Oncology Biology Physics 111(3): S76-S77.
Full Text
Department of Radiation Oncology

Klotz AD, Caterino JM, Durham D, Rico JF, Pallin DJ, Grudzen CR, McNaughton C, Marcelin I, Abar B, Adler D, **Bastani A**, Bernstein SL, Bischof JJ, Coyne CJ, Henning DJ, Hudson MF, Lyman GH, Madsen TE, Reyes-Gibby CC, Ryan RJ, Shapiro NI, Swor R, Thomas CR, Venkat A, Wilson J, Yeung SCJ, Yilmaz S, Stutman R and Baugh CW (2021). "Observation unit use among patients with cancer following emergency department visits: Results of a multicenter prospective cohort from CONCERN." Academic Emergency Medicine. ePub Ahead of Print.
Full Text
Department of Emergency Medicine

Purpose: Emergency department (ED) visits by patients with cancer frequently end in hospitalization. As concerns about ED and hospital crowding increase, observation unit care may be an important strategy to deliver safe and efficient treatment for eligible patients. In this investigation, we compared the prevalence and clinical characteristics of cancer patients who received observation unit care with those who were admitted to the hospital from the ED. Methods: We performed a multicenter prospective cohort study of patients with cancer presenting to an ED affiliated with one of 18 hospitals of the Comprehensive Oncologic Emergency Research Network (CONCERN) between March 1, 2016 and January 30, 2017. We compared patient characteristics with the prevalence of observation unit care usage, hospital admission, and length of stay. Results: Of 1051 enrolled patients, 596 (56.7%) were admitted as inpatients, and 72 (6.9%) were placed in an observation unit. For patients admitted as inpatients, 23.7% had a length of stay <= 2 days. The conversion rate from observation to inpatient was 17.1% (95% CI 14.6-19.4) among those receiving care in an observation unit. The average observation unit length of stay was 14.7 h. Patient factors associated ED disposition to observation unit care were female gender and low Charlson Comorbidity Index. Conclusion: In this multicenter prospective cohort study, the discrepancy between observation unit care use and short inpatient hospitalization may represent underutilization of this resource and a target for process change.

Kohli U, Desai L, Chowdhury D, Harahsheh AS, Yonts AB, Ansong A, Sabati A, Nguyen HH, Hussain T, Khan D, Parra DA, Su JA, Patel JK, Ronai C, Bohun M, **Freij BJ**, O'Connor MJ, Rosanno JW, Gupta A, Salavitabar A, Dorfman AL, Hansen J, Frosch O, Profita EL, Maskatia S, Thacker D, Shrivastava S, Harris T, Feingold B, Berger S, Campbell M, Idriss SF, Das S, Renno MS, Knecht K, Asaki SY, Patel S, Ashwath R, Shih R, Phillips J, Das B, Ramachandran P, Sagiv E, Bhat AH, Johnson JN, Taggart N, Imundo J, Nakra N, Behere S, Patel A, Agarwal A, Aljemmali S, Lang S, Batlivala S, Forsha DE, Conners GP, Shaw J, Smith FC, Pauliks L, Vettukattil J, Shaffer K, Cheang S, Voleti S, Shenoy R, Komarlu R, Ryan SJ, Snyder C, Bansal N, Sharma M,

Robinson J, Arnold SR, Salvatore CM, Kumar M, Fremed M, Glickstein JS, Perrotta M, Orr W, Rozema T, Thirumoorthi M, Mullett CJ and Ang JY (2021). "mRNA Coronavirus-19 vaccine-associated myopericarditis in adolescents: A survey study." Journal of Pediatrics. ePub Ahead of Print.
Full Text
Department of Pediatrics

In this survey study of institutions across the US, marked variability in evaluation, treatment, and follow-up of adolescents 12 through 18 years of age with mRNA COVID-19 vaccine-associated myopericarditis (VAM) was noted. Only one adolescent with life-threatening complications was reported with no deaths at any of the participating institutions.

Koreckij T, Kreiner S, **Khalil JG**, Smuck M, Markman J and Garfin S (2021). "Prospective, randomized, multicenter study of intraosseous basivertebral nerve ablation for the treatment of chronic low back pain: 24-Month treatment arm results." North American Spine Society Journal 8: 100089.
Full Text
Department of Orthopaedic Surgery

Background: Vertebral endplates, innervated by the basivertebral nerve, can be a source of vertebrogenic low back pain when damaged with inflammation, visible as types 1 or 2 Modic changes. A randomized controlled trial (RCT) compared basivertebral nerve ablation (BVNA) to standard care (SC) showed significant differences between arms at 3 and 6-months. At 12-months, significant improvements were sustained for BVNA. We report results of the BVNA arm at 24-months. Methods: Prospective, open label, single-arm follow-up of the BVNA treatment arm of a RCT in 20 US sites with visits at 6-weeks, and 3, 6, 9, 12 and 24-months. Paired comparisons to baseline were made for the BVNA arm at each timepoint for Oswestry Disability Index (ODI), Visual Analog Scale (VAS), Short Form Health Survey (SF-36), EQ-5D-5L, and responder rates. Results: 140 patients were randomized, 66 to BVNA. In the 58 BVNA patients completing a 24-month visit, 67% had back pain for >5 years, 36% were actively taking opioids at baseline, 50% had prior epidural steroid injections, and 12% had prior low back surgery. Improvements in ODI, VAS, SF-36 PCS, and EQ-5D-5L were statistically significant at all timepoints through 2 years. At 24 months, ODI and VAS improved 28.5±16.2 points (from baseline 44.5; $p < 0.001$) and 4.1±2.7 cm (from baseline 6.6; $p < 0.001$), respectively. A combined responder rate of ODI≥15 and VAS≥2 was 73.7%. A ≥50% reduction in pain was reported in 72.4% of patients and 31.0% were pain-free at 2 years. At 24 months, only 3(5%) of patients had BVNA-level steroid injections, and 62% fewer patients were actively taking opioids. There were no serious device or device-procedure related adverse events reported through 24 months. Conclusion: Intraosseous BVNA demonstrates an excellent safety profile and significant improvements in pain, function, and quality of life that are sustained through 24 months in patients with chronic vertebrogenic low back pain.

Kumar M, **Harvey RN**, **Fatima A**, Osei SK, Menning A, **Stallion A** and **Novotny NM** (2021). "Nutritional impact of medical management and operation in responsive and refractory ulcerative colitis in children." Journal of the American College of Surgeons 233(5): S187-S187.
Full Text
OUWB Medical Student Author
Department of Pediatrics
Department of Surgery

Kumar M, **Long GW**, Major M, Gates E, Studzinski DM, Callahan RE, **Brown OW** and **Welsh RJ** (2021). "Predictors of mortality in nonagenarians undergoing abdominal aortic aneurysm repair: Analysis of the

National Surgical Quality Improvement Program dataset." Journal of Vascular Surgery. ePub Ahead of Print.
Full Text
Department of Surgery

Background: The present study used the American College of Surgeons National Surgical Quality Improvement Program dataset to identify the predictors of 30-day mortality for nonagenarians undergoing endovascular aortic aneurysm repair (EVAR) or open surgical repair (OSR). Methods: Patients aged >90 years who had undergone abdominal aortic aneurysm repair from 2005 to 2017 were identified using procedure codes. Those with operative times <15 minutes were excluded. The demographics, preoperative comorbidities, and postoperative complications of those who had died by 30 days were compared with those of the patients alive at 30 days. Results: A total of 1356 nonagenarians met the criteria: 1229 (90.6%) had undergone EVAR and 127 (9.4%) had undergone OSR. The overall 30-day mortality was 10.4%. The patients who had died within 30 days were significantly more likely to have undergone OSR than EVAR (40.9% vs 7.2%; P < .001). They also had a greater incidence of dependent functional status (22.0% for those who had died vs 8.1% for those alive at 30 days; P < .001), American Society of Anesthesiology (ASA) classification of ≥4 (81.2% vs 18.8%; P < .001), perioperative blood transfusion (59.6% vs 20.3%; P < .001), postoperative pneumonia (12.1% vs 2.9%; P = .001), mechanical ventilation >48 hours (22.7% vs 2.6%; P < .001), and acute renal failure (12.1% vs 0.5%; P < .001). The EVAR group had a 30-day mortality rate of 2.6% in 1008 elective cases and 28.6% in 221 emergent cases. The OSR group had a 30-day mortality rate of 19.1% in 47 elective cases and 53.7% in 80 emergent cases. In the EVAR cohort, the 30-day mortality group had had a significantly greater incidence of dependent functional status (17% for those who had died vs 8% for those alive at 30 days; P = .004), ASA classification of ≥4 (76.4% vs 40.3%; P < .001), perioperative blood transfusion (57% vs 19%; P < .001), emergency surgery (71% vs 14%; P < .001), and longer operative times (150 vs 128 minutes; P = .001). Conclusions: Nonagenarians had an incrementally increased, but acceptable, risk of 30-day mortality with EVAR in elective and emergent cases compared with that reported for octogenarians and cohorts of patients not selected for age. We found greater mortality for patients with dependent status, a higher ASA classification, emergent repair, and OSR. These preoperative risk factors could help identify the best surgical candidates. Given these results, consideration for EVAR or OSR might be reasonable for highly selected patients, especially for elective patients with a larger abdominal aortic aneurysm diameter for whom the risk of rupture is higher.

Kumar M, **Peters MR**, Karabon P, **Welsh RJ** and **Brahmamdam P** (2021). "Clostridium difficile infection after appendectomy: An analysis of the NSQIP database." Journal of the American College of Surgeons 233(5): S75-S75.
Full Text
OUWB Medical Student Author
Department of Surgery

Kumar M, Rimar SD, **Long GW**, Studzinski D and **Brown OW** (2021). "Indications for a “surgery first" approach for the treatment of lower extremity arterial disease." Journal of Vascular Surgery 74(4): E375-E375.
Full Text
Department of Surgery

Kus KJB, LaChance AH and Vleugels RA (2021). "Recognition and management of cutaneous connective

tissue diseases." Medical Clinics of North America 105(4): 757-782.
Full Text
OUWB Medical Student Author

Kus KJB, Murad F, Smile TD, Chang M, Ashrafzadeh S, Zhou G, Ilori EO, Koyfman SA, Vidimos AT, Schmults CD and Ruiz ES (2021). "Higher metastasis and death rates in cutaneous squamous cell carcinomas with lymphovascular invasion." Journal of the American Academy of Dermatology. ePub Ahead of Print.
Full Text
OUWB Medical Student Author

Background: Lymphovascular invasion (LVI) is an aggressive histologic finding but is excluded from current staging systems due to its lack of demonstrated independent prognostic significance. Objective: To evaluate the impact of LVI on cutaneous squamous cell carcinoma tumor outcomes. Methods: In total, 10,707 cutaneous squamous cell carcinoma tumors from a 20-year, retrospective, multicenter cohort were stratified by the presence (LVI(+)) or absence (LVI(-)) of LVI. Outcomes (local recurrence, in-transit metastasis, nodal metastasis, disease-specific death) were compared based on low (Brigham and Women's Hospital [BWH] stage T1/T2a) and high (BWH T2b/T3) tumor stages. Results: Of the 10,707 tumors, 78 had LVI. The analysis of low-stage BWH tumors showed the LVI(+) group had a significantly higher 5-year cumulative incidence of local recurrence (LVI(+): 12.3%; LVI(-): 1.1%; P < .01), metastasis (LVI(+): 4.2%; LVI(-): 0.4%; P < .01), and disease-specific death (LVI(+): 16.2%; LVI(-): 0.4%; P < .01). The analysis of BWH high-stage tumors showed the LVI(+) group maintained a higher 5-year cumulative incidence of metastasis (LVI(+): 28.5%; LVI(-): 16.8%; P = .06) and disease-specific death (LVI(+): 25.3%; LVI(-): 13.9%; P = .03), however, there was no difference in local recurrence (LVI(+): 16.3%; LVI(-): 15.8%; P = .11). Limitations: Retrospective study design. Conclusion: LVI(+) cutaneous squamous cell carcinomas have higher rates of metastasis and death at 5 years. Future staging systems should consider incorporating LVI.

Kus KJB and Ruiz ES (2021). "Non-surgical treatments for keratinocyte carcinomas." Advances in Therapy 38(12): 5635-5648.
Full Text
OUWB Medical Student Author

Skin cancer is the most common malignancy worldwide, comprising approximately 30% of all human tumors. In recent decades, the incidence of keratinocyte carcinomas, which include basal cell carcinoma and cutaneous squamous cell carcinoma, has been steadily increasing globally (Rogers et al. in JAMA Dermatol 151(10):1081-1086. https://doi.org/10.1001/jamadermatol.2015.1187 , 2015; Nehal and Bichakjian in N Engl J Med 379(4):363-374. https://doi.org/10.1056/nejmra1708701 , 2018). Most tumors are cured with surgical excision; however, some tumors are best treated with non-surgical approaches. Superficial tumors can often be cured with non-surgical methods whereas more advanced stage tumors may not be amenable to surgery. Additionally, surgical treatment may not be available for all populations depending on geographic location and accessibility to care. This article reviews commonly utilized nonsurgical options such as cryotherapy, photodynamic therapy, topical treatments, and radiation as well as systemic treatments including immunotherapies and chemotherapies.

Kus KJB and Ruiz ES (2021). "Genomic tumor studies aid in diagnosing metastatic basal cell carcinoma: A case series." JAAD Case Reports 16: 30-32.

Full Text
OUWB Medical Student Author

Lamb LE, Timar R, Wills M, Dhar S, Lucas SM, Komnenov D, **Chancellor MB** and Dhar N (2021). "Long COVID and COVID-19-associated cystitis (CAC)." International Urology & Nephrology. ePub Ahead of Print.
Full Text
Department of Urology

Purpose: There is scarce literature regarding genitourinary symptoms in COVID-19, especially post-acute disease otherwise known as Long COVID. We identified recovered COVID-19 patients presenting with new or worsening overactive bladder symptoms, known as COVID-19-associated cystitis (CAC). Methods: We used the American Urological Association Urology Care Foundation Overactive Bladder (OAB) Assessment Tool to screen COVID-19 recovered patients presenting with urological complaints at our urban-located institution from 5/22/2020 to 12/31/2020. Patients 10-14 weeks post-discharge responded to 5 symptom and 4 quality-of-life (QoL) questions. We reported median symptom scores, as well as QoL scores, based on new or worsening urinary symptoms, and by sex. Results: We identified 350 patients with de novo or worsening OAB symptoms 10-14 weeks after hospitalization with COVID-19. The median total OAB symptom score in both men and women was 18. The median total QoL score for both men and women was 19. Patients with worsening OAB symptoms had a median pre-COVID-19 symptom score of 8 (4-10) compared to post-COVID-19 median symptom score of 19 (17-21). Median age was 64.5 (range 47-82). Median hospital length-of-stay was 10 days (range 5-30). Conclusion: We report survey-based results of patients suffering from new or worsening OAB symptoms months after their hospitalization from COVID-19. Future studies with larger sample sizes and more extensive testing will hopefully elucidate the specific pathophysiology of OAB symptoms in the context of long COVID so urologists can timely and appropriately treat their patients.

Lao K, **Sykes E**, van Wijk XMR, Li J, Williams JA, Gherasim C and **Sun Q** (2021). "Large inter-assay difference of serum creatinine in pediatric population: A threat to accurate staging of chronic kidney disease." Pediatric Nephrology. ePub Ahead of Print.
Full Text
Department of Pathology

Background: Serum creatinine concentration is a primary component of Bedside Schwartz equation for estimated glomerular filtration rate (eGFR) in children. To standardize creatinine measurement, most manufacturers have adopted calibration procedures traceable to isotope dilution mass spectrometry (IDMS) using National Institute of Standards and Technology reference material. However, reference material representing much lower creatinine concentrations seen in children is not available and it is unclear how well commercial assays perform at pediatric levels. Methods: One thousand nine hundred seventy-one specimens from consecutive children <19 years, with creatinine ≤0.8 mg/dL by Abbott Jaffe method were included. Creatinine measurements were compared between Abbott-Jaffe and Abbott-enzymatic methods. Furthermore, we evaluated performance of six commercial creatinine assays at concentrations seen in pediatric patients utilizing IDMS traceable serum samples. Results: Median difference (enzymatic-Jaffe) for prepubertal females was –0.18 mg/dL (2.5%tile, 97.5%tile: –0.30, –0.06), –0.12 mg/dL (–0.25, –0.00) for pubertal females, –0.17 mg/dL (–0.30, –0.04) for prepubertal males, –0.11 mg/dL (–0.24, 0.01) for pubertal males. Bias appeared proportional for each subgroup and decreased as creatinine concentrations increased. Using

IDMS traceable samples, the greatest inter-assay variability was seen with the lowest creatinine levels (target 0.273 mg/dL), where 67% (4/6) of methods failed to reach minimal bias specification of 8% (range –7.5 to 86%). For samples with higher creatinine targets (0.440–0.634 mg/dL), two methods failed to meet minimal bias specification, whereas four showed bias <8%. Conclusion: Many commonly used creatinine assays remain inaccurate for pediatric populations after over a decade of nationwide efforts to standardize measurements. When creatinine-based eGFR is used for chronic kidney disease (CKD) staging in children, large inter-assay variability can lead to disease misclassification, inappropriate diagnostic and therapeutic interventions.

Lau B, No H, Wu Y, Devine M, **Ko R**, Loo B, Diehn M, Chin A and Vitzthum L (2021). "Pulmonary hemorrhage n patients treated with thoracic stereotactic ablative radiotherapy and anti-angiogenic agents." American Journal of Clinical Oncology-Cancer Clinical Trials 44(10): S105-S105.
Full Text
OUWB Medical Student Author

Lau WC, **Shannon FL**, Bolling SF, Romano MA, Sakwa MP, Trescot A, Shi L, **Johnson RL**, Starnes VA and Grehan JF (2021). "Intercostal cryo nerve block in minimally invasive cardiac surgery: The Prospective Randomized FROST Trial." Pain and Therapy 10(2): 1579-1592.
Full Text
Department of Anesthesiology
Department of Surgery
Department of Neurosurgery

Introduction: Intercostal cryo nerve block has been shown to enhance pulmonary function recovery and pain management in post-thoracotomy procedures. However, its benefit have never been demonstrated in minimal invasive thoracotomy heart valve surgery (Mini-HVS). The purpose of the study was to determine whether intraoperative intercostal cryo nerve block in conjunction with standard of care (collectively referred to hereafter as CryoNB) provided superior analgesic efficacy in patients undergoing Mini-HVS compared to standard-of-care (SOC). Methods: FROST was a prospective, 3:1 randomized (CryoNB vs. SOC), multicenter trial in patients undergoing Mini-HVS. The primary endpoint was the 48-h postoperative forced expiratory volume in 1 s (FEV1) result. Secondary endpoints were visual analog scale (VAS) scores for pain at the surgical site and general pain, intensive care unit and hospital length-of-stay, total opioid consumption, and allodynia at 6 months postoperatively. Results: A total of 84 patients were randomized to the two arms of the trial CryoNB (n = 65) and SOC (n = 19). Baseline Society of Thoracic Surgeons Predictive Risk of Mortality (STS PROM) score, ejection fraction, and FEV1 were similar between cohorts. A higher 48-h postoperative FEV1 result was demonstrated in the CryoNB cohort versus the SOC cohort (1.20 ± 0.46 vs. 0.93 ± 0.43 L; P = 0.02, one-sided two-sample t test). Surgical site VAS scores were similar between the CryoNB and SOC cohorts at all postoperative timepoints evaluated, but VAS scores not related to the surgical site were lower in the SOC group at 72, 94, and 120 h postoperatively. The SOC cohort had a 13% higher opioid consumption than the CryoNB cohort. One of 64 CryoNB patients reported allodynia that did not require pain medication at 10 months. Conclusions: The results of FROST demonstrated that intercostal CryoNB provided enhanced FEV1 score at 48 h postoperatively with optimized analgesic effectiveness versus SOC. Future larger prospective randomized trials are warranted to determine whether intercostal CryoNB has an opioid-sparing effect in patients undergoing Mini-HVS. TRIAL 02922153.

Lazar N, **Aneese A** and **Jamil LH** (2021). "Endoscopic removal of uncovered metallic biliary stents: A case

report." American Journal of Gastroenterology 116: S1073-S1073.
Full Text
OUWB Medical Student Author
Department of Internal Medicine/Gastroenterology

Lazarczyk P, Zakaria A, Chandra R, Imam Z, **Li W** and Gamarra R (2021). "Hiding in plain sight: A challenging case of obscure GI bleeding due to appendiceal endometriosis in a postmenopausal female patient." American Journal of Gastroenterology 116: S1002-S1002.
Full Text
Department of Pathology

Lee JS, **Lee KC**, **Bojrab D**, **Chen PY**, Jacob J and **Grills IS** (2021). "Long-term quality of life and audiometric outcomes following noninvasive stereotactic radiosurgery for acoustic neuromas." International Journal of Radiation Oncology Biology Physics 111(3): E560-E560.
Full Text
Department of Radiation Oncology
Department of Surgery

Lehrberg A, Sebai M, Finn D, **Lee D**, Karabon P, **Kiran S** and **Dekhne N** (2021). "Trends, survival outcomes, and predictors of nonadherence to mastectomy guidelines for nonmetastatic inflammatory breast cancer." Breast Journal 27(10): 753-760.
Full Text
Department of Surgery
OUWB Medical Student Author

Background: The Current National Comprehensive Cancer Network guidelines recommend modified radical mastectomy (MRM) as the surgical treatment of choice for nonmetastatic inflammatory breast cancer (IBC). Limited studies have looked into the outcomes of breast conserving surgery (BCS) vs. MRM for IBC. Methods: National Cancer Database (NCDB) data from 2004 to 2014 were retrospectively analyzed. Patients' demographics, tumor characteristics, and overall survival (OS) trends were compared for BCS and MRM cases of nonmetastatic IBC. Univariate and multivariate analyses were performed. Results: A total of 413 (3.89%) BCS and 10,197 (96.11%) MRM cases were identified. Median follow-up was 58.45 months. Compared to MRM, BCS patients were more likely to be older, be African American, have Medicare/Medicaid or be uninsured, live in lower education ZIP codes, and live in a metropolitan area (all $p < 0.05$). BCS rates significantly decreased from 5.84% in 2004 to 3.19% in 2014 ($p < 0.001$). BCS patients also were more likely to have less than 50% of the breast involved (51.57% vs. 43.88%; $p = 0.0081$) and were less likely to receive trimodal therapy (50.85% vs. 74.62%; $p = <0.0001$). The OS was significantly higher in the mastectomy group over 9 years at 62.02% vs. 54.47% in the BCS group. Additionally, in the adjusted multivariate model, BCS cases were associated with 23% higher hazards of overall mortality ($p = 0.0091$). Conclusion: BCS was performed in a limited number of cases, which decreased over the study period. The analysis identified both demographic predictors of receiving BCS and significantly lower OS for IBC patients undergoing a BCS.

Leong R, Rodd C, **Gomes KM**, Savedchuk S and **Kellerman PS** (2021). "Diagnosis of early delayed graft function (DGF) using TIMP-2∗IGFPB-7 product in transplant recipients: Preliminary results." Journal of the American Society of Nephrology 32: 670-671.
Full Text

OUWB Medical Student Author
Department of Internal Medicine/Nephrology

Background: DGF is acute kidney injury (AKI) defined as need for dialysis within one week of renal transplant. AKI is defined by a change in serum creatinine (SCr), however early recognition is limited by delay in creatinine rise. Accurate early biomarkers may lead to prevention or treatment of established AKI. The product of two novel biomarkers of cell cycle arrest, tissue Inhibitor of metalloproteinase-2 (TIMP-2) and insulin-like growth factor binding protein (IGFBP-7) have shown promise in predicting AKI. In prior studies, TIMP-2∗IGFPB-7 ≤0.3 had high negative predictive value, and ≥2 high positive predictive value for AKI. Aims -1) Investigate the early diagnostic value of TIMP-2∗IGFPB-7 for DGF; 2) Correlate TIMP-2∗IGFPB-7 with long term graft function. Methods: This is a prospective, double-blinded single center observational study with goal enrollment of 150 transplant recipients. Urine TIMP-2∗IGFBP-7 was measured in (ng/mL)2/1000 with a commercial kit, Nephrocheck (Astute Medical, San Diego, CA) at 4-12 hours, 48-72 hours and 72-96 hours post-transplant. SCr was measured just prior to transplant, 1 week post-transplant, and at 1, 3, 6, 9 and 12 months post-transplant. Results: Thus far, 64 patient samples have been collected, 11 with DGF. Mean TIMP-2∗IGFPB-7 were 3.08 ± 0.63 vs 0.54 ± 0.23 (p-value <0.001) at 4-12 hours, 3.39 ± 0.93 vs 0.38 ± 0.13 at 24-48 hours (p-value <0.001), and 1.73 ± 0.76 vs 0.62 ± 0.27 (p-value =0.09) at 72-96 hours in DGF vs non DGF patients respectively. Mean SCr at 1 week were 6.14 ± 0.71 mg/dL in DGF vs 2.13 ± 0.26 mg/dL (p-value <0.001) in non-DGF. Correlation between peak TIMP-2∗IGFPB-7 at 24-48 hours and sCr at 1, 3, 6, 9, and 12 months, was nonsignificant. Conclusions: These preliminary results confirm the use of TIMP-2∗IGFBP product measured by Nephrocheck in the diagnosis and prediction of DGF in the post-kidney transplant period as early as 4-12 hours, and peaking at 24-48 hours. The non-DGF TIMP-2∗IGFBP-7 means were higher than prior reports, suggesting mild renal injury in the peritransplant period in those patients without DGF. The current sample size is too small and underpowered as of yet to draw conclusions on prediction of long-term renal dysfunction.

Lerchenfeldt S, **Attardi SM**, **Pratt RL**, **Sawarynski KE** and **Taylor TAH** (2021). "Twelve tips for interfacing with the new generation of medical students: iGen." Medical Teacher 43(11): 1249-1254.
Full Text
Department of Foundational Medical Studies (OU)

iGen, or Generation Z, is the newest generation of health professions students to enter the classroom. This generation represents the first cohort of students in which technology has been present in all aspects of their lives. Since birth, they have been influenced by the boom of social media and wide-spread internet availability, leading to decreased face-to-face interactions and a desire for immediate access to information. Health professions educators should recognize the unique attributes of iGen students in order to foster student success and create a more positive learning environment. The following twelve tips examine the research-based distinctive characteristics of iGen students and highlight important concepts to consider when modifying current pedagogy to better support their needs. Incorporating these tips as an educator can promote lifelong learning and skill development for iGen students and empower this generation to thrive.

Lim S, Yeh HH, Macki M, Mansour T, Schultz L, Telemi E, Haider S, Nerenz DR, Schwalb JM, Abdulhak M, Park P, Aleem I, **Easton R**, Khalil J, **Perez-Cruet M** and Chang V (2021). "Preoperative HbA1c > 8% is associated with poor outcomes in lumbar spine surgery: A Michigan Spine Surgery Improvement Collaborative study." Neurosurgery 89(5): 819-826.
Full Text

Department of Neurosurgery
Department of Orthopaedic Surgery

Background: Preoperative hemoglobin A1c (HbA1c) is a useful screening tool since a significant portion of diabetic patients in the United States are undiagnosed and the prevalence of diabetes continues to increase. However, there is a paucity of literature analyzing comprehensive association between HbA1c and postoperative outcome in lumbar spine surgery. Objective: To assess the prognostic value of preoperative HbA1c > 8% in patients undergoing elective lumbar spine surgery. MethodS: The Michigan Spine Surgery Improvement Collaborative (MSSIC) database was queried to track all elective lumbar spine surgeries between January 2018 and December 2019. Cases were divided into 2 cohorts based on preoperative HbA1c level (≤8% and >8%). Measured outcomes include any complication, surgical site infection (SSI), readmission (RA) within 30 d (30RA) and 90 d (90RA) of index operation, patient satisfaction, and the percentage of patients who achieved minimum clinically important difference (MCID) using Patient-Reported Outcomes Measurement Information System. Results: We captured 4778 patients in this study. Our multivariate analysis demonstrated that patients with HbA1c > 8% were more likely to experience postoperative complication (odds ratio [OR] 1.81, 95% CI 1.20-2.73; P =. 005) and be readmitted within 90 d of index surgery (OR 1.66, 95% CI 1.08-2.54; P =. 021). They also had longer hospital stay (OR 1.12, 95% CI 1.03-1.23; P =. 009) and were less likely to achieve functional improvement after surgery (OR 0.64, 95% CI 0.44-0.92; P =. 016). Conclusion: HbA1c > 8% is a reliable predictor of poor outcome in elective lumbar spine surgery. Clinicians should consider specialty consultation to optimize patients' glycemic control prior to surgery.

Liu G, Zhao L, **Qin A**, **Deraniyagala RL**, **Stevens CW**, **Yan D**, **Li X**, **Ding X** and **Deraniyagala RL, Jr.** (2021). "Lung Stereotactic Body Radiotherapy (SBRT) Using Spot-Scanning Proton Arc (SPArc) Therapy: A feasibility study." International Journal of Radiation Oncology, Biology, Physics 111(3): e548-e548.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): We developed a 4D interplay effect model to quantitatively evaluate breathing-induced interplay effects and assess the feasibility of utilizing spot-scanning proton arc (SPArc) therapy for hypo-fractionated lung stereotactic body radiotherapy (SBRT). The model was then validated by retrospective application to clinical cases. Materials/Methods: A digital lung 4DCT phantoms was used to mimic targets in diameter of 3cm with breathing motion amplitudes: 5, 10, 15, and 20 mm, respectively. Two planning groups based on robust optimization were generated: (1) Two-field Intensity Modulated Proton Therapy (IMPT) plans and (2) SPArc plans via a partial arc. 5000 cGy was prescribed to the internal target volume (ITV) in 5 fractions. To quantitatively assess the breathing induced interplay effect, the 4D dynamic dose was calculated by synchronizing the breathing pattern with the simulated proton machine delivery sequence, including IMPT, Volumetric repainting (IMPTvolumetric), iso-layered repainting (IMPTlayer) and SPArc. Ten lung patients' 4DCT previously treated with VMAT SBRT, were used to validate the digital lung tumor model. Normal tissue complicated probability (NTCP) of chestwall toxicity was calculated. Results: Target dose were degraded as the tumor motion amplitude increased. The 4D interplay effect phantom model indicated that motion mitigation effectiveness using SPArc was about five times of IMPTvolumetric or IMPTlayer using maximum MU/spot as 0.5 MU at 20 mm motion amplitude. The retrospective study showed that SPArc has an advantage in normal tissue sparing. The probability of chestwall's toxicity were significantly improved from 40.2% ± 29.0% (VMAT) (P = 0.01) and 16.3% ± 12.0% (IMPT) (P = 0.01) to 10.1% ± 5.4% (SPArc). SPArc significantly mitigated the interplay effect compared to

IMPT, where the average target D99 in single fraction 4D dynamic dose throughout patients was 4876 ± 107 cGy[RBE] (IMPT) vs. 4913 ± 64 cGy[RBE] (SPArc) (P < 0.01). Conclusion: SPArc is an efficient treatment modality capable of effectively mitigating the interplay effect in lung SBRT compared to IMPT with repainting. Such a technique has the potential to further reduce the normal tissue complexity compared to the VMAT.

Liu G, Zhao L, **Yan D**, **Deraniyagala RL**, **Stevens CW**, **Li X**, **Ding X** and **Deraniyagala RL, Jr.** (2021). "The first modeling of the Spot-Scanning Proton Arc (SPArc) delivery sequence and investigating its efficiency improvement in the clinical proton treatment workflow." International Journal of Radiation Oncology, Biology, Physics 111(3): e524-e524.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): To quantitatively model a precise spot-scanning proton arc (SPArc) delivery sequence and assess its efficiency improvement in the routine proton clinical operation. Materials/Methods: The SPArc delivery sequence model (DSMSPArc) includes two kinds of parameters: (1) mechanical parameters (the maximum gantry velocity, acceleration, and deceleration speed). (2) irradiation parameters (tolerance window and buffer, spot scanning speed, energy layer switching time, and burst switching time). An independent gantry inclinometer was used to measure mechanical parameters. Log files were used to derive the irradiation parameters through a series of SPArc test plans. The in-house DSMSPArc was established by fitting both mechanical and irradiation parameters. Eight SPArc plans from different disease sites (brain, HN, lung, and liver cancer) were used to validate the model's accuracy. To quantitatively assess the treatment efficiency improvement compared to the clinical IMPT, a random clinical operation date of our proton center (total 21 cases on Jan 6th 2021) was selected, and SPArc plans were generated for all the cases. The DSMSPArc was used to simulate the SPArc treatment delivery sequence and compared to the clinical IMPT treatment logfiles. Results: The relative difference of treatment time between log files and DSMSPArc's prediction was 6.1% ± 3.9% on average, and the gantry angle vs. delivery time showed a good agreement between the DSMSPArc and log file. Additionally, the SPArc plan could effectively save two hours out of 10 hours of clinical operation by simplifying the treatment workflow for a single room proton therapy center. The average treatment delivery time (including gantry rotation and irradiation) per patient was reduced to 226 ± 149s using SPArc compared to 665 ± 407s using IMPT (P < 0.01). Conclusion: This is the first modeling of the SPArc delivery sequence, which paves the roadmap for implementing the delivery speed and time into the SPArc optimization algorithm. Additionally, SPArc can offer a superior delivery efficiency to improve clinical treatment throughput, compared to IMPT.

Liu G, Zhao L, **Yan D**, **Li X** and **Ding X** (2021). "A direct machine-specific parameters incorporated Spot-Scanning Proton Arc (SPArc) algorithm." International Journal of Radiation Oncology Biology Physics 111(3): E143-E143.
Full Text
Department of Radiation Oncology

Lowenstern A, Takagi H, Ng N, Rymer J, Koweek L, Douglas P, Duran J, Rabbat M, **Chinnaiyan K**, Berman D, De Bruyne B, Bax J, Akasaka T, Amano T, Nieman K, Rogers C, Kitabata H, Sand NPR, Kawasaki T, Mullen S, Matsuo H, Norgaard B, Patel M, Leipsic J and Daubert M (2021). "The influence of obesity on coronary artery disease and clinical outcomes in the ADVANCE Registry." Journal of the American College of Cardiology 78(19): B124-B125.

Full Text
Department of Internal Medicine/Cardiovascular Disease

Ma TM, Xiang M, Tilki D, Karnes RJ, Stish BJ, Martinez-Monge R, Tendulkar RD, Klein EA, Tran PT, Tosoian J, Berlin A, Tward JD, Merrick GS, Spratt DE, **Krauss DJ**, Horwitz EM, Gafita A, Grogan T, Calais J and Kishan AU (2021). "Prognostic significance of the risk of non-localized disease on PSMA/PET: Comparative performance of a novel, PSMA/PET-derived risk stratification tool for high-risk prostate cancer in a large, multi-institutional cohort." International Journal of Radiation Oncology Biology Physics 111(3): S51-S52.
Full Text
Department of Radiation Oncology

Madanat L, **Bloomingdale R**, Shah K, Khalife A, **Haines DE** and **Mehta NK** (2021). "Left atrial appendage occlusion device infection: Take it or leave it?" HeartRhythm Case Reports 7(11): 750-753.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Madanat L, Saleh M, Maraskine M, **Halalau A** and **Bukovec F** (2021). "Congestive heart failure 30-day readmission: Descriptive study of demographics, comorbidities, heart failure knowledge, and self-care." Cureus 13(10): e18661.
Full Text
Department of Internal Medicine/Hospitalist Medicine
Department of Internal Medicine

Background: Congestive heart failure (CHF) readmissions are associated with substantial financial and medical implications. We performed a descriptive study to determine demographic, clinical, and behavioral factors associated with 30-day readmission. Materials and Methods: Patients hospitalized with CHF at William Beaumont Hospital in Royal Oak, MI, from March 2019-May 2019 were studied. Response to heart failure knowledge and self-care questionnaires along with the patients' demographic and clinical factors were collected. Thirty-day readmission to any of the eight hospitals in the Beaumont Health System was documented. Results: One-hundred ninety-six (196) patients were included. The all-cause 30-day readmission rate was 23%. A numerical higher rate of readmissions was observed among males (23.7% vs 22.2%), current smokers (27.3% vs 22.9%), and patients with peripheral vascular disease (PVD; 28.9% vs 21.2%), diabetes mellitus (DM; 26.4% vs 18.9%), hypertension (HTN; 26.4% vs 10%), coronary artery disease (CAD; 24.6% vs 19%), and prior history of cerebrovascular accident (CVA; 28.9% vs 21.2%) ($p>0.05$). Reduced left ventricular ejection fraction (LVEF) was associated with higher readmissions (24.4% vs 20.5%, $p=0.801$). Patients with the highest reported questionnaire scores corresponding to better heart failure knowledge and self-care behaviors at home were readmitted at a similar rate compared to those scoring in the lowest interval (25%, $p=0.681$). Conclusion: Though statistically insignificant due to the limitations of sample size, a higher percentage of readmissions was observed in male patients, current smokers, reduced LVEF, and higher comorbidity burden. Better reported patient self-care behavior, medication compliance, and heart failure knowledge did not correlate with reduced readmission rates. While the impact of medical comorbidities on 30-day readmissions is better established, the role of socioeconomic factors remains unclear and might suggest a focus for future work.

Mahalingam VD and **Zhang P** (2021). "A case report of autopsy: Large mass of pulmonary metastatic calcification in a patient with end-stage renal disease." American Journal of Clinical Pathology 156: S24-

S24.
Full Text
Department of Pathology

Mahmoud TH and Shields RA (2021). "Tips for successful autologous retinal transplantation." Retina Today 2021(October): 26-28.
Full Text
Department of Ophthalmology

Maisels MJ, Newman TB and Kaplan M (2021). "A new hour-specific serum bilirubin nomogram for neonates ≥35 weeks of gestation." Journal of Pediatrics 237: 317.
Full Text
Department of Pediatrics

Mando R, **Waheed M**, **Michel A**, Karabon P and **Halalau A** (2021). "Prediabetes as a risk factor for major adverse cardiovascular events." Annals of Medicine 53(1): 2090-2098.
Full Text
OUWB Medical Student Author
Department of Internal Medicine

Introduction: Type II diabetes mellitus (DM) is a proinflammatory process and a known risk factor for major adverse cardiac events (MACE). The same inflammatory markers may be present in prediabetes (pDM); however, the relationship between pDM by HbA1c and MACE is not well studied. We sought to see if pDM increases one's risk for MACE. Methods: We retrospectively studied patients at Beaumont Health, Michigan between 2006 and 2020. We divided patients into groups (G1-G5) based on haemoglobin A1c (HbA1c) trends over the study period as follows: G1: pDM patients who remained pDM; G2: pDM who progressed into DM; G3: pDM who normalized their HbA1c; G4: patients who maintained a normal HbA1c; and G5: patients with HbA1c persistently in the DM range. We compared MACE between the groups by univariate and multivariate regression analyses. Results: A total of 119,271 patients were included in the study (G1: N = 13,520, G2: N = 6314, G3: N = 1585, G4: N = 15,018, G5: N = 82,834). Pairwise comparison revealed a statistically significant increase in the odds of MACE in all groups compared to those with normal HbA1c values (G4; $p < .001$). After adjusting for baseline characteristics, multivariate regression revealed elevated odds of MACE in patients with persistent pDM (G1; aOR = 1.087, $p = .002$) and diabetes (G2/G5; aOR = 1.25 and aOR = 1.18, $p < .001$) compared to individuals with normal HbA1c values. Conclusion: Prediabetes is a risk factor for MACE. Normalization of HbA1c values appears to decrease the adjusted risk for MACE and should be the goal in patients with pDM.KEY MESSAGESPatients with prediabetes (pDM) are at increased risk for major cardiovascular events.Normalization of HbA1c in pDM patients may have a clinically significant benefit, in terms of lowering the MACE risk.Prediabetes patients who progress into diabetes mellitus may represent a particularly high-risk group.

Mankuzhy N, Grzywacz VP, 2nd, **Quinn TJ**, **Jawad MS**, **Gustafson GS**, **Dilworth JT** and **Chen PY** (2021). "Thirty-year single institution experience of accelerated partial breast irradiation for early-stage breast cancer." International Journal of Radiation Oncology, Biology, Physics 111(3): S36.
Full Text
OUWB Medical Student Author
Department of Radiation Oncology

Purpose/Objective(s): Accelerated partial breast irradiation (APBI) can reduce treatment time and spare normal breast tissue. Techniques for APBI include applicator-based, external beam radiotherapy (EBRT), intra-operative radiotherapy (IORT), and interstitial implant-based. Data comparing these various APBI modalities and associated outcomes are lacking in the literature. We conducted a single-institution retrospective analysis of patients treated with APBI to compare treatment techniques and report outcomes. Materials/Methods: Patients treated with APBI between 1990 and 2019 were included. Baseline patient characteristics, clinical and pathological features, treatment details, and clinical outcomes were retrospectively reviewed using a single-institution database. Outcomes were updated through August 2020. Statistical methods included Kruskal-Wallis test, Fisher's exact test, chi-square test of independence, and Kaplan-Meier analysis. Results: A total of 926 APBI cases were analyzed, a majority of which were invasive ductal carcinoma (50.6%). Comparing applicator-based to EBRT, IORT, and implant-based, there was no difference in overall survival, freedom from local recurrence, or freedom from mastectomy (Table 1). 5-, 10-, and 25-year cumulative incidence of ipsilateral breast tumor recurrence (IBTR) was 1.5% (0.87-2.5%), 3.3% (2.3-4.7%), and 5.2% (3.9-6.7%), with no difference between treatment techniques. The median follow-up time was 121.6 months (66-165.7 months). Cosmesis was good/excellent in 91%, 84%, and 93%, for applicator, EBRT, and interstitial techniques, respectively. Late toxicities assessed included pigmentary changes, telangiectasias, induration/fibrosis, and fat necrosis. The majority of late toxicities were none or Grade 1, with less than 10% of patients experiencing Grade 2 or greater toxicity. Conclusion: With our 30-year single-institution APBI experience using various treatment techniques, long term outcomes of both disease control and local morbidity demonstrate that the various APBI techniques are equally effective for suitable early-stage breast cancer patients. As evolving radiotherapy paradigms incorporate more shortened time-course treatments, these results affirm that APBI remains a viable alternative for such favorable patients.

McCrohan M, **Nierenberg L**, Karabon P, Wunderlich-Barillas T and **Halalau A** (2021). "The impact of disparities in social determinants of health on hospitalization rates for patients with COVID-19 in Michigan (USA)." International Journal of General Medicine 14: 7681-7686.
Full Text
OUWB Medical Student Author
Department of Internal Medicine

Importance: The COVID-19 pandemic continues to impact the health-care system in the United States and has brought further light on health disparities within it. However, only a few studies have examined hospitalization risk with regard to social determinants of health. Objective: We aimed to identify how health disparities affect hospitalization rates among patients with COVID-19. Design: This observational study included all individuals diagnosed with COVID-19 from February 25, 2020 to December 31, 2020. Uni- and multivariate analyses were utilized to evaluate associations between demographic data and inpatient versus outpatient status for patients with COVID-19. Setting: Multicenter (8 hospitals), largest size health system in Southeast Michigan, a region highly impacted by the pandemic. Participants: All outpatients and inpatients with a positive RT-PCR for SARS-CoV-2 on nasopharyngeal swab were included. Exclusion criteria included missing demographic data or status as a non-permanent Michigan resident. Exposure: Patients who met inclusion and exclusion criteria were divided in 2 groups: outpatients and inpatients. Main Outcome and Measures: We described the comparative demographics and known disparities associated with hospitalization status. Results: Of 30,292 individuals who tested positive for SARS-CoV-2, 34.01% were admitted to the hospital. White or Caucasian race was most prevalent (57.49%), and 23.35% were African-American. The most

common ethnicity was non-Hispanic or Latino (70.48%). English was the primary language for the majority of patients (91.60%). Private insurance holders made up 71.11% of the sample. Within the hospitalized patients, lower socioeconomic status, African-American race and Hispanic and Latino ethnicity, non-English speaking status, and Medicare and Medicaid were more likely to be admitted to the hospital. Conclusions and Relevance: Several health disparities were associated with greater rates of hospitalization due to COVID-19. Addressing these inequalities from an individual to system level may improve health-care outcomes for those with health disparities and COVID-19.

McFarlane MR, Hochstedler KA, Laucis AM, Sun Y, Chowdhury A, Matuszak MM, Hayman J, Bergsma D, Boike T, Kestin L, Movsas B, **Grills I**, Dominello M, Dess RT, Schonewolf C, Spratt DE, Pierce L, Paximadis P, Jolly S and Schipper M (2021). "Predictors of pneumonitis after conventionally fractionated radiotherapy for locally advanced lung cancer." International Journal of Radiation Oncology Biology Physics 111(5): 1176-1185.
Full Text
Department of Radiation Oncology

Purpose: Multiple factors influence the risk of developing pneumonitis after radiation therapy (RT) for lung cancer, but few resources exist to guide clinicians in predicting risk in an individual patient treated with modern techniques. We analyzed toxicity data from a state-wide consortium to develop an integrated pneumonitis risk model. Methods and Materials: All patients (N = 1302) received conventionally fractionated RT for stage II-III non-small cell lung cancer between April 2012 and July 2019. Pneumonitis occurring within 6 months of treatment was graded by local practitioners and collected prospectively from 27 academic and community clinics participating in a state-wide quality consortium. Pneumonitis was modeled as either grade ≥2 (G2+) or grade ≥3 (G3+). Logistic regression models were fit to quantify univariable associations with dose and clinical factors, and stepwise Akaike information criterion-based modeling was used to build multivariable prediction models. Results: The overall rate of pneumonitis of any grade in the 6 months following RT was 16% (208 cases). Seven percent of cases (n = 94) were G2+ and <1% (n = 11) were G3+. Adjusting for incomplete follow-up, estimated rates for G2+ and G3+ were 14% and 2%, respectively. In univariate analyses, gEUD, V5, V10, V20, V30, and mean lung dose (MLD) were positively associated with G2+ pneumonitis risk, whereas current smoking status was associated with lower odds of pneumonitis. G2+ pneumonitis risk of ≥22% was independently predicted by MLD of ≥20 Gy, V20 of ≥35%, and V5 of ≥75%. In multivariate analyses, the lung V5 metric remained a significant predictor of G2+ pneumonitis, even when controlling for MLD, despite their close correlation. For G3+ pneumonitis, MLD and V20 were statistically significant predictors. Number of patient comorbidities was an independent predictor of G3+, but not G2+ pneumonitis. Conclusions: We present an analysis of pneumonitis risk after definitive RT for lung cancer using a large, prospective dataset. We incorporate comorbidity burden, smoking status, and dosimetric parameters in an integrated risk model. These data may guide clinicians in assessing pneumonitis risk in individual patients.

McLeod MR, Vasudevan A, **Warnick S, Jr.** and Wolfson JA (2021). "Screening for food insecurity in the primary care setting: Type of visit matters." Journal of General Internal Medicine 36(12): 3907-3909.
Full Text
Department of Family Medicine and Community Health

Meier K, Hiller S, Dauw C, Hollingsworth J, Kim T, Qi J, Telang J, Ghani KR and **Jafri SMA** (2021).

"Understanding ureteral access sheath use within a statewide collaborative and its effect on surgical and clinical outcomes." Journal of Endourology 35(9): 1340-1347.
Full Text
Department of Urology

Ureteral access sheaths (UASs) are frequently used during ureteroscopy (URS), but their use is not without potential risk. We investigated patterns of UAS use and associated outcomes across practices in Michigan within a quality improvement collaborative. Methods: The Michigan Urological Surgery Improvement Collaborative (MUSIC) Reducing Operative Complications from Kidney Stones (ROCKS) initiative maintains a web-based, prospective clinical registry of patients undergoing URS for urinary stone disease (USD). We analyzed all patients undergoing primary URS for renal and ureteral stones from June 2016 to July 2018 in the ROCKS registry. We determined rates of UAS usage across practices and associated outcomes, including 30-day emergency department (ED) visits and hospitalization, as well as stone-free rates. Using multivariate logistical regression, we determined the predictors of UAS use as well as outcomes, including stone-free rates, ED visits, and hospitalizations, associated with UAS use. Results: Of the 5316 URS procedures identified, UASs were used in 1969 (37.7%) cases. Stones were significantly larger and more likely to be located in the kidney in cases with UAS use. UAS use during URS varied greatly across practices (1.9%-96%, $p < 0.05$). After adjusting for clinical and surgical risk factors, UAS use significantly increased the odds of postoperative ED visits (odds ratio [OR] = 1.50, 95% confidence interval [CI] 1.17-1.93, $p < 0.05$) and hospitalization (OR = 1.77, 95% CI 1.22-2.56, $p < 0.05$) as well as decreased the odds of being stone free (OR = 0.75, 95% CI 0.57-0.99, $p < 0.05$). Conclusions: In the current study, UAS use during URS for USD was not associated with an increased likelihood of being stone free; moreover, it increased the odds of a postoperative ED visit and or hospitalization. Our findings demonstrate that UAS use is not without risk and should be employed judiciously.

Milojevic M, Bond C, He C, **Shannon FL**, Clark M, Theurer PF and Prager RL (2021). "Failure to rescue: Variation in mortality after cardiac surgery." Interactive Cardiovascular and Thoracic Surgery 33(6): 848-856.
Full Text
Department of Surgery

Objectives: Measures to prevent surgical complications are critical components of optimal patient care, and adequate management when complications occur is equally crucial in efforts to reduce mortality. This study aims to elucidate clinical realities underlying inhospital variations in failure to rescue (FTR) after cardiac surgery. Methods: Using a statewide database for a quality improvement program, we identified 62 450 patients who had undergone adult cardiac surgery between 2011 and 2018 in 1 of the 33 Michigan hospitals performing adult cardiac surgery. The hospitals were first divided into tertiles according to their observed to expected (O/E) ratios of 30-day mortality: low-mortality tertile (O/E 0.46-0.78), intermediate-mortality tertile (O/E 0.79-0.90) and high-mortality tertile (O/E 0.98-2.00). We then examined the incidence of 15 significant complications and the rates of death following complications among the 3 groups. Results: A total of 1418 operative deaths occurred in the entire cohort, a crude mortality rate of 2.3% and varied from 1.3% to 5.9% at the hospital level. The death rates also diverged significantly according to mortality score tertiles, from 1.6% in the low-mortality group to 3.2% in the high-mortality group ($P < 0.001$). Hospitals ranked in a high- or intermediate-mortality tertile had similar rates of overall complications (21.3% and 20.7%, $P = 0.17$), while low-mortality hospitals had significantly fewer complications (16.3%) than the other 2 tertiles ($P < 0.001$). FTR increased in a stepwise manner from low- to high-mortality hospitals (8.3% vs

10.0% vs 12.7%, P < 0.001, respectively). Differences in FTR were related to survival after cardiac arrest, multi-system organ failure, prolonged ventilation, reoperation for bleeding and severe acute kidney disease that requires dialysis. Conclusions: This study demonstrates that timely recognition and appropriate treatment of complications are as important as preventing complications to further reduce operative mortality in cardiac surgery. FTR tools may provide vital information for quality improvement initiatives.

Minkowitz H, **Soto R**, Fanikos J, Hammer GB, Mehta N, Hu J and Redan J (2021). "Opioid-free recovery after hernia repair with HTX-011 as the foundation of a non-opioid, multimodal analgesia regimen in a real-world setting: A randomized, open-label study." Pain and Therapy 10(2): 1295-1308.
Full Text
Department of Anesthesiology

Introduction: Helping Opioid Prescription Elimination (HOPE) is a project designed to provide surgeons with practical, real-world solutions to effectively manage postoperative pain and eliminate the need for opioids using HTX-011 (extended-release bupivacaine/low-dose meloxicam). In phase 3 herniorrhaphy and bunionectomy studies, HTX-011 without multimodal analgesia (MMA) was superior to bupivacaine hydrochloride in reducing pain and opioid consumption. Here, we examine the HOPE Hernia-1 study, which was designed to compare alternating ibuprofen/acetaminophen with concurrent use as part of an HTX-011-based non-opioid MMA regimen in patients undergoing herniorrhaphy and to evaluate the effectiveness of a personalized opioid prescription algorithm. Methods: Patients undergoing outpatient open inguinal herniorrhaphy with intraoperative administration of HTX-011 (300 mg bupivacaine/9 mg meloxicam) were randomly assigned to receive a scheduled oral regimen of ibuprofen plus acetaminophen, either taken together every 6 hours or alternating every 3 hours, for 5 days following surgery, while awake. Based on the opioid prescription algorithm evaluated here, patients could receive an oxycodone prescription upon discharge only if they had a numeric rating scale pain score of ≥ 6 at discharge and/or had received a postoperative rescue opioid. Results: The majority of patients did not require an opioid prescription through 2 weeks following surgery, and this was similar between cohorts (alternating MMA, 89.1%; concurrent MMA, 93.6%). Patient satisfaction was high for both regimens, and 95% of patients had an opioid-free recovery. No patient discharged without a prescription called back to request one. Treatment was well tolerated, without evidence of nonsteroidal anti-inflammatory drug-related toxicity. Conclusions: HTX-011, used with over-the-counter products ibuprofen/acetaminophen and personalized opioid prescription algorithm in a real-world environment, has the potential to reduce opioid use and opioid prescriptions after herniorrhaphy without compromising patient satisfaction.

Movsas B, Rodgers J, Elshaikh MA, Martinez AA, Morton G, **Krauss DJ**, **Yan D**, Citrin DE, Hershatter B, Michalski JM, Ellis RJ, 3rd, Kavadi VS, Gore EM, **Gustafson GS**, Schulz CA, Velker V, Olson AC, Karrison TG, Sandler HM and Bruner DW (2021). "Dose escalated Radiotherapy (RT) alone or in combination with short-term Total Androgen Suppression (TAS) for intermediate risk prostate cancer: Patient Reported Outcomes (PROs) from the NRG Oncology/RTOG 0815 Randomized Trial." International Journal of Radiation Oncology, Biology, Physics 111(3): S3.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): To report the PROs of a phase III randomized trial evaluating TAS combined with dose-escalated RT for patients with intermediate risk prostate cancer. Materials/Methods: Eligible patients had intermediate risk prostate cancer defined as harboring

≥ 1 of these risk factors: clinical stage T2b-T2c, Gleason score 7, or PSA > 10 to ≤ 20 ng/mL. Patients were randomized to dose-escalated RT alone (Arm 1) or RT plus TAS (Arm 2) consisting of LHRH agonist/antagonist with oral antiandrogen for 6 months. Validated PROs included the Expanded Prostate Cancer Index Composite (EPIC-50) and Patient-Reported Outcome Measurement Information System (PROMIS) Fatigue short form. PRO change scores, calculated for each patient as the follow-up score minus baseline score (at end of RT, 6, 12, and 60 months from start of RT) were compared between treatment arms using a two-sample t test. An effect size (ES) of 0.50 SD (standard deviation) of the baseline measure was considered clinically meaningful. For the PRO sample size, 200 patients per arm would provide 90% statistical power to detect an ES < 0.50 if the completion rate was only 60%. Mixed effect regression models were also utilized. Clinical outcomes are reported in a separate abstract. Results: Of the 402 initial planned subset of trial patients who completed baseline PROs, PRO compliance was approximately 96%, 89%, 86% and 87% at end of RT, 6, 12 and 60 months, respectively. There were no significant differences between these 402 patients and the remaining patients on this trial with respect to age, race, performance status, # risk factors, or comorbidity score. While EPIC urinary and bowel scores decreased significantly by the end of RT in both arms, no clinically meaningful differences between arms were detected over time. For the EPIC hormonal and sexual domains, however, there were clinically meaningful differences between the two arms with greater (P < 0.0001) deficits in the RT + TAS arm. These differences improved over time, with ~50% resolution by one year after treatment and no clinically meaningful differences by 5 years between arms. PROMIS-fatigue scores increased from baseline in both arms and were significantly higher in arm 2 at the end of RT (P = 0.016), though slightly lower at 12 and 60 months. Conclusion: The addition of TAS to dose-escalated RT demonstrated significant clinically meaningful declines in the EPIC hormonal and sexual domains, and increases in the PROMIS-fatigue scores, compared to RT alone. These scores gradually improved over time, with no clinically meaningful differences between arms in fatigue by one year, or in hormonal and sexual domains by 5 years. Beyond the clinical outcomes, these PRO results directly from patients provide added value to help patients make informed decisions among treatment options.

Mustafa SF, Zafar MR, Vira A, **Halalau A**, **Rabah M**, **Dixon S** and **Hanson I** (2021). "In-hospital outcomes of patients with chronic kidney disease undergoing percutaneous coronary intervention for chronic total occlusion: A systematic review and meta-analysis." Coronary Artery Disease 32(8): 681-688.
Full Text
Department of Internal Medicine
Department of Internal Medicine/Internal Medicine/Cardiovascular Disease

Background: The relative safety and efficacy of percutaneous coronary intervention (PCI) for chronic total occlusions (CTO) in patients with chronic kidney disease (CKD) have not been well defined. We performed a systematic review and meta-analysis of observational studies to assess in-hospital outcomes in this population. Methods: We searched MEDLINE, EMBASE, and Cochrane Library databases from inception to April 2020 for all clinical trials and observational studies. Five observational studies with a total of 6769 patients met our inclusion criteria. Patients were divided into two groups based on estimated glomerular filtration rate (eGFR <60 ml/min/1.73m2 in CKD group and ≥ 60 ml/min/1.73m2 in non-CKD group). The primary outcome was in-hospital mortality. Secondary outcomes were acute kidney injury, coronary injury (perforation, dissection or tamponade), stroke and procedural success. Mantel-Haenszel random-effects model was used to calculate the odds ratio (OR) and 95% confidence intervals (CI). Results: In-hospital mortality was significantly higher among patients with CKD undergoing PCI for CTO (OR: 5.16, 95% CI: 2.60-10.26, P < 0.00001). Acute kidney injury (OR: 2.54, 95% CI:

1.89-3.40, P < 0.00001) and major bleeding (OR: 2.58, 95% CI: 1.20-5.54, P < 0.01) were also more common in the CKD group. No significant difference was observed in the occurrence of stroke (OR: 2.36, 95% CI: 0.74-7.54, P < 0.15) or coronary injury (OR: 1.38, 95% CI: 0.98-1.93, P < 0.06) between the two groups. Non-CKD patients had a higher likelihood of procedural success compared to CKD patients (OR: 0.66, 95% CI: 0.57-0.77, P < 0.00001). Conclusion: Patients with CKD undergoing PCI for CTO have a significantly higher risk of in-hospital mortality, acute kidney injury and major bleeding when compared to non-CKD patients. They also have a lower procedural success rate.

Mutter RW, Choi JI, Jimenez RB, Kirova YM, Fagundes M, Haffty BG, Amos RA, Bradley JA, **Chen PY**, **Ding X**, Carr AM, Taylor LM, Pankuch M, Vega RBM, Ho AY, Nyström PW, McGee LA, Urbanic JJ, Cahlon O and Maduro JH (2021). "Proton therapy for breast cancer: A consensus statement from the Particle Therapy Cooperative Group Breast Cancer Subcommittee." International Journal of Radiation Oncology, Biology, Physics 111(2): 337-359.
Request Form
Department of Radiation Oncology

Radiation therapy plays an important role in the multidisciplinary management of breast cancer. Recent years have seen improvements in breast cancer survival and a greater appreciation of potential long-term morbidity associated with the dose and volume of irradiated organs. Proton therapy reduces the dose to nontarget structures while optimizing target coverage. However, there remain additional financial costs associated with proton therapy, despite reductions over time, and studies have yet to demonstrate that protons improve upon the treatment outcomes achieved with photon radiation therapy. There remains considerable heterogeneity in proton patient selection and techniques, and the rapid technological advances in the field have the potential to affect evidence evaluation, given the long latency period for breast cancer radiation therapy recurrence and late effects. In this consensus statement, we assess the data available to the radiation oncology community of proton therapy for breast cancer, provide expert consensus recommendations on indications and technique, and highlight ongoing trials' cost-effectiveness analyses and key areas for future research.

Myrzykowski M, Xie C, Sweet R and **Xie M** (2021). "Laboratory analysis of antiphospholipid antibodies with clinical correlation: A hospital-based 10 year study." American Journal of Clinical Pathology 156: S104-S105.
Full Text
Department of Pathology

Nair GB, **Al-Katib S**, Podolsky R, Quinn T, **Stevens C** and **Castillo E** (2021). "Dynamic lung compliance imaging from 4DCT-derived volume change estimation." Physics in Medicine & Biology 66(21): 21NT06.
Full Text
Department of Internal Medicine/Pulmonary & Critical Care Medicine
Department of Diagnostic Radiology and Molecular Imaging
Department of Radiation Oncology

Background: Lung compliance (LC) is the ability of the lung to expand with changes in pressure and is one of the earliest physiological measurements to be altered in patients with parenchymal lung disease. Therefore, compliance monitoring could potentially identify patients at risk for disease progression. However, in clinical practice, compliance measurements are prohibitively invasive for use as a routine monitoring tool. Purpose: We propose a novel method for computing dynamic lung compliance imaging (LCI) from non-contrast computed tomography

(CT) scans. LCI applies image processing methods to free-breathing 4DCT images, acquired under two different continuous positive airway pressures (CPAP) applied using a full-face mask, in order to compute the lung volume change induced by the pressure change. LCI provides a quantitative volumetric map of lung stiffness. Methods: We compared mean LCI values computed for 10 patients with idiopathic pulmonary fibrosis (IPF) and 7 non-IPF patients who were screened for lung nodules. 4DCTs were acquired for each patient at 5 cm and 10 cm H(2)0 CPAP, as the patients were free breathing at functional residual capacity. LCI was computed from the two 4DCTs. Mean LCI intensities, which represent relative voxel volume change induced by the change in CPAP pressure, were computed. Results: The mean LCI values for patients with IPF ranged between [0.0309, 0.1165], whereas the values ranged between [0.0704, 0.2185] for the lung nodule cohort. Two-sided Wilcoxon rank sum test indicated that the difference in medians is statistically significant (pvalue = 0.009) and that LCI -measured compliance is overall lower in the IPF patient cohort. Conclusion: There is considerable difference in LC scores between patients with IPF compared to controls. Future longitudinal studies should look for LC alterations in areas of lung prior to radiographic detection of fibrosis to further characterize LCI's potential utility as an image marker for disease progression.

Nair GB, Galban CJ, **Al-Katib S**, Podolsky R, van Den Berge M, **Stevens C** and **Castillo E** (2021). "An assessment of the correlation between robust CT-derived ventilation and pulmonary function test in a cohort with no respiratory symptoms." British Journal of Radiology 94(1118): 20201218.
Full Text
Department of Radiation Oncology
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Objective: To evaluate CT-ventilation imaging (CTVI) within a well-characterized, healthy cohort with no respiratory symptoms and examine the correlation between CTVI and concurrent pulmonary function test (PFT). Methods: CT scans and PFTs from 77 Caucasian participants in the NORM dataset (clinicaltrials.gov NCT00848406) were analyzed. CTVI was generated using the robust Integrated Jacobian Formulation (IJF) method. IJF estimated total lung capacity (TLC) was computed from CTVI. Bias-adjusted Pearson's correlation between PFT and IJF-based TLC was computed. Results: IJF- and PFT-measured TLC showed a good correlation for both males and females [males: 0.657, 95%CI (0.438–0.797); females: 0.667, 95%CI (0.416–0.817)]. When adjusting for age, height, smoking, and abnormal CT scan, correlation moderated [males: 0.432, 95% CI (0.129–0.655); females: 0.540, 95% CI (0.207–0.753)]. Visual inspection of CTVI revealed participants who had functional defects, despite the fact that all participant had normal high-resolution CT scan. Conclusion: In this study, we demonstrate that IJF computed CTVI has good correlation with concurrent PFT in a well-validated patient cohort with no respiratory symptoms. Advances in Knowledge: IJF-computed CTVI's overall numerical robustness and consistency with PFT support its potential as a method for providing spatiotemporal assessment of high and low function areas on volumetric non-contrast CT scan.

Nandalur KR, Colvin R, Walker D, **Nandalur SR**, **Seifman B**, Gangwish D and **Hafron J** (2021). "Benign prostate hyperplasia as a potential protective factor against prostate cancer: Insights from a magnetic resonance imaging study of compositional characteristics." Prostate 81(14): 1097-1104.
Full Text
Department of Diagnostic Radiology and Molecular Imaging
Department of Radiation Oncology
Department of Urology

Purpose: The structural relationship between benign prostate hyperplasia (BPH) and prostate

cancer (Pca) is controversial. The purpose of our study was to examine the association between quantitative prostate compositional metrics by magnetic resonance imaging (MRI) and Pca. Methods: We identified 405 patients who underwent prostate MRI and biopsy and/or prostatectomy from January 2019 to January 2021 at our institution. Segmentation volumetric methods were used to assess central gland (CG) and peripheral zone (PZ) volume. PZ mean thickness and mean apparent diffusion coefficient (ADC), marker of underlying histologic components, were measured. Multivariable logistic regression was performed with outcomes of ≥Grade Group (GG) 2 Pca and for multifocal disease. Results: On multivariable analysis, higher CG volumes were at lower odds of ≥GG2 disease (n = 227) (OR: 0.97, 95% CI 0.96-0.98, $p < 0.0001$), taking into account PZ volume ($p = 0.18$) and thickness ($p = 0.70$). For every one cc increase in CG volume, there was an approximately 3% decrease in odds of ≥GG2 disease. Similar findings were noted for multifocal disease (n = 180) (OR: 0.97, 95% CI 0.96-0.98, $p < 0.0001$). Notably, ADC of the normal PZ was not significantly associated with CG volume ($p = 0.21$) nor a predictor of disease ($p = 0.49$). Conclusions: Increasing central gland volume, driven by BPH, is associated with lower odds of significant Pca, including multifocal disease, while PZ anatomic and histologic surrogate changes were noncontributory. Findings support BPH impediment of global tumor growth predicted by theoretical mechanobiological model. This potential stabilizing factor should be further studied for risk stratification and in consideration for BPH therapy.

Natesan S, **Todd B**, Hsu RS, Ren RK, Clark R, Jara-Almonta G, Vissoci JRN and Narajeenron K (2021). "Novel tool for assessing the quality of feedback in the emergency room (FEED-ER)." AEM Education and Training 5(4): e10698.

Full Text

Department of Emergency Medicine

Background: The Accreditation Council for Graduate Medical Education (ACGME) emphasizes constructive feedback as a critical component of residency training. Despite over a decade of using competency-based milestone evaluations, emergency medicine (EM) residency programs lack a standardized method for assessing the quality of feedback. We developed two novel EM-specific feedback surveys to assess the quality of feedback in the ER (FEED-ER) from both the resident and the faculty perspectives. This study aimed to evaluate the surveys' psychometric properties. Methods: We developed FEED-ER using a Likert scale with faculty and resident versions based on the ACGME framework and a literature review. The preliminary survey consisted of 25 questions involving the feedback domains of timeliness, respect/communication, specificity, action plan, and feedback culture. We conducted two modified Delphi rounds involving 17 content experts to ensure respondent understanding of the items, item coherence to corresponding feedback domains, thematic saturation of domain content, and time duration. A multicenter study was conducted at five university-based EDs in the United States and one in Thailand in 2019. We evaluated the descriptive statistics of the frequency of responses, validity evidence, and reliability of FEED-ER. Results: A total of 147 EM faculty and 126 EM residents completed the survey. Internal consistency was adequate (Cronbach's alpha > 0.70) and test–retest reliability showed adequate temporal stability (ICC > 0.80) for all dimensions. Content validity was deemed acceptable (CVC > 0.80) for all items. From the 25 items of FEED-ER, 23 loaded into the originally theorized dimensions (with factor loadings > 0.50). Additionally, the five feedback domains were found to be statistically distinct, with correlations between 0.40 and 0.60. The final survey has 23 items. Conclusions: This is the first study to develop and provide validity evidence for an EM-specific feedback tool that has strong psychometric properties, is reproducible and reliable, and provides an objective measure

for assessing the quality of feedback in the ED.

Nauman J, **Franklin BA**, Nes BM, Sallis RE, Sawada SS, Marinović J, Stensvold D, Lavie CJ, Tari AR and Wisløff U (2021). "Association between personal activity intelligence and mortality: Population-based China Kadoorie Biobank Study." Mayo Clinic Proceedings. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Objective: To prospectively investigate the association between personal activity intelligence (PAI) - a novel metabolic metric which translates heart rate during physical activity into a simple weekly score - and mortality in relatively healthy participants in China whose levels and patterns of physical activity in addition to other lifestyle factors are different from those in high-income countries. Patients and Methods: From the population-based China Kadoorie Biobank study, 443,792 healthy adults were recruited between June 2004 and July 2008. Participant's weekly PAI score was estimated and divided into four groups (PAI scores of 0, ≤50, 51-99, or ≥100). Using Cox proportional hazard analyses, we calculated adjusted hazard ratios (AHRs) for cardiovascular disease (CVD) and all-cause mortality related to PAI scores. Results: During a median follow-up of 8.2 (interquartile range, 7.3 to 9.1) years, there were 21,901 deaths, including 9466 CVD deaths. Compared with the inactive group (0 PAI score), a baseline weekly PAI score greater than or equal to 100 was associated with a lower risk of CVD mortality, an AHR of 0.87 (95% CI, 0.81 to 0.94) in men, and an AHR of 0.84 (95% CI, 0.78 to 0.92) in women, after adjusting for multiple confounders. Participants with a weekly PAI score greater than or equal to 100 also had a lower risk of all-cause mortality (AHR, 0.93; 95% CI, 0.89 to 0.97 in men, and AHR, 0.93; 95%, 0.88 to 0.98 in women). Moreover, this subgroup gained 2.7 (95% CI, 2.4 to 3.0) years of life, compared with the inactive cohort. Conclusion: Among relatively healthy Chinese adults, the PAI metric was inversely associated with CVD and all-cause mortality, highlighting the generalizability of the score in different races, ethnicities, and socioeconomic strata.

Nelson L (2021). "A letter to my patient." Journal of Emergency Medicine 61(4): 445-446.
Full Text
OUWB Medical Student Author

Niederman MS, Baron RM, Bouadma L, Calandra T, Daneman N, DeWaele J, Kollef MH, Lipman J and **Nair GB** (2021). "Initial antimicrobial management of sepsis." Critical Care 25(1): 307.
Full Text
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Sepsis is a common consequence of infection, associated with a mortality rate > 25%. Although community-acquired sepsis is more common, hospital-acquired infection is more lethal. The most common site of infection is the lung, followed by abdominal infection, catheter-associated blood steam infection and urinary tract infection. Gram-negative sepsis is more common than gram-positive infection, but sepsis can also be due to fungal and viral pathogens. To reduce mortality, it is necessary to give immediate, empiric, broad-spectrum therapy to those with severe sepsis and/or shock, but this approach can drive antimicrobial overuse and resistance and should be accompanied by a commitment to de-escalation and antimicrobial stewardship. Biomarkers such a procalcitonin can provide decision support for antibiotic use, and may identify patients with a low likelihood of infection, and in some settings, can guide duration of antibiotic therapy. Sepsis can involve drug-resistant pathogens, and this often necessitates consideration of newer antimicrobial agents.

Oleszek J, Tilton A, Carranza del Rio J, Dursun N, Bonikowski M, **Dabrowski E**, Page S, Regnault B, Thompson C and Delgado MR (2021). "Muscle selection and dosing in a phase 3, pivotal study of abobotulinumtoxinA injection in upper limb muscles in children with cerebral palsy." Frontiers in Neurology 12: 728615.

Full Text

Department of Physical Medicine & Rehabilitation

Background: Guidelines recommend botulinum toxin-A in pediatric upper limb spasticity as part of routine practice. Appropriate dosing is a prerequisite for treatment success and it is important that injectors have an understanding on how to tailor dosing within a safe and effective range. We report upper limb dosing data from a phase 3 study of abobotulinumtoxinA injections in children with cerebral palsy. Methods: This was a double-blind, repeat-treatment study (NCT02106351). In Cycle 1, children were randomized to abobotulinumtoxinA at 2 U/kg control dose or clinically relevant 8 U/kg or 16 U/kg doses. Doses were divided between the primary target muscle group (PTMG, wrist or elbow flexors) and additional muscles tailored to clinical presentation. During Cycles 2–4, children received doses of 8 U/kg or 16 U/kg and investigators could change the PTMG and other muscles to be injected. Injection of muscles in the other upper limb and lower limbs was also permitted in cycles 2–4, with the total body dose not to exceed 30 U/kg or 1,000 U (whichever was lower) in the case of upper and lower limb treatment. Results: 212 children were randomized, of which 210 received ≥1 abobotulinumtoxinA injection. Per protocol, the elbow and wrist flexors were the most commonly injected upper limb muscles. Across all 4 cycles, the brachialis was injected in 89.5% of children (dose range 0.8–6 U/kg), the brachioradialis in 83.8% (0.4–3 U/kg), the flexor carpi ulnaris in 82.4% (0.5–3 U/kg) and the flexor carpi radialis in 79.5% (0.5–4 U/kg). Other frequently injected upper limb muscles were the pronator teres(70.0%, 0.3–3 U/kg). adductor pollicis (54.3%, 0.3-1 U/kg), pronator quadratus (44.8%, 0.1–2 U/kg), flexor digitorum superficialis (39.0%, 0.5-4 U/kg), flexor digitorum profundus (28.6%, 0.5–2 U), flexor pollicis brevis/opponens pollicis (27.6%, 0.3-1 U/kg) and biceps (27.1%, 0.5–6 U/kg). AbobotulinumtoxinA was well-tolerated at these doses; muscular weakness was reported in 4.3% of children in the 8 U/kg group and 5.7% in the 16 U/kg group. Conclusions: These data provide information on the pattern of injected muscles and dose ranges used in this study, which were well-tolerated. Per protocol, most children received injections into the elbow and wrist flexors. However, there was a wide variety of other upper limb muscles injected as physicians tailored injection patterns to clinical need.

Oliveira S, Andrade R, **Hinckel BB**, Silva F, Espregueira-Mendes J, Carvalho Ó and Leal A (2021). "In vitro and in vivo effects of light therapy on cartilage regeneration for knee osteoarthritis: A systematic review." Cartilage 13(2_suppl): 1700s-1719s.

Full Text

Department of Orthopaedic Surgery

Objective: To analyze the effects of light therapy (LT) on cartilage repair for knee osteoarthritis (OA) treatment. Design: The PubMed, Embase, Scopus, and Web of Science databases were searched up to August 31, 2020 to identify in vitro and in vivo studies that analyzed the effects of LT on knee cartilage for OA treatment. The study and sample characteristics, LT intervention parameters and posttreatment outcomes were analyzed. Risk of bias was assessed using the Risk of Bias Assessment for Non-randomized Studies (RoBANS) tool. Results: Three in vitro and 30 in vivo studies were included. Most studies were judged as high risk of performance and detection bias. Biochemical outcomes were analyzed for both in vitro and in vivo studies, and histological and behavioral outcomes were analyzed for in vivo studies. LT reduced extracellular

matrix (ECM) degradation, inflammation, and OA progression, promoting ECM synthesis. LT improved pain-like behavior in animal models, having no apparent effect on gait performance. There were conflicting findings of some of the biochemical, histological, and behavioral outcomes. Conclusion: The included studies presented different strategies and LT parameters. LT resulted in positive effects on cartilage repair and may be an adequate therapy for OA treatment.

Osto M, **Parry N**, **Rehman R**, Ahmed U and Mehregan D (2021). "Malignant proliferating trichilemmal tumor of the scalp: A systematic review." American Journal of Dermatopathology. ePub Ahead of Print.
Full Text
OUWB Medical Student Author

Objectives: Malignant proliferating trichilemmal tumors of the scalp can exhibit aggressive presentation and recurrences. Our objective was to perform an evidence-based systematic review evaluating clinical presentation, tumor characteristics, and treatment modalities used to determine which treatment strategies had the best outcomes. Methods: The databases PubMed, Embase, and Cochrane Library were searched for relevant literature by the authors. Patient demographics, imaging, treatments, and other clinical characteristics were obtained. The results were reported using the Preferred Reporting Systems for Systematic Reviews and Meta-Analysis guidelines. Results: Thirty-nine studies with a total of 65 patients were identified. The most common presentation was a history of slow-growing, painless swollen mass on the scalp. In total, 10 patients (15.4%) presented with spread to the regional lymph nodes and 6 (9.2%) additional patients presented with metastasis to distant locations. In total, 61 patients (93.8%) underwent surgery. Various chemotherapy and radiation therapy regimens were used. Of the 45 cases with documented follow-up, 11 (24.4%) patients had one or multiple instances of local, lymph node or metastatic tumor recurrence. Conclusions: Surgery is favored, and the exact approach should be based on clinical judgment. However, Mohs micrographic surgery should strongly be considered because of its superior margin control against such an invasive tumor. Radiotherapy and chemotherapy have been used as adjuvant therapy in aggressive cases or recurrence. Patients should be followed closely and examined often to frequently assess recurrence or metastasis. Randomized controlled trials are needed to further clarify these findings.

Osto M, Smidi SA, Alnabolsi A, **Rehman R** and Potts G (2021). "An evidence-based approach for malignancy-associated and paraneoplastic generalized granuloma annulare." Journal of the American Academy of Dermatology. ePub Ahead of Print.
Full Text
OUWB Medical Student Author

Ozcan A, **Laskowski E**, **Sahai S** and Levasseur K (2021). "Febrile infants without respiratory symptoms or sick contacts: Are chest radiographs or RSV/influenza testing indicated?" BMC Infectious Diseases 21(1): 862.
Full Text
Department of Pediatrics

Background: Serious bacterial infection rates in febrile infants < 60 days are about 8–11%. Less than 1% of febrile infants with no respiratory symptoms will have pneumonia however, chest radiography (CXR) rates remain between 30 and 60%. Rapid Respiratory Syncytial Virus (RSV) and influenza (flu) testing is common, however, there is not enough data to determine if febrile infants without any respiratory symptoms should be tested. The goal of this study is to

determine the rate of positive CXR and RSV/flu results in febrile infants with no respiratory symptoms and no sick contacts. Methods: Well-appearing febrile infants between 7 and 60 days of age who presented to the pediatric emergency department (PED) from September 1st, 2015 through October 30th, 2017 were enrolled. Demographic data, respiratory symptoms, CXR findings and RSV/flu results were collected. SAS statistical software was used for analysis. Results: 129 infants met enrollment criteria. Of the 129 infants, 58 (45.0%) had no respiratory symptoms and no sick contacts. Of these 58, 36 (62.1%) received a CXR and none of them had any abnormal findings, 48 (82.8%) had RSV/flu testing, no patients tested positive for RSV and only one patient tested positive for flu. Costs of CXR and RSV/flu testing for this cohort was $19,788. Conclusion: The absence of positive CXRs in this patient population reinforces the current recommendations that CXR is not indicated. The low incidence of RSV/flu indicate that routine testing may not be necessary in this population especially outside of the flu season. Reduced testing could decrease overall costs to the healthcare system as well as radiation exposure to this population.

Paleti S, Sobani ZA, McCarty TR, Gutta A, Gremida A, Shah R, Nutalapati V, Bazerbachi F, Jesudoss R, Amin S, Okwara C, Kathi PR, Ahmed A, Gessel L, Hung K, Masoud A, Yu J, Mony S, Akshintala V, **Jamil L**, Nasereddin T, Kochhar G, Vyas N, Saligram S, Garg R, Sandhu D, Benrajab K, Konjeti R, Agnihotri A, Trivedi H, Grunwald M, Mayer I, Mohanty A and Rustagi T (2021). "Impact of COVID-19 on gastroenterology fellowship training: A multicenter analysis of endoscopy volumes." Endoscopy International Open 9(10): E1572-e1578.
Full Text
Department of Internal Medicine/Gastroenterology

Background and Study Aims: The COVID-19 pandemic has had a profound impact on gastroenterology training programs. We aimed to objectively evaluate procedural training volume and impact of COVID-19 on gastroenterology fellowship programs in the United States. Methods: This was a retrospective, multicenter study. Procedure volume data on upper and lower endoscopies performed by gastroenterology fellows was abstracted directly from the electronic medical record. The study period was stratified into 2 time periods: Study Period 1, SP1 (03/15/2020 to 06/30/2020) and Study Period 2, SP2 (07/01/2020 to 12/15/2020). Procedure volumes during SP1 and SP2 were compared to Historic Period 1 (HP1) (03/15/2019 to 06/30/2019) and Historic Period 2 (HP2) (07/01/2019 to 12/15/2019) as historical reference. Results: Data from 23 gastroenterology fellowship programs (total procedures = 127,958) with a median of 284 fellows (range 273-289; representing 17.8% of all trainees in the United States) were collected. Compared to HP1, fellows performed 53.6% less procedures in SP1 (total volume: 28,808 vs 13,378; mean 105.52 ± 71.94 vs 47.61 ± 41.43 per fellow; $P < 0.0001$). This reduction was significant across all three training years and for both lower and upper endoscopies ($P < 0.0001$). However, the reduction in volume was more pronounced for lower endoscopy compared to upper endoscopy [59.03% (95% CI: 58.2-59.86) vs 48.75% (95% CI: 47.96-49.54); $P < 0.0001$]. The procedure volume in SP2 returned to near baseline of HP2 (total volume: 42,497 vs 43,275; mean 147.05 ± 96.36 vs 150.78 ± 99.67; $P = 0.65$). Conclusions: Although there was a significant reduction in fellows' endoscopy volume in the initial stages of the pandemic, adaptive mechanisms have resulted in a return of procedure volume to near baseline without ongoing impact on endoscopy training.

Pandey S, **Amin M** and **Cappell M** (2021). "Metastasis of solitary fibrous tumor to the peripancreatic area causing pancreatitis." American Journal of Gastroenterology 116: S754-S754.
Full Text

Department of Pathology
Department of Internal Medicine/Gastroenterology

Parzen JS, **Quinn T**, **Almahariq MF**, **Siddiqui ZA**, **Thompson A**, **Guerrero TM**, **Lee KC**, **Stevens CW** and **Grills IS** (2021). "Assessing the benefit of higher biologically effective dose in patients with squamous cell carcinoma of the lung treated with stereotactic body radiation therapy." International Journal of Radiation Oncology Biology Physics 111(3): E448-E448.
Full Text
Department of Radiation Oncology

Parzen JS, Wilson T, **Stevens CW**, **Chinnaiyan P** and **Kabolizadeh P** (2021). "The downstream "Halo Effect" of opening a single-vault proton therapy facility at a cancer center." International Journal of Radiation Oncology Biology Physics 111(3): E343-E343.
Full Text
Department of Radiation Oncology

Patel PR, Stafford PL, Bilchick KC, Walker MR, Ibrahim S, Martin D, Betz Y, Patel TR, Kwon Y, **Mehta N**, Sodhi N, Mwansa H, Breathett K and Mazimba S (2021). "Right atrial volume index to left atrial volume index ratio is associated with adverse clinical outcomes in cardiogenic shock." Journal of Echocardiography. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Background: Structural remodeling in chronic systolic heart failure (HF) is associated with neurohormonal and hemodynamic perturbations among HF patients presenting with cardiogenic shock (CS) and HF. Our objective was to test the hypothesis was that atrial remodeling marked by an increased right atrial volume index (RAVI) to left atrial volume index (LAVI) ratio is associated with adverse clinical outcomes in CS. Methods: Patients in this cohort were admitted to the intensive care unit with evidence of congestion (pulmonary capillary wedge pressure > 15) and cardiogenic shock (cardiac index < 2.2, systolic blood pressure < 90 mmHg, and clinical evidence supporting CS) and had an echocardiogram at the time of admission. RAVI was measured using Simpson's method in the apical four-chamber view, while LAVI was measured using the biplane disc summation method in the four and two-chamber views by two independent observers. Cox proportional hazards regression analysis was used to assess the association of RAVI-LAVI with the combined outcome of death or left ventricular assist device (LVAD). Results: Among 113 patients (mean age 59 +/- 14.9 years, 29.2% female), median RAVI/LAVI was 0.84. During a median follow-up of 12 months, 43 patients died, and 65 patients had the combined outcomes of death or LVAD. Patients with RAVI/LAVI ratio above the median had a greater incidence of death or LVAD (Log-rank p <= 0.001), and increasing RAVI/LAVI was significantly associated with the outcomes of death or LVAD (HR 1.71 95% CI 1.11-2.64, chi square 5.91, p = 0.010) even after adjustment for patient characteristics, echocardiographic and hemodynamic variables. Conclusion: RAVI/LAVI is an easily assessed novel echocardiographic parameter strongly associated with the survival and or the need for mechanical circulatory support in patients with CS.

Patel SN, **Mahmoud TH**, Kazahaya M and Todorich B (2021). "Autologous neurosensory retinal transplantation: Bridging the gap." Retina 41(12): 2417-2423.
Full Text
Department of Ophthalmology

Purpose: To review the autologous retinal transplantation surgical technique, indications, rationale, and current outcomes of data published to date. Methods: Review of surgical technique, preoperative and postoperative best-corrected visual acuity, and macular hole (MH) closure rate in studies with at least five eyes. Results: The weighted average macular hole closure rate is 88%, with a MH closure rate ranging from 66.7% to 100%. The weighted average best-corrected visual acuity improved from mean logarithm of the minimum angle of resolution 1.35 (Snellen equivalent of 20/450) preoperatively to mean logarithm of the minimum angle of resolution 1.02 (Snellen equivalent of 20/210) postoperatively. From the largest autologous retinal transplantation case series, 37% of patients gained 3 or more lines of visual acuity after autologous retinal transplantation for primary or refractory MHs and 74% gained 3 or more lines of visual acuity after autologous retinal transplantation for MH-retinal detachments. Functional improvement including negative Watzke-Allen sign and conversion from positive to negative scotoma was reported in large case series. Conclusion: Autologous retinal transplantation is a promising technique for closure of large and refractory MHs otherwise difficult to repair with conventional techniques. This technique may allow for replacement of neural tissue in the macula through cell rehabilitation and regeneration through presumed ectopic synaptogenesis, retinal progenitor cell differentiation and integration, and/or retinal progenitor cell material transfer to host neurons.

Peacock WF, Kuehl D, Bazarian J, Singer AJ, Cannon C, Rafique Z, d'Etienne JP, Welch R, **Clark C** and Diaz-Arrastia R (2021). "Defining acute traumatic encephalopathy: Methods of the "HEAD Injury Serum Markers and Multi-Modalities for Assessing Response to Trauma" (HeadSMART II) study." Frontiers in Neurology 12: 733712.

Full Text

Department of Emergency Medicine

Despite an estimated 2.8 million annual ED visits, traumatic brain injury (TBI) is a syndromic diagnosis largely based on report of loss of consciousness, post-traumatic amnesia, and/or confusion, without readily available objective diagnostic tests at the time of presentation, nor an ability to identify a patient's prognosis at the time of injury. The recognition that "mild" forms of TBI and even sub-clinical impacts can result in persistent neuropsychiatric consequences, particularly when repetitive, highlights the need for objective assessments that can complement the clinical diagnosis and provide prognostic information about long-term outcomes. Biomarkers and neurocognitive testing can identify brain injured patients and those likely to have post-concussive symptoms, regardless of imaging testing results, thus providing a physiologic basis for a diagnosis of acute traumatic encephalopathy (ATE). The goal of the HeadSMART II (HEAD injury Serum markers and Multi-modalities for Assessing Response to Trauma) clinical study is to develop an in-vitro diagnostic test for ATE. The BRAINBox TBI Test will be developed in the current clinical study to serve as an aid in evaluation of patients with ATE by incorporating blood protein biomarkers, clinical assessments, and tools to measure, identify, and define associated pathologic evidence and neurocognitive impairments. This protocol proposes to collect data on TBI subjects by a multi-modality approach that includes serum biomarkers, clinical assessments, neurocognitive performance, and neuropsychological characteristics, to determine the accuracy of the BRAINBox TBI test as an aid to the diagnosis of ATE, defined herein, and to objectively determine a patient's risk of developing post-concussive symptoms.

Pendell Meyers H, Bracey A, Lee D, Lichtenheld A, Li WJ, Singer DD, **Rollins Z**, Kane JA, Dodd KW, Meyers KE, Shroff GR, Singer AJ and Smith SW (2021). "Ischemic st-segment depression maximal in v1–v4 (Versus v5–v6) of any amplitude is specific for occlusion myocardial infarction (versus nonocclusive

ischemia)." Journal of the American Heart Association 10(23): e022866.
Full Text
OUWB Medical Student Author

Background: Occlusion myocardial infarctions (OMIs) of the posterolateral walls are commonly missed by ST-segment– elevation myocardial infarction (STEMI) criteria, with >50% of patients with circumflex occlusion not receiving emergent rep-erfusion and experiencing increased mortality. ST-segment depression maximal in leads V1–V4 (STDmaxV1– 4) has been suggested as an indicator of posterior OMI. Methods and Results: We retrospectively reviewed a high-risk population with acute coronary syndrome. OMI was defined from prior studies as a culprit lesion with TIMI (Thrombolysis in Myocardial Infarction) 0 to 2 flow or TIMI 3 flow plus peak troponin T >1.0 ng/mL or troponin I >10 ng/mL. STEMI was defined by the Fourth Universal Definition of Myocardial Infarction. ECGs were interpreted blinded to outcomes. Among 808 patients, there were 265 OMIs, 108 (41%) meeting STEMI criteria. A total of 118 (15%) patients had “suspected ischemic” STDmaxV1– 4, of whom 106 (90%) had an acute culprit lesion, 99 (84%) had OMI, and 95 (81%) underwent percutaneous coronary intervention. Suspected ischemic STDmaxV1– 4 had 97% specificity and 37% sensitivity for OMI. Of the 99 OMIs detected by STDmaxV1– 4, 34% had <1 mm ST-segment depression, and only 47 (47%) had accompanying STEMI criteria, of which 17 (36%) were identified a median 1.00 hour earlier by STDmaxV1– 4 than STEMI criteria. Despite similar infarct size, TIMIS flow, and coronary interventions, patients with STEMI(−) OMI and STDmaxV1– 4 were less likely than STEMI(+) patients to undergo catheterization within 90 minutes (46% versus 68%; P=0.028). Conclusions: Among patients with high-risk acute coronary syndrome, the specificity of ischemic STDmaxV1– 4 was 97% for OMI and 96% for OMI requiring emergent percutaneous coronary intervention. STEMI criteria missed half of OMIs detected by STDmaxV1– 4. Ischemic STDmaxV1–V4 in acute coronary syndrome should be considered OMI until proven otherwise.

Powers JM, Muñoz KDR, Parkerson J, Nigro LC and Blanchet NP (2021). "From salvage to prevention: A single-surgeon experience with acellular dermal matrix and infection in prepectoral breast reconstruction." Plastic and Reconstructive Surgery 148(6): 1201-1208.
Full Text
Department of Pathology

Background: Increasing amounts of acellular dermal matrix are being used with the adoption of prepectoral breast reconstruction. Postoperative infection remains a challenge in breast reconstruction, and the contribution of acellular dermal matrix type, processing, and sterility assurance level to risk of complications in prepectoral reconstruction is not well studied. Methods: The authors performed a retrospective review of patients who underwent immediate prepectoral breast reconstruction from February of 2017 to July of 2020. Because of an increase in the rate of infection, the drain protocol was changed and acellular dermal matrix type was switched from AlloDerm (sterility assurance level, 10-3) to DermACELL (sterility assurance level, 10-6) in January of 2019. Demographic and surgical variables were collected, in addition to details regarding development and management of infection. Results: Despite higher rates of direct-to-implant reconstruction and bilateral procedures and increased implant volumes, the rate of infection was significantly lower in patients who received DermACELL instead of AlloDerm [two of 38 (5.3 percent) versus 11 of 41 (26.8 percent); p = 0.014]. Drain duration was slightly longer in the DermACELL group, consistent with the change in drain protocol. Baseline demographic and clinical characteristics remained similar between the two groups. Conclusions: With increased reliance on large amounts of acellular dermal matrix for prepectoral breast reconstruction, it directly follows that the properties of acellular dermal matrix with respect to

incorporation, sterility, and implant support are that much more important to consider. There have been few studies comparing different types of acellular dermal matrix in prepectoral breast reconstruction, and further research is required to determine the contribution of acellular dermal matrix type and processing techniques to development of postoperative infection.

Qin A, Liu G, Chen S, Zhao L, **Zheng W**, **Yan D**, **Grills IS**, **Stevens CW**, **Li X** and **Ding X** (2021). "Investigate the feasibility of using CBCT to assess the dose validation for Spot-Scanning Proton Arc (SPArc) therapy for advanced staged lung cancer treatment." International Journal of Radiation Oncology Biology Physics 111(3): S98-S98.
Full Text
Department of Radiation Oncology

Qin A, **Snyder M**, **Liang J**, Chen S and **Yan D** (2021). "Achievable accuracy of DIR for tumor/organ with large progressive shrinkage during the radiation treatment: A bio-tissue phantom study." International Journal of Radiation Oncology Biology Physics 111(3): S17-S17.
Full Text
Department of Radiation Oncology

Qu Z, Qu E, **Huang J**, **Micale MA** and Li E (2021). "Utilization of 2D barcode technology to create surgical pathology reports." American Journal of Clinical Pathology 156: S116-S116.
Full Text
Department of Pathology

Qumseya BJ, **Jamil LH**, Elmunzer BJ, Riaz A, Ceppa EP, Thosani NC, Buxbaum JL, Storm AC, Sawhney MS, Pawa S, Naveed M, Lee JK, Law JK, Kwon RS, Jue TL, Fujii-Lau LL, Fishman DS, Calderwood AH, Amateau SK, Al-Haddad M and Wani S (2021). "ASGE guideline on the role of endoscopy in the management of malignant hilar obstruction." Gastrointestinal Endoscopy 94(2): 222-234.e222.
Full Text
Department of Internal Medicine/Gastroenterology

This clinical guideline from the American Society for Gastrointestinal Endoscopy (ASGE) provides an evidence-based approach for the management of patients with malignant hilar obstruction (MHO). This document was developed using the Grading of Recommendations Assessment, Development and Evaluation framework and addresses primary drainage modality (percutaneous transhepatic biliary drainage [PTBD] vs endoscopic biliary drainage [EBD]), drainage strategy (unilateral vs bilateral), and stent selection (plastic stent [PS] vs self-expandable metal stent [SEMS]). Regarding drainage modality, in patients with MHO undergoing drainage before potential resection or transplantation, the panel suggests against routine use of PTBD as first-line therapy compared with EBD. In patients with unresectable MHO undergoing palliative drainage, the panel suggests PTBD or EBD. The final decision should be based on patient preferences, disease characteristics, and local expertise. Regarding drainage strategy, in patients with unresectable MHO undergoing palliative stent placement, the panel suggests placement of bilateral stents compared with a unilateral stent in the absence of liver atrophy. Finally, regarding type of stent, in patients with unresectable MHO undergoing palliative stent placement, the panel suggests placing SEMSs or PSs. However, in patients who have a short life expectancy and who place high value on avoiding repeated interventions, the panel suggests using SEMSs compared with PSs. If optimal drainage strategy has not been established, the panel suggests placing PSs. This document clearly outlines the process, analyses, and decision

processes used to reach the final recommendations and represents the official ASGE recommendations on the above topics.

Radhakrishna U, Nath SK, Vishweswaraiah S, Uppala LV, Forray A, Muvvala SB, Mishra NK, Southekal S, Guda C, Govindamangalam H, Vargas D, Gardella WG, Crist RC, Berrettini WH, Metpally RP and **Bahado-Singh RO** (2021). "Maternal opioid use disorder: Placental transcriptome analysis for neonatal opioid withdrawal syndrome." Genomics 113(6): 3610-3617.
Full Text
Department of Obstetrics & Gynecology

Excessive prenatal opioid exposure may lead to the development of Neonatal Opioid Withdrawal Syndrome (NOWS). RNA-seq was done on 64 formalin-fixed paraffin-embedded placental tissue samples from 32 mothers with opioid use disorder, with newborns with NOWS that required treatment, and 32 prenatally unexposed controls. We identified 93 differentially expressed genes in the placentas of infants with NOWS compared to unexposed controls. There were 4 up- and 89 downregulated genes. Among these, 7 genes CYP1A1, APOB, RPH3A, NRXN1, LINC01206, AL157396.1, UNC80 achieved an FDR p-value of <0.01. The remaining 87 genes were significant with FDR p-value <0.05. The 4 upregulated, CYP1A1, FP671120.3, RAD1, RN7SL856P, and the 10 most significantly downregulated genes were RNA5SP364, GRIN2A, UNC5D, DMBT1P1, MIR3976HG, LINC02199, LINC02822, PANTR1, AC012178.1, CTNNA2. Ingenuity Pathway Analysis identified the 7 most likely to play an important role in the etiology of NOWS. Our study expands insights into the genetic mechanisms of NOWS development.

Rajeev-Kumar G, Manjunath R, Harkenrider MM, Das P, Tendulkar RD, Corbin KS, Jagsi R, Marwaha G, Johung KL, Evans SB, **Jawad MS**, Shinohara ET, Komarnicky LT, Yeung AR, Buckstein M, Golden DW and Hasan Y (2021). "Preliminary report assessing resident and faculty evaluations across radiation oncology programs." International Journal of Radiation Oncology Biology Physics 111(3): E191-E191.
Full Text
Department of Radiation Oncology

Rali P, Sacher D, Rivera-Lebron B, Rosovsky R, Elwing JM, Berkowitz J, Mina B, **Dalal B**, Davis GA, Dudzinski DM, Duval A, Ichinose E, Kabrhel C, Kapoor A, Lio KU, Lookstein R, McDaniel M, Melamed R, Naydenov S, Sokolow S, Field KR, Tapson V, Bossone E, Keeling B, Channick R and Ross CB (2021). "Interhospital transfer of patients with acute pulmonary embolism challenges and opportunities." Chest 160(5): 1844-1852.
Full Text
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Acute pulmonary embolism (PE) is associated with significant morbidity and mortality. The management paradigm for acute PE has evolved in recent years with wider availability of advanced treatment modalities ranging from catheter-directed reperfusion therapies to mechanical circulatory support. This evolution has coincided with the development and implementation of institutional pulmonary embolism response teams (PERT) nationwide and internationally. Because most institutions are not equipped or staffed for advanced PE care, patients often require transfer to centers with more comprehensive resources, including PERT expertise. One of the unmet needs in current PE care is an organized approach to the process of interhospital transfer (IHT) of critically ill PE patients. In this review, we discuss medical optimization and support of patients before and during transfer, transfer checklists, defined roles of emergency medical services, and the roles and responsibilities of referring and receiving centers involved in the IHT of acute PE patients.

Randall DJ, Zhang Y, Harris AP, Qiu Y, Li H, Stephens AR and Kazmers NH (2021). "The minimal clinically important difference of the Patient-Reported Outcomes Measurement Information System (PROMIS) physical function and upper extremity computer adaptive tests and QuickDASH in the setting of elbow trauma." JSES International 5(6): 1132-1138.
Full Text
OUWB Medical Student Author

Background: Minimal clinically important difference (MCID) estimates are useful for gauging clinical relevance when interpreting changes or differences in patient-reported outcomes scores. These values are lacking in the setting of elbow trauma. Our primary purpose was to estimate the MCID of the Patient-Reported Outcomes Measurement Information System (PROMIS) physical function (PF) computer adaptive test (CAT), the PROMIS upper extremity (UE) CAT, and the QuickDASH using an anchor-based approach for patients recovering from elbow trauma and related surgeries. Secondarily, we aimed to estimate the MCID using the 1/2 standard deviation method. MATERIALS & Methods: Adult patients undergoing treatment for isolated elbow injuries between July 2014 and April 2020 were identified at a single tertiary academic medical center. Outcomes, including the PROMIS PF CAT v1.2/2.0, PROMIS UE CAT v1.2, and QuickDASH, were collected via a tablet computer. For inclusion, baseline (6 months before injury up to 11 days postoperatively or after injury) and follow-up (11 to 150 days postoperative or after injury) PF or UE CAT scores were required, as well as a response to an anchor question querying improvement in physical function. The MCID was calculated using (1) an anchor-based approach using the difference in mean score change between anchor groups reporting "No change" and "Slightly Improved/Improved" and (2) the 1/2 standard deviation method. Results: Of the 146 included patients, the mean age was 46 ± 18 years and 67 (46%) were women. Most patients (129 of 146 or 88%) were recovering from surgery, and the remaining 12% were recovering from nonoperatively managed fractures and/or dislocations. The mean follow-up was 157 ± 192 days. Scores for each instrument improved significantly between baseline and follow-up. Anchor-based MCID values were calculated as follows: 5.7, 4.6, and 5.3 for the PROMIS PF CAT, PROMIS UE CAT, and QuickDASH, respectively. MCID values estimated using the 1/2 standard deviation method were 4.3, 4.8, and 11.7 for the PROMIS PF CAT, PROMIS UE CAT, and QuickDASH, respectively. Conclusions: In the setting of elbow trauma, we propose MCID ranges of 4.3 to 5.7 for the PROMIS PF CAT, 4.6 to 4.8 for the PROMIS UE CAT, and 5.3 to 11.7 for the QuickDASH. These values will provide a framework for clinical relevance when interpreting clinical outcomes studies, or powering clinical trials, for populations recovering from trauma.

Rapp CM, Koueiter DM, Bojnowski J, Kalma J, **Wiater B**, Kurdziel MD and **Wiater JM** (2021). "Are suture tape knots as secure as standard suture? A biomechanical study." Orthopaedic Journals of Sports Medicine 9(10): 23259671211045411.
Full Text
Department of Orthopaedic Surgery

Background: Few studies have investigated the biomechanical performance of flat-braided suture tapes versus round-braided sutures after being knotted. Purpose: To compare the loop security and knot strength of a standard round-braided suture with 3 commercially available flat-braided suture tapes using 2 types of arthroscopic knots. Study Design: Controlled laboratory study. Methods: One standard suture (SS) and 3 suture tapes (T1, T2, and T3) were tied with the surgeon's knot (SK) and the Tennessee slider (TS), 25 times each, by a single surgeon. Each combination of knots and sutures underwent a preload, cyclic loading, and load

to failure. Outcomes were loop security (defined by loop stretch after a 5-N preload), load at clinical failure (3 mm of displacement), and load at ultimate failure (suture rupture or knot slippage). Two-way analysis of variance was used for analysis. Results: Overall, the SK group had greater overall loop security than that of the TS group (0.4 ± 0.3 vs 0.5 ± 0.3 mm of stretch, respectively; P = .020). The clinical failure load varied by suture type (P < .001) but not knot type (P = .106). For both knot types, the SS had the lowest mean ± SD clinical failure load (SK, 171 ± 49 N; TS, 176 ± 37 N), which was significantly less than that of T2 (247 ± 85 N; P < .001) and T3 (251 ± 96 N; P < .001) for the SK type and T2 (231 ± 67 N; P = .023) for the TS type. T2 sutures had the greatest ultimate failure load for both knot types (SK, 418 ± 45 N; TS, 461 ± 57 N), which was significantly greater than SS, T1, and T3 (P < .001 for all). The TS knot had greater overall ultimate failure load than the SK (375 ± 64 vs 350 ± 66 N; P < .001). Conclusions: Not all suture tape knots had the same biomechanical properties, although knot security and strength appeared to be adequate for all suture tapes as well as for SS. There was no evidence that suture tape knots are lower profile than SS knots.

Rehman R, **Azam M**, Rehman S, Arora H and Kohen L (2021). "Gender and ethnic representation of incoming Mohs micrographic surgery fellows in the United States: A look into fellowship diversity." JAAD International. ePub Ahead of Print.
Full Text
OUWB Medical Student Author

Rehman R, **Dekhou A**, Osto M, Agemy J, Chaaban A, Yuhan B and Thorpe E (2021). "Aneurysmal bone cysts of the craniofacial origin: A systematic review." OTO Open 5(4): 2473974x211052950.
Full Text
OUWB Medical Student Author

Objective: Aneurysmal bone cysts (ABCs) are blood-filled, locally destructive, benign bone tumors. Our objective was to conduct a systematic review outlining patient demographics, clinical characteristics, management, and outcomes of those with ABCs of the craniofacial bones. Data Sources: Using PubMed, Cochrane, and Embase databases, 116 studies were included. REVIEW Methods: Following Preferred Reporting Items for Systematic Reviews and Meta-Analysis guidelines, a systematic review was conducted. Data including patient demographics, clinical characteristics, treatment strategies, and patient outcomes were collected. Results: A total of 127 patients from 116 studies were identified. Age ranged from 8 months to 90 years, with a mean age of 19.0 years. The most commonly affected craniofacial locations were the mandible (n = 31, 24.4%), temporal bone (n = 21, 16.5%), and occipital bone (n = 14, 11.0%). The most common presenting symptoms included a nontender mass (n = 51, 40.2%), a tender mass (n = 31, 24.4%), and generalized headache (n = 30, 23.6%). Imaging modalities included computed tomography (CT) and magnetic resonance imaging (MRI) (n = 77, 60.6%), CT alone (n = 31, 24.4%), and MRI alone (n = 8, 6.2%). All patients underwent surgical resection, with 1 patient requiring adjuvant radiation in addition to surgery. In total, 121 patients were disease-free and symptom-free without evidence of recurrence (17.4-month mean follow-up, 5.4 months average time to first recurrence). Conclusion: The current literature's characterization of ABCs in craniofacial bones is limited to case reports and case series. Given the rarity of these tumors, head and neck surgeons may rely on systematic reviews such as the present analysis to guide management.

Rehman R, Saad M, Huq F, Oska S, Mehregan D and Daveluy S (2021). "A cross-sectional analysis of popular hidradenitis suppurativa content on TikTok." JAAD International 5: 98-100.

Full Text
OUWB Medical Student Author

Rehman R, Saad M, **Suhrawardy A** and Kerr H (2021). "Contact dermatitis and TikTok: A cross-sectional analysis of trending content." Dermatitis. ePub Ahead of Print.
Full Text
OUWB Medical Student Author

Reilly J, **Faridmoayer E**, Lapkus M, **Pastewski J**, **Sun F**, **Elassar H**, Studzinski DM, Callahan RE, **Czako P** and **Nagar S** (2021). "Vascular invasion predicts advanced tumor characteristics in papillary thyroid carcinoma." American Journal of Surgery. ePub Ahead of Print.
Full Text
OUWB Medical Student Author
Department of Surgery

Background: The clinical impact of vascular invasion in Papillary Thyroid Carcinoma (PTC) is not well understood. Our aim was to determine if there was an association between vascular invasion and other tumor characteristics and patient outcomes in PTC. Methods: A retrospective chart review was performed of 536 patients with PTC between January 2007-December 2011. Patient demographics, comorbidities, tumor characteristics, and outcomes were collected. Results: Vascular invasion was associated with lymphatic invasion, capsular invasion, extrathyroidal extension, and the presence of positive lymph nodes. Logistic regression revealed that tumor size was a predictor of vascular invasion. Vascular invasion in PTC tumors was associated with higher tumor recurrence rates, but there were no differences in mortality. Conclusion: This study indicates that vascular invasion in PTC is associated with other aggressive pathologic features and an increased recurrence rate. For these reasons, vascular invasion should be an important tumor characteristic when determining extent of treatment.

Rymer J, Takagi H, Lowenstern A, Rabbat M, Fairbairn T, **Chinnaiyan K**, Douglas P, Koweek L, Berman D, De Bruyne B, Bax J, Akasaka T, Amano T, Nieman K, Rogers C, Kitabata H, Rønnow Sand NP, Kawasaki T, Mullen S and Matsuo H (2021). "Anatomic and functional discordance among patients with nonobstructive coronary disease." Journal of the American College of Cardiology 78(19): B36-B37.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Rymer J, Takagi H, Lowenstern A, Rabbat M, Fairbairn T, **Chinnaiyan K**, Douglas P, Koweek L, Berman D, De Bruyne B, Bax J, Akasaka T, Amano T, Nieman K, Rogers C, Kitabata H, Sand NPR, Kawasaki T, Mullen S, Matsuo H, Norgaard B, Leipsic J, Patel M and Daubert M (2021). "Anatomic and functional discordance among patients with nonobstructive coronary disease." Journal of the American College of Cardiology 78(19): B36-B37.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Sabina RL, Woods GL, Turner H, Abali E, Simmons JM and Huang GC (2021). "The MedEdPORTAL infinity mirror: Conducting an interactive workshop on how to develop an educational summary report for MedEdPORTAL." MedEdPORTAL 17: 11197.
Full Text
Department of Foundational Studies (BH)

Introduction: MedEdPORTAL is an open-access journal for health professions educators to

publish their educational activities. The Educational Summary Report (ESR) is the manuscript that represents scholarly expression of those activities, aligned with Glassick's criteria for scholarship; however, prospective authors face challenges in writing ESRs, which can lead to rejection. Methods: We developed a conference workshop to teach health professions educators how to write an ESR by reviewing a sample ESR in small groups. The workshop began with a didactic on best practices in crafting each section of an ESR. We then divided participants into small groups to review an assigned section of a sample ESR using a reviewer's checklist and completing a templated flip chart. Each small group then reported out in a large-group discussion. A conference evaluation was distributed online to solicit perceptions of the workshop's effectiveness. Results: The 90-minute workshop was presented by separate teams of two facilitators at three national conferences. Approximately 35 participants attended the first workshop, and 50 attended the second and third workshops. Survey feedback from 19 respondents (38%) to the evaluation survey at the third workshop was representative of the previous two iterations and demonstrated that workshop content and materials were helpful. Discussion: A workshop enabling educators to serve as group peer reviewers of a sample ESR for a MedEdPORTAL submission was well received. Associate editors, faculty mentors, and other experienced faculty development leaders can use these materials to support future authors in submitting to MedEdPORTAL while providing opportunities for national presentations.

Safian RD (2021). "Renal artery stenosis." Progress in Cardiovascular Diseases 65: 60-70.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Renal artery stenosis is the most common secondary cause of hypertension and predominantly caused by atherosclerosis. In suspected patients, a non-invasive diagnosis with ultrasound is preferred. Asymptomatic, incidentally found RAS does not require revascularization. In symptomatic patients requiring revascularization, renal artery stenting is the preferred therapy. Selecting appropriate patients for revascularization requires careful consideration of lesion severity and is optimized with a multidisciplinary team. All patients with atherosclerotic RAS should be treated with guideline-directed medical therapy, including hypertension control, diabetes control, statins, antiplatelet therapy, smoking cessation and encouraging activity.

Salari K, **Quinn TJ**, **Ding X**, Abbott V, **Chen PY** and **Dilworth JT** (2021). "Near-surface dose correlates with toxicity in patients receiving pencil beam scanning intensity modulated proton beam breast irradiation." International Journal of Radiation Oncology Biology Physics 111(3): E225-E225.
Full Text
Department of Radiation Oncology

Sargent T, **Kolderman N**, **Nair GB**, Jankowski M and **Al-Katib S** (2021). "Risk factors for pneumothorax development following CT-guided core lung nodule biopsy." Journal of Bronchology & Interventional Pulmonology.
Full Text
OUWB Medical Student Author
Department of Diagnostic Radiology and Molecular Imaging
Department of Internal Medicine/Pulmonary & Critical Care Medicine

Background: This study aims to correlate nodule, patient, and technical risk factors less commonly investigated in the literature with pneumothorax development during computed tomography-guided core needle lung nodule biopsy. Patients and Methods: Retrospective data on 671 computed tomography-guided percutaneous core needle lung biopsies from 671

patients at a tertiary care center between March 2014 and August 2016. Univariate and multivariable logistic regression analyses were used to identify pneumothorax risk factors. Results: The overall incidence of pneumothorax was 26.7% (n=179). Risk factors identified on univariate analysis include anterior [odds ratio (OR)=1.98; P<0.001] and lateral (OR=2.17; P=0.002) pleural surface puncture relative to posterior puncture, traversing more than one pleural surface with the biopsy needle (OR=2.35; P=0.06), patient positioning in supine (OR=2.01; P<0.001) and decubitus nodule side up (OR=2.54; P=0.001) orientation relative to decubitus nodule side down positioning, and presence of emphysema in the path of the biopsy needle (OR=3.32; P<0.001). In the multivariable analysis, the presence of emphysematous parenchyma in the path of the biopsy needle was correlated most strongly with increased odds of pneumothorax development (OR=3.03; P=0.0004). Increased body mass index (OR=0.95; P=0.001) and larger nodule width (cm; OR=0.74; P=0.02) were protective factors most strongly correlated with decreased odds of pneumothorax development. Conclusion: Emphysema in the needle biopsy path is most strongly associated with pneumothorax development. Increases in patient body mass index and width of the target lung nodule are most strongly associated with decreased odds of pneumothorax.

Sawarynski KE, Swanberg SM, **Roach VA**, **Taylor TAH** and **Baxa DM** (2021). "Fostering early preclinical experiences for developing knowledge, skills, and confidence in key residency competencies through participation in a medical student research training program." Journal of Medical Education and Curricular Development. ePub Ahead of Print.

Full Text

Department of Foundational Medical Studies (OU)

Periods of academic transition are challenging and require medical students to adjust to new environments and expectations. Commonly cited areas of struggle include integrating into the interprofessional health care team, communication, organization and time management, and self-regulated learning. Consciously designing opportunities early in the preclinical curriculum to help students gradually build these competencies can be achieved within existing research training programs or projects. This perspective article reflects on how the medical student research training program at the Oakland University William Beaumont School of Medicine supports student growth in these areas beginning in the first year, so that students can directly apply these skills as they progress to the clinical years and beyond.

Scherr K, Delaney RK, Ubel P, Kahn VC, **Hamstra D**, Wei JT and Fagerlin A (2021). "Preparing patients with early stage prostate cancer to participate in clinical appointments using a shared decision making training video." Medical Decision Making. ePub Ahead of Print.

Full Text

Department of Radiation Oncology

Background: Rates of shared decision making (SDM) are relatively low in early stage prostate cancer decisions, as patients' values are not well integrated into a preference-sensitive treatment decision. The study objectives were to develop a SDM training video, measure usability and satisfaction, and determine the effect of the intervention on preparing patients to participate in clinical appointments. Methods: A randomized controlled trial was conducted to compare a plain-language decision aid (DA) to the DA plus a patient SDM training video. Patients with early stage prostate cancer completed survey measures at baseline and after reviewing the intervention materials. Survey items assessed patients' knowledge, beliefs related to SDM, and perceived readiness/intention to participate in their upcoming clinical appointment. Results: Of those randomized to the DA + SDM video group, most participants (91%) watched the video and

93% would recommend the video to others. Participants in the DA + SDM video group, compared to the DA-only group, reported an increased desire to participate in the decision (mean = 3.65 v. 3.39, P < 0.001), less decision urgency (mean = 2.82 v. 3.39, P < 0.001), and improved self-efficacy for communicating with physicians (mean = 4.69 v. 4.50, P = 0.05). These participants also reported increased intentions to seek a referral from a radiation oncologist (73% v. 51%, P = 0.004), to take notes (mean = 3.23 v. 2.86, P = 0.004), and to record their upcoming appointments (mean = 1.79 v. 1.43, P = 0.008). Conclusions: A novel SDM training video was accepted by patients and changed several measures associated with SDM. This may be a scalable, cost-effective way to prepare patients with early stage prostate cancer to participate in their clinical appointments.

Schlecht KD, **Reitz LS**, **Farr CM**, **Spencer LM** and **Jewulski JJ** (2021). "Millennial medical students' educational expectations of anesthesia clerkships." Journal of Education in Perioperative Medicine 23(4): E677-E677.
Full Text
Department of Anesthesiology

Background: The unique characteristics of the millennial generation has promulgated changes in the workplace and in academia. A lack of national standards necessitates that anesthesia faculty create educational content for anesthesia clerkships. Assessing expectations before an anesthesia rotation would provide data to accommodate millennial medical students' needs and preferences for learning. Methods: A 16-question survey using Qualtrics software was created, with input from millennial medical students, to query preclinical medical students at the Oakland University William Beaumont School of Medicine on their educational expectations of an anesthesia clerkship. Results: Seventy-four surveys were completed, with 34 (46%) of 74 from first-year and 40 (54%) of 74 from second-year medical students. Daily feedback (44 [59%] of 74) and written exams (43 [58%] of 74) were preferred methods of evaluation. No lectures, observing in an operating room, and performing procedures on real patients were the preferred format for instruction. Two (23 [31%] or 74) to 3 (33 [45%] of 74) weeks was the preferred duration of an anesthesia rotation. Conclusions: This study demonstrates that millennial medical students have preconceived educational expectations of an anesthesia clerkship, and identifies learning preferences that differ from the implemented anesthesia curriculum currently described in the literature.

Schoenherr DT, **Dereski MO**, **Bernacki KD**, **Khayyata S** and **Attardi SM** (2021). "Development and evaluation of an online integrative histology module: Simple design, low-cost, and improves pathology self-efficacy." Medical Education Online 27(1): 2011692.
Full Text
OUWB Medical Student Author
Department of Foundational Medical Studies (BH)
Department of Pathology
Department of Foundational Medical Studies (OU)

Integration of core concepts is an important aspect of medical curriculum enhancement. Challenges to improving integration include the risk of curtailing the basic sciences in the process and the push to decrease contact hours in medical curricula. Self-paced learning tools can be developed that deliberately relate basic and clinical sciences to aid students in making interdisciplinary connections. The purpose of this project was to develop, implement, and evaluate a self-paced learning module that would be applicable to integration of different disciplines in medical education. The module was intended to improve integration between

histology and anatomic pathology before a respiratory pathology laboratory session. Qualtrics XM, a survey software commonly available at educational institutions, was used in a novel manner to create the module. Module activities included pre- and post-module quizzes; four short videos emphasizing normal histological features and recalling associated pathologies; three categorization activities designed for students to recognize normal versus abnormal characteristics of lung specimens; and post-activity feedback. Preliminary data from first-year medical students showed that post-module quiz scores were significantly higher than pre-module quiz scores ($p < 0.001$) and that module users? pre-laboratory pathology self-efficacy was significantly higher than non-users ($p < 0.05$). These data suggest that module use facilitated short-term knowledge gain and improved pathology self-efficacy before the laboratory session. Online modules can be developed affordably using Qualtrics XM to integrate anatomical sciences with other disciplines, while providing students interactive learning resources without increasing contact hours. The module presented in this report focused on normal versus abnormal morphology, guiding students through recognizing the continuum from healthy to disease states before learning about the pathologies more in depth. A similar module design would likely be effective in integrating other disciplines in medicine, especially in disciplines that require recognition of changes in morphology.

Schwab IR and **Heidemann DG** (2021). "Ommatophore (Eyestalk) magic: Lobatus costatus." Ophthalmology 128(11): 1548.
Full Text
Department of Ophthalmology

Setty P, Fernandez-Miranda JC, Wang EW, Snyderman CH and Gardner PA (2021). "Residual and recurrent disease following endoscopic endonasal approach as a reflection of anatomic limitation for the resection of midline anterior skull base meningiomas." Operative Neurosurgery 21(4): 207-216.
Full Text
Department of Neurosurgery

Background: Endoscopic endonasal approaches (EEAs) to anterior skull base meningiomas have grown in popularity, though anatomic limitations remain unclear. Objective: To show the anatomic limits of EEA for meningiomas. Methods: Retrospective chart review for all patients that underwent EEA for anterior skull base meningiomas from 2005 to 2014. Results: A total of 100 patients averaged follow-up of 46.9 mo (24-100 mo). A total of 35 patients (35%) had olfactory groove, 33 planum sphenoidale (33%), and 32 tuberculum sella (32%) meningiomas. The average diameter was 2.9 cm (0.5-8.1 cm). Vascular encasement was seen in 11 patients (11%) and calcification in 20 (20%). Simpson Grade 1 (SG1) resection was achieved in 64 patients (64%). Only calcification impacted degree of resection (40% SG1, P = .012). The most common residual was on the anterior clinoid dura (11 patients [11%]). Six (6%) had residual superior/lateral to the optic nerve. Residual tumor was adherent to the optic apparatus or arteries in 5 patients (5%) each, and 3 patients (3%) had residual lateral to the mid-orbit. Rates of residual decreased over time. A total of 11 patients (11%) had tumor recurrence (mean of 40 mo): 4 (4%) on the anterior clinoid, 2 (2%) each on the lateral orbital roof, adherent to optic apparatus and superolateral to the optic nerve, and 1 (1%) was at the anterior falx. Conclusion: Anterior skull base meningiomas can effectively be approached via EEA in most patients; tumors extending to the anterior clinoid, anterior falx, or superolateral to the optic nerve or orbital roof, especially if calcified, may be difficult to reach via EEA.

Shah KB, Saado J, Kerwin M, Mazimba S, Kwon Y, Mangrum JM, Salerno M, **Haines DE** and **Mehta NK**

(2021). "Meta-analysis of new-onset atrial fibrillation versus no history of atrial fibrillation in patients with noncardiac critical care illness." American Journal of Cardiology. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Cardiovascular Disease

The incidence of new-onset secondary atrial fibrillation (NOSAF) is as high as 44% in noncardiac critical illness. A systematic review and meta-analysis were performed to evaluate the impact of NOSAF, compared with history of prior atrial fibrillation (AF) and no history of AF in noncardiac critically ill patients. Patients undergoing cardiothoracic surgery were excluded. NOSAF incidence, intensive care unit (ICU)/hospital length of stay (LOS), and mortality outcomes were analyzed. Of 2,360 studies reviewed, 19 studies met inclusion criteria (n = 306,805 patients). NOSAF compared with no history of AF was associated with increased in-hospital mortality (risk ratio [RR] 2.06, 95% confidence interval [CI] 1.76 to 2.41, p <0.001), longer ICU LOS (standardized difference in means [SMD] 0.66, 95% CI 0.41 to 0.91, p <0.001), longer hospital LOS (SMD 0.31, 95% CI 0.07 to 0.56, p = 0.001) and increased risk of long-term (>1 year) mortality (RR 1.76, 95% CI 1.29 to 2.40, p <0.001). NOSAF compared with previous AF was also associated with higher in-hospital mortality (RR 1.29, 95% CI 1.12 to 1.49, p <0.001), longer ICU LOS (SMD 0.37, 95% CI 0.03 to 0.70, p = 0.03) but no difference in-hospital LOS (SMD −0.18, 95% CI −0.66 to 0.31, p = 0.47). In conclusion, NOSAF, in the setting of noncardiac critical illness is associated with increased in-hospital mortality compared with no history of AF and previous AF. NOSAF (vs no history of AF) is also associated with increased long-term mortality.

Shen YC, Tyagi P, Lee WC, **Chancellor M** and Chuang YC (2021). "Improves symptoms and urinary biomarkers in refractory interstitial cystitis/bladder pain syndrome patients randomized to extracorporeal shock wave therapy versus placebo." Scientific Reports 11(1): 7558.
Full Text
Department of Urology

Extracorporeal shock wave therapy (ESWT) has been shown to improve symptoms in patients with interstitial cystitis/bladder pain syndrome (IC/BPS); however, there is a lack of objective evidence. We measured change of urinary biomarker levels in 25 patients with IC/BPS received ESWT or placebo once a week for 4 weeks. Urines were collected from participants at baseline, 4 and 12 weeks post treatment. A representative 41 inflammatory growth factors, cytokines, and chemokines in urine were measured using a MILLIPLEX immunoassay kit. Symptom bother was assessed by O'Leary-Sant symptom scores (OSS), and visual analog scale (VAS) for pain. The ESWT group exhibited a significant reduction in the OSS and VAS compared to the placebo group 4 weeks post-treatment (P < 0.05), and the effects were persistent at 12 weeks. The difference in urinary markers change in ESWT versus placebo was P = 0.054 for IL4, P = 0.013 for VEGF, and P = 0.039 for IL9 at 4 weeks. The change of urine biomarker was not significant in other biomarkers or all the measured proteins at 12 weeks. The current data suggest that IL4, IL9, and VEGF mediation may be involved in its pathophysiologic mechanisms and response to LESW treatment.

Shields RA, Cheng OT, **Ruby AJ**, **Williams GA** and **Wolfe JD** (2021). "Retinal complications after yttrium-aluminum-garnet laser vitreolysis for vitreous floaters." Ophthalmic Surgery Lasers and Imaging Retina 52(11): 610-613.
Full Text
Department of Ophthalmology

This is an observational case series of two patients who developed direct retinal damage following neodymium-doped yttrium-aluminum-garnet (YAG) laser treatment for symptomatic

vitreous floaters. The first patient developed a vitreous hemorrhage and subsequent branch retinal vein occlusion from laser damage to a major retinal venule. The second patient developed a temporal scotoma from a full-thickness retinal break in the posterior pole requiring laser retinopexy. Direct YAG laser damage to the posterior pole can cause permanent visual deficits.

Shields RA and **Mahmoud TH** (2021). "Management of autologous retinal transplant complications: A case series." Retina. ePub Ahead of Print.
Full Text
Department of Ophthalmology

Purpose: To present representative cases of the most common complications associated with an autologous retinal transplant (ART) for macular hole repair. Methods: A retrospective, consecutive case series on patients that underwent an ART by a single provider (THM). Results: Four cases were included in this review. Each suffered an ART-specific complication, including graft displacement and dislocation, sub-ART Perfluoron, and a delayed proliferative vitreoretinopathy-associated retinal detachment. Conclusions: As more surgeons utilize ART to treat atypical macular holes, an adequate understanding of surgery-specific complications and techniques to treat those complications is increasingly necessary.

Shifman H, Middlesworth W and Khlevner J (2021). "Respiratory comorbidities and nutritional status in children with esophageal atresia/tracheoesophageal fistula (EA/TEF)." Journal of Pediatric Gastroenterology and Nutrition 73(1 SUPPL 1): S8-S9.
Full Text
OUWB Medical Student Author

Introduction: EA/TEF is a complex congenital anomaly occurring in 1 in 2500-4500 live births. Respiratory and gastrointestinal (GI) complications/comorbidities including aspiration pneumonia, recurrent upper respiratory infections (URI), chronic lung disease (CLD), reactive airway disease (RAD)/asthma, laryngeal cleft (LC), dysphagia, esophageal dysmotility, & feeding disorders are highly prevalent among affected children. These conditions place children with EA/TEF at risk for poor growth and malnutrition, though nutritional outcome studies of this patient population are limited. Objectives: We examined the relationship between respiratory comorbidities and growth parameters in a cohort of children with EA/TEF at 6 time points in the first 2 years of life. Methods: We report a retrospective analysis of 114 patients with EA/TEF followed in a multidisciplinary EA clinic at our institution. Patient data were abstracted from the electronic health record and analyzed. Associations between respiratory comorbidities and weight-for-length (WFL) z-scores were assessed using multiple linear regression. Statistical analyses were performed in RStudio for Mac. Results: 114 patients (55M/59F, median age 7.31 years) were identified with a diagnosis of EA/TEF. 109/114 (95.6%) patients had at least 1 GI or respiratory comorbidity. 93/114 patients had measurements from at least 1 time point under 2 years of age, resulting in 353 total anthropometric measurements. Mean WFL z-scores for infants ≤1 year (-0.87, -0.66, -0.99, -0.22 for 3, 6, 9, & 12 months respectively) were significantly lower than those recorded at 18 months (-0.08) and 2 years (0.13) ($P < 0.05$) (Figure 1). RAD/asthma, CLD, LC, additional surgery in the 1st year of life, long-gap EA, & VACTERL (Vertebral defects, Anorectal malformations, Cardiac defects, TracheoEsophageal anomalies, Renal anomalies, and Limb abnormalities) association were identified as significant predictors of WFL z-scores (Table 1). RAD/asthma & additional surgery in the 1st year of life were associated with lower WFL z-scores when compared to EA/TEF patients without these risk factors, while CLD, LC, long-gap EA, & VACTERL were associated with higher WFL z-scores in various age

groups. No one variable was a significant predictor of WFL z-score across all age groups. Conclusions: Children with EA/TEF face significant health challenges from respiratory and GI comorbidities/complications, and poor growth parameters are common. While complications like anastomotic stricture & tracheomalacia may be unavoidable, early intervention by speech-language pathologists and pulmonologists, screening for aspiration, & guidance surrounding the consumption of certain consistencies may decrease the incidence of aspiration pneumonia/URI and improve outcomes for EA/TEF patients. We observed that, while many children with EA/TEF experience compromised nutritional status early in life, most will recover as they age. Interestingly, the associations between respiratory comorbidities and nutritional status vary throughout early childhood. LC is associated with an increase in WFL z-score in the 6-and 18-month groups, despite LC being independently associated with feeding difficulty. It's likely that diagnosis of LC leads to greater focus on nutritional supportive measures, and therefore early diagnosis and intervention for LC may be able to contribute positively to growth parameters. Identifying respiratory comorbidities that affect growth and nutritional status early may help providers intervene on risk factors or tailor a nutrition plan accordingly.

Sims BM, Patel AD, Garnica BG, **Faraj MT**, Tang A, Parsons T, Hoegler JJ and Day CS (2021). "Effect of elective surgery cancellations during the COVID-19 pandemic on patients' activity, anxiety and pain." British Journal of Surgery 108(12): e392-e393.
Full Text
OUWB Medical Student Author

Patient's perspectives and changes in symptoms after cancellation of their elective procedures due to the COVID-19 pandemic were analysed. Most patients experienced no change in symptoms, but women and black patients experienced adverse impacts at higher rates than other groups.

Sims M, Podolsky RH, **Maine GN**, **Kennedy RH** and **Homayouni R** (2021). "Reply to Escandon et al." Clinical Infectious Diseases 73(11): 2149-2150.
Full Text
Department of Internal Medicine/Infectious Disease
Department of Pathology
Department of Foundational Medical Studies (OU)

Sims M, Podolsky RH, **Maine GN**, **Kennedy RH** and **Homayouni R** (2021). "Concerns with and recommendations for Coronavirus Disease 2019 research related to asymptomatic infection and mask wearing reply." Clinical Infectious Diseases 73(11): 2149-2150.
Full Text
Department of Internal Medicine/Infectious Disease
Department of Pathology
Department of Foundational Medical Studies (OU)

Sims MD, **Maine GN**, Childers KL, Podolsky RH, Voss DR, Berkiw-Scenna N, Oh J, Heinrich KE, Keil H, **Kennedy RH** and **Homayouni R** (2021). "Coronavirus disease 2019 (covid-19) seropositivity and asymptomatic rates in healthcare workers are associated with job function and masking." Clinical Infectious Diseases 73: S154-S162.
Full Text
Department of Internal Medicine/Infectious Disease
Department of Pathology

Department of Foundational Medical Studies (OU)

Background. Although the risk of exposure to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) is higher for frontline healthcare workers, not all personnel have similar risks. Determining infection rate is difficult due to the limits on testing and the high rate of asymptomatic individuals. Detection of antibodies against SARS-CoV-2 may be useful for determining prior exposure to the virus and assessing mitigation strategies, such as isolation, masks, and other protective equipment. Methods. An online assessment that included demographic, clinical, and exposure information and a blood sample was collected from 20 614 participants out of ∼43 000 total employees at Beaumont Health, which includes 8 hospitals distributed across the Detroit metropolitan area in southeast Michigan. The presence of anti-SARS-CoV-2 IgG was determined using the EUROIMMUN assay. Results. A total of 1818 (8.8%) participants were seropositive between April 13 and May 28, 2020. Among the seropositive individuals, 44% reported that they were asymptomatic during the month prior to blood collection. Healthcare roles such as phlebotomy, respiratory therapy, and nursing/nursing support exhibited significantly higher seropositivity. Among participants reporting direct exposure to a Coronavirus Disease 2019 (COVID-19) positive individual, those wearing an N95/PAPR mask had a significantly lower seropositivity rate (10.2%) compared to surgical/other masks (13.1%) or no mask (17.5%). Conclusions. Direct contact with COVID-19 patients increased the likelihood of seropositivity among employees but study participants who wore a mask during COVID-19 exposures were less likely to be seropositive. Additionally, a large proportion of seropositive employees self-reported as asymptomatic.

Squires BS, **Grills IS**, Fontanesi J, **Quinn TJ**, **Guerrero TM**, **Stevens CW**, **Lee KC** and Lee KC, Jr. (2021). "Treatment of early-stage pulmonary carcinoid tumors with hypofractionated radiotherapy." International Journal of Radiation Oncology, Biology, Physics 111(3): e464-e464.
Full Text

Department of Radiation Oncology

Purpose/Objective(s): Stereotactic body radiotherapy (SBRT) is standard for early-stage non-small cell lung cancer in patients who are inoperable or refuse surgery. Data are limited regarding definitive hypofractionated radiotherapy (HFRT) regimens for pulmonary carcinoid tumors. The only two published experiences consist of four and ten patients, respectively. We hypothesize that HFRT is safe and effective for definitive treatment of pulmonary carcinoid tumors. Materials/Methods: Records from a single healthcare system were retrospectively analyzed. Patients were eligible for analysis if they had undergone histologic confirmation of an early-stage (cT1-2, N0) typical or atypical pulmonary carcinoid tumor and had been treated with HFRT (> 2.2 Gy/fraction) for gross disease. Clinical, radiographic, and dosimetric characteristics were recorded. Overall survival (OS) was calculated with the Kaplan-Meier method. Results: From 2008-2020, 10 patients (80% female) were treated with HFRT with a median follow-up of 29 months (5.1 - 145.1). Nine patients (90%) had typical histology; one patient with atypical histology remains alive almost six years post-HFRT. Median max tumor dimension was 1.5 cm (0.9 - 3.8). Five patients (50%) had central tumors per RTOG 0813. Five patients (50%) were medically inoperable, while the remaining five refused surgery. Nine patients (90%) underwent SBRT consisting of 4-5 fractions to 47.5-50 Gy (9.5-12 Gy/fraction); one patient underwent 60 Gy in 20 fractions and remains alive > 12 years post-HFRT. Thus, median BED10Gy was 98.2 Gy (78 - 105.6). On CT, three patients (30%) had stable disease, four (40%) had partial response, and the remaining three (30%) had post-treatment changes obscuring treatment response assessment. Of the four patients (40%) with pre- and post-HFRT metabolic imaging available (FDG-PET, 111In-pentetreotide scintigraphy, or 68Ga-DOTATATE PET), three had a reduction in metabolic

activity and one had an increase in activity attributed to inflammation. Availability of pre- and post-HFRT laboratory markers (serum chromogranin A or urine 5-hydroxyindoleacetic acid) was too infrequent to allow for meaningful analysis. There were no local, regional, or distant disease progressions or recurrences. Three patients (30%) have died, none from their carcinoid tumors. Five-year OS was 50% (95% CI 22.5-100). Two patients (20%) developed grade 1 pneumonitis. There were no definite grade 3+ toxicities; one patient treated with five-fraction SBRT developed atrial fibrillation two years post-HFRT with a mean and max heart dose of 6.5 Gy and 37.44 Gy, respectively. Conclusion: Definitive HFRT appears to be a safe and effective treatment for early-stage pulmonary carcinoid tumors in this limited cohort. Prospective data with larger sample sizes are needed to further validate this approach, along with standardization of staging studies and post-treatment assessment.

Squires BS and **Krauss DJ** (2021). "Single-dose radiotherapy for prostate cancer-lessons learned from single-fraction high-dose-rate brachytherapy." JAMA Oncology 7(10): 1572.
Full Text
Department of Radiation Oncology

Squires BS, **Levitin R**, Hazy AJ, Walters KJ, **Maywood MJ**, **Delise AP**, **Almahariq MF**, **Chen PY** and **Dilworth JT** (2021). "Near-surface dosimetry as a predictor for unplanned surgery or implant failure after post-mastectomy radiotherapy." International Journal of Radiation Oncology Biology Physics 111(3): E226-E226.
Full Text
Department of Radiation Oncology
OUWB Medical Student Author

Starr MR, Cai L, Obeid A, Ryan EH, Eliott D, Ryan C, Forbes NJ, Ammar M, Patel LG, **Capone A**, Emerson GG, Joseph DP, Gupta OP, Regillo CD, Hsu J and Yonekawa Y (2021). "Risk factors for presence of cystoid macular edema following rhegmatogenous retinal detachment surgery." Current Eye Research 46(12): 1867-1875.
Full Text
Department of Ophthalmology

Purpose: Cystoid macular edema (CME) following cataract surgery is a well-known entity. Less is known regarding the risk factors of developing CME following repair of rhegmatogenous retinal detachments (RRD). Methods: This was a multi-institutional study of primary RRD surgeries from 1/1/2015 through 12/31/2015. The primary outcome was the development of postoperative CME following RRD surgery. Post-operative optical coherence tomography imaging and 3 months of follow-up following RRD repair were required. Results: There were 1,466 eyes that met the inclusion criteria, and 140 (9.6%) developed postoperative CME following primary RRD repair. On multivariate analysis, the statistically significant metrics were older patient age (OR 1.03 per year, 95% CI 1.01 to 1.05), pre-operative proliferative vitreoretinopathy (PVR, OR 1.74, 95% 1.03 to 2.95), and cataract surgery following RRD repair (OR 2.18, 95% CI 1.47 to 3.25). Single surgery success was protective against CME (OR 0.20 (95% CI 0.14-0.30). Seventy-six (9.0%) of the phakic eyes and 60 (9.9%) of the pseudophakic eyes developed post-operative CME. Multivariate analysis showed that cataract surgery following RRD repair ($p < .0001$) for phakic eyes and older age ($p = .0075$) for pseudophakic eyes were risk factors. In eyes that underwent successful retinal reattachment with one surgery, post-operative cataract surgery ($p = .0005$) and pre-operative PVR ($p = .0011$) were risk factors for CME in this subgroup. Conclusion: CME occurred in nearly 10% of the eyes following RRD repair. The biggest risk

factors were recurrent RRD, preexisting PVR, older age, and cataract surgery following RRD repair.

Starr MR, Hsu J, Yonekawa Y, Mittra RA, Ryan C, Forbes NJ, Ammar M, Patel LG, Obeid A, **Capone A, Jr.**, Emerson GG, Joseph DP, Eliott D, Gupta OP, Regillo CD and Ryan EH (2021). "Surgical techniques for primary rhegmatogenous retinal detachments between surgeons with high versus low single surgery success rates." Acta Ophthalmologica 99(8): e1501-e1508.
Full Text
Department of Ophthalmology

Background/Aims: To identify differences in preoperative characteristics and intraoperative approaches between surgeons with higher versus lower single surgery success rates (SSSR) for repair of rhegmatogenous retinal detachments (RRDs). Methods: This study is a sub-analysis of subjects who underwent RRD repair in the Primary Retinal Detachment Outcomes (PRO) study, a multi-institutional, retrospective comparative interventional study. The PRO study examined consecutive primary RRD surgeries from January 1, 2015 through December 31, 2015. The primary outcome was variations in surgical approach to different types of RRDs with secondary analyses of pre and intraoperative metrics for surgeons with SSSR > 90% compared to those <80% who performed at least 40 operations during the study period. Results: A total of 689 surgeries were included in the analysis. The mean SSSR was 94% for the higher tier and 75% for the lower tier ($p < 0.0001$). Surgeons with >90% SSSR were more likely to have graduated fellowship more recently ($p = 0.0025$), use less perfluorocarbon liquid ($p < 0.0001$), perform less 360 degree laser retinopexy ($p < 0.0001$), and perform a higher percentage of primary buckles and combined PPV/SB ($p < 0.0001$). For pseudophakic eyes there was no difference between PPV and PPV/SB use ($p = 0.6211$). Conclusion: Surgeons with high SSSR typically performed SB as well as combination PPV/SB for more RRDs. Similar numbers of PPV and PPV/SB were performed for pseudophakic eyes, suggesting that the difference in SSSR between the two groups may be related to a combination of preoperative and intraoperative decisions as well as differences in technique.

Takagi H, Fairbairn T, Akasaka T, Norgaard B, Berman D, **Raff G**, Hurwitz-Koweek L, Pontone G, Kawasaki T, Sand N, Jensen J, Amano T, Poon M, Ovrehusn K, Leipsic J and Investigators AR (2021). "Trans-stenotic pressure gradient as derived from CT improves patient management: ADVANCE registry." European Heart Journal 42: 196-196.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Takagi H, Leipsic JA, Indraratna P, Gulsin G, Khasanova E, Tzimas G, Lin FY, Shaw LJ, Lee SE, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Conte E, Marques H, de Araújo Gonçalves P, Gottlieb I, Hadamitzky M, Maffei E, Pontone G, Shin S, Kim YJ, Lee BK, Chun EJ, Sung JM, Virmani R, Samady H, Stone PH, Berman DS, Narula J, Bax JJ and Chang HJ (2021). "Association of tube voltage with plaque composition on coronary CT angiography: Results from PARADIGM registry." JACC Cardiovascular Imaging 14(12): 2429-2440.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Objectives: This study sought to investigate the impact of low tube voltage scanning heterogeneity of coronary luminal attenuation on plaque quantification and characterization with coronary computed tomography angiography (CCTA). Background: The impact of low tube voltage and coronary luminal attenuation on quantitative coronary plaque remains uncertain.

Methods: A total of 1,236 consecutive patients (age: 60 ± 9 years; 41% female) who underwent serial CCTA at an interval of ≥2 years were included from an international registry. Patients with prior revascularization or nonanalyzable coronary CTAs were excluded. Total coronary plaque volume was assessed and subclassified based on specific Hounsfield unit (HU) threshold: necrotic core, fibrofatty plaque, and fibrous plaque and dense calcium. Luminal attenuation was measured in the aorta. Results: With increasing luminal HU (<350, 350-500, and >500 HU), percent calcified plaque was increased (16%, 27%, and 40% in the median; P < 0.001), and fibrofatty plaque (26%, 13%, and 4%; P < 0.001) and necrotic core (1.6%, 0.3%, and 0.0%; P < 0.001) were decreased. Higher tube voltage scanning (80, 100, and 120 kV) resulted in decreasing luminal attenuation (689 ± 135, 497 ± 89, and 391 ± 73 HU; P < 0.001) and calcified plaque volume (59%, 34%, and 23%; P < 0.001) and increased fibrofatty plaque (3%, 9%, and 18%; P < 0.001) and necrotic core (0.2%, 0.1%, and 0.6%; P < 0.001). Mediation analysis showed that the impact of 100 kV on plaque composition, compared with 120 kV, was primarily caused by an indirect effect through blood pool attenuation. Tube voltage scanning of 80 kV maintained a direct effect on fibrofatty plaque and necrotic core in addition to an indirect effect through the luminal attenuation. Conclusions: Low tube voltage usage affected plaque morphology, mainly through an increase in luminal HU with a resultant increase in calcified plaque and a reduction in fibrofatty and necrotic core. These findings should be considered as CCTA-based plaque measures are being used to guide medical management and, in particular, when being used as a measure of treatment response.

Tantisattamo E and Eguchi N (2021). "Rate of developing hyponatremia and outcomes in kidney transplant recipients during COVID-19 hospitalization." Journal of the American Society of Nephrology 32: 777.

Full Text

Department of Internal Medicine/Nephrology

Background: Hyponatremia is one of the surrogate markers of poor clinical outcomes especially in hospitalized patients. Outcomes related to hyponatremia particularly rate of developing hyponatremia in kidney transplant recipients (KTR) with COVID-19 is unknown. We aim to examine association between the degree of hyponatremia and outcomes in hospitalized KTR with COVID-19. Methods: This is a single-center retrospective cohort study including consecutive KTR admitted for COVID-19. Association of delta serum sodium (ΔSNa) defined by percent drop of admission serum Na (SNa) from a 3-month pre-admission SNa with outcomes including acute kidney injury (AKI) defined by rising serum creatinine (SCr) 0.3 mg/dL from the baseline SCr 3-month prior, death, and length of stay (LOS) is examined by multiple logistic and linear regression as appropriate. Results: Of 125 KTR, mean age±SD was 47.03±15.19 years old and 53% were male. The majority were White 87 patients (70%) followed by others 27 (22%), Asian 9 (7%), and Black 2 (1%) patients. Mean SNa was 133±6 mmol/L and ΔSNa were -4±5 mmol/L. Mean ΔSNa were -3.02±4.09%. Seven patients (6%) died, and 24 (19%) patients developed AKI. Every one percent increase in ΔSNa was associated 2% decrease the odds of death and developing AKI (ORdeath 0.98, p 0.81, 95%CI 0.81, 1.18 and ORAKI 0.98, p 0.74, 95%CI 0.86, 1.11). Mean LOS was 12.6±15.4 days (range 1 to 70). Every one percent increase in ΔSNa was associated 0.33 day increase in the LOS (βLOS 0.33, p 0.547, 95% CI -.76, 1.41). After adjusted by age, gender, race, presence or absence of diabetes or hypertension, the magnitude and direction of the association were similar in those all three outcomes. Conclusions: Hyponatremia appears to be protective for mortality and AKI in KTR hospitalized for COVID-19 but associated with increased LOS; although the statistical significance was limited by small sample size. Future studies are required to elucidate the association of hyponatremia particularly degree of

worsening SNa in immunocompromized patients such KTRs who are generally at risk for poor clinical outcomes.

Tantisattamo E, Leventhal JR, Mathew JM and Gallon L (2021). "Chimerism and tolerance: Past, present and future strategies to prolong renal allograft survival." Current Opinion in Nephrology and Hypertension 30(1): 63-74.
Full Text
Department of Internal Medicine/Nephrology

Purpose of Review: Immunological factors are a major cause of kidney allograft loss. Calcineurin inhibitors (CNIs) have improved short-term kidney allograft survival; however, they in turn contribute to long-term kidney allograft loss from chronic CNI nephrotoxicity. Tolerance induction in transplantation can avoid the long-term adverse effects of immunosuppressive medications. This review aims to critically discuss recent efforts in inducing transplantation tolerance. Recent Findings: Tolerance induction mediated by chimerism has shown some promise in minimizing or even complete withdrawal of immunosuppressive treatments in kidney allograft recipients. There has been a number of approaches as varied as the number of centres conducting these trials. However, they can be grouped into those mediated by transient microchimerism and those facilitated by more stable macro or full donor chimerism. The success rates in terms of long-term drug-free graft survival has been limited in microchimerism-mediated tolerance induction approaches. Mixed macrochimerism of less than 50% donor may be unstable with mostly the recipient's native immune system overpowering the donor chimeric status. Tolerance induction leading to chimerism has been limited to living donor kidney transplantation and additional long-term outcomes are required. Furthermore, immune monitoring after tolerance induction has faced a limitation in studying due to a lack of sufficient study participants and appropriate study controls. Summary: Tolerance induction is one of several strategies used to prolong kidney allograft survival, but it has not been routinely utilized in clinical practice. However, future applications from the trials to clinical practice remain limited to living donor kidney transplantation. Once further data regarding tolerance inductions exist and practicality becomes widely accepted, tolerance induction may shift the paradigm in the field of kidney transplantation to achieve the best possible outcome of 'One Organ for Life'.

Tantisattamo E, Reddy UG, Ichii H, Ferrey AJ, Dafoe DC, Ioannou N, Xie J, Pitman TR, Hendricks E, Eguchi N and Kalantar-Zadeh K (2021). "Is it time to utilize genetic testing for living kidney donor evaluation?" Nephron. ePub Ahead of Print.
Full Text
Department of Internal Medicine/Nephrology

Living donor kidney transplantation is an effective strategy to mitigate the challenges of solid organ shortage. However, being a living kidney donor is not without risk, as donors may encounter short- and long-term complications including the risk of developing chronic kidney disease, end-stage kidney disease, hypertension, and possible pregnancy-related complications. Although the evaluation of potential living donors is a thorough and meticulous process with the intention of decreasing the chance of complications, particularly in donors who have lifetime risk projection, risk factors for kidney disease including genetic predispositions may be missed because they are not routinely investigated. This type of testing may not be offered to patients due to variability and decreased penetrance of symptoms and lack of availability of appropriate genetic testing and genetic specialists. We report a case of a middle-aged woman with a history of gestational diabetes and preeclampsia who underwent an uneventful living kidney donation. She developed postdonation nonnephrotic range proteinuria and microscopic hematuria. Given

the risk of biopsy with a solitary kidney, genetic testing was performed and revealed autosomal dominant Alport syndrome. Our case underscores the utility of genetic testing. Hopefully, future research will examine the incorporation of predonation genetic testing into living kidney donor evaluation.

Taranikanti V, **Challa JA** and Mittal AK (2021). "Radiological and embryological relevance of persistent sciatic arteries: A rare presentation." Cureus 13(10): e18660.
Full Text
Department of Foundational Medical Studies (OU)
OUWB Medical Student Author

Persistent sciatic artery (PSA) is an extremely rare condition that is present in around 0.05% of the population and is commonly associated with many complications. The management is conservative or through surgical intervention and depends on the type of complication. The case presented is of a 40-year-old man who complained of persistent pain in the buttock region. On radiology, bilateral PSAs were observed exiting through the infra-pyriformis compartment of the greater sciatic foramen accompanying the sciatic nerve. The femoral artery and the external iliac artery are small in caliber. In this case report, we discuss the underlying embryology that might have led to the persistence of this vessel with illustrations and the abnormal radiological pattern of this anomaly. Increased awareness of PSA can improve patient care and prevent potentially hazardous complications during hip and renal transplant surgery.

Tennant T, Pandey S, Edhi A and **Batke M** (2021). "Esophageal stricture caused by cytomegalovirus in a renal transplant patient not infected by human immune deficiency virus." American Journal of Gastroenterology 116: S889-S889.
Full Text
Department of Internal Medicine/Gastroenterology

Thorburn C, **Jabbar KJ**, **Li W**, **Kanaan H** and **Zhang P** (2021). "Recurrent focal segmental glomeruloscleosis progressing to collapsing flomerulopathy in renal graft of an autopsy study." American Journal of Clinical Pathology 156: S153-S153.
Full Text
Department of Pathology

Thorburn C, **Qu Z** and **Zhang P** (2021). "Increased activated plasma cells in inflammatory bowel disease when compared to ischemic acute colitis." American Journal of Clinical Pathology 156: S56-S56.
Full Text
Department of Pathology

Todd BR and **Nelson LN** (2021). "The impact of medical scribes on emergency physician diagnostic testing and diagnosis charting." Diagnosis. ePub Ahead of Print.
Full Text
Department of Emergency Medicine
OUWB Medical Student Author

Objectives: Since the widespread adoption of electronic medical records (EMRs), medical scribes have been increasingly utilized in emergency department (ED) settings to offload the documentation burden of emergency physicians (EPs). Scribes have been shown to increase EP productivity and satisfaction; however, little is known about their effects on the EP's diagnostic process. We aimed to assess what effect, if any, scribes have on EP diagnostic test ordering and

their documentation of differential diagnoses. Methods: We conducted a retrospective cohort study utilizing a chart review to compare diagnostic practices of EPs working both with and without scribes. We analyzed the number of laboratory and radiologic diagnostic studies ordered per encounter as well as characteristics of differential diagnosis documentation. Results: Scribes did not affect laboratory studies ordered per encounter (mean 6.31 by scribes vs. 7.35 by EPs, difference -1.04; 95% confidence interval [CI] -2.34 to 0.26) or radiologic studies ordered per encounter (mean 1.49 by scribes vs. 1.39 by EPs, difference 0.10; 95% CI -0.15 to 0.35). Scribes did not affect the frequency of documenting a differential diagnosis or the number of diagnoses considered in each differential, but they were associated with higher word counts in EP differentials (mean 72.29 by scribes vs. 50.00 by EPs, mean difference 22.79; 95% CI 6.77 to 38.81). Conclusions: Scribe use does not appear to affect EP diagnostic test ordering but may have a small effect on their documentation of differential diagnoses.

Trang A, Bushman J and **Halalau A** (2021). "Effect of long-term proton pump inhibitor use on glycemic control in patients with type two diabetes mellitus." Journal of Diabetes Research 2021: 5578265.
Full Text
OUWB Medical Student Author
Department of Internal Medicine

There have been conflicting results regarding the effect of proton pump inhibitors (PPIs) as an adjunctive therapy to oral antidiabetic medication (OAM) in those with type 2 diabetes (T2DM). PPIs increase gastrin levels, causing a rise in insulin. No studies have evaluated the duration of PPI therapy and its effect on glycemic control. Medical records across 8 hospitals between 2007 and 2016 were reviewed for 14,602 patients with T2DM (not on insulin therapy) taking PPIs. Values of HbA1c (baseline, follow-up, and the difference between the two) in those prescribed with PPIs and years of therapy were compared to HbA1c values of those who had no record of PPI use. Baseline and follow-up HbA1c for patients on PPIs were 6.8 and 7.0, respectively, compared to 7.1 and 7.2 in their untreated counterparts ($p<0.001$ in both comparisons). For both groups, an increase in baseline HbA1c was seen with time. Those on PPI had an increase in HbA1c of 0.16 compared to 0.08 in those not prescribed PPI. Our results show no relationship between the length of PPI therapy and HbA1c reduction.

Tuan H, **Yu LM**, Yin L, Sicco KL and Shapiro J (2021). "Prediction of therapeutic outcomes of female pattern hair loss patients based on clinical features with application of artificial intelligence." Journal of the American Academy of Dermatology 85(6): 1622-1624.
Full Text
Department of Pathology

Valle L, Xiang M, Kishan A, Romero T, Wong J, Stish B, Spratt D, Pilar A, Ciezki J, Wedde T, Merrick G, Stock R, Moran B, Tran P, Martinez-Monge R, **Krauss D**, Ross A, Tilki D, Tward J, Davis B and Steinberg M (2021). "The benefit of whole pelvis radiation therapy in patients with high-risk prostate cancer relative to the risk of nodal metastases in a multi-institutional cohort." American Journal of Clinical Oncology-Cancer Clinical Trials 44(10): S8-S9.
Request Form
Department of Radiation Oncology

van Rosendael AR, van den Hoogen IJ, Gianni U, Ma X, Tantawy SW, Bax AM, Lu Y, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Conte E, Marques H, de Araújo Gonçalves P, Gottlieb I, Hadamitzky M, Leipsic JA, Maffei E, Pontone G, Shin S, Kim YJ, Lee BK, Chun EJ, Sung JM, Lee

SE, Virmani R, Samady H, Sato Y, Stone PH, Berman DS, Narula J, Blankstein R, Min JK, Lin FY, Shaw LJ, Bax JJ and Chang HJ (2021). "Association of statin treatment with progression of coronary atherosclerotic plaque composition." JAMA Cardiology 6(11): 1257-1266.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Importance: The density of atherosclerotic plaque forms the basis for categorizing calcified and noncalcified morphology of plaques. Objective: To assess whether alterations in plaque across a range of density measurements provide a more detailed understanding of atherosclerotic disease progression. Design, Setting, and Participants: This cohort study enrolled 857 patients who underwent serial coronary computed tomography angiography 2 or more years apart and had quantitative measurements of coronary plaques throughout the entire coronary artery tree. The study was conducted from 2013 to 2016 at 13 sites in 7 countries. Main Outcomes and Measures: The main outcome was progression of plaque composition of individual coronary plaques. Six plaque composition types were defined on a voxel-level basis according to the plaque attenuation (expressed in Hounsfield units [HU]): low attenuation (-30 to 75 HU), fibro-fatty (76-130 HU), fibrous (131-350 HU), low-density calcium (351-700 HU), high-density calcium (701-1000 HU), and 1K (>1000 HU). The progression rates of these 6 compositional plaque types were evaluated according to the interaction between statin use and baseline plaque volume, adjusted for risk factors and time interval between scans. Plaque progression was also examined based on baseline calcium density. Analysis was performed among lesions matched at baseline and follow-up. Data analyses were conducted from August 2019 through March 2020. Results: In total, 2458 coronary lesions in 857 patients (mean [SD] age, 62.1 [8.7] years; 540 [63.0%] men; 548 [63.9%] received statin therapy) were included. Untreated coronary lesions increased in volume over time for all 6 compositional types. Statin therapy was associated with volume decreases in low-attenuation plaque (β, -0.02; 95% CI, -0.03 to -0.01; P = .001) and fibro-fatty plaque (β, -0.03; 95% CI, -0.04 to -0.02; P < .001) and greater progression of high-density calcium plaque (β, 0.02; 95% CI, 0.01-0.03; P < .001) and 1K plaque (β, 0.02; 95% CI, 0.01-0.03; P < .001). When analyses were restricted to lesions without low-attenuation plaque or fibro-fatty plaque at baseline, statin therapy was not associated with a change in overall calcified plaque volume (β, -0.03; 95% CI, -0.08 to 0.02; P = .24) but was associated with a transformation toward more dense calcium. Interaction analysis between baseline plaque volume and calcium density showed that more dense coronary calcium was associated with less plaque progression. Conclusions and Relevance: The results suggest an association of statin use with greater rates of transformation of coronary atherosclerosis toward high-density calcium. A pattern of slower overall plaque progression was observed with increasing density. All findings support the concept of reduced atherosclerotic risk with increased densification of calcium.

Vinogradskiy Y, Castillo R, **Castillo E**, Schubert LK, Jones BL, Faught AM, Gaspar LE, Kwak J, Bowles DW, Waxweiler TV, Dougherty M, Gao D, **Stevens CW**, Miften M, Kavanagh BD, **Grills IS**, Rusthoven CG, **Guerrero TM** and Rusthoven CG, Jr. (2021). "Results of a multi-institutional phase II clinical trial for 4DCT-ventilation functional avoidance thoracic radiotherapy." International Journal of Radiation Oncology, Biology, Physics 111(3): S8-S9.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): Pulmonary toxicity, and in particular radiation pneumonitis, remains a major limitation in the radiotherapy treatment of lung cancer patients. Functional avoidance radiotherapy proposes to use functional imaging to reduce pulmonary toxicity by designing radiotherapy treatment plans that reduce doses to functional regions of the lung. A novel form

of lung functional imaging has been proposed that uses 4DCT imaging to calculating 4DCT-based lung ventilation (4DCT-ventilation) maps. A phase II, multi-center, prospective study was initiated to evaluate 4DCT-ventilaiton functional avoidance radiotherapy. The study hypothesis was that functional avoidance radiotherapy could reduce the rate of ≥ grade 2 radiation pneumonitis to 12% compared to a 25% ≥ grade 2 historical pneumonitis rate. Based on a binomial, one-sided 95% confidence interval (CI), the trial would be positive if ≤ 11 of 67 patients (16.4%) experienced ≥ grade 2 radiation pneumonitis. Materials/Methods: Lung cancer patients receiving curative intent radiotherapy (prescription doses of 45-75 Gy) and planned curative intent chemotherapy were accrued from 2 institutions. Patient 4DCTs along with image processing techniques were used to generate 4DCT-ventilation images. The 4DCT-ventilation images were used to generate functional avoidance plans that reduced doses to functional portions of the lung while delivering the prescribed tumor dose and respecting tolerances of organs-at-risk. Functional doses were reduced by selecting favorable arc geometry and employing optimization techniques. Patients were evaluated for pneumonitis at 3, 6, and 12 months after completing radiotherapy. Results: Sixty-seven evaluable patients were accrued between April 2015 and December 2019. Median Karnofsky performance status was 90 and 76% of patient's had stage III disease. The median prescription dose was 60 Gy (range 45-66 Gy) delivered in 30 fractions (range 15-33 fractions). Eleven patients (16%) underwent surgery as part of their treatment, 88% of patients received concurrent chemotherapy, and 25% of patients were treated with immunotherapy while they were on study. Median follow-up was 312 days. The crude rate of ≥ grade 2 radiation pneumonitis was 14.9% (10/67 patients, upper 95% CI of 24.0%), meeting the phase II criteria. Conclusion: Because 4DCTs are a standard part of the treatment planning process for lung cancer patients, 4DCT-ventilation offers an imaging modality that is convenient and provides functional imaging without an extra imaging procedure necessary. Our study reports on the first multi-center, prospective study of 4DCT-ventilation functional avoidance radiotherapy. The study met phase II criteria demonstrating reduced pneumonitis rates and provides favorable evidence for 4DCT-ventilation functional avoidance to be investigated in a phase III study. Future work will report on secondary objective including pulmonary function, patient-reported outcomes, and imaging-based end-points.

Wagner CM, Clark MJ, Theurer PF, Lall SC, Nemeh HW, Downey RS, Martin DE, Dabir RR, Asfaw ZE, **Robinson PL**, Harrington SD, Gandhi DB, Waljee JF, Englesbe MJ, Brummett CM, Prager RL, Likosky DS, Kim KM, Lagisetty KH and Brescia AA (2021). "Predictors of discharge home without opioids after cardiac surgery: A multicenter analysis." Annals of Thoracic Surgery. ePub Ahead of Print.
Full Text
Department of Surgery

Background: Whether all patients will require an opioid prescription after cardiac surgery is unknown. We performed a multicenter analysis to identify patient predictors of not receiving an opioid prescription at the time of discharge home after cardiac surgery. Methods: Opioid-naïve patients undergoing coronary artery bypass grafting and/or valve surgery through a sternotomy at 10 centers from January to December 2019 were identified retrospectively from a prospectively maintained data set. Opioid-naïve was defined as not taking opioids at the time of admission. The primary outcome was discharge without an opioid prescription. Mixed-effects logistic regression was performed to identify predictors of discharge without an opioid prescription, and postdischarge opioid prescribing was monitored to assess patient tolerance of discharge without an opioid prescription. Results: Among 1924 eligible opioid-naïve patients, mean age was 64 ± 11 years, and 25% were women. In total, 28% of all patients were discharged without an opioid prescription. On multivariable analysis, older age, longer length of hospital

stay, and undergoing surgery during the last 3 months of the study were independent predictors of discharge without an opioid prescription, whereas depression, non-Black and non-White race, and using more opioid pills on the day before discharge were independent predictors of receiving an opioid prescription. Among patients discharged without an opioid prescription, 1.8% (10 of 547) were subsequently prescribed an opioid. Conclusions: Discharging select patients without an opioid prescription after cardiac surgery appears well tolerated, with a low incidence of postdischarge opioid prescriptions. Increasing the number of patients discharged without an opioid prescription may be an area for quality improvement.

Warnick SJ, Mehdi L and **Kowalkowski J** (2021). "Wait-there's evidence for that? Integrative medicine treatments for major depressive disorder." International Journal of Psychiatry in Medicine 56(5): 334-343.
Full Text
Department of Family Medicine and Community Health

Depression is one of the most common mental health disorders and currently affects over 17 million Americans. Up to two-thirds of patients with depression in the United States will seek complementary and alternative or integrative medical treatments and thus medical providers who treat depression should understand that many integrative medical treatments have evidence of efficacy either as monotherapies or as add-on adjuncts to other treatments. This review references guidelines from the Canadian Network for Mood and Anxiety Treatments and Michigan Medicine, along with an updated literature review, to provide a framework for reviewing medications or herbal formulation, as well as other therapies, which have evidence in the treatment of depression. In general, St. John's Wort, Omega-3 Fatty Acids, S-adenosyl-L-methionine, and crocus sativus (saffron) have the highest levels of evidence in the treatment of mild-to-moderate depression. Acetyl-l-carnitine, l-methylfolate, DHEA, and lavender have a moderate level of evidence in treating depression, whereas Vitamin D, one of the most common supplements in the United States, does not have evidence in treating depression. Of the non-medication-based therapies, exercise, light therapy, yoga, acupuncture, and probiotics have evidence in the treatment of depression, whereas a full review of dietary modifications for depression was out of scope for this article.

Wasserman JA and **Browne BJ** (2021). "On triggering and being triggered: Civil society and building brave spaces in medical education." Teaching and Learning in Medicine 33(5): 561-567.
Full Text
Department of Foundational Medical Studies (OU)

Issue: How educators should respond to student reports of intense emotional reactions to curricular content-i.e., being triggered-invites intense debate. There are claims of insensitivity on one side and calls to "toughen up" on the other. These polemics aside, such instances sometimes represent a true dilemma, particularly within medical education where engaging highly sensitive content is essential to future patient care and where managing one's own emotions is a core competency. Parsing this convoluted and emotional debate into these domains illustrates how medical educators can simultaneously legitimize the lived experiences of students, engage in honest dialogue, and maintain a shared commitment to education. Evidence: While substantial energy has been spent debating the legitimacy of students' emotional reactions, the discourse lacks a clear conceptual framework and we often end up talking past each other. The concept of brave spaces offers an important alternative where sensitive subject matter can be engaged with civility. Implications: This paper offers a model for building brave spaces within medical education by clarifying the rights and responsibilities of

both teachers and learners in each of three intersecting domains: intrapersonal, interpersonal, and civic. This model is exemplified in a case where students reported being triggered by course content. By parsing this case across the three domains, we can clarify how responses are multifaceted and we can simultaneously avoid indictment of another's lived experiences while preserving the pedagogical integrity of the curriculum.

Wilkie JR, Hochstedler KA, Schipper MJ, Matuszak MM, Paximadis P, Dominello MM, **Grills I**, Hayman JA, Dess R, Dragovic AF, Jagsi R, Pierce LJ, Spratt DE, Bergsma D, Boike TP, Movsas B and Jolly S (2021). "Association between physician and patient reported symptoms in patients treated with definitive radiotherapy for locally advanced lung cancer in a statewide consortium." International Journal of Radiation Oncology Biology Physics. ePub Ahead of Print.
Full Text
Department of Radiation Oncology

Introduction: Little data have been reported about the patient experience during curative radiotherapy for lung cancer in routine clinical practice, or how this relates to treatment toxicity reported by clinicians. The purpose of this study was to compare clinician-reported adverse events (AEs) with patient-reported outcomes (PROs) including both specific symptoms/side effects as well as overall quality of life (QOL) during and after definitive radiotherapy (RT) for locally advanced lung cancer (LALC) in a large statewide cohort. Methods and Materials: Patient-reported outcomes (PROs) were prospectively collected from patients treated with definitive radiotherapy for LALC at 24 institutions within the XXXX Radiation Oncology Quality Consortium between 2012-2018 using the Functional Assessment of Cancer Therapy Trial Outcome Index (FACT-TOI). Physicians prospectively recorded adverse events (AEs) using CTCAE version 4.0. Patient-reported quality of life (QOL) changes from baseline were assessed during and after radiotherapy using the FACT-TOI. Spearman correlation coefficients were calculated for AEs and similar PROs, and multivariable analysis was used to assess associations with QOL. Results: 1361 patients were included and 53% of respondents reported clinically meaningful declines in QOL at the end of RT. Correlation between clinician-reported esophagitis and patient-reported trouble swallowing was moderate (R=0.67) while correlations between clinician-reported pneumonitis and patient-reported shortness of breath (R=0.13) and cough (R=0.09) were weak. Clinician-reported AEs were significantly associated with clinically meaningful declines inpatient-reported QOL, with R=-0.46 for a summary AE-score. QOL was more strongly associated with fatigue (R=-0.41) than lung-specific AEs. Conclusions: AEs are associated with clinically meaningful declines in QOL during and after RT for LALC, but associations between AEs and QOL are only modest. This highlights the importance of PRO data, and future research should assess whether earlier detection of PRO changes could allow for interventions that reduce the frequency of treatment-related clinically meaningful declines in QOL.

Willen B, **Krauss DJ**, **Nandalur SR**, Ye H, Marvin K and **Lang D** (2021). "High dose rate brachytherapy as monotherapy vs. external beam with HDR boost in unfavorable intermediate risk localized prostate cancer: A matched-pair analysis." International Journal of Radiation Oncology, Biology, Physics 111(3): e297.
Full Text
Department of Radiation Oncology
OUWB Medical Student Author

Purpose/Objective(s): Both high-dose-rate brachytherapy as monotherapy (HDR-M) as well as combined with external beam radiotherapy as a boost (HDR-B) are acceptable treatment approaches for intermediate risk prostate cancer, but data directly comparing relative outcomes

of these two approaches for unfavorable intermediate risk (UIR) patients is lacking. This matched-pair analysis compares clinical outcomes for National Comprehensive Cancer Network (NCCN) defined unfavorable intermediate-risk (UIR) patients treated with HDR-M relative to those treated with HDR-B. Materials/Methods: Patients with NCCN UIR prostate cancer [Gleason grade group 3, ≥ 50% biopsy cores positive, or ≥ 2 of the following: PSA > 10 and ≤ 20 ng/mL, Gleason score 7, or clinical stage T2b-T2c] were identified in a prospectively maintained, single institution database. Criteria for the matched pair analysis included: 1) age ± 3 years, 2) Gleason Score (minor and major), and 3) clinical T stage. Brachytherapy doses were based on our current institutional standards: 10.5 Gy x 2 for HDR-B and 13.5 Gy x 2 for HDR-M. HDR-B patients received 45-46 Gy in 23-25 fractions EBRT to the prostate, seminal vesicles, and pelvic lymph nodes. Follow-up time was measured from the date of first HDR implant to the date of last recorded follow-up. Biochemical failure was defined as PSA nadir + 2. Kaplan-Meier method was used to estimate overall survival (OS), cause specific survival (CSS), disease-free survival (DFS), loco-regional recurrence (LRR) and freedom from biochemical failure (FFBF). Results: 51 matched pairs were identified and included in the analysis. HDR-M had a shorter median follow-up time of 39 months vs 100 months in HDR-B (P < 0.001). Race and pre-treatment PSA were well balanced. No significant differences in OS, CSS, or DFS at 1, 3, 5, or 8 years were identified. OS was 100%, 97.9%, 97.9%, 86.8% (HDR-B) vs 100%, 100%, 100%, 85.7% (HDR-M, P = 0.870). CSS was 100%, 100%, 100%, 94.6% (HDR-B) vs 100%, 100%, 100%, 100% (HDR-M, P = 0.426). Kaplan-Meier FFBF at 1/3/5/8 years was 100%, 91.7%, 91.7%, 91.7% (HDR-B) vs 95.7%, 92.1%, 92.1%, 92.1% (HDR-M, P = 0.821). Disease-free survival at 1/3/5/8 years was 82.4%, 76.2%, 76.2%, 76.2% (HDR-B) vs 92%, 88.4%, 88.4%, 88.4% (HDR-M, P = 0.092). Conclusion: HDR brachytherapy as monotherapy represents a highly effective upfront therapy without the added toxicity of pelvic radiation for appropriately selected UIR prostate cancer patients. Copyright © 2021. Published by Elsevier Inc.

Willows J, Rydzewska-Rosołowska A, **Topf JM** and Hiremath S (2021). "CONFIRMing hepatorenal syndrome management: #NephJC Editorial." Kidney Medicine. ePub Ahead of Print.
Full Text
Department of internal Medicine/Nephrology

Wood EH, Ji MH, Rao P, Lertjirachai I, Nguyen L, Sbrocca RV, Shah N and **Drenser KA** (2021). "Management of yype 2 retinopathy of prematurity or less in infants aged 45 weeks postmenstrual age or older." Ophthalmic Surgery Lasers and Imaging Retina 52(12): 636-641.
Full Text
Department of Ophthalmology

Background and Objective: This study aimed to identify the degree of concordance between fluorescein angiograms (FA) and fundus photographs (FP) in assessing the severity and potential need for treatment in infants 45 weeks or older postmenstrual age (PMA) with type 2 or less retinopathy of prematurity (ROP). Patients and Methods: An observational retrospective case series performed at Associated Retinal Consultants, William Beaumont Hospital in Royal Oak, Michigan. All infants born between 2006 and 2016 with stage 1 to 3 ROP that did not meet type 1 ROP criteria (type 2 or less) who received ablative laser therapy during or after age 45 weeks PMA. Pretreatment FP and FA images were randomized and sent to nine expert retina specialist graders to assess severity and inter-grader variability. Results: A total of 10 babies (19 eyes) were enrolled in this study, and 53 FAs and 27 FPs of these 19 eyes were selected to be interpreted by the nine graders. The number of eyes deemed to be abnormal and warranted for treatment was higher with FA, whereas more eyes were deemed "normal" with FP. Conclusion:

Although still controversial, knowledge of these findings may encourage retina specialists to closely examine infants with mild ROP older than age 45 weeks PMA and consider ablative laser therapy under certain conditions (even if not meeting type 1 Early Treatment for ROP criteria).

Wright JO, Gehrke CK, **Wiater JM**, **Weisz KM** and **Baker EA** (2021). "Applying the new shoulder periprosthetic joint infection consensus definition to a case series of revision shoulder arthroplasty procedures to assess concordance between consensus definitions and diagnoses." Seminars in Arthroplasty JSES 31(3): 571-580.
Full Text
Department of Orthopaedic Surgery
OUWB Medical Student Author

Purpose: As the number of shoulder arthroplasty procedures performed rises yearly, so does the number of periprosthetic joint infections (PJIs). In this study, PJI consensus definitions were compared and contrasted in a series of revision shoulder arthroplasty cases preoperatively diagnosed as PJI. Understanding the variations in these definitions may guide PJI diagnoses, thereby improving treatment strategies and patient outcomes in the setting of infected shoulder arthroplasty. Methods: All revision shoulder arthroplasty cases with preoperatively-diagnosed or suspected PJI (determined by procedure code) performed from 2008 – 2017 at a single institution by a single surgeon (fellowship-trained in shoulder and elbow surgery) were retrospectively evaluated. Following Institutional Review Board approval, patient demographic, treatment, and laboratory data were collected. Musculoskeletal Infection Society (MSIS; 2011) and International Consensus Meeting on Orthopaedic Infections (ICM; 2013, 2018 Revision, 2018 Shoulder) definitions of PJI were applied to the data. Statistical analysis assessed significant associations between culture status and PJI classification algorithm criteria. Results: Thirty-seven patients with suspected PJI were identified; 24 culture-positive (CP) and 13 culture-negative (CN). In this series, the 2018 ICM Shoulder definition for definite infection was met at lower rates than all other definitions (CP; 71% vs. 96%; CN; 62% vs. 69%). 2018 ICM Shoulder major criteria showed stronger correlations to 2011 MSIS, 2013 ICM, and 2018 ICM Revision major criteria when “gross intra-articular pus” was excluded than when pus was included as a major criterion. 2018 ICM Revision cases determined to be infected were very strongly, positively, correlated with the 2018 ICM Shoulder cases determined to have definite or probable infections ($\rho = 1.000$, $P < .0001$). Additionally, cases classified as “definite” or “probable” infections with the 2018 ICM Shoulder definition were more likely to require reoperation for suspected recurrent infection after completion of antibiotic therapy. Conclusions: In this series, the 2018 ICM Shoulder definition and previous PJI definitions classified cases as PJI at similar rates. However, the inclusion of a third major criterion of “gross intra-articular pus” weakened the correlation with prior definitions.

Xiang M, Ma TM, Savjani R, Pollom EL, Karnes RJ, Grogan T, Wong JK, Motterle G, Tosoian JJ, Trock BJ, Klein EA, Stish BJ, Dess RT, Spratt DE, Pilar A, Reddy C, Levin-Epstein R, Wedde TB, Lilleby WA, Fiano R, Merrick GS, Stock RG, Demanes DJ, Moran BJ, Huland H, Tran PT, Martin S, Martinez-Monge R, **Krauss DJ**, Abu-Isa EI, Alam R, Schwen Z, Pisansky TM, Choo CR, Song DY, Greco S, Deville C, McNutt T, DeWeese TL, Ross AE, Ciezki JP, Boutros PC, Nickols NG, Bhat P, Shabsovich D, Juarez JE, Chong N, Kupelian PA, Rettig MB, Zaorsky NG, Berlin A, Tward JD, Davis BJ, Reiter RE, Steinberg ML, Elashoff D, Horwitz EM, Tendulkar RD, Tilki D, Czernin J, Gafita A, Romero T, Calais J and Kishan AU (2021). "Performance of a prostate-specific membrane antigen positron emission tomography/computed tomography-derived risk-stratification tool for high-risk and very high-risk prostate cancer." JAMA Network Open 4(12):

e2138550.
Full Text
Department of Radiation Oncology

Importance: Prostate-specific membrane antigen (PSMA) positron emission tomography/computed tomography (PET/CT) can detect low-volume, nonlocalized (ie, regional or metastatic) prostate cancer that was occult on conventional imaging. However, the long-term clinical implications of PSMA PET/CT upstaging remain unclear. Objectives: To evaluate the prognostic significance of a nomogram that models an individual's risk of nonlocalized upstaging on PSMA PET/CT and to compare its performance with existing risk-stratification tools. Design, Setting, and Participants: This cohort study included patients diagnosed with high-risk or very high-risk prostate cancer (ie, prostate-specific antigen [PSA] level >20 ng/mL, Gleason score 8-10, and/or clinical stage T3-T4, without evidence of nodal or metastatic disease by conventional workup) from April 1995 to August 2018. This multinational study was conducted at 15 centers. Data were analyzed from December 2020 to March 2021. Exposures: Curative-intent radical prostatectomy (RP), external beam radiotherapy (EBRT), or EBRT plus brachytherapy (BT), with or without androgen deprivation therapy. Main Outcomes and Measures: PSMA upstage probability was calculated from a nomogram using the biopsy Gleason score, percentage positive systematic biopsy cores, clinical T category, and PSA level. Biochemical recurrence (BCR), distant metastasis (DM), prostate cancer-specific mortality (PCSM), and overall survival (OS) were analyzed using Fine-Gray and Cox regressions. Model performance was quantified with the concordance (C) index. Results: Of 5275 patients, the median (IQR) age was 66 (60-72) years; 2883 (55%) were treated with RP, 1669 (32%) with EBRT, and 723 (14%) with EBRT plus BT; median (IQR) PSA level was 10.5 (5.9-23.2) ng/mL; 3987 (76%) had Gleason grade 8 to 10 disease; and 750 (14%) had stage T3 to T4 disease. Median (IQR) follow-up was 5.1 (3.1-7.9) years; 1221 (23%) were followed up for at least 8 years. Overall, 1895 (36%) had BCR, 851 (16%) developed DM, and 242 (5%) died of prostate cancer. PSMA upstage probability was significantly prognostic of all clinical end points, with 8-year C indices of 0.63 (95% CI, 0.61-0.65) for BCR, 0.69 (95% CI, 0.66-0.71) for DM, 0.71 (95% CI, 0.67-0.75) for PCSM, and 0.60 (95% CI, 0.57-0.62) for PCSM ($P < .001$). The PSMA nomogram outperformed existing risk-stratification tools, except for similar performance to Staging Collaboration for Cancer of the Prostate (STAR-CAP) for PCSM (eg, DM: PSMA, 0.69 [95% CI, 0.66-0.71] vs STAR-CAP, 0.65 [95% CI, 0.62-0.68]; $P < .001$; Memorial Sloan Kettering Cancer Center nomogram, 0.57 [95% CI, 0.54-0.60]; $P < .001$; Cancer of the Prostate Risk Assessment groups, 0.53 [95% CI, 0.51-0.56]; $P < .001$). Results were validated in secondary cohorts from the Surveillance, Epidemiology, and End Results database and the National Cancer Database. Conclusions and Relevance: These findings suggest that PSMA upstage probability is associated with long-term, clinically meaningful end points. Furthermore, PSMA upstaging had superior risk discrimination compared with existing tools. Formerly occult, PSMA PET/CT-detectable nonlocalized disease may be the main driver of outcomes in high-risk patients.

Yan A, Hanna A, Wilson TG, **Deraniyagala R**, **Krauss DJ**, Grzywacz VP, **Yan D** and **Wilson GD** (2021). "Correlation between tumor voxel dose response matrix and tumor biomarker profile in patients with head and neck squamous cell carcinoma." Radiotherapy & Oncology 164: 196-201.
Full Text
Department of Radiation Oncology

Background: We have developed a novel imaging analysis procedure that is highly predictive of local failure after chemoradiation in head and neck cancer. In this study we investigated whether any pretreatment biomarkers correlated with key imaging parameters. Methods:

Pretreatment biopsy material was available for 28 patients entered into an institutional trial of adaptive radiotherapy in which FDG-PET images were collected weekly during treatment. The biopsies were immunohistochemically stained for CD44, EGFR, GLUT1, ALDH1, Ki-67 and p53 and quantified using image analysis. Expression levels were correlated with previously derived imaging parameters, the pretreatment SUV(max) and the dose response matrix (DRM). Results: The different parameters of the SUV(max) and DRM did not correlate with each other. We observed a positive and highly significant (p = 0.0088) correlation between CD44 expression and volume of tumor with a DRM greater than 0.8. We found no correlation between any DRM parameter and GLUT1, p53, Ki-67 and EGFR or ALDH1. GLUT1 expression did correlate with the maximum SUV(0) and the volume of tumor with an SUV(0) greater than 20. Conclusions: The pretreatment SUV(max) and DRM are independent imaging parameters that combine to predict local recurrence. The significant correlation between CD44 expression, a known cancer stem cell (CSC) marker, and volume of tumor with a DRM greater than 0.8 is consistent with concept that specific foci of cells are responsible for tumor recurrence and that CSCs may be randomly distributed in tumors in specific niches. Dose painting these small areas may lead to improved tumor control.

Yanson K, Laviers W, Neely L, Lockamy E, Castillo-Hernandez LC, Oldfied C, Ackerman R, Ackerman J, **Ortiz DA**, Pacheco S, Simner PJ, Young S, McElvania E and Cooper CK (2021). "Performance evaluation of the BD SARS-CoV-2 reagents for the BD MAX system." Journal of Clinical Microbiology 59(12): e0101921.
Full Text
Department of Pathology

Nucleic acid amplification testing (NAAT) for SARS-CoV-2 is the standard approach for confirming COVID-19 cases. This study compared results between two emergency use authorization (EUA) NAATs, with two additional EUA NAATs utilized for discrepant testing. The limits of detection (LOD) for the BD SARS-CoV-2 reagents for the BD MAX system (MAX SARS-CoV-2 assay), the bioMérieux BioFire respiratory panel 2.1 (BioFire SARS-CoV-2 assay), the Roche cobas SARS-CoV-2 assay (cobas SARS-CoV-2 assay), and the Hologic Aptima SARS-CoV-2 assay Panther (Aptima SARS-CoV-2 assay) NAAT systems were determined using a total of 84 contrived nasopharyngeal specimens with 7 target levels for each comparator. The positive and negative percent agreement (PPA and NPA, respectively) of the MAX SARS-CoV-2 assay, compared to the Aptima SARS-CoV-2 assay, was evaluated in a postmarket clinical study utilizing 708 nasopharyngeal specimens collected from suspected COVID-19 cases. Discordant testing was achieved using the cobas and BioFire SARS-CoV-2 NAATs. In this study, the measured LOD for the MAX SARS-CoV-2 assay (251 copies/ml; 95% confidence interval [CI], 186 to 427) was comparable to the cobas SARS-CoV-2 assay (298 copies/ml; 95% CI, 225 to 509) and the BioFire SARS-CoV-2 assay (302 copies/ml; 95% CI, 219 to 565); the Aptima SARS-CoV-2 assay had an LOD of 612 copies/ml (95% CI, 474 to 918). The MAX SARS-CoV-2 assay had a PPA of 100% (95% CI, 97.3% to 100.0%) and an NPA of 96.7% (95% CI, 94.9% to 97.9%) compared to the Aptima SARS-CoV-2 assay. The clinical performance of the MAX SARS-CoV-2 assay agreed with another sensitive EUA assay.

Yashar CM, Khan AJ, Haffty BG, **Chen PY**, Yehia ZA, Vicini FA, Kowzun M, **Quinn TJ**, Scanderbeg DJ, Simon L, Kuske RR and Haffty BG, Jr. (2021). "Three-fraction TRIUMPH-T brachytherapy for delivery of APBI offers effective disease control with minimal late toxicity." International Journal of Radiation Oncology, Biology, Physics 111(3): S7-S7.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): Shorter courses of breast radiotherapy are offered as an alternative to 4-6 weeks of whole breast irradiation after lumpectomy, including brachytherapy. A prospective phase II multi-institution clinical trial to study 3-fraction accelerated partial breast irradiation (APBI) delivered by brachytherapy was conducted. Materials/Methods: The trial treated selected breast cancers after breast-conserving surgery with brachytherapy applicators that delivered 22.5 Gy in 3 fractions of 7.5 Gy. The planning treatment volume was 1 to 2 cm beyond the surgical cavity. Eligible women were age ≥ 45 years with unicentric invasive or in situ tumors ≤ 3 cm excised with negative margins and with positive estrogen or progesterone receptors and no metastases to axillary nodes. Strict dosimetric parameters were required to be met and follow up information was collected from the participating sites. Results: A total of 175 patients who were enrolled were followed for a median of 3.63 years. Three-fraction brachytherapy was associated with low chronic toxicity. There was excellent or good cosmesis in 95% of patients. There were no grade 4 toxicities. Grade 3 fibrosis at the treatment site was present in 1.7% and 32% percent had grades 1 or 2 fibrosis at the treatment site. There was 1 rib fracture. Other late toxicities included 7.4% grade 1 hyperpigmentation, 2% grade 1 telangiectasias, 1.7% symptomatic seromas, 1.7% abscessed cavities, and 1.1% symptomatic fat necrosis. There were 2 (1.1%) ipsilateral local recurrences, 2 (1.1%) nodal recurrences and no distant recurrences. Other incidents included one contralateral breast cancer and 2 second malignancies (lung). Conclusion: Ultra-short breast brachytherapy is feasible and with acceptable late toxicity and could be an alternative to standard 5-day, 10 fraction APBI in eligible patients. Patients from this prospective trial will continue to be followed to evaluate long term outcomes.

Yedulla NR, **Faraj MT**, Koolmees DS, Battista EB, Montgomery ZA and Day CS (2021). "Assessing orthopedic patient preferences for mandated virtual care during the COVID-19 pandemic and elective virtual care in non-pandemic circumstances." Orthopedics 44(4): E471-E476.
Full Text
OUWB Medical Student Author

The purpose of this study was to compare orthopedic patient preferences for mandated virtual care during the coronavirus disease 2019 (COVID-19) pandemic and elective virtual care during non-pandemic circumstances. An orthopedic virtual care questionnaire was administered to adult orthopedic patients undergoing their first orthopedic virtual visit between March 15, 2020, and May 18, 2020. The questionnaire had 13 items rated on a 1-to-5 Likert scale ("strongly agree" to "strongly disagree"). Responses were compared using Kruskal-Wallis and nonparametric Wilcoxon rank-sum tests. Patients showed higher preferences for mandated virtual care during the pandemic when compared with elective virtual care during non-pandemic circumstances (2.25±1.31 vs 4.10±1.25, P<.0001) and also preferred virtual visits in other specialties compared with orthopedics (2.17±1.35 vs 2.79±1.42, P<.0001). Patients older than 50 years were more likely to view virtual care as the best option during the pandemic (2.06±1.25 vs 2.48±1.35, P<.0165) and equally as effective as in-person visits in non-pandemic circumstances (2.45±1.36 vs 2.83±1.18, P<.0150). Female patients were more likely to pursue future orthopedic virtual visits (2.61±1.37 vs 3.07±1.45, P<.0203) and view their virtual visit as equally effective as an in-person visit (2.47±1.33 vs 2.87±1.18, P<.0181). Orthopedic patient preference for mandated virtual care during the COVID-19 pandemic seems to be higher than for elective virtual care during non-pandemic circumstances, and older and female patients appear to favor virtual care.

Yoon YE, Baskaran L, Lee BC, Pandey MK, Goebel B, Lee SE, Sung JM, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Chun EJ, Conte E, Gottlieb I, Hadamitzky M, Kim YJ, Lee BK,

Leipsic JA, Maffei E, Marques H, de Araújo Gonçalves P, Pontone G, Shin S, Narula J, Bax JJ, Lin FYH, Shaw L and Chang HJ (2021). "Differential progression of coronary atherosclerosis according to plaque composition: A cluster analysis of PARADIGM registry data." Scientific Reports 11(1): 17121.
Full Text
Department of Internal Medicine/Cardiovascular Disease

Patient-specific phenotyping of coronary atherosclerosis would facilitate personalized risk assessment and preventive treatment. We explored whether unsupervised cluster analysis can categorize patients with coronary atherosclerosis according to their plaque composition, and determined how these differing plaque composition profiles impact plaque progression. Patients with coronary atherosclerotic plaque (n = 947; median age, 62 years; 59% male) were enrolled from a prospective multi-national registry of consecutive patients who underwent serial coronary computed tomography angiography (median inter-scan duration, 3.3 years). K-means clustering applied to the percent volume of each plaque component and identified 4 clusters of patients with distinct plaque composition. Cluster 1 (n = 52), which comprised mainly fibro-fatty plaque with a significant necrotic core (median, 55.7% and 16.0% of the total plaque volume, respectively), showed the least total plaque volume (PV) progression (+ 23.3 mm3), with necrotic core and fibro-fatty PV regression (− 5.7 mm3 and − 5.6 mm3, respectively). Cluster 2 (n = 219), which contained largely fibro-fatty (39.2%) and fibrous plaque (46.8%), showed fibro-fatty PV regression (− 2.4 mm3). Cluster 3 (n = 376), which comprised mostly fibrous (62.7%) and calcified plaque (23.6%), showed increasingly prominent calcified PV progression (+ 21.4 mm3). Cluster 4 (n = 300), which comprised mostly calcified plaque (58.7%), demonstrated the greatest total PV increase (+ 50.7mm3), predominantly increasing in calcified PV (+ 35.9 mm3). Multivariable analysis showed higher risk for plaque progression in Clusters 3 and 4, and higher risk for adverse cardiac events in Clusters 2, 3, and 4 compared to that in Cluster 1. Unsupervised clustering algorithms may uniquely characterize patient phenotypes with varied atherosclerotic plaque profiles, yielding distinct patterns of progressive disease and outcome.

Zakko P, Kasir R, Chen NW and **Park D** (2021). "Dysphagia weakly correlates With other patient-reported outcomes after anterior cervical Discectomy and fusion." Cureus Journal of Medical Science 13(12): e20742.
Full Text
Department of Orthopaedic Surgery

Introduction: Dysphagia is a common complication after anterior cervical discectomy and fusion (ACDF), but it is not a routinely asked question in legacy patient-reported outcome measures (PROMs). This study analyzes whether there are associations between dysphagia and legacy outcome measures. Methods: We retrospectively reviewed 168 patients who underwent ACDF surgery from 2017 to 2019 at a single institution. Demographics, anthropometric data, Neck Disability Index (NDI), Visual Analog Scale (VAS) Arm and VAS-Neck Pain scores, Patient-Reported Outcomes Measurement Information System (PROMIS)Physical and PROMIS-Mental scores, Charlson Comorbidity Index (CCI), and Eating Assessment Tool-10 (EAT-10) were obtained for each patient preoperatively and at one, three, six, and 12 months postoperatively. Pearson's correlation coefficients were used to evaluate the bivariate correlations between legacy, PROMIS, and EAT-10 measures. Results: Significant but weak correlations existed between NDI and EAT-10 at one, three, and six months postoperatively (correlation coefficient (R) = 0.31, 0.42, and 0.34 at one, three, and six months, $p < 0.001$) and VAS-Neck Pain and EAT-10 scores at one, three, and six months postoperatively (R = 0.27, 0.30, and 0.28 at one, three, and six months, $p <= 0.004$). Both PROMIS-Physical and PROMIS-Mental scores showed

significant but weak correlations with EAT-10 scores at three and six months postoperatively (R =-0.29 and-0.25, p <= 0.01, at three months and R = -0.25 and -0.28, p < 0.01, at six months). In all comparisons of EAT-10 scores with legacy outcome measures, the significance of correlations disappeared by 12 months postoperatively. In addition, there was a positive association between CCI and EAT-10 score (beta = 0.37, p < 0.05). Conclusion: Weak correlations exist between self-reported dysphagia scores and legacy patient-reported outcome measures in patients undergoing ACDF. The correlation strength decreases over time; therefore, dysphagia scores should be reported separately when looking at outcomes after ACDF. Patients with more comorbidities are also at increased risk for dysphagia.

Zalikha AK, Karabon P, **Hussein IH** and El-Othmani MM (2021). "Anxiety and depression impact on inhospital complications and outcomes after total knee and hip arthroplasty: A propensity score-weighted retrospective analysis." Journal of the American Academy of Orthopaedic Surgeons 29(20): 873-884.
Full Text
Department of Foundational Medical Studies (OU)

Zhang PL, Raza S, **Li W** and **Kanaan HD** (2021). "Pathologic correlation with renal dysfunction after intravitreal injections of vascular endothelial growth factor antagonists." Annals of Clinical & Laboratory Science 51(6): 875-882.
Full Text
Department of Pathology

Objective: Vascular endothelial growth factor (VEGF) antagonists have been used for treating metastatic neoplasms. It has also been known that one of its side effects is to cause proteinuria and renal failure in the setting of thrombotic microangiopathy (TMA). The underlying mechanism is likely due to the inhibition of VEGF production in podocytes, resulting in diffuse fusion of foot processes and impaired glomerular endothelial fenestrations, and leading to massive proteinuria and subsequent glomerular endothelium injury. Intravitreal injection of VEGF antagonists (IIVA) has been also used to treat macular degeneration and diabetic retinal neo-vascular proliferation. The majority of patients tolerate the treatment well. However, IIVA can lead to renal dysfunction including proteinuria and gradual renal failure as a rare side effect. The goal of this study was to report two cases related to the nephrotoxicity of IIVA and review the literature associated with this topic. Case Report: The first diabetic patient had elevated serum creatinine at 3.25 mg/dl and proteinuria/creatinine ratio at 6.1 after 48-month treatment of IIVA. The first renal biopsy revealed thrombotic microangiopathy that was correlated with his increased serum creatinine and nephrotic range of proteinuria. The second diabetic patient had increased serum creatinine up to 1.89 mg/dl but low proteinuria. The second biopsy showed acute tubular necrosis that was correlated with his elevated serum creatinine. Conclusion: Intravitreal injection of VEGF antagonist can be associated with thrombotic microangiopathy and acute tubular necrosis, leading to renal dysfunction.

Zhao L, Liu G, Zheng W, Shen J, Lee AK, **Yan D**, **Deraniyagala RL, Jr.**, **Stevens CW**, **Li X**, Tang S and **Ding X** (2021). "Assessing the interplay effect based on a precise machine-specific delivery sequence and time for cyclotron accelerator proton therapy system." International Journal of Radiation Oncology, Biology, Physics 111(3): e529-e530.
Full Text
Department of Radiation Oncology

Purpose/Objective(s): Proton Pencil Beam Scanning (PBS) delivery sequence is critical in the

evaluation of the motion interplay effect. We proposed an experimental approach to build a precise machine-specific model for standard delivery, volumetric repainting delivery, and layer repainting delivery based on a cyclotron accelerator system and assessed the interplay effect quantitatively. Materials/Methods: Test fields and clinical treatment plans were used to derive each beam delivery parameters experimentally. The machine delivery log files were retrospectively analyzed to model beam delivery parameters, such as energy layer switching time (ELST), spot switching time, and spot drill time, for standard, volumetric and layer repainting delivery techniques. To quantitatively evaluate the interplay effect, a series of digital thoracic 4DCT image sets were used through 4D dynamic dose accumulation method. A small tumor in radius 5mm (labeled by R5) and a large tumor in radius 2cm (R20) phantom were created to simulate the mobile target with different sizes. Target motion was simulated based on the periodic respiratory motion with an amplitude 5 mm. The breathing cycle is 4s. Two-field Single Field Uniform Dose (SFUD) plans were generated using PA and lateral field. Different delivery techniques such as standard delivery, volumetric repainting delivery (n = 2,3,4) and layer repainting delivery (n = 2,3,5,25) were simulated based on the machine-specific delivery sequence model and a simplified model published by West German Proton Therapy Essen (WPE). D99 (Dose received by 99% of target volume) of the target is used to estimate the delivery accuracy. Results: The results showed that the WPE model's spot delivery sequence deviated from the log file significantly compared to the machine-specific model, which results the difference in the interplay effect evaluation. More specifically, for a lung treatment plan with target size (65 mm^3) and layer repainting 25 times, the difference is about 21.01% due to a coarse spot scanning speed modeling and an oversimplified assumption of a constant ELST from WPE model. Such a difference also resulted in a very different interplay effects estimation between the two models even though both institutions used the same proton system from IBA and calculated using the same 4DCT imaging set. Conclusion: A precise machine-specific delivery sequence model is highly recommended to ensure an accurate estimation of mobile target treatment's interplay effect for each institution.

Zhao L, Liu G, **Zheng W**, Shen J, Lee AK, **Yan D**, **Deraniyagala RL**, **Stevens CW**, **Li X**, Tang S, **Ding X** and **Deraniyagala RL, Jr.** (2021). "Assessing the interplay effect based on a precise machine-specific delivery sequence and time for cyclotron accelerator proton therapy system." International Journal of Radiation Oncology, Biology, Physics 111(3): e529-e530.

Full Text

Department of Radiation Oncology

Purpose/Objective(s): Proton Pencil Beam Scanning (PBS) delivery sequence is critical in the evaluation of the motion interplay effect. We proposed an experimental approach to build a precise machine-specific model for standard delivery, volumetric repainting delivery, and layer repainting delivery based on a cyclotron accelerator system and assessed the interplay effect quantitatively. Materials/Methods: Test fields and clinical treatment plans were used to derive each beam delivery parameters experimentally. The machine delivery log files were retrospectively analyzed to model beam delivery parameters, such as energy layer switching time (ELST), spot switching time, and spot drill time, for standard, volumetric and layer repainting delivery techniques. To quantitatively evaluate the interplay effect, a series of digital thoracic 4DCT image sets were used through 4D dynamic dose accumulation method. A small tumor in radius 5mm (labeled by R5) and a large tumor in radius 2cm (R20) phantom were created to simulate the mobile target with different sizes. Target motion was simulated based on the periodic respiratory motion with an amplitude 5 mm. The breathing cycle is 4s. Two-field Single Field Uniform Dose (SFUD) plans were generated using PA and lateral field. Different

delivery techniques such as standard delivery, volumetric repainting delivery (n = 2,3,4) and layer repainting delivery (n = 2,3,5,25) were simulated based on the machine-specific delivery sequence model and a simplified model published by West German Proton Therapy Essen (WPE). D99 (Dose received by 99% of target volume) of the target is used to estimate the delivery accuracy. Results: The results showed that the WPE model's spot delivery sequence deviated from the log file significantly compared to the machine-specific model, which results the difference in the interplay effect evaluation. More specifically, for a lung treatment plan with target size (65 mm^3) and layer repainting 25 times, the difference is about 21.01% due to a coarse spot scanning speed modeling and an oversimplified assumption of a constant ELST from WPE model. Such a difference also resulted in a very different interplay effects estimation between the two models even though both institutions used the same proton system from IBA and calculated using the same 4DCT imaging set. Conclusion: A precise machine-specific delivery sequence model is highly recommended to ensure an accurate estimation of mobile target treatment's interplay effect for each institution.

Zureick AH, **Zakalik D**, Rangarajan TS, **Quinn TJ**, **Chen PY** and **Dilworth JT** (2021). "Breast irradiation is well tolerated in carriers of a pathogenic ATM variant." International Journal of Radiation Oncology Biology Physics 111(3): E227-E227.
Full Text
Department of Internal Medicine/Hematology-Oncology
Department of Radiation Oncology

Zwaans BMM, Carabulea AL, Bartolone SN, Ward EP, **Chancellor MB** and **Lamb LE** (2021). "Voiding defects in acute radiation cystitis driven by urothelial barrier defect through loss of E-cadherin, ZO-1 and Uroplakin III." Scientific Reports 11(1): 19277.
Full Text
Department of Urology

Long term-side effects from cancer therapies are a growing health care concern as life expectancy among cancer survivors increases. Damage to the bladder is common in patients treated with radiation therapy for pelvic cancers and can result in radiation (hemorrhagic) cystitis (RC). The disease progression of RC consists of an acute and chronic phase, separated by a symptom-free period. Gaining insight in tissue changes associated with these phases is necessary to develop appropriate interventions. Using a mouse preclinical model, we have previously shown that fibrosis and vascular damage are the predominant pathological features of chronic RC. The goal of this study was to determine the pathological changes during acute RC. We identified that radiation treatment results in a temporary increase in micturition frequency and decrease in void volume 4–8 weeks after irradiation. Histologically, the micturition defect is associated with thinning of the urothelium, loss of urothelial cell–cell adhesion and tight junction proteins and decrease in uroplakin III expression. By 12 weeks, the urothelium had regenerated and micturition patterns were similar to littermate controls. No inflammation or fibrosis were detected in bladder tissues after irradiation. We conclude that functional bladder defects during acute RC are driven primarily by a urothelial defect.