

OAKLAND UNIVERSITY WILLIAM BEAUMONT SCHOOL OF MEDICINE
PUBLICATION LIST
April - June 2021

We compiled this bibliography to recognize the school's scholarly activity and to provide ease of access to the journal articles, published meeting abstracts, book chapters, books, and other works written by OUWB faculty, students and staff. We created the list by searching the institutional affiliation fields in PubMed, Scopus, Web of Science, EMBase, CINAHL, MedEd Portal, Google Scholar and Google Books. Because of search limitations, it does not represent an exhaustive collection of all published works by OUWB authors. If we inadvertently missed your publication, please email the citation to the Medical Library at medref@oakland.edu, and we will add it to the next quarter's list.

Click the "Full-Text" link to download the articles available through the OUWB Medical Library. If the full-text is not available, you may request a copy by clicking the "Request Form" link or calling us at 248-370-3772. If you would us to add you to the automatic distribution list to receive quarterly updates via email, or if you have any questions or comments, please contact David Stewart at davidstewart@oakland.edu.

Allen M, Spillinger A, Arianpour K, Johnson J, Johnson AP, Folbe AJ, Hotaling J and Svider PF (2021). "Tracheal resection in the management of thyroid cancer: An evidence-based approach." *Laryngoscope* 131(4): 932-946.

[Full Text](#)

*OUWB Medical Student Author
Department of Surgery*

Allen MA, Lucas JP, Chung M, Rayess HM and Zuliani G (2021). "Nasal analysis of classic animated movie villains versus hero counterparts." *Facial Plastic Surgery* 37(3): 348-353.

[Full Text](#)

OUWB Medical Student Author

Opposing facial features between animated villains and heroes have historically been used to demonstrate contrasting morality between characters, and this could have an impact on how humans view someone as good or evil in everyday life. Studies have been done investigating classic dermatologic features of villainous characters. This principle can be applied to nasal features as well. A search for top animated characters was performed. Characters were chosen from American Film Institute's The Top Tens, Rolling Stone's 25 Best Pixar Movie Characters, and Screenrant's The 30 Best Animated Movie Characters of All Time. Twenty villains and twenty hero counterparts from respective films were chosen. Classic nasal features were analyzed. Twenty villains (14 male, 6 female) and 20 heroes (12 male, 8 female) were analyzed. Sixteen villains (80%) had greater than normal nasal frontal angle versus 18 heroes (90%). Thirteen villains (65%) had an acute nasolabial angle versus two heroes (10%). Two villains (10%) had excess columellar show versus seven heroes (35%). Seven villains (35%) and one hero (5%) had a dorsal hump. Twelve villains (60%) had an overprojected chin versus three heroes (15%). Villains in pre-2000s films more frequently had a dorsal hump, overprojected chin, ptotic tip, pollybeak deformity, and bulbous tip. Heroes in pre-2000s films more frequently had an overrotated tip. Villains and heroes commonly have a greater than normal nasofrontal angle. Villains more commonly have an acute nasolabial angle, underrotated tip, overprojected chin, dorsal hump, and pollybeak deformity. Heroes more commonly have a large nasolabial angle and overrotated tip. Further research in conjunction with psychologists is required to obtain concrete data on how this affects whether an individual in real life is seen as good or evil, and the impact this has on interactions in society, including in the medical

field.

Almahariq MF, Quinn TJ, Arden JD, Roskos PT, **Wilson GD**, Marples B, **Grills IS**, **Chen PY**, **Krauss DJ**, **Chinnaiyan P** and **Dilworth JT** (2021). "Pulsed radiation therapy for the treatment of newly diagnosed glioblastoma." *Neuro-oncology* 23(3): 447-456.

[Full Text](#)

Department of Radiation Oncology

Background: Pulsed radiation therapy (PRT) has shown effective tumor control and superior normal-tissue sparing ability compared with standard radiotherapy (SRT) in preclinical models and retrospective clinical series. This is the first prospective trial to investigate PRT in the treatment of patients with newly diagnosed glioblastoma (GBM). Methods: This is a single-arm, prospective study. Patients with newly diagnosed GBM underwent surgery, followed by 60 Gy of PRT with concurrent temozolomide (TMZ). Each day, a 2-Gy fraction was divided into ten 0.2-Gy pulses, separated by 3-minute intervals. Patients received maintenance TMZ. Neurocognitive function (NCF) and quality of life (QoL) were monitored for 2 years using the Hopkins Verbal Learning Test–Revised and the European Organisation for Research and Treatment of Cancer QLQ–C30 QoL questionnaire. Change in NCF was evaluated based on a minimal clinically important difference (MCID) threshold of 0.5 standard deviation. Results: Twenty patients were enrolled with a median follow-up of 21 months. Median age was 60 years. Forty percent underwent subtotal resection, and 60% underwent gross total resection. One patient had an isocitrate dehydrogenase (IDH)-mutated tumor. Median progression-free survival (PFS) and overall survival (OS) were 10.7 and 20.9 months, respectively. In a post-hoc comparison, median OS for the prospective cohort was longer, compared with a matched cohort receiving SRT (20.9 vs 14 mo, $P = 0.042$). There was no decline in QoL, and changes in NCF scores did not meet the threshold of an MCID. Conclusions: Treatment of newly diagnosed GBM with PRT is feasible and produces promising effectiveness while maintaining neurocognitive function and QoL. Validation of our results in a larger prospective trial warrants consideration.

Anne S, Mims J, Tunkel DE, Rosenfeld RM, Boisoineau DS, Brenner MJ, Cramer JD, Dickerson D, Finestone SA, **Folbe AJ**, Galaiya DJ, Messner AH, Paisley A, Sedaghat AR, Stenson KM, Sturm AK, Lambie EM, Dhepyasuwan N and Monjur TM (2021). "Clinical practice guideline: Opioid prescribing for analgesia after common otolaryngology operations executive summary." *Otolaryngology-Head and Neck Surgery* 164(4): 687-703.

[Full Text](#)

Department of Surgery

Objective: Opioid use disorder (OUD), which includes the morbidity of dependence and mortality of overdose, has reached epidemic proportions in the United States. Overprescription of opioids can lead to chronic use and misuse, and unused narcotics after surgery can lead to their diversion. Research supports that most patients do not take all the prescribed opioids after surgery and that surgeons are the second largest prescribers of opioids in the United States. The introduction of opioids in those with OUD often begins with prescription opioids. Reducing the number of extra opioids available after surgery through smaller prescriptions, safe storage, and disposal should reduce the risk of opioid use disorder in otolaryngology patients and their families. Purpose: The purpose of this specialty-specific guideline is to identify quality improvement opportunities in postoperative pain management of common otolaryngologic surgical procedures. These opportunities are communicated through clear actionable statements with explanation of the support in the literature, evaluation of the quality of the evidence, and recommendations on implementation. Employing these action statements should reduce the variation in care across the specialty and improve postoperative pain control while reducing risk of OUD. The target patients for the guideline are any patients treated for anticipated or reported pain within the first 30 days after undergoing common otolaryngologic procedures. The target audience of the guideline is otolaryngologists who perform surgery and clinicians who manage pain after surgical procedures. Outcomes to be considered include whether the patient has stopped using opioids, has disposed of unused opioids, and was satisfied with the pain management plan. The guideline addresses assessment of the patient for OUD risk factors, counseling on pain expectations, and identifying factors that can affect pain duration and/or severity. It also discusses the use of multimodal analgesia as first-line treatment and the responsible use of opioids. Last, safe disposal of unused opioids is discussed. This guideline is intended to focus on evidence-based quality improvement opportunities judged most important by the guideline development group. It is not a comprehensive guide

on pain management in otolaryngologic procedures. The statements in this guideline are not intended to limit or restrict care provided by clinicians based on their experiences and assessments of individual patients. Action Statements: The guideline development group made strong recommendations for the following key action statements: (3A) prior to surgery, clinicians should identify risk factors for opioid use disorder when analgesia using opioids is anticipated; (6) clinicians should advocate for nonopioid medications as first-line management of pain after otolaryngologic surgery; (9) clinicians should recommend that patients (or their caregivers) store prescribed opioids securely and dispose of unused opioids through take-back programs or another accepted method. The guideline development group made recommendations for the following key action statements: (1) prior to surgery, clinicians should advise patients and others involved in the postoperative care about the expected duration and severity of pain; (2) prior to surgery, clinicians should gather information specific to the patient that modifies severity and/or duration of pain; (3B) in patients at risk for OUD, clinicians should evaluate the need to modify the analgesia plan; (4) clinicians should promote shared decision making by informing patients of the benefits and risks of postoperative pain treatments that include nonopioid analgesics, opioid analgesics, and nonpharmacologic interventions; (5) clinicians should develop a multimodal treatment plan for managing postoperative pain; (7) when treating postoperative pain with opioids, clinicians should limit therapy to the lowest effective dose and the shortest duration; (8A) clinicians should instruct patients and caregivers how to communicate if pain is not controlled or if medication side effects occur; (8B) clinicians should educate patients to stop opioids when pain is controlled with nonopioids and stop all analgesics when pain has resolved; (10) clinicians should inquire, within 30 days of surgery, whether the patient has stopped using opioids, has disposed of unused opioids, and was satisfied with the pain management plan.

Arianpour K, Allen M, Ashman P and Folbe AJ (2021). "Perioperative analgesia in cranial and skull base surgery," In Svider PF, Pashkova AA and Johnson AP (ed). Perioperative Pain Control: Tools for Surgeons: A Practical, Evidence-Based Pocket Guide. Cham: Springer International Publishing. pp: 207-222.

[Full Text](#)

*OUIB Medical Student Author
Department of Surgery*

This chapter examines the approach to management of perioperative analgesia in cranial and skull base surgeries. The controversy of pain management in cranial surgery dates back many years, and current trends in the literature are discussed including further addressing previously underrecognized pain and a drive toward the use of multimodal and non-opioid modalities. The use of scalp blockade and systemic therapies in cranial surgery are discussed. The approach to the skull base has evolved drastically in the last few decades, evolving into minimally invasive techniques that have reduced morbidity and consequently pain burden. Given the diversity of these procedures and the numerous subspecialties involved, it is not surprising that there is a need for further high-quality procedure-specific randomized controlled trials and systematic evidence-based reviews on perioperative analgesia in cranial and skull base surgeries. The current status of training in perioperative pain management in otolaryngology and neurosurgical residents also remains to be elucidated.

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 S, Barremkala M, Bentley D, Dennis J, Farkas G, Goldman H, Harmon D, Harrell K, Klein B, Ramnanan C and Brown K (2021). "Changes in gross anatomy laboratory assessment during COVID-19." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction & Objective: Traditional gross anatomy lab assessment involves in-person examination using cadavers or models. Covid-19 related restrictions introduced challenges to gross anatomy education due to the discipline's reliance on lab-based learning and assessment. Therefore, the objective of this study was to assess changes made by anatomy educators to gross anatomy lab assessments during May-August 2020. **Materials & Methods:** A 20-item survey assessed gross anatomy pedagogy, teaching resources, and assessment before and during the pandemic. The survey was distributed online to anatomy educators through professional associations and listservs in June 2020. Data were obtained from two survey items that asked respondents for narrative descriptions of their lab-based assessment before and during Covid-19. Open coding was used to apply descriptive codes relating to 3 categories: (1) setting of the assessment, (2) format of the assessment, and (3) materials used for the questions. The last author coded the data, while the first author reviewed the coding. Both authors reconciled and re-coded discrepancies. Code frequencies and percentages were calculated. Chi-square or Fisher's exact test was used to assess differences in frequencies before and during Covid-19. $\alpha < 5\%$. **Results:** Of the 61 respondents who described lab assessment, the use of the physical lab setting decreased (before: 82%, during: 20%; $P < 0.001$) while computer-based platforms increased (before: 9%, during: 61%; $P < 0.001$). The use of medical imaging and other anatomical images were maintained (before: 11%, during: 51%; $P = 0.37$), but there were decreases in the use of cadavers (before: 63%, during: 14%; $P < 0.001$) as well as bones, plastic models, and plastinates (before: 12%, during: 0%; $P < 0.001$). There were no significant changes in assessment structure, with the majority of participants maintaining a practical examination (i.e. "bell ringer") format during Covid-19 (before: 66%, during: 62%; $P = 0.39$). **Conclusion:** Anatomy educators continued the use of "bell ringer" style lab assessments during the early part of the Covid-19 pandemic. The setting shifted towards computer-based examinations due to Covid-19 restrictions; thus, the use of digital images was maintained while cadaver use decreased. **Significance/Implication:** The early adaptations made by anatomy educators to their lab assessments during Covid-19 provide insight into how assessment may be offered in dire circumstances when the physical lab is unavailable, when accommodating students with extenuating circumstances preventing them from attending in-person lab assessments, and for remediation assessments.

Bahl A, Gibson SM, Jankowski D and Chen NW (2021). "Short peripheral intravenous catheter securement with cyanoacrylate glue compared to conventional dressing: A randomized controlled trial." *Journal of Vascular Access* 11297298211024037.

[Request Form](#)

Department of Emergency Medicine

Background: Short peripheral intravenous catheters (PIVCs) fail prior to completion of therapy in up to 63% of hospitalizations. This unacceptably high rate of failure has become the norm for the most common invasive procedure in all of medicine. Securement strategies may improve PIVC survival. **Methods:** We conducted a prospective, single-site, parallel, two-arm randomized controlled investigation with a primary outcome of catheter failure comparing securement with standard semi-permeable dressing and clear tape (SPD) to standard semipermeable dressing and clear tape with cyanoacrylate glue (SPD + CG). Adult emergency department patients with a short PIVC and anticipated hospital duration ≥ 48 h were enrolled and followed until IV failure or completion of therapy for up to 7 days. Secondary outcomes included complications and cost comparisons between groups. Primary outcome was assessed by intention to treat

and per protocol analyses. Findings: 350 patients were enrolled between November 2019 and October 2020. PIVC survival for SPD + CG was similar to SPD group with the absolute risk difference of IV failure in the intention-to-treat (-5.8%, $p = 0.065$) population and improved in the per protocol (-8.1%, $p = 0.04$) population, respectively. Kaplan-Meier survival analysis indicated there was a significant benefit of the SPD + CG at greater than 2 days of hospitalization ($p = 0.04$). Prior to 48 h, there was no survival enhancement to either group ($p = 0.98$) in the intention to treat population. In a multivariable analysis with piecewise Cox regression, when the IV was functional greater than 48 h, the risk of IV failure in the SPD + CG was 43% less than the SPD group (adjusted hazard ratio [HR] 0.57, 95% confidence interval [CI] 0.34 to 0.97; $p = 0.04$). Cumulative cost related to IV during hospitalization was similar between groups with a lower incremental rescue cost in the SPD + CG group. Interpretation: SPD combined with cyanoacrylate glue provides similar benefit to patients compared to SPD alone and potentially improves short PIVC survival when the IV was inserted >48 h. As this strategy is cost neutral, it could be considered in admitted patients, particularly those with longer anticipated hospital durations.

Bahl A, Johnson S, **Mielke N** and Karabon P (2021). "Early recognition of peripheral intravenous catheter failure using serial ultrasonographic assessments." *PLoS ONE* 16: 0253243.

[Full Text](#)

Department of Emergency Medicine

OUIB Medical Student Author

Objective: Peripheral intravenous catheter (PIVC) failure occurs frequently, but the underlying mechanisms of failure are poorly understood. We aim to identify ultrasonographic factors that predict impending PIVC failure prior to clinical exam. Methods: We conducted a single site prospective observational investigation at an academic tertiary care center. Adult emergency department (ED) patients who underwent traditional PIVC placement in the ED and required admission with an anticipated hospital length of stay greater than 48 hours were included. Ongoing daily PIVC assessments included clinical and ultrasonographic evaluations. The primary objective was to identify ultrasonographic PIVC site findings associated with an increased risk of PIVC failure. The secondary outcome was to determine if ultrasonographic indicators of PIVC failure occurred earlier than clinical recognition of PIVC failure. Results: In July and August of 2020, 62 PIVCs were enrolled. PIVC failure occurred in 24 (38.71%) participants. Multivariate logistic regression demonstrated that the presence of ultrasonographic subcutaneous edema [AOR 7.37 (1.91, 27.6) $p = 0.0030$] was associated with an increased likelihood of premature PIVC failure. Overall, 6 (9.67%) patients had subcutaneous edema present on clinical exam, while 35 (56.45%) had subcutaneous edema identified on ultrasound. Among patients with PIVC failure, average time to edema detectable on ultrasound was 46 hours and average time to clinical recognition of failure was 67 hours ($P = < 0.0001$). Conclusions: Presence of subcutaneous edema on ultrasound is a strong predictor of PIVC failure. Subclinical subcutaneous edema occurs early and often in the course of the PIVC lifecycle with a predictive impact on PIVC failure that is inadequately captured on clinical examination of the PIVC site. The early timing of this ultrasonographic finding provides the clinician with key information to better anticipate the patient's vascular access needs. Further research investigating interventions to enhance PIVC survival once sonographic subcutaneous edema is present is needed.

Barnard E, Dambaeva A, **Gibney B**, Tenewitz C, Farag A and Vatakencherry G (2021). "Abstract No. 470 "Day in the Life of IR" YouTube Series: Recruiting undergraduate and medical students to interventional radiology." *Journal of Vascular & Interventional Radiology* 32(5): S118-S119.

[Full Text](#)

OUIB Medical Student Author

Beaudoin FL, Zhai W, Merchant RC, Clark MA, Kurz MC, Hendry P, **Swor RA**, Peak D, Pearson C, Domeier R, Ortiz C and McLean SA (2021). "Persistent and widespread pain among blacks six weeks after MVC: Emergency department-based cohort study." *Western Journal of Emergency Medicine* 22(2): 139-147.

[Full Text](#)

Department of Emergency Medicine

Introduction: Blacks in the United States experience greater persistent pain than non-Hispanic Whites across a range of medical conditions, but to our knowledge no longitudinal studies have examined the risk factors or incidence of persistent pain among Blacks experiencing common traumatic stress exposures such as after

a motor vehicle collision (MVC). We evaluated the incidence and predictors of moderate to severe axial musculoskeletal pain (MSAP) and widespread pain six weeks after a MVC in a large cohort of Black adults presenting to the emergency department (ED) for care. Methods: This prospective, multi-center, cohort study enrolled Black adults who presented to one of 13 EDs across the US within 24 hours of a MVC and were discharged home after their evaluation. Data were collected at the ED visit via patient interview and self-report surveys at six weeks after the ED visit via internet-based, self-report survey, or telephone interview. We assessed MSAP pain at ED visit and persistence at six weeks. Multivariable models examined factors associated with MSAP persistence at six weeks post-MVC. Results: Among 787 participants, less than 1% reported no pain in the ED after their MVC, while 79.8 (95% confidence interval [CI], 77.1 - 82.2) reported MSAP and 28.3 (95% CI, 25.5 - 31.3) had widespread pain. At six weeks, 67% (95% CI, 64, 70%) had MSAP and 31% (95% CI, 28, 34%) had widespread pain. ED characteristics predicting MSAP at six weeks post-MVC (area under the curve = 0.74; 95% CI, 0.72, 0.74) were older age, peritraumatic dissociation, moderate to severe pain in the ED, feeling uncertain about recovery, and symptoms of depression. Conclusion: These data indicate that Blacks presenting to the ED for evaluation after MVCs are at high risk for persistent and widespread musculoskeletal pain. Preventive interventions are needed to improve outcomes for this high-risk group.

Belovich AN, Bahner I, Bonaminio G, Breneman A, Brooks WS, Chinn C, El-Sawi N, Haight M, Haudek SB, Ikonne U, **McAuley RJ**, McKell D, Rowe R, **Taylor TAH** and Vari RC (2021). "USMLE Step-1 is going to pass/fail, now what do we do?" *Medical Science Educator* 31: 1551-1556.

[Full Text](#)

Department of Foundational Medical Studies (OU)

The Winter 2021 Webinar Audio Series (WAS) of the International Association of Medical Science Educators (IAMSE), titled, "USMLE Step-1 is Going to Pass/Fail, Now what do we do?" was broadcast live to audiences at academic institutions worldwide in five weekly webinars from January 7, 2021, to February 4, 2021. Recognized experts from various stakeholder groups discussed the impact of the decision to score the United States Medical Licensing Examination (USMLE) Step 1 exam Pass/Fail (P/F). The speakers identified challenges to their respective programs and explored creative ways to address potential consequences. Sessions included the perspectives of allopathic and osteopathic residency program directors, basic science faculty, undergraduate medical education curriculum designers, clinical educators, and programs for international medical students matriculating to the United States. On February 25, 2021, a bonus session provided cutting-edge updates from a co-chair of the Coalition for Physician Accountability Undergraduate Medical Education (UME) to Graduate Medical Education (GME) Review Committee (UGRC).

Bernstein PS, Cheung G, Kadonosono K, Kim JE, **Mahmoud TH**, Querques G, Roca JA and Wu L (2021). "Retina around the world: Experts share the latest research and preferred techniques for macular holes, nonexudative macular neovascularization, myopic traction maculopathy, and more." *Retina Today* 2021: 34-38.

[Full Text](#)

Department of Ophthalmology

Black EH and **Schlachter DM-B** (2021). "Forehead/brow ptosis," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). *Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery*. Cham: Springer International Publishing. pp: 351-357.

[Full Text](#)

Department of Ophthalmology

Descent of the upper face and brow area occurs frequently with age. With brow ptosis in particular, many patients complain of appearing tired, angry, or sad. Returning the brow, sub-brow fat, and forehead to an improved anatomic position is important to achieve an aesthetically pleasing appearance of the upper face and periorbital area. Numerous techniques exist to elevate the forehead and brow area, so a thorough evaluation and discussion will help determine which technique is appropriate for each patient.

Bojrab DI, 2nd, **Fritz CG**, Lin KF, **Schutt CA**, **Hong RS**, **Babu SC**, **Chen PY**, Maitz A and **Bojrab DI** (2021). "A protective cap: Fundal fluid cap facilitates a reduction in inner ear radiation dose in the radiosurgical treatment of vestibular schwannoma." *Otology & Neurotology* 42(2): 294-299.

[Full Text](#)

Department of Surgery

OUWB Medical Student Author

Department of Radiation Oncology

Objective: Assess inner ear radiation dose magnitude as it relates to fundal cap length and hearing outcomes in the radiosurgical treatment of vestibular schwannoma. Study Design: Retrospective case series. Setting: Tertiary neurotology referral center. Patients: Patients treated with Gamma Knife radiosurgery for vestibular schwannoma between March 2007 and March 2017 were considered for this study. Exclusion criteria included pretreatment pure-tone average (PTA) >90 dB, neurofibromatosis type II, history of previous surgical resection, and follow-up less than 1 year. Main Outcome Measures: Hearing function was assessed by maintenance of class A/B hearing level and maintenance of baseline hearing (≤ 20 dB change in PTA following Gamma Knife radiosurgery). Results: Lower radiation doses delivered to the inner ear were associated with longer fundal cap lengths: mean cochlear dose ($r = -0.130$; $p = 0.184$), mean labyrinth dose ($r = -0.406$; $p < 0.001$), max cochlear dose ($r = -0.326$; $p = 0.001$), and max labyrinth dose ($r = -0.360$; $p < 0.001$). Kaplan-Meier analysis with log-rank testing revealed that patients with a mean labyrinth dose < 3 Gy achieved higher rates of preserving baseline hearing (≤ 20 dB change in PTA) following radiosurgery, compared to patients with a mean labyrinth dose ≥ 3 Gy ($p < 0.001$). A fundal fluid cap length of 2.5 mm was associated with the 3 Gy mean labyrinth dose threshold. Conclusions: We report that fundal cap presence facilitated the creation of treatment plans with a lower dose delivered to the labyrinth. By affording this dose reduction, a fundal cap may be associated with a slight improvement in hearing outcomes.

Bowers T and **Goldstein JA** (2021). "Hemodynamic compromise in pulmonary embolism: "A tale of two ventricles"." *Catheterization and Cardiovascular Interventions* 97(2): 299-300.

[Full Text](#)

Department of Internal Medicine

In acute pulmonary embolism (PE), low cardiac output (CO)–hypotension results from disparate ventricular conditions: The left ventricle (LV) is under-filled and contracting vigorously, whereas the right ventricle (RV) is failing and dilated. The proximate cause of LV preload deprivation is thrombus-induced pulmonary vascular obstruction; abruptly increased pulmonary vascular resistance (PVR) induces acute RV systolic dysfunction which further compromises trans-pulmonary flow. "Escalation of Care" interventions (thrombolytics and aspiration thrombectomy) improve systemic hemodynamics by increasing LV preload delivery directly by reducing PVR and indirectly by relief of the strained failing RV.

Bradley CJ, **Williamson BD**, George J and **Haines DE** (2021). "Protocol driven periprocedural anticoagulation for left atrial ablation." *Journal of Cardiovascular Electrophysiology* 32(3): 639-646.

[Full Text](#)

Department of Internal Medicine

Introduction: A weight-based heparin dosing policy adjusted for preprocedural oral anticoagulation was implemented to reduce the likelihood of subtherapeutic dosing during left atrial catheter ablation procedures. We hypothesized that initiation of the protocol would result in a greater prevalence of therapeutic activated clotting time (ACT) values and decreased time to therapeutic ACT during left atrial ablation procedures. Methods: A departmental protocol was initiated for which subjects received intravenous unfractionated heparin (UFH) to achieve and maintain a goal of ACT > 300 s. Initial bolus dose was adjusted for pre-procedure oral anticoagulation and weight as follows: 50 units/kg for those receiving warfarin, 75 units/kg for those not anticoagulated, and 120 units/kg for those on direct oral anticoagulants (DOACs). A UFH infusion was initiated at 10% of the bolus per hour. One hundred consecutive left atrial ablation procedures treated with Protocol Guided heparin dosing were compared with a retrospective consecutive cohort of Usual Care heparin dosing. Results: When the Usual Care and Protocol Guided cohorts were compared, significant findings were limited to those on pre-procedure DOAC. The initial UFH bolus increased from 99.3 ± 24.8 to 118.2 ± 22.8 units/kg ($p < .001$), the proportion of therapeutic ACT on the first draw after heparin administration increased from 57.7% to 76.6% ($p = .010$), and the time to therapeutic ACT after UFH administration decreased from 37.8 ± 19.8 to 30.2 ± 16.4 min ($p = .032$). Conclusion: A weight-based protocol for periprocedural UFH administration resulted in a higher proportion of therapeutic ACT values and decreased the time to therapeutic ACT for those on pre-procedure DOAC.

Brummett A (2021). "Affirming the existence and legitimacy of secular bioethical consensus, and rejecting Engelhardt's Alternative: A reply to Nick Colgrove and Kelly Kate Evans." *HEC Forum*. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

One of the most significant and persistent debates in secular clinical ethics is the question of ethics expertise, which asks whether ethicists can make justified moral recommendations in active patient cases. A critical point of contention in the ethics expertise debate is whether there is, in fact, a bioethical consensus upon which secular ethicists can ground their recommendations and whether there is, in principle, a way of justifying such a consensus in a morally pluralistic context. In a series of recent articles in this journal, Janet Malek defends a positive view of ethics expertise, claiming that secular ethicists should comport their recommendations with bioethical consensus. In response, Nick Colgrove and Kelly Kate Evans deny the existence of a secular bioethical consensus; question why, even if it did exist, consensus should be considered a reliable way of resolving bioethical questions; and recommend a friendlier approach to clinical ethics based on the thought of H. Tristram Engelhardt Jr. In this article, I respond to Colgrove and Evans on all three points. In part one, I show there is a secular bioethical consensus but note it could be better consolidated and created through a more systematic and inclusive process. In part two, I argue that bioethical consensus is morally justified but note that this justification cannot be plausibly based upon claims that it only invokes moral principles available to or shared by all. In part three, I argue Engelhardt's approach cannot be described as "friendlier" to clinical ethics because it is incompatible with many current healthcare laws and policies.

Brummett A and Campo-Engelstein L (2021). "Conscientious objection and LGBTQ discrimination in the United States." *Journal of Public Health Policy* 42(2): 322-330.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Given recent legal developments in the United States, now is a critical time to draw attention to how 'conscientious objection' is sometimes used by health care providers to discriminate against the LGBTQ community. We review legal developments from 2019 and present several cases where health care providers used conscientious objection in ways that discriminate against the LGBTQ community, resulting in damaged trust by this underserved population. We then discuss two important conceptual points in this debate. The first involves the interpretation of discrimination (provider versus patient-centered views), and we argue for a patient-centered view; the second involves the use of the people versus procedure distinction to reach a compromise between LGBTQ individuals and the clinicians who do not want to treat them. We argue the distinction is problematic when applied to treatment of the LGBTQ population.

Brummett AL (2021). "Defending, improving, expanding, and applying a moral-metaphysical proceduralism for secular clinical ethics." *American Journal of Bioethics* 21(7): W6-W9.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Brummett AL (2021). "Secular clinical ethicists should not be neutral toward all religious beliefs: An argument for a moral-metaphysical proceduralism." *American Journal of Bioethics* 21(6): 5-16.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Secular clinical ethics has responded to the problem of moral pluralism with a procedural approach. However, defining this term stirs debate: H. Tristram Engelhardt Jr. has championed a contentless proceduralism (P1), while others, conversely, argue for a proceduralism that permits some content in the form of moral claims (P2). This paper argues that the content P2 permits ought to be expanded to include some metaphysical commitments, in an approach referred to as P2+. The need for P2+ is demonstrated by analyzing and rejecting three standards (the best interest or harm principle, internal reasonability, and the child's right to an open future) used by P2 to justify overriding religiously motivated refusals of treatment for children. These approaches fail because each maintains a neutral stance regarding the truth of religious belief. This paper drives at the broader thesis that the proceduralism of secular clinical ethics requires some

moral and metaphysical commitments.

Cappell MS (2021). "Problems for gastrointestinal patients with diarrheal disorders: Limited access to public bathrooms because previously open public bathrooms have closed due to COVID-19 Pandemic and inadequate number of bathrooms in some endoscopy suites." *The American Journal of Gastroenterology* 116(6): 1355-1356.

[Full Text](#)

Department of Internal Medicine

Chalil A, **Staudt MD**, Harland TA, Leimer EM, Bhullar R and Argoff CE (2021). "A safety review of approved intrathecal analgesics for chronic pain management." *Expert Opinion on Drug Safety* 20(4): 439-451.

[Request Form](#)

Department of Neurosurgery

Introduction: Intrathecal (IT) drug therapy is an effective treatment option for patients with chronic pain of malignant or nonmalignant origin, with an established safety profile and fewer adverse effects compared to oral or parenteral pain medications. Morphine (a μ -opioid receptor agonist) and ziconotide (a non-opioid calcium channel antagonist) are the only IT agents approved by the U.S. Food and Drug Administration for the treatment of chronic pain. Although both are considered first-line IT therapies, each drug has unique properties and considerations. Areas Covered: This review will evaluate the pivotal trials that established the use of morphine and ziconotide as first-line IT therapy for patients with chronic pain, as well as safety and efficacy data generated from various retrospective and prospective studies. Expert Opinion: Morphine and ziconotide are effective IT therapies for patients with chronic malignant or nonmalignant pain that is refractory to other interventions. IT ziconotide is recommended as a first-line therapy due to its efficacy and avoidance of many adverse effects commonly associated with opioids. The use of IT morphine is also considered first-line; however, the risks of respiratory depression, withdrawal with drug discontinuation or pump malfunction, and the development of tolerance require careful patient selection and management.

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](#)

OUIB Medical Student Author

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, David SW, Khan ZA, Metzger DC, Wasserman HS, Lotfi AS, **Hanson ID, Dixon SR**, LaLonde TA, Génereux P, Ozan MO, Maehara A and Stone GW (2021). "One-year outcomes of supersaturated oxygen therapy in acute anterior myocardial infarction: The IC-HOT study." *Catheterization and Cardiovascular Interventions* 97(6): 1120-1126.

[Full Text](#)

Department of Internal Medicine

Background: Supersaturated oxygen (SSO₂) has recently been approved by the U.S. Food and Drug Administration for administration after primary percutaneous coronary intervention (pPCI) in patients with anterior ST-segment elevation myocardial infarction (STEMI) based on its demonstration of infarct size

reduction in the IC-HOT study. Objectives: To describe the 1-year clinical outcomes of intracoronary SSO2 treatment after pPCI in patients with anterior STEMI. Methods: IC-HOT was a prospective, open-label, single-arm study in which 100 patients without cardiogenic shock undergoing successful pPCI of an occluded left anterior descending coronary artery were treated with a 60-min SSO2 infusion. One-year clinical outcomes were compared with a propensity-matched control group of similar patients with anterior STEMI enrolled in the INFUSE-AMI trial. Results: Baseline and postprocedural characteristics were similar in the two groups except for pre-PCI thrombolysis in myocardial infarction 3 flow, which was less prevalent in patients treated with SSO2 (9.6% vs. 22.9%, $p = .02$). Treatment with SSO2 was associated with a lower 1-year rate of the composite endpoint of all-cause death or new-onset heart failure (HF) or hospitalization for HF (0.0% vs. 12.3%, $p = .001$). All-cause mortality, driven by cardiovascular mortality, and new-onset HF or HF hospitalization were each individually lower in SSO2-treated patients. There were no significant differences between groups in the 1-year rates of reinfarction or clinically driven target vessel revascularization. Conclusions: Infusion of SSO2 following pPCI in patients with anterior STEMI was associated with improved 1-year clinical outcomes including lower rates of death and new-onset HF or HF hospitalizations.

Clark JM, Kozower BD, Kosinski AS, Chang A, Broderick SR, David EA, Block M, Schipper PH, **Welsh RJ**, Seder CW, Farjah F and Brown LM (2021). "Variability in smoking status for lobectomy among Society of Thoracic Surgeons Database participants." *Annals of Thoracic Surgery* 111(6): 1842-1848.

[Full Text](#)

Department of Surgery

Background: Current smokers undergoing lobectomy are at greater risk of complications than are former smokers. The Society of Thoracic Surgeons (STS) composite score for rating program performance for lobectomy adjusts for smoking status, a modifiable risk factor. This study examined variability in the proportion of current smokers undergoing lobectomy among STS database participants. Additionally, the study determined whether each participant's rating changed if smoking was excluded from the risk adjustment model. Methods: This is a retrospective analysis of the STS cohort used to develop the composite score for rating program performance for lobectomy. The study summarized the variability among STS database participants for performing lobectomy on current smokers and compared star ratings developed from models with and without smoking status. Results: There were 24,912 patients with smoking status data: 23% current smokers, 62% former smokers, and 15% never smokers. There was significant variability among participants in the proportion of current smokers undergoing lobectomy (3% to 48.6%; $P < .001$). Major morbidity or mortality (composite) was greater in current smokers (12.1%) than in former smokers (8.6%) and never smokers (4.2%) ($P < .001$). Using the current risk adjustment model, participant star ratings were as follows: 1 star, $n = 6$ (3.2%); 2 stars, $n = 170$ (91.4%); and 3 stars, $n = 10$ (5.4%). When smoking status was excluded from the model, 1 participant shifted from a 2-star to a 3-star program. Conclusions: There is substantial variability among STS database participants with regard to the proportion of current smokers undergoing lobectomy. However, exclusion of smoking status from the model did not significantly affect participant star rating.

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*. ePub Ahead of Print.

[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.

Demirci H, Elnar VM, Demirci FY, Robinson DR, Chinnaiyan A, **Schlachter D**, Joseph S and Worden F (2021). "Immunotherapy for conjunctival squamous cell carcinoma with orbital extension." *Ophthalmology* 128(5): 801-804.

[Full Text](#)

Department of Ophthalmology

Dennis J, **Attardi S**, Bentley D, Brown K, Farkas G, Goldman H, Harmon D, Harrell K, Klein B, Ramnanan C and **Barremkala M** (2021). "Unmasking the structure of gross anatomy laboratory sessions during COVID-19." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction/Objective: Covid-19 created immediate challenges to anatomy education. The traditional format of gross laboratory sessions experienced a direct impact and few reports documented curricular delivery changes specific to laboratory format. The purpose of this study was to assess the adaptations incorporated in gross anatomy laboratories by anatomists, during May-August 2020, in response to Covid-19. Materials/Methods: Data were collected through the IRB-approved Virtual Anatomy During Covid-19 survey that consisted of 20 questions, including open-ended prompts asking participants to describe the structure of a "typical" laboratory session during Covid-19. Responses were solicited from professional anatomy associations during June 2020. Open-ended responses describing anatomy laboratory teaching methods used during Covid-19 were coded. Descriptive codes were applied to the data according to published methods to summarize verbatim responses. Responses were tabulated and converted to frequencies and percentages. Chi square test assessed differences among the responses when applicable. Alpha < 5%. Results: Descriptions of gross anatomy lab teaching during Covid-19 were coded into four categories: (1) delivery format, (2) format of laboratory practice, (3) type of anatomy digital resources used, and (4) format of student teaching groups. In the first category, synchronous (46.7%), asynchronous (15.6%), and/or a combination of the two (18.8%) were the most frequent laboratory delivery formats (P < 0.001). In the second category, student-led dissection (17.2%), prosection (10.9%), and/or utilization of commercial and/or in-house anatomical resources (26.2%) were the most frequent laboratory practices (P < 0.001). Within this category, a subcategory was discovered in which physical distancing and personal protective equipment practices were reported (15.6%). Concerning the third category, anatomy digital resources (26.2%) were used for asynchronous laboratory preparation and laboratory sessions. In the final category, student small groups (29.7%) were used in remote sessions where "breakout rooms" permitted students to meet with peers and/or faculty. Large groups (9.4%) were used for faculty to review and present the assigned laboratory topic. Conclusion: Anatomists largely taught through a remote, synchronous delivery format that relied on cadaveric specimens and digital anatomy resources, as well as small group learning. Significance/Implication: This study shows that anatomists were able to adapt the gross anatomy laboratory sessions to synchronous, virtual mediums; however, the impact of these changes to the learner during this unconventional time remains to be determined.

Derias N, Loftus S and Kamel-ElSayed S (2021). "Threshold concepts in preclinical medical education: Students' perceptions." *Medical Science Educator* 31(2): 917-921.

[Full Text](#)

OUWB Medical Student Author

Department of Foundational Medical Studies (OU)

Threshold concepts are those ideas that learners often find difficult, but must understand in order to master a discipline. Nearly all research into threshold concepts has been from the perspective of teachers. We argue

that the students' perspectives can also be helpful. In this commentary, we explore this issue and inform the debate by drawing on insights from a pilot study in which medical students articulated their own views on what constituted threshold concepts from recent learning experiences in physiology. Combining insights, from teachers and students, into candidate threshold concepts could be used to improve the medical curriculum.

Dirks RC, Athanasiadis DI, Hilgendorf WA, **Ziegler KM**, Waldrop C, Embry M and Selzer DJ (2021). "High-risk bariatric candidates: Does red-flagging predict the post-operative course?" Surgical Endoscopy. ePub Ahead of Print.

[Full Text](#)

Department of Surgery

Background: Standards for preoperative bariatric patient selection include a thorough psychological evaluation. Using patients "red-flagged" during preoperative evaluations, this study aims to identify trends in long-term follow-up and complications to further optimize bariatric patient selection. Methods: A multidisciplinary team held a case review conference (CRC) to discuss red-flagged patients. A retrospective chart review compared CRC patients to control patients who underwent bariatric surgery in the same interval. Patients under 18 years old, undergoing revisional bariatric surgery, or getting band placement were excluded. High-risk characteristics causing CRC inclusion, preoperative demographics, percent follow-up and other postoperative outcomes were collected up to 5 years postoperatively. If univariate analysis revealed a significant difference between cohorts, multivariable analysis was performed. Results: Two hundred and fifty three patients were red-flagged from 2012 to 2013, of which 79 underwent surgery. After excluding 21 revisions, 3 non-adult patients, and 6 band patients, 55 red-flagged patients were analyzed in addition to 273 control patients. Patient age, sex, initial BMI, ASA, and co-morbidities were similar between groups, though flagged patients underwent RYGB more frequently than control patients. Notably, percent excess BMI loss and percent follow-up (6 months–5 years) were similar. In multivariable analysis, minor complications were more common in flagged patients; and marginal ulcers, endoscopy, and dilation for stenosis were more common in flagged versus control patients who underwent RYGB. Perforation, reoperation, revision, incisional hernia, and internal hernia were statistically similar in both groups, though reoperation was significantly more common in patients with multiple reasons to be flagged compared to controls. Conclusion: Bariatric patients deemed high risk for various psychosocial issues have similar follow-up, BMI loss, and major complications compared to controls. High-risk RYGB patients have greater minor complications, warranting additional counseling of high-risk patients.

Dixon SR, Rabah M, Emerson S, Schultz C and Madder RD (2021). "A novel catheterization laboratory radiation shielding system: Results of pre-clinical testing." Cardiovascular Revascularization Medicine. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Department of Diagnostic Radiology and Molecular Imaging

Background: This pre-clinical study evaluated the efficacy of a novel shielding system to reduce scatter radiation in the cardiac catheterization laboratory. Methods: Using a scatter radiation phantom in a standard cardiac catheterization laboratory, a radiation physicist recorded radiation measurements at 20 reference points on the operator side of the table. Measurements were made with fluoroscopy and cine with the C-arm in the posterior-anterior (PA) and 40 degrees left anterior oblique (LAO) orientations. Scatter radiation doses were compared with and without use of the shielding system. Results: Use of the shielding system was associated with >94.2% reduction in scatter radiation across all reference points in the PA and LAO projections with fluoroscopy and cine. With the shielding system, dose reductions at the location of the primary operator ranged from 97.8% to 99.8%. At locations of maximum scatter radiation, use of the shielding system resulted in dose reductions ranging from 97.8% to 99.8% with fluoroscopy and from 97.9% to 99.8% with cine. Conclusions: In this pre-clinical study, a novel radiation shielding system was observed to dramatically reduce scatter radiation doses. Based on these results, clinical testing is warranted to determine whether the shielding system will enable operators and staff to perform interventional procedures with less radiation exposure that may obviate the need to wear standard lead apparel.

Dorneich MC, O'Dwyer B, Dolowitz AR, Styron JL and **Grogan J** (2021). "Application exercise design for team-based learning in online courses." New Directions for Teaching and Learning 2021(165): 41-52.

[Full Text](#)

Department of Foundational Medical Studies (OU)

This chapter describes best practices for adapting traditional, face-to-face, team-based learning principles to develop online application exercise design, support effective facilitation, and use appropriate technology to promote effective online team collaboration. The unique challenges of online TBL applications include maintaining effective team collaboration, discussion facilitation, and simultaneous reporting. A framework is proposed to guide practitioners to make appropriate, systematic choices in the development of online TBL applications.

Elterman D, Li W, Hatiboglu G, **Relle J**, Zorn KC, Bhojani N and Chin J (2021). "Relief of lower urinary tract symptoms after mri-guided transurethral ultrasound ablation for localized prostate cancer: Subgroup analyses in patients with concurrent cancer and benign prostatic hyperplasia." *Journal of Endourology* 35(4): 497-505.

[Request Form](#)

Department of Urology

Background: MRI-guided transurethral ultrasound ablation (TULSA) offers minimally invasive thermal ablation of benign and malignant prostate tissue, using directional high-intensity ultrasound and real-Time, magnetic resonance thermometry feedback control. Feasibility of TULSA for alleviating lower urinary tract symptoms (LUTSs) associated with benign prostatic hyperplasia (BPH) is retrospectively assessed in a subgroup of men from a localized prostate cancer study who also had LUTSs. Patients and Methods: TULSA was used to ablate 90% of the prostate gland in 30 men with localized prostate cancer, without plans to spare ejaculatory ducts. Mean \pm standard deviation treatment time was 37 ± 10 minutes. Retrospective analysis was conducted on a subpopulation of nine patients who also suffered from LUTSs (International Prostate Symptom Score [IPSS] ≥ 12 at baseline) as well as a smaller subgroup of five patients with IPSS > 12 and peak urinary flow (Qmax) < 15 mL/second. Urinary symptom relief, continence, and erectile function were assessed using IPSS, International Index of Erectile Function (IIEF), and uroflowmetry. Results: At 12 months post-TULSA, IPSS improved significantly by 58% to 6.3 ± 5.0 ($p = 0.003$), with at least a moderate (≥ 6 points) reduction in eight of nine patients. IPSS quality of life improved in eight of nine patients. Erectile function (IIEF-EF) remained stable from 14.6 ± 9.3 at baseline to 15.7 ± 9.0 at 12 months. The proportion of patients with erections sufficient for penetration (IIEF Q2 ≥ 2) was unchanged. Full urinary continence (pad free and leak free) was achieved at 12 months in all patients. In five men who suffered from more severe symptoms, Qmax increased from 11.6 ± 2.6 mL/second to 22.5 ± 14.2 mL/second at 12 months ($p = 0.126$). Perfused prostate volume, measured on MRI, decreased 70% to 13.6 ± 4.6 mL ($p = 0.003$) at 12 months. All adverse events were mild to moderate (Common Terminology Criteria for Adverse Events [CTCAE] Grade 1-2) with no serious events reported. Conclusions: This retrospective analysis demonstrates promising safety and feasibility of TULSA to relieve LUTSs, with improvement in IPSS comparable with modern, minimally invasive surgical therapies. Larger controlled studies with BPH-specific ablation plans in men seeking treatment for LUTSs are warranted.

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*. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

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 HY, 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, Lee HJ, Ok CY, Xu J and Miranda RN (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*. ePub Ahead of Print.

[Full Text](#)

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.

Fathi E, Yarbro JM and **Homayouni R** (2021). "NIPSNAP protein family emerges as a sensor of mitochondrial health." *BioEssays* 43(6): 202100014.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Since their discovery over two decades ago, the molecular and cellular functions of the NIPSNAP family of proteins (NIPSNAPs) have remained elusive until recently. NIPSNAPs interact with a variety of mitochondrial and cytoplasmic proteins. They have been implicated in multiple cellular processes and associated with different physiologic and pathologic conditions, including pain transmission, Parkinson's disease, and cancer. Recent evidence demonstrated a direct role for NIPSNAP1 and NIPSNAP2 proteins in regulation of mitophagy, a process that is critical for cellular health and maintenance. Importantly, NIPSNAPs contain a 110 amino acid domain that is evolutionary conserved from mammals to bacteria. However, the molecular function of the conserved NIPSNAP domain and its potential role in mitophagy have not been explored. It stands to reason that the highly conserved NIPSNAP domain interacts with a substrate that is ubiquitously present across all species and can perhaps act as a sensor for mitochondrial health. © 2021 Wiley Periodicals LLC

Fiani B, Doan T, Covarrubias C, Shields J, **Sekhon M** and Rose A (2021). "Determination and optimization of ideal patient candidacy for anterior odontoid screw fixation." *Surgical Neurology International* 12: 170.

[Full Text](#)

OUWB Medical Student Author

Background: Odontoid process fractures are one of the most common spine fractures, especially in patients over age 70. There is still much controversy over the ideal candidate for anterior odontoid screw fixation (AOSF), with outcomes affected by characteristics such as fracture morphology, nonideal body habitus, and osteoporosis. Therefore, this systematic review seeks to discuss the optimal criteria, indications, and adverse postoperative considerations when deciding to pursue AOSF. Methods: This investigation was conducted from experiential recall and article selection performed using the PubMed electronic bibliographic databases. The search yielded 124 articles that were assessed and filtered for relevance. Following the screening of titles and abstracts, 48 articles were deemed significant for final selection. Results: AOSF is often utilized to treat Type IIB odontoid fractures, which has been shown to preserve atlantoaxial motion, limit soft-tissue injuries/blood loss/vertebral artery injury/reduce operative time, provide adequate osteosynthesis, incur immediate spinal stabilization, and allow motion preservation of C1 and C2. However, this technique is limited by patient characteristics such as fracture morphology, transverse ligament rupture, remote injuries, short neck or inability to extend neck, barrel chested, and severe spinal kyphosis, in addition to adverse postoperative outcomes such as dysphagia and vocal cord paralysis. Conclusion: Due to the fact that odontoid fractures have a significant morbidity in elderly population, treatment with AOSF is generally recommended for this population with higher risk for nonoperative fusion. Considerations should be made to achieve fracture stability and fusion, while lowering the risk for operative and postoperative complications.

Fiani B, Jarrah R, Shields J and **Sekhon M** (2021). "Enhanced biomaterials: Systematic review of alternatives to supplement spine fusion including silicon nitride, bioactive glass, amino peptide bone graft, and tantalum." *Neurosurgical Focus* 50(6): 1-9.

[Full Text](#)

OUWB Medical Student Author

Objective: Spinal fusions are among the most common and effective spinal surgical practices; however, the current model presents some cost and safety concerns within the patient population. Therefore, enhanced biomaterials have been presented to be an innovative yet underutilized tool to supplement the success of spinal fusion surgery. Herein, the authors discuss these biomaterials, their compositions, clinical outcomes, and cost analysis through a systematic review of the literature to date. Methods: This systematic review was conducted using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) criteria and guidelines. Article selection was performed using the PubMed electronic bibliographic databases. The search yielded 1168 articles that were assessed and filtered for relevance by the four authors. Following the screening of titles and abstracts, 62 articles were deemed significant enough for final selection. Results: To date, silicon nitride, bioactive glass, amino peptide bone grafts, and tantalum are all biomaterials that could have significant roles in supporting spinal fusion. Their unique compositions allow them to be biocompatible in the spine, and their mechanisms of action stimulate osteoblast formation and support fusion success. Moreover, these biomaterials also present positive clinical and cost outcomes that support their application in spinal procedures. However, further studies with longer follow-ups are necessary to fully understand these biomaterials prior to their incorporation in mainstream spinal practice. Conclusions: The combination of their positive clinical outcomes, biocompatibility, and cost-effectiveness makes these biomaterials valuable, innovative, and effective treatment modalities that could revolutionize the current model of spinal fusion.

Fotheringham S, Karabon P, Wunderlich-Barillas T, Traynor J and **Gowans K** (2021). "Optimization of school reintegration for pediatric oncology patients and their peers." *Pediatric Blood & Cancer* 68: S101-S102.

[Full Text](#)

OUWB Medical Student Author

Department of Pediatrics

Gaddy A and **Topf J** (2021). "Facebook groups can provide support for patients with rare diseases and reveal truths about the secret lives of patients." *Kidney International Reports* 6(5): 1205-1207.

[Full Text](#)

Department of Internal Medicine

Gemechu J, Zenebe A, **Wasserman J**, **Barremkala M** and **Hajj Hussein I** (2021). "The perception, emotional

experiences and cultural attachments of Ethiopian medical students during human cadaver dissection." [The FASEB Journal](#) 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Human cadaver dissection has been used as an instructional methodology in Anatomy for centuries and remains time-honored and accepted method. However, initial exposure to cadaver dissection has been found to evoke emotional reactions in medical students, and has raised concern. Previous studies report that some students experience stress and even psychological trauma, with a concern about exposure to disease during dissection. The emotional experiences and coping strategies may also be affected by cultural differences between medical students. The main aim of this study is to assess and compare medical students' perception, emotional experiences and the impact of cultural attachment on the dissection of the human cadaver. A longitudinal survey was conducted focusing on cultural identity, prior experience with cadaver dissection, emotional experiences, and coping strategies in a medical school of Addis Ababa University, Ethiopia in 2018. Data were collected at three time points a week before initial exposure to dissection (time 1), a week after the first encounter (time 2), and at the end of cadaver dissection (time 3). Findings indicate that self-rated perception of evoked emotional experiences enjoyable, stimulating, exhilarating, and interesting increased across the three time points, while scary, depressing, unbearable, and anxiety-provoking emotions significantly decreased. These results suggest that while cultural attachment appears to affect the rate of change over time in several different emotional responses, religious affiliation (Christian, Muslim) or an ethnic background (Amhara, Oromo or others) per se, do not manifest any significant differences across these emotional experiences, nor the rate at which they change for individuals in the sample.

Gjeorgjievski M and **Ghaith G** (2021). "ERCP after percutaneous cholecystostomy: Methylene blue–assisted biliary cannulation for diminutive papilla." [Gastrointestinal Endoscopy](#) 93(4): 984-985.

[Full Text](#)

Department of Internal Medicine

Gladstone GJ and Kim JM (2021). "Endoscopic conjunctivodacryocystorhinostomy," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). [Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery](#). Cham: Springer International Publishing. pp: 577-582.

[Full Text](#)

Department of Ophthalmology

The evaluation of a patient with excess tears involves investigating causes of excess lacrimation as well as lacrimal outflow obstruction. There are many causes of excess lacrimation, including dry eye syndrome, entropion, trichiasis, and other causes of ocular irritation. Idiopathic hypersecretion, although a diagnosis of exclusion, is an important consideration.

Golan S, Zoumalan CI, **Nesi FA** and Lelli GJ (2021). "Instrumentation in ophthalmic plastic surgery," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). [Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery](#). Cham: Springer International Publishing. pp: 105-118.

[Full Text](#)

Department of Ophthalmology

The use of proper instrumentation in ophthalmic plastic surgery is an essential element to successful surgical outcomes. However, the surgeon must be aware that without proper adherence to the basic surgical principles, surgical outcomes will be suboptimal. The surgeon must have an intimate knowledge of the eyelid, orbital, and facial anatomy. Furthermore, an understanding of the anatomy and the natural tissue planes allows the surgeon to surgically dissect the tissue planes as atraumatically as possible with the aid of appropriate and adequate instrumentation.

Goldman H, **Attardi S**, **Barremkala M**, Bentley D, Brown K, Dennis J, Farkas G, Harrell K, Klein B, Ramnanan C and Harmon D (2021). "Shifts in digital resources usage for gross anatomy education during COVID-19." [The FASEB Journal](#) 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction/Objective: Covid-19 has led to sudden changes to gross anatomy education when traditional dissection-based laboratories had to shift towards virtual modalities due to physical distancing and remote learning requirements. The purpose of this study was to determine how the use of digital teaching resources in gross anatomy education changed from before to during Covid-19. Material/Methods: Data were obtained from an IRB-approved survey distributed to professional associations and listservs targeting anatomy educators from June to November 2020. Respondents were asked to select the digital resources they used before and during Covid-19. Data were analyzed during the early and latter parts of the pandemic as May-August (T1) and August-December (T2), as well as overall (T3). T2 data were classified into five categories: 2D illustrations, dissection media, interactive software, in-house, and open access. Total usage for each timepoint, the proportions of digital resources, and the 5 categories before and during Covid-19 were compared using McNemar's test with $\alpha < 5\%$. Data are presented as percent increase (+value) or decrease (-value). Results: 60 and 208 responses were received for T1 and T2, respectively. The total number of digital resources used for anatomy education increased from before to during COVID-19 as seen in the data analysis from T1 (+47%), T2 (+41%), and T3 (+43%) ($P \leq 0.003$). In T1, the use of BlueLink (+122%) and Complete Anatomy (+140%) software increased ($P < 0.04$), while Acland's Anatomy (+68%), Anatomy.TV (+1300%), Complete Anatomy (+89%), and BlueLink (+148%) increased in T2 ($P \leq 0.03$). During T3, the usage of Acland's Anatomy (+60%), Anatomy.TV (+750%), Complete Anatomy (+102%), BlueLink (+143%), and VisibleBody (+100%) increased ($P \leq 0.03$). All other digital resources did not change ($P > 0.05$). When data for T2 were categorized, dissection media (+44%), interactive software (+87%), and open-access (+100%) content increased ($P \leq 0.008$), while 2D illustrations (-3%) and in-house content (-23%) decreased ($P > 0.05$). Conclusions: This study demonstrates sustained increases in digital resource usage for gross anatomy education during Covid-19. This was particularly pronounced for interactive software, open access resources and dissection media that allowed educators to mimic features of a dissection lab. Significance: These rapid shifts in both commercial and free digital resources are likely to drive innovation in anatomy education for years to come. It remains unknown if the current findings are transient Covid-19-related changes or if they will persist long-term.

Gudipati S, **Hanson I** and **Shoukfeh M** (2021). "Profound patent foramen ovale shunting unmasked by an episode of atrial fibrillation." *Journal of the American College of Cardiology* 77(18): 2395-2395.

[Full Text](#)

Department of Internal Medicine

Guzzetti E, Oh JK, Shen M, Dweck MR, Poh KK, **Abbas AE**, Mando R, Pressman GS, Brito D, Tastet L, Pawade T, Falconi ML, de Arenaza DP, Kong W, Tay E, Pibarot P, Song JK and Clavel MA (2021). "Validation of aortic valve calcium quantification thresholds measured by computed tomography in Asian patients with calcific aortic stenosis." *European Heart Journal Cardiovascular Imaging*. ePub Ahead of Print.

[Request Form](#)

Department of Internal Medicine

Aims: Sex-specific thresholds of aortic valve calcification (AVC) have been proposed and validated in Caucasians. Thus, we aimed to validate their accuracy in Asians. Methods and Results: Patients with calcific aortic stenosis (AS) from seven international centres were included. Exclusion criteria were \geq moderate aortic/mitral regurgitation and bicuspid valve. Optimal AVC and AVC-density sex-specific thresholds for severe AS were obtained in concordant grading and normal flow patients (CG/NF). We included 1263 patients [728 (57%) Asians, 573 (45%) women, 837 (66%) with CG/NF]. Mean gradient was 48 (26-64) mmHg and peak aortic velocity 4.5 (3.4-5.1) m/s. Optimal AVC thresholds were: 2145 Agatston Units (AU) in men and 1301 AU in women for Asians; and 1885 AU in men and 1129 AU in women for Caucasians. Overall, accuracy (% correctly classified) was high and comparable either using optimal or guidelines' thresholds (2000 AU in men, 1200 AU in women). However, accuracy was lower in Asian women vs. Caucasian women (76-78% vs. 94-95%; $P < 0.001$). Accuracy of AVC-density (476 AU/cm² in men and 292 AU/cm² in women) was comparable to absolute AVC in Caucasians (91% vs. 91%, respectively, $P = 0.74$), but higher than absolute AVC in Asians (87% vs. 81%, $P < 0.001$). There was no interaction between AVC/AVC-density and ethnicity (all $P > 0.41$) with regards to AS haemodynamic severity. Conclusion: AVC thresholds defining

severe AS are comparable in Asian and Caucasian populations, and similar to those proposed in the guidelines. However, accuracy of AVC to identify severe AS in Asians (especially women) is sub-optimal. Therefore, the use of AVC-density is preferable in Asians.

Halalau A, Halalau M, Carpenter C, Abbas AE and Sims M (2021). "Vestibular neuritis caused by severe acute respiratory syndrome coronavirus 2 infection diagnosed by serology: Case report." *SAGE Open Medical Case Reports* 9: 2050313X211013261.

[Full Text](#)

Department of Internal Medicine

Vestibular neuritis is a disorder selectively affecting the vestibular portion of the eighth cranial nerve generally considered to be inflammatory in nature. There have been no reports of severe acute respiratory syndrome coronavirus 2 causing vestibular neuritis. We present the case of a 42-year-old Caucasian male physician, providing care to COVID-19 patients, with no significant past medical history, who developed acute vestibular neuritis, 2 weeks following a mild respiratory illness, later diagnosed as COVID-19. Physicians should keep severe acute respiratory syndrome coronavirus 2 high on the list as a possible etiology when suspecting vestibular neuritis, given the extent and implications of the current pandemic and the high contagiousness potential.

Halalau A, Holmes B, Rogers-Snyr A, Donisan T, Nielsen E, Cerqueira TL and Guyatt G (2021). "Evidence-based medicine curricula and barriers for physicians in training: A scoping review." *International Journal of Medical Education* 12: 101-124.

[Full Text](#)

Department of Internal Medicine

Objectives: To describe the published literature on EBM curricula for physicians in training and barriers during curriculum implementation. Methods: We performed a systematic search and review of the medical literature on PubMed, Embase, ERIC, Scopus and Web of Science from the earliest available date until September 4, 2019. Results: We screened 9,042 references and included 29 full-text studies and 14 meeting abstracts. Eighteen studies had moderate validity, and 6 had high validity. The EBM curricular structure proved highly variable in between studies. The majority of the EBM curricula was longitudinal with different lengths. Only five studies reported using Kern's six-step approach for curriculum development. Twenty-one articles reported on EBM skills and knowledge, and only 5/29 full-text articles used a validated assessment tool. Time was the main barrier to EBM curriculum implementation. All the included studies and abstracts, independent of the EBM curriculum structure or evaluation method used, found an improvement in the residents' attitudes and/or EBM skills and knowledge. Conclusions: The current body of literature available to guide educators in EBM curriculum development is enough to constitute a strong scaffold for developing any EBM curriculum. Given the amount of time and resources needed to develop and implement an EBM curriculum, it is very important to follow the curriculum development steps and use validated assessment tools.

Hanna A, **Anese AM** and **Cappell MS** (2021). "Biliary-colonic fistula associated with high-grade biliary stenosis from errant surgical clip during previous biliary surgery: Diagnosis and treatment by ERCP." *ACG Case Reports Journal* 8(6): e00617.

[Full Text](#)

OUWB Medical Student Author

Department of Internal Medicine

Hanna A, Gill I, Imam Z, **Halalau A** and **Jamil LH** (2021). "Low yield of head CT in cirrhotic patients presenting with hepatic encephalopathy." *BMJ Open Gastroenterology* 8(1): e000609.

[Full Text](#)

Department of Internal Medicine

Goals and Background: The utility of routine head CT (HCT) in hepatic encephalopathy (HE) evaluation is unclear. We investigated HCT yield in detecting acute intracranial abnormalities in cirrhotic patients presenting with HE. Study Retrospective: Review of cirrhotic patient encounters with HE between 2016 and 2018 at Beaumont Health, in Michigan was performed. A low-risk (LR) indication for HCT was defined as

altered mental status (AMS), which included dizziness and generalised weakness. A high-risk (HR) indication was defined as trauma/fall, syncope, focal neurological deficits (FNDs) or headache. Descriptive statistics and univariate/multivariate analyses by logistic regression were performed using SPSS to identify HCT abnormality correlates. Results: Five hundred twenty unique encounters were reviewed. Mean age was 63.4 (12.1) years, 162 (37.5%) had alcoholic cirrhosis and median Model for End-Stage Liver Disease (MELD)-score was 17 (13-23). LR indication was reported in 408 (78.5%) patients and FNDs reported in 24 (4.6%) patients. Only 13 (2.5%) patients were found to have an acute intracranial pathology (seven haemorrhagic stroke, two ischaemic stroke, four subdural haematoma). Aspirin use prior to presentation (aOR 4.6, 95% CI 1.1 to 19.2), and HR indication (aOR 7.3, 95% CI 2.3 to 23.8) were independent correlates of acute intracranial pathology on HCT. Age, sex, MELD-score, haemoglobin, platelet count, race and cirrhosis aetiology did not correlate with HCT abnormalities. Number needed to screen to identify one acute pathology was 14 in HR indications versus 82 for LR indications. Conclusion: Routine HCTs in cirrhotic patients presenting with HE with AMS in the absence of history of trauma, headache, syncope, FNDs or aspirin use is of low diagnostic yield.

Harmon D, **Attardi S**, **Barremkala M**, Bentley D, Brown K, Dennis J, Goldman H, Harrell K, Klein B, Ramnanan C, Richtsmeier J and Farkas G (2021). "Changes in anatomy lecture and laboratory instruction during COVID-19." The FASEB Journal 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction/Objective: Covid-19 created challenges to anatomy education, particularly gross anatomy given the traditional in-person format of lectures and lab. The objective of this study was to assess the changes in lecture methods and lab materials used in anatomy courses that ran between May-August (T1) and August-December (T2) 2020 responding to Covid-19 restrictions. Materials/Methods: A survey was distributed to anatomy educators through professional associations from June-November 2020. Respondents indicated (1) their institution; (2) programs taught (professional health (PH), medicine (MED), or undergraduate (UG)); (3) course type (integrated or stand-alone); (4) percentage of lab time before and during Covid-19 that utilized cadaveric, plastic, and/or other teaching materials; and (5) lecture format. Institutions were classified as public or private via institution websites. Mann-Whitney U and Wilcoxon signed-rank tests with Bonferroni correction compared responses before and during Covid-19 across programs, course type, and institution. Data are presented as percent increase (+value) or decrease (-value). Alpha<5%. Results: T1 and T2 received 67 and 191 responses, respectively. During T1 and T2, cadaver use decreased in PH (-58% & -28%), MED (-55% & -34%), and UG (-57% & -55%) programs (P≤0.045); stand-alone (-58% & -33%, P<0.001) and integrated (-48% & -28%, P≤0.004) courses; and private (-49% & -25%, P<0.001) and public (-65% & -34%, P<0.001) institutions. During T1 and T2, plastic use did not change for programs, institutions, or courses (P>0.05), except UG decreased plastic usage during T2 (-20%; P=0.033). During T1 and T2, use of other teaching materials increased in PH (+1180% & +278%), MED (+385% & +1000%), and UG (+285% & +246%) (P≤0.015); stand-alone (+920% & +540%, P<0.001) and integrated (+330% & +500%, P≤0.002) courses; and private (+1233% & +667%, P<0.001) and public (+415% & +400%, P<0.001) institutions. For T1 and T2, in-person lecture decreased (-89% & -72%, P≤0.001), while remote lecture increased (+509% & +533%, P≤0.001) during Covid-19. Conclusion: Reduction in cadaver use and in-person lecture were most pronounced in T1, but remained diminished through both time points, suggesting a shift from the initial pandemic response to teaching to more complex hybrid programs as regulations permitted. Significance/Implication: This study provides evidence to better understand how anatomy educators adapted their gross anatomy teaching due to Covid-19 across programs. In addition, this study provides first of its kind insight into how anatomy was taught across programs prior to Covid-19. Future studies need to determine whether the findings characterized here were pandemic-based or if they represent long-term changes for anatomy education.

Hiller SC, Qi J, Leavitt D, Frontera JR, **Jafri SM**, Hollingsworth JM, Dauw CA and Ghani KR (2021). "Ureteroscopy in patients taking anticoagulant or antiplatelet therapy: Practice patterns and outcomes in a surgical collaborative." Journal of Urology 205(3): 833-840.

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Department of Urology

Purpose: AUA guidelines recommend ureteroscopy as first line therapy for patients on anticoagulant or

antiplatelet therapy and advocate using a ureteral access sheath. We examined practice patterns and unplanned health care use for these patients in Michigan. Materials and Methods: Using the Michigan Urological Surgery Improvement Collaborative (MUSIC) clinical registry we identified ureteroscopy cases from 2016 to 2019. We assessed outcomes and adherence to guidelines based on therapy at time of ureteroscopy: 1) anticoagulant: continuous warfarin or novel oral agent therapy; 2) antiplatelet: continuous clopidogrel or aspirin therapy; 3) control: not on anticoagulant/antiplatelet therapy. We fit multivariate models to assess anticoagulant or antiplatelet therapy association with emergency department visits, hospitalization and ureteral access sheath use. Results: In total, 9,982 ureteroscopies were performed across 31 practices with 3.1% and 7.8% on anticoagulant and antiplatelet therapy, respectively. There were practice (0% to 21%) and surgeon (0% to 35%) variations in performing ureteroscopy on patients on anticoagulant/antiplatelet therapy regardless of volume. After adjusting for risk factors, anticoagulant or antiplatelet therapy was not associated with emergency department visits. Hospitalization rates in anticoagulant, antiplatelet and control groups were 4.3%, 5.5% and 3.2%, respectively, and significantly increased with antiplatelet therapy (OR 1.48, 95% CI 1.02-2.14). Practice-level ureteral access sheath use varied (23% to 100%) and was not associated with anticoagulant/antiplatelet therapy. Limitations include inability to risk stratify between type/dosage of anticoagulant/antiplatelet therapy. Conclusions: We found practice-level and surgeon-level variation in performing ureteroscopy while on anticoagulant/antiplatelet therapy. Ureteroscopy on anticoagulant is safe. However, antiplatelet therapy increases the risk of hospitalization. Despite guideline recommendations, ureteral access sheath use is not associated with anticoagulant/antiplatelet therapy.

Huynh KA, Yoon AP, Seyferth AV and Chung KC (2021). "Cost-benefit analysis of ultrasonography in the hand clinic." *Plastic and Reconstructive Surgery* 147(4): 894-902.

[Full Text](#)

OUWB Medical Student Author

Background: Despite previous studies demonstrating the benefit of office-based ultrasonography for musculoskeletal evaluation, many hand surgery clinics have yet to adopt this practice. The authors conducted a cost-benefit analysis of establishing an ultrasound machine in a hand clinic. Methods: The authors used the Medicare Physician Fee Schedule, Physician/Supplier Procedure Summary, and Physician Compare National Downloadable File databases to estimate provider reimbursement and annual frequency of office-based upper extremity-related ultrasound procedures. Ultrasound machine cost, maintenance fees, and consumable supply prices were gleaned from the literature. The primary outcomes were net cost-benefit difference and benefit-cost ratio at 1 year, 5 years, and 10 years after implementation. Sensitivity analyses were performed by varying factors that influence the net cost-benefit difference. Results: The estimated total initial expense to establish ultrasonography in the clinic was \$53,985. The overall cost-benefit difference was -\$49,530 per practice at the end of the first year (benefit-cost ratio, 0.3), -\$1049 after 5 years (benefit-cost ratio, 1.0), and \$52,022 after 10 years (benefit-cost ratio, 1.4). Benefits primarily accrued because of physician reimbursements. One-way sensitivity analysis revealed machine price, annual procedure volume, and reimbursement rate as the most influential parameters in determining the benefit-cost ratio.

Ultrasonography was cost beneficial when the machine price was less than \$46,000 or if the billing frequency exceeded six times per week. A societal perspective analysis demonstrated a large net benefit of \$218,162 after 5 years. Conclusions: Implementation of office-based ultrasound imaging can result in a positive financial return on investment. Ultrasound machine cost and procedural volume were the most critical factors influencing benefit-cost ratio.

Imam Z, Gill I, Antonios B, Hasan L, **Aneese A**, Kakked G and **Halalau A** (2021). "Hyperlipasemia does not confer worse clinical outcomes in a retrospective cohort of novel coronavirus patients." *Minerva Gastroenterology*. ePub Ahead of Print.

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OUWB Medical Student Author

Department of Internal Medicine

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. ePub Ahead of Print.

[Full Text](#)

Department of Radiation Oncology

Department of Internal Medicine

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 [\pm 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.

Jackman TD, Dersch AM, Taylor TAH and Cortes C (2021). "An integrated mycobacterium tuberculosis infection session: Utilizing an online collaborative platform in a synchronous classroom setting." MedEdPORTAL 17: 11143.

[Full Text](#)

OUWB Medical Student Author

Department of Foundational Medical Studies (OU)

Introduction: Tuberculosis (TB) remains a major public health concern worldwide. It is important to provide high-quality instructional sessions to students about the pathogenesis and risk factors of TB, as medical students are likely to encounter TB infections in clinical practice. Methods: We describe an interactive instructional session integrating immunology and microbiology concepts of Mycobacterium tuberculosis infection that was presented to first-year medical students in their respiratory organ systems course. The session included a pretest primer followed by a brief review of mucosal immunity with an emphasis on the respiratory system. Using an online collaborative application, learners created a study guide on a shared spreadsheet while faculty provided real-time feedback. Following the cloud-based portion, faculty presented interactive lectures using student-created content. The session concluded with a formative posttest. We evaluated the session with responses to an optional student survey. Results: One hundred fourteen students (37% male and 63% female) completed the survey across 4 years from 2016 to 2019. The session received high student satisfaction ratings across five questions, with 83% of students indicating they were slightly satisfied to strongly satisfied. The students had an absolute increase in their scores of 31% on the posttest as compared to the pretest mean ($p < .001$). Discussion: We developed an interactive TB instructional session that integrates disciplines, contains real-time instructor feedback, and promotes teamwork in a large class setting. The session allows medical students to learn content and create their own study guide using online collaboration technology.

Jae SY, Bunsawat K, Kurl S, Kunutsor SK, Fernhall B, **Franklin BA** and Laukkanen JA (2021). "Cardiorespiratory fitness attenuates the increased risk of sudden cardiac death associated with low socioeconomic status." American Journal of Cardiology 145: 164-165.

[Full Text](#)

Department of Internal Medicine

Jae SY, Heffernan KS, Kurl S, Kunutsor SK, Kim CH, Johnson BD, **Franklin BA** and Laukkanen JA (2021).

"Cardiorespiratory fitness, inflammation, and the incident risk of pneumonia." Journal of Cardiopulmonary Rehabilitation and Prevention 41(3): 199-201.

[Full Text](#)

Department of Internal Medicine

Introduction: Both inflammation and cardiorespiratory fitness (CRF) are associated with the risk of respiratory infections. To clarify the hypothesis that CRF attenuates the incident risk of pneumonia due to inflammation, we conducted a prospective study examining the independent and joint associations of inflammation and CRF on the risk of pneumonia in a population sample of 2041 middle-aged men. Methods: Cardiorespiratory fitness was directly measured as peak oxygen uptake ($\text{Vo}_{2\text{peak}}$) during progressive exercise testing to volitional fatigue, and categorized into tertiles. Inflammation was defined by high-sensitivity C-reactive protein (hsCRP). Pneumonia cases were identified by internal medicine physicians using the International Classification of Diseases codes in clinical practice. Results: During a median follow-up of 27 yr, 432 pneumonia cases were recorded. High hsCRP and CRF were associated with a higher risk (HR = 1.38; 95% CI, 1.02-1.88) and a lower risk of pneumonia (HR = 0.55; CI, 0.39-0.76) after adjusting for potential confounders, respectively. Compared with normal hsCRP-Fit, moderate to high hsCRP-Unfit had an increased risk of pneumonia (HR = 1.63; CI, 1.21-2.20), but moderate to high hsCRP-Fit was not associated with an increased risk of pneumonia (HR = 1.25; CI, 0.93-1.68). Conclusions: High CRF attenuates the increased risk of pneumonia due to inflammation. These findings have potential implications for the prevention of respiratory infection characterized by systemic inflammation, such as coronavirus disease-2019 (COVID-19).

James E, Evans M and Mi M (2021). "Leadership training and undergraduate medical education: A scoping review." *Medical Science Educator*. ePub Ahead of Print.

[Full Text](#)

OUWB Medical Student Author

Medical Library

Department of Foundational Medical Studies (OU)

The purpose of this scoping review is to fill the gap in understanding the current status of intervention-based studies regarding leadership training in undergraduate medical education. As of late, there is an increased focus on the role of physicians as leaders in their fields, and communities. In order to evaluate these studies, both the PubMed and ERIC databases were searched, and an ultimate total of 35 articles methodologies were evaluated for their general methodology, curricular content, specific teaching methods, and evaluation methodologies. There were a number of trends identified, as well as remaining gaps. © 2021, International Association of Medical Science Educators.

James E and Salahou A (2021). "Medical students and issues of social change: Gender inclusion in student organizations." *Medical Science Educator* 31(2): 315-316.

[Full Text](#)

OUWB Medical Student Author

In order to promote the mentality of inclusion and highlight the importance of inclusion more broadly in medicine, we provided summaries of primary research data to first- and second-year medical students in response to the lack of gender variation amongst the leadership boards of our student organizations.

Jin ML, **Brown MM**, Patwa D, Nirmalan A and Edwards PA (2021). "Telemedicine, telementoring, and telesurgery for surgical practices." *Current Problems in Surgery*. ePub Ahead of Print.

[Full Text](#)

OUWB Medical Student Author

Kadri AN, Hanzel G, Mando R, Ali A, **Shannon F**, Vivacqua A, **Almany S** and **Abbas A** (2021). "The impact of flow-improvement after transcatheter aortic valve replacement on mortality in patients with low flow and severe aortic stenosis." *Journal of the American College of Cardiology* 77(18): 905-905.

[Full Text](#)

Department of Internal Medicine

Department of Surgery

Kadry H, Noorani B, Bickel U, Abbruscato TJ and **Cucullo L** (2021). "Comparative assessment of in vitro BBB tight junction integrity following exposure to cigarette smoke and e-cigarette vapor: A quantitative evaluation of the protective effects of metformin using small-molecular-weight paracellular markers." *Fluids Barriers CNS* 18(1): 28.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Background: The blood-brain barrier (BBB) plays a critical role in protecting the central nervous system (CNS) from blood-borne agents and potentially harmful xenobiotics. Our group's previous data has shown that tobacco smoke (TS) and electronic cigarettes (EC) affect the BBB integrity, increase stroke incidence, and are considered a risk factor for multiple CNS disorders. Metformin was also found to abrogate the adverse effects of TS and EC. Methods: We used sucrose and mannitol as paracellular markers to quantitatively assess TS and EC's impact on the BBB in-vitro. Specifically, we used a quantitative platform to determine the harmful effects of smoking on the BBB and study the protective effect of metformin. Using a transwell system and iPSCs-derived BMECs, we assessed TS and EC's effect on sucrose and mannitol permeability with and without metformin pre-treatment at different time points. Concurrently, using immunofluorescence (IF) and Western blot (WB) techniques, we evaluated the expression and distribution of tight junction proteins, including ZO-1, occludin, and claudin-5. Results: Our data showed that TS and EC negatively affect sucrose and mannitol permeability starting after 6 h and up to 24 h. The loss of barrier integrity was associated with a reduction of TEER values. While the overall expression level of ZO-1 and occludin was not significantly downregulated, the distribution of ZO-1 was altered, and discontinuation patterns were evident through IF imaging. In contrast to occludin, claudin-5 expression was significantly decreased by TS and EC, as demonstrated by WB and IF data. Conclusion: In agreement with previous studies, our data showed the metformin could counteract the negative impact of TS and EC on BBB integrity, thus suggesting the possibility of repurposing this drug to afford cerebrovascular protection.

Kahana A (2021). "Orbital inflammatory disorders: New knowledge, future challenges." *Current Opinion in Ophthalmology* 32(3): 255-261.

[Full Text](#)

Department of Ophthalmology

Purpose of Review: This review aims to bring together recent advances in basic, translational and clinical research on the pathogenesis and treatment of orbital inflammatory conditions. Recent Findings: Basic science studies provide mechanistic insights into why the orbit is targeted for inflammation by autoimmune inflammatory disorders. Using Graves' disease as a test case reveals that endocrine pathways, such as the TSH and IGF1 receptor pathways play important roles in stimulating orbital inflammation. Furthermore, orbital tissues contain high concentrations of retinoids - byproducts of the visual pathway that diffuse across the sclera and can activate de novo transcription of inflammatory cytokines. Such cytokine expression places the orbit in a hyper-inflammatory 'resting' state, prone to respond to any additional systemic or local pro-inflammatory signals. The HIF2A--LOX pathway appears important for orbital tissue fibrosis. Lastly, bench-to-bedside studies of the IGF1R pathway have led to an FDA-approved drug, teprotumumab that represents a novel treatment approach for Graves' orbitopathy. Unfortunately, high drug costs and misplaced insurance company 'step-therapy' policies may block patients from receiving therapy that can protect vision and improve quality of life. Summary: Improved understanding of orbital inflammatory conditions has led to a new drug and promises additional breakthroughs. Translational research is successful, but requires time, resources, and patience.

Kaneko T, Makkar RR, Krishnaswami A, Hermiller J, Greenbaum A, Babaliaros V, Shah PB, Bailey SH, Bapat V, Kapadia S and **Abbas AE** (2021). "Valve-in-surgical-valve with SAPIEN 3 for transcatheter aortic valve replacement based on society of thoracic surgeons predicted risk of mortality." *Circulation-Cardiovascular Interventions* 14(5): 503-512.

[Request Form](#)

Department of Internal Medicine

Background: The use of valve-in-valve-transcatheter aortic valve replacement (VIV-TAVR) in degenerated aortic bioprosthesis has been increasing, but the Food and Drug Administration approval is limited to high-risk patients. We analyzed the real-world experience of SAPIEN 3 VIV-TAVR, especially in lower-risk patients, based on the Society of Thoracic Surgeons (STS) score. Methods: All transfemoral VIV-TAVR with the SAPIEN 3 and Ultra valves between June 2015 and January 2020 were identified using the STS/American College of Cardiology Transcatheter Valve Therapies Registry. Patients were grouped based on STS score (low score: <4%, intermediate score: 4%<= and <= 8%, high score: >8%). Propensity-matched (1:3) analysis was conducted to compare to patients undergoing native TAVR. Results: Of 145 917 SAPIEN 3 TAVR patients, 4460 (3%) underwent transfemoral VIV-TAVR with available baseline STS data in 4276 patients. Average age

was 73.9 +/- 11.2, 66.4% were male, and the mean STS score was 6.9 +/- 6.0%. Overall 30-day mortality was 2.4% (observed to expected ratio, 0.33), and 1-year mortality was 10.8%. 30-day mortality and observed to expected ratio were 0.9% and 0.32 in low-score, 2.2% and 0.38 in the intermediate-score, and 4.3% and 0.31 in the high-score group. Based on propensity-matched analysis, 30-day mortality was similar and 1-year mortality was lower in VIV compared to native TAVR among all risk groups. When the groups were analyzed based on the Heart Team risk stratification using high-risk and non-high risk, the findings remained consistent. Conclusions: In this real-world study, VIV-TAVR had excellent 30-day and 1-year outcomes, especially in lower-risk patients. These findings may suggest the feasibility and expansion of VIV-TAVR in lower-risk patients. However, long-term follow-up continues to be crucial.

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 Computed Assisted Tomography. ePub Ahead of Print.

[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.

Khalili H, **Abbas A**, Pilgrim T, Okuno T, Elmariah S, Al-Azizi K, Hanzel G, Waggoner T, Mando R, Bavry A, Pibarot P, Mack M and **Shannon F** (2021). "Comparisons of echocardiographic and invasive aortic gradient assessment in aortic stenosis, degenerated surgical bioprosthesis, native and valve-in-valve TAVR: A multicenter study." Journal of the American College of Cardiology 77(18): 917-917.

[Full Text](#)

Department of Internal Medicine

Department of Surgery

Khanal S, **Jewulski J** and Dahal K (2021). "Platypnea orthodeoxia syndrome with patient foramen ovale and positional right to left shunt despite normal right sided pressures." Journal of the American College of Cardiology 77(18): 2477-2477.

[Full Text](#)

OUIWB Medical Student Author

Khanna AK, Jungquist CR, Buhre W, **Soto R**, Di Piazza F and Saager L (2021). "Modeling the cost savings of continuous pulse oximetry and capnography monitoring of United States general care floor patients receiving opioids based on the PRODIGY Trial." Advances in Therapy. ePub Ahead of Print.

[Full Text](#)

Department of Anesthesiology

Introduction: Despite the high incidence of respiratory depression on the general care floor and evidence that continuous monitoring improves patient outcomes, the cost-benefit of continuous pulse oximetry and capnography monitoring of general care floor patients remains unknown. This study modeled the cost and length of stay savings, investment break-even point, and likelihood of cost savings for continuous pulse oximetry and capnography monitoring of general care floor patients at risk for respiratory depression. Methods: A decision tree model was created to compare intermittent pulse oximetry versus continuous pulse oximetry and capnography monitoring. The model utilized costs and outcomes from the PRediction of Opioid-induced respiratory Depression In patients monitored by capnoGraphY (PRODIGY) trial, and was

applied to a modeled cohort of 2447 patients receiving opioids per median-sized United States general care floor annually. Results: Continuous pulse oximetry and capnography monitoring of high-risk patients is projected to reduce annual hospital cost by \$535,531 and cumulative patient length of stay by 103 days. A 1.5% reduction in respiratory depression would achieve a break-even investment point and justify the investment cost. The probability of cost saving is $\geq 80\%$ if respiratory depression is decreased by $\geq 17\%$. Expansion of continuous monitoring to high- and intermediate-risk patients, or to all patients, is projected to reach a break-even point when respiratory depression is reduced by 2.5% and 3.5%, respectively, with a $\geq 80\%$ probability of cost savings when respiratory depression decreases by $\geq 27\%$ and $\geq 31\%$, respectively. Conclusion: Compared to intermittent pulse oximetry, continuous pulse oximetry and capnography monitoring of general care floor patients receiving opioids has a high chance of being cost-effective.

Kim M, Lee SP, Kwak S, Yang S, Kim YJ, 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, Raff GL, Shin S, Lee BK, Chun EJ, Sung JM, Lee SE, Berman DS, Lin FY, Virmani R, Samady H, Stone PH, Narula J, Bax JJ, Shaw LJ, Min JK and Chang HJ (2021). "Impact of age on coronary artery plaque progression and clinical outcome: A PARADIGM substudy." *Journal of Cardiovascular Computed Tomography* 15(3): 232-239.

[Full Text](#)

Department of Internal Medicine

Background: The association of age with coronary plaque dynamics is not well characterized by coronary computed tomography angiography (CCTA). Methods: From a multinational registry of patients who underwent serial CCTA, 1153 subjects (61 ± 5 years old, 61.1% male) were analyzed. Annualized volume changes of total, fibrous, fibrofatty, necrotic core, and dense calcification plaque components of the whole heart were compared by age quartile groups. Clinical events, a composite of all-cause death, acute coronary syndrome, and any revascularization after 30 days of the initial CCTA, were also analyzed. Random forest analysis was used to define the relative importance of age on plaque progression. Results: With a 3.3-years' median interval between the two CCTA, the median annual volume changes of total plaque in each age quartile group was 7.8, 10.5, 10.8, and 12.1 mm³/year and for dense calcification, 2.5, 4.6, 5.4, and 7.1 mm³/year, both of which demonstrated a tendency to increase by age (p -for-trend = 0.001 and $\< 0.001$, respectively). However, this tendency was not observed in any other plaque components. The annual volume changes of total plaque and dense calcification were also significantly different in the propensity score-matched lowest age quartile group versus the other age groups as was the composite clinical event (log-rank $p = 0.003$). In random forest analysis, age had comparable importance in the total plaque volume progression as other traditional factors. Conclusions: The rate of whole-heart plaque progression and dense calcification increases depending on age. Age is a significant factor in plaque growth, the importance of which is comparable to other traditional risk factors.

Kim SJ, Sonmez K, Swan R, Campbell JP, Ostmo S, Chan RVP, Nagiel A, **Drenser KA**, Berrocal AM, Horowitz JD, Li X, Chen YDI, Taylor KD, Simmons C, Rotter JI, Chiang MF, Chiang MF, Ostmo S, Kim SJ, Sonmez K, Campbell JP, Chan RVP, Jonas K, Horowitz J, Coki O, Eccles CA, Sarna L, Orlin A, Berrocal A, Negron C, Denser K, Cumming K, Osentoski T, Check T, Zajeckowski M, Lee T, Kruger E, McGovern K, Simmons C, Murthy R, Galvis S, Rotter J, Chen I, Li X, Taylor K, Roll K, Kalpathy-Cramer J, Erdogmus D, Ioannidis S, Martinez-Castellanos MA, Salinas-Longoria S, Romero R, Arriola A, Olguin-Manriquez F, Meraz-Gutierrez M, Dulanto-Reinoso CM and Montero-Mendoza C (2021). "Identification of candidate genes and pathways in retinopathy of prematurity by whole exome sequencing of preterm infants enriched in phenotypic extremes." *Scientific Reports* 11(1): 4966.

[Full Text](#)

Department of Ophthalmology

Retinopathy of prematurity (ROP) is a vasoproliferative retinal disease affecting premature infants. In addition to prematurity itself and oxygen treatment, genetic factors have been suggested to predispose to ROP. We aimed to identify potentially pathogenic genes and biological pathways associated with ROP by analyzing variants from whole exome sequencing (WES) data of premature infants. As part of a multicenter ROP cohort study, 100 non-Hispanic Caucasian preterm infants enriched in phenotypic extremes were subjected to WES. Gene-based testing was done on coding nonsynonymous variants. Genes showing enrichment of qualifying variants in severe ROP compared to mild or no ROP from gene-based tests with adjustment for gestational age and birth weight were selected for gene set enrichment analysis (GSEA).

Mean BW of included infants with pre-plus, type-1 or type 2 ROP including aggressive posterior ROP (n = 58) and mild or no ROP (n = 42) were 744 g and 995 g, respectively. No single genes reached genome-wide significance that could account for a severe phenotype. GSEA identified two significantly associated pathways (smooth endoplasmic reticulum and vitamin C metabolism) after correction for multiple tests. WES of premature infants revealed potential pathways that may be important in the pathogenesis of ROP and in further genetic studies.

Klein M, Bacher J, Barth S, Atzadeh F, Siebenhaller K, Ferreira I, Beisken S, Posch AE, Carroll KC, Wunderink RG, Qi C, Wu F, Hardy DJ, Patel R and **Sims MD** (2021). "Multicenter evaluation of the unyvero platform for testing bronchoalveolar lavage fluid." *Journal of Clinical Microbiology* 59(3): e02497-20.

[Full Text](#)

Department of Internal Medicine

Bronchoalveolar lavage (BAL) culture is a standard, though time-consuming, approach for identifying microorganisms in patients with severe lower respiratory tract (LRT) infections. The sensitivity of BAL culture is relatively low, and prior antimicrobial therapy decreases the sensitivity further, leading to overuse of empirical antibiotics. The Unyvero LRT BAL Application (Curetis GmbH, Germany) is a multiplex molecular panel that detects 19 bacteria, 10 antibiotic resistance markers, and a fungus, *Pneumocystis jirovecii*, in BAL fluid in 4.5h. Its performance was evaluated using 1,016 prospectively collected and 392 archived specimens from 11 clinical trial sites in the United States. Overall positive and negative percent agreements with culture results for identification of bacteria that grow in routine cultures were 93.4% and 98.3%, respectively, with additional potential pathogens identified by Unyvero in 21.7% of prospectively collected specimens. For detection of *P. jirovecii*, the positive percent agreement with standard testing was 87.5%. Antibiotic resistance marker results were compared to standard antibiotic susceptibility test results to determine positive predictive values (PPVs). PPVs ranged from 80 to 100%, based on the microorganism and specific resistance marker(s). The Unyvero LRT BAL Application provides accurate detection of common agents of bacterial pneumonia and of *P. jirovecii*. The sensitivity and rapidity of this panel suggest significant clinical value for choosing appropriate antibiotics and for antibiotic stewardship.

Kommenov D, Dhar N, **Lamb L**, Wills M, Khaliq F, Timar R, **Chancellor M**, Bartolone S, Ward E, Rossi N, Bitar A, Dhar S and Cohn J (2021). "Urine cytokines as biomarkers in COVID-19 patients." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Urology

Introduction: COVID-19 pandemic has been one of the main global health concerns in 2020, and many aspects of the disease remain enigmatic. While some patients infected with the disease-causing virus SARS-CoV2 have no or mild symptoms, others experience severe symptoms requiring hospitalization. Of these more severe patients, some remain stable while others experience cytokine storm syndrome or an exaggerated immune response that has been correlated with disease severity and progression of acute respiratory deterioration. It is currently unknown why some patients with COVID-19 demonstrate this response and others do not. In light of the apparent prominent role of the inflammatory mediators (i.e. cytokines) in COVID-19 pathogenesis, the ability to identify screening tools not only for the SARS-CoV2 virus but also for cytokines is important. The present investigation was designed to identify the urinary cytokine signature in COVID-19 patients. Methods: The study enrolled 17 COVID-19 patients and 10 control subjects (SARS-CoV-2 negative) 18 years or older with glomerular filtration rate of > 60mL/min. Urine samples were collected and cytokines quantitated using the Luminex multiplex assay. The cytokines analyzed were growth-regulated oncogene (GRO), interleukin-8 (IL-8), and interleukin-6 (IL-6). Results: The levels of GRO and IL-6 were significantly elevated in urine samples obtained from COVID-19 patients compared to controls (mean 16.8 pg/ml vs. 9.2 pg/ml \pm 2.39, $p < 0.0171$ and mean 16.8 pg/ml vs 9.2 pg/ml \pm 2.42, $p < 0.0157$, respectively). Conversely, IL-8 level was similar between COVID-19 patients and controls (15.6 pg/ml vs 11.3 pg/ml \pm 1.3, $p < 0.1833$). Conclusion: The present investigation found that the levels of urinary cytokines GRO and IL-6 were significantly elevated in COVID-19 patients compared to controls and may serve as urinary biomarkers of disease progression. Furthermore, IL-8 although elevated in COVID-19 patients, did not reach statistical significance in our population sample. The findings of this proof of concept study underscore that the urinary cytokines may serve as prognostic and diagnostic accessible biomarkers in COVID-19.

Korot E, Rolain MM, Evans A, Thanos A, Bergeles C, Wood EH and **Rolain MA** (2021). "Purpose-built, head-mounted 3D display for ophthalmic microsurgery: Surgical skill performance and evaluation: A pilot study." *BMJ Innovations* 7(2): 463-469.

[Request Form](#)

Department of Ophthalmology

Koulisis N, Moysidis SN, Govindaraju VK, **Dersch AM, Capone A, Jr.**, Covert DJ, Dadgostar H, Dass AB, **Drenser KA**, Engstrom RE, Jr., **Faia LJ**, Garretson BR, Guerami AH, Hanscom TA, **Mahmoud TH**, Margherio AR, Oh KT, **Randhawa S**, Raphaelian PV, Rhoades WR, **Ruby AJ**, Sanfilippo CJ, Sneed SR, **Trese MT, Wolfe JD, Williams GA**, Yedavally S and **Hassan TS** (2021). "Clinical outcomes and treatment course of eyes with neovascular age-related macular degeneration following the development of endophthalmitis." *Retina* 41(6): 1242-1250.

[Full Text](#)

Department of Ophthalmology

OUWB Medical Student Author

Purpose: To evaluate the clinical course of patients with neovascular age-related macular degeneration (nAMD) after developing endophthalmitis during their treatment with intravitreal injections. Methods: Multicenter, retrospective series. Results: From April 2013 to October 2018, 196,598 intravitreal anti-vascular endothelial growth factor (VEGF) injections were performed, with 75 cases of endophthalmitis (incidence 0.0381%). There was no association between intravitreal anti-VEGF drug ($P = 0.29$), anesthetic method ($P = 0.26$), povidone concentration ($P = 0.22$), or any intraprocedure variable and endophthalmitis incidence. Seventy-two patients (96%) were treated with intravitreal tap and inject, while 3 underwent immediate pars plana vitrectomy. After endophthalmitis resolution, 17 patients (22.7%) were not re-treated for nAMD (in 10 cases due to inactive disease; follow-up, 115 ± 8.4 weeks). Patients required less frequent anti-VEGF injections after infection (7.4 ± 0.61 weeks vs. 11.5 ± 1.8 weeks; $P = 0.004$). Preinfection logarithm of the minimum angle of resolution visual acuity was 0.585 ± 0.053 ($\sim 20/77$). It worsened with endophthalmitis (1.67 ± 0.08 , $\sim 20/935$; $P < 0.001$) and again on postendophthalmitis treatment day 1 (1.94 ± 0.064 ; count fingers; $P < 0.001$), but improved after reinitiating nAMD therapy (1.02 ± 0.11 ; $\sim 20/209$; $P < 0.001$). Better visual acuity on postendophthalmitis week 1 ($P = 0.002$) and reinitiation of nAMD treatment ($P = 0.008$) were associated with better final visual acuity, and streptococcal culture with worse visual acuity ($P = 0.028$). The postendophthalmitis treatment interval was associated with the anti-VEGF drug used (aflibercept = ranibizumab > bevacizumab; $P < 0.001$). Conclusion: Patients with nAMD required fewer injections after endophthalmitis, suggesting a biological change in disease activity. Neovascular age-related macular degeneration became quiescent in 13.3% of eyes. Most achieved better outcomes with anti-VEGF reinitiation.

Kuang S, Walter S, Yang X and Li X (2021). "The concept of osmotic pressure: Two common misunderstandings and resolutions." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: In a previous publication titled "The Concept of Osmolarity: Problems and Resolutions" (Vol 34, Issue S1, The FASEB Journal), we defined two osmosis systems: 1) a simple osmosis system (S-m-H₂O, in which a solution compartment (S) and a pure water (H₂O) compartment are separated by a selectively permeable membrane (m)) and 2) a composite osmosis system (S1-m-S2, in which two solution compartments (S1 and S2) are separated by m). In this presentation, we will apply the concepts of S-m-H₂O and S1-m-S2 to address two common misunderstandings in the measurement/definition of the concept of osmotic pressure (π) in physiology and biology, as well as in chemistry and physics. Method: Deconstructing a composite osmosis S1-m-S2 into two mirrored simple osmosis systems: S1-m-H₂O and H₂O-m-S2 (Fig 1). Results: From Fig 1, the following points are clear and thus can be addressed: 1) π should be measured/defined in the context of a simple S-m-H₂O not a composite S1-m-S2. 2) The first common misunderstanding that plagues the areas mentioned above is the measurement/definition of π in the context of S1-m-S2. What is measured is not π but the difference between two osmotic pressures ($\pi(S1-m-H2O)$ and $\pi(H2O-m-S2)$) in S1-m-S2. 3) π is a system parameter because it is m-dependent or S-m-H₂O-dependent: Facing various m, a solution can form various simple osmosis systems with pure water, resulting in various

magnitudes of π . Hence π is specific to each given, simple osmosis system and thus a system parameter rather than belonging to a solution. Therefore, 4) the second common misunderstanding is that π is the solution's π . 5) Osmosis across a cell membrane occurs in a composite osmosis system, ECF-m-ICF = ECF-m-H₂O + H₂O-m-ICF, where ECF and ICF refer to intracellular and extracellular fluids. This step is a prerequisite for us to develop our other abstract titled "The Pressure Profiles of the Equilibrium States of Osmosis Across Plant and Animal Cell Membranes" in EB2021. Conclusion: 1) The missing step of defining simple and composite osmosis systems is essential to define osmotic pressure and study osmotic pressure difference/gradient ($\Delta\pi$) across cell membrane in the human body. 2) The view of osmotic pressure as a system parameter of a simple osmosis system derives from this essential step, which advances our understanding of the concept of osmotic pressure.

Kuang S, Walter S, Yang X and Li X (2021). "The nature and measures of osmotic pressure." [The FASEB Journal](#) 35(S1). [Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: In our first abstract titled "The Concept of Osmotic Pressure: Two Common Misunderstandings and Resolutions" in EB2021, we addressed that osmotic pressure should be defined in the context of a simple osmosis system (i.e., S-m-H₂O, with a solution compartment (S) and a water compartment separated by a selectively permeable membrane (m)), not in the context of a composite osmosis system (i.e., S₁-m-S₂), which can instead be deconstructed into two mirrored simple osmosis systems: S₁-m-H₂O and H₂O-m-S₂. In this presentation, we 1) use a new set of terminology to differentiate the osmotic pressure (π) defined in three common ways in physiology and biology as well as in chemistry and physics; 2) address which of these ways represents the nature of π ; and 3) illustrate the osmotic pressure difference/gradient in S₁-m-S₂.

Method: Logical reasoning as shown in Fig 1 and 2. Results: 1) In S-m-H₂O (Fig 1a to 1b), osmosis occurs and reaches equilibrium (1). We define the gravitational hydrostatic pressure exerted by the resulting liquid column as π_{achieved} . 2) We define the π applied to S to prevent osmosis as π_{applied} (Fig 1c). 3) According to van't Hoff's Law, π_{achieved} or $\pi_{\text{applied}} = RTOC_0$ (OC₀ is the initial osmotic concentration in S). 4) In S-m-H₂O, a transmembrane pressure drives osmosis (illustrated using the blue arrow in Fig 1c), which can be viewed as exerted by either the water potential difference ($\Delta\mu_0$, not shown) or the OC₀ difference (ΔOC_0 , the red gradient in Fig 1a and 1c) across the m: during osmosis, $\Delta\mu_0$ pushes or ΔOC_0 pulls water toward S. We define this pressure to be π_{TM} (TM refers to transmembrane). In physical chemistry, π (our π_{TM}) = $\text{const} \times \Delta\mu_0$. Hence, $\pi_{\text{TM}} = -RTOC_0 = \text{const} \times \Delta\mu_0$. Conclusion: 1) Among the three common ways to define π (π_{achieved} , π_{applied} , π_{TM}), π_{TM} is the nature of osmotic pressure; 2) π_{achieved} and π_{applied} are two different ways to measure π_{TM} . 3) In S₁-m-S₂, it is the osmotic pressure difference ($\Delta\pi_{\text{TM}}$) that drives osmosis, which can be measured using either $\Delta\pi_{\text{achieved}}$ or $\Delta\pi_{\text{applied}}$ (Fig 2). In our third abstract, titled "The Pressure Profiles of the Equilibrium States of Osmosis Across Plant and Animal Cell Membranes" in EB2021, we will apply the concepts of $\Delta\pi_{\text{TM}}$ to analyze the pressure profiles that characterize the equilibrium states of osmosis (after water enters a cell) across plant and animal cell membranes. 1 Chang R. Physical Chemistry for the Chemical and Biological Sciences. Sausalito, CA: University Science Books, 2000, p. 235.

Kuang S, Walter S, Yang X and Li X (2021). "The pressure profiles of the equilibrium states of osmosis across plant and animal cell membranes." [The FASEB Journal](#) 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: In our previous abstract titled "The Nature and Measures of Osmotic Pressure" in EB2021, we illustrated that 1) in a simple osmosis system where a solution compartment and a water compartment are separated by a selectively permeable membrane (m), π_{achieved} , π_{applied} , and π_{TM} (TM refers to transmembrane) are the three common ways osmotic pressure (π) is defined, where π_{TM} is the nature of osmotic pressure that drives osmosis; and 2) in a composite osmosis system where a cell membrane separates two solutions (extracellular and intracellular fluids, i.e., ECF and ICF), the driving pressure of osmosis is the osmotic pressure difference/gradient ($\Delta\pi_{\text{TM}}$) across the m. In this presentation, we apply the concepts of a composite ECF-m-ICF and the $\Delta\pi_{\text{TM}}$ to illustrate how three different types of pressure characterize the equilibrium states of osmosis (after water enters the cells) across plant and animal cell membranes. Method: 1) Deconstructing a composite ECF-m-ICF (Fig 1) into two simple osmosis systems

(ECF-m-H₂O and H₂O-m-ICF) to understand the $\Delta\pi_{TM}$. 2) Graphical (logical) analysis of the three pressures in plant and animal ECF-m-ICF (Fig 2). Results 1) As shown in Fig 1, $\Delta\pi_{TM} = \pi_{TM}(\text{ECF-m-H}_2\text{O}) - \pi_{TM}(\text{H}_2\text{O-m-ICF})$. 2) After water enters a cell and reaches equilibrium of osmosis, $\Delta\pi_{TM}$ is reduced to $\Delta\pi_{eq}$ (Fig 2). 3) In a plant ECF-m-ICF (Fig 2a and 2b), large $\Delta\pi_{eq}$ (close to $\Delta\pi_{TM}$), high hydrostatic pressure (ΔP_{H_2O} , thick grey arrows in Fig 2b) inside the cell, and high tension in the cell wall (ΔT_{wall} , thick white bidirectional arrows, Fig 2b) characterize this equilibrium state. To focus on the pressure profiles and simplify the Fig 2, the vacuoles that store water in the plant cell are not shown. In contrast, in an animal ECF-m-ICF, smaller $\Delta\pi_{eq}$, lower P_{H_2O} (the thin grey arrows, Fig 2d), and lesser tension in the cell membrane (ΔT_{CM} , the white bidirectional arrows, Fig 2d) characterize the equilibrium state. Conclusion: This is the first work to illustrate in detail the differences in the three pressure profiles across plant and animal cell membranes after water enters the cells due to osmosis using the method of deconstruction of ICF-m-ECF and the concept of $\Delta\pi_{TM}$.

Lane GI, Gracely A, Uberoi P, Lee U, Smith AL, Anger JT, Theva D, DeLong J, Kowalik C, **Padmanabhan P**, Powell CR, Carmel ME, Clemens JQ, Cameron AP, Gupta P and Network SR (2021). "Changes in patient reported outcome measures after treatment for female urethral stricture." *Neurourology and Urodynamics* 40(4): 986-993.

[Full Text](#)

Department of Urology

Introduction: There is a paucity of patient reported outcome measure (PROM) data for women with urethral strictures. To address this gap, we aim to evaluate change in PROM among women who underwent surgery for a stricture. Methods: American Urological Association Symptom Index (AUA-SI) and Urogenital Distress Inventory (UDI-6) data from a multi-institutional retrospective cohort study of women treated for urethral stricture was assessed. Results: Fifty-seven women had either AUA-SS or UDI-6 and 26 had baseline and postoperative data for either. Most women underwent urethroplasty (77%) and the majority (73%) remained stricture free at median follow-up of 21 months (interquartile range [IQR] 7-37). The median baseline AUA-SI was 21 (IQR 12-28) and follow-up was 10 (IQR 5-24). After treatment, there was a median decrease of 12 (IQR -18 to -2) in AUA-SI ($p = 0.003$). The median AUA Quality of life (QOL) score at baseline and follow-up were 6 (IQR 4-6) and 3 (IQR 2-5), respectively. There was a median AUA-QOL improvement of 2 points (-5,0; $p = 0.007$) from a baseline 5 (unhappy) to 3 (mixed). Median UDI-6 scores were 50 (IQR 33-75) at baseline and 17 (IQR 0-39), at follow-up. After treatment, there was a median decrease of 19 (-31 to -11; $p = 0.01$). Conclusion: Women with urethral strictures have severe lower urinary tract symptoms which improved after surgery. This study substantiates the claims that recognizing and treating women with urethral stricture disease greatly improves lower urinary tract symptoms and QOL.

Lazar N, Sardarli K, Imam Z, Khasawneh M and **Hader I** (2021). "A rare twist of the forgotten disease: A case of fusobacterium necrophorum sepsis with portomesenteric thrombosis and a review of the literature." *Case Reports in Gastrointestinal Medicine* 2021: 6699867.

[Full Text](#)

Department of Internal Medicine

Abdominal variants of Lemierre's syndrome presenting with pylephlebitis are rare, and the role of anticoagulation in treatment is controversial. We hereby report a case of pylephlebitis secondary to *F. necrophorum* bacteremia in a 57-year-old female originating from bacterial translocation secondary to colitis, who developed a favorable outcome with prompt treatment with antibiotics and anticoagulation. We also perform a literature review on similar cases in the literature and discuss management options of this rare but potentially fatal complication.

Lee R, Govindaraju V, Farley ND, Abbey AM, Stem MS, Shields RA, Wa CA, **Williams GA, Faia LJ, Hassan TS and Wolfe JD** (2021). "Refractive outcomes after sutureless intrascleral fixation of intraocular lens with pars plana vitrectomy." *Retina* 41(4): 822-826.

[Full Text](#)

Department of Ophthalmology

Purpose: To evaluate the refractive outcomes of sutureless intrascleral fixation of intraocular lens with pars plana vitrectomy. Method: A retrospective, consecutive cohort from multiple surgeons of a single center. Primary outcomes included spherical equivalent (SEQ) and change in SEQ (ΔSEQ) from preoperative

intraocular lens power calculations. Secondary outcomes included refractive outcomes of fixation at 1.5 mm, 2 mm, and 2.5 mm posterior to the limbus. Results: In total, 84 eyes of 80 patients were included. Preoperative logarithm of the minimum angle of resolution visual acuity was 1.21 ± 0.68 (20/320). The mean follow-up time was 2.33 ± 1.36 years. At 3 months, SEQ was -0.50 ± 1.59 D and Δ SEQ was 0.58 ± 1.49 D. At 1 year, SEQ was -0.55 ± 1.32 D and Δ SEQ was 0.39 ± 1.42 D. At the last follow-up, logarithm of the minimum angle of resolution visual acuity was 0.34 ± 0.34 (20/40), SEQ was -0.51 ± 1.44 D, and Δ SEQ was 0.57 ± 1.27 D. There was no difference between SEQ or Δ SEQ throughout follow-up ($P = 0.97$ and $P = 0.96$, respectively). At fixation distances more posterior to the limbus, mean Δ SEQ was more hyperopic at 3 months, 1-year, and the last follow-up ($P = 0.02$, $P = 0.01$, and $P = 0.006$, respectively). Conclusion: Refractive outcomes for sutureless intrascleral fixation of intraocular lens with pars plana vitrectomy were favorable and showed stability postoperatively. These results may aid surgeons achieve better desired refractive outcomes for this technique.

Lehrberg A, **Dekhne N**, **Desai A** and **Kiran S** (2021). "Trends contributing to disparities in inflammatory breast cancer." *Annals of Surgical Oncology* 28(SUPPL 2): S290-S292.

[Full Text](#)

Department of Surgery

OUIB Medical Student Author

Lin KF, **Bojrab D**, **Fritz CG**, **Schutt CA**, **Hong RS** and **Babu SC** (2021). "Hearing outcomes with a novel total ossicular replacement prosthesis." *Otology & Neurotology* 42(3): 447-454.

[Full Text](#)

Department of Surgery

OUIB Medical Student Author

Introduction: A total ossicular replacement prosthesis (TORP) is used to reconstruct the ossicular chain in the absence of the stapes suprastructure. The Wildcat prosthesis is a novel TORP that eliminates the need for a separate footplate shoe prosthesis and aims to improve ease-of-use and stability. This study evaluates hearing outcomes using the Wildcat prosthesis. Study Design: Case series with chart review. Setting: Tertiary neurotology referral center. Methods: Retrospective chart review of 64 patients undergoing ossicular chain reconstruction using the Wildcat TORP. Hearing outcomes after surgery were assessed with air conduction pure-tone average, bone conduction pure-tone average, air-bone gap (ABG), speech recognition threshold, and word recognition score as primary outcome measures. The stability of hearing outcomes was evaluated on subsequent long-term follow-up. Results: At mean short-term follow-up of 4.4 ± 2.7 months, ABG improved from 31.0 ± 13.0 dB preoperatively to 22.5 ± 10.0 dB ($p < 0.001$) with 51.6% achieving ABG less than 20 dB. No significant difference in any primary outcome measures was found when analyzing outcomes by initial versus revision surgery, use of cartilage graft, or type of mastoidectomy. The only exception was a smaller reduction in ABG of 4.2 dB for patients with canal wall down mastoidectomy compared with a 13.7 dB ABG closure in patients with canal wall up mastoidectomy ($p = 0.039$). Conclusion: Total ossicular chain reconstruction using the Wildcat demonstrates versatility in challenging cases to provide hearing outcomes that are comparable to published data using TORPs. Copyright © 2020, Otology & Neurotology, Inc.

Lindell SD, Maechling S, Klein R, Freigang J, Laber B, Blanazs L, Leonhardt M, Haupt S, Petry T and **Sabina RL** (2021). "Mechanism and structure based design of inhibitors of AMP and adenosine deaminase." *Bioorganic & Medical Chemistry* 43: 116272.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Inhibitors of the enzyme adenosine monophosphate deaminase (AMPD) show interesting levels of herbicidal activity. An enzyme mechanism-based approach has been used to design new inhibitors of AMPD starting from nebularine (6) and resulting in the synthesis of 2-deoxy isonebularine (16). This compound is a potent inhibitor of the related enzyme adenosine deaminase (ADA; IC₅₀ 16 nM), binding over 5000 times more strongly than nebularine. It is proposed that the herbicidal activity of compound 16 is due to 5'-phosphorylation in planta to give an inhibitor of AMPD. Subsequently, an enzyme structure-based approach was used to design new non-ribosyl AMPD inhibitors. The initial lead structure was discovered by in silico screening of a virtual library against plant AMPD. In a second step, binding to AMPD was further optimised

via more detailed molecular modeling leading to 2-(benzyloxy)-5-(imidazo[2,1-f][1,2,4]triazin-7-yl)benzoic acid (36) (IC₅₀) 300 nM). This compound does not inhibit ADA and shows excellent selectivity for plant over human AMPD.

Lucia VC and Wedemeyer R (2021). "Evaluating effectiveness of faculty and near-peer delivered teaching and communication skills training." *Medical Science Educator* 31(3): 1019-1024.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Medical students who are given opportunities to teach and communicate complex information in an understandable manner will be more effective in educating patients in the future. We provided faculty and near-peer training to medical student facilitators of a community outreach program for middle school students to assess which type of training resulted in better teaching preparedness and confidence. Near-peer-trained students were more confident in their teaching compared to faculty trained counterparts; therefore, there may be some added benefit to peer-delivered/faculty-supervised training for community outreach programs.

Lupher V, Lynch A and **Zalesin KC** (2021). "Health, weight loss, and surgery beliefs: Why patients choose to undergo bariatric surgery and what influences their choice of surgery procedure." *Bariatric Surgical Practice and Patient Care*. ePub Ahead of Print.

[Request Form](#)

Department of Internal Medicine

Introduction: The purpose of this study was to determine what factors influence an individual's decision to have bariatric surgery, including why they choose a particular surgery type. Methods: Thirty bariatric surgery patients (11 gastric bypass [GB] and 19 sleeve gastrectomy [SG]) participated in qualitative interviews pre- and postsurgery. Interviews questioned why patients chose bariatric surgery, their specific procedure choice, timing, and expectations for surgery. Verbatim transcripts were coded using a constant comparative method and a grounded theory approach. Analysis focused on surgery motivations, personal influences, and choice of procedure. Results: Five themes emerged regarding the decision to have bariatric surgery: Health, Activity and Lifestyle Interference, Frustration with Weight, Social Influences, and Body Image. Most participants selected GB surgery based on beliefs about weight loss outcomes. Rationales for choosing a SG centered on surgery effects, including perceptions that the sleeve was less invasive or allowed for less restrictive eating habits postsurgery. Surgery veterans emerged as an important influence on the choice of surgery procedure. Conclusion: Patients consider multiple factors in their decision to undergo bariatric surgery. Health care professionals should take these factors into account to help patients make informed decisions and to clarify existing misconceptions.

Madanat L, Khalife A and **Sims M** (2021). "Asystole during nasopharyngeal swab: Is COVID-19 to blame?" *Cureus* 13(6): 15448.

[Full Text](#)

Department of Internal Medicine

The use of nasopharyngeal (NP) swab sampling for the detection of various respiratory pathogens has been a standard procedure in medicine for many years. While this is a fairly common procedure, there has been a significant increase in utilization recently due to the SARS-CoV-2 pandemic. We describe a case of a 40-year-old SARS-CoV-2 positive patient with no prior cardiac history who developed asystole while an NP swab was being used to obtain a sample for a SARS-CoV-2 assay. Return of normal sinus rhythm was achieved with chest compressions alone. The incident was deemed to have been an exaggerated vagal response to intranasal stimulation; better known as the trigeminocardiac reflex. This is the first reported case describing asystole during use of an NP swab. This case occurred in a patient with no known cardiac disease and highlights the potential importance of the arrhythmogenic nature of COVID-19 that could potentiate the vagal response in susceptible individuals undergoing NP sampling.

Madanat L, **Schoenherr D**, **Wey E** and Gupta R (2021). "Rasburicase-induced haemolysis and methemoglobinemia: An ongoing issue." *BMJ Case Reports* 14(3): 15448.

[Full Text](#)

OUWB Medical Student Author
Department of Pathology

We report a case of a 91-year-old Caucasian woman with a history of chronic lymphocytic leukaemia who developed acute hypoxic respiratory failure (AHRF) requiring intubation for less than 24 hours after receiving rasburicase. Laboratory workup was significant for methemoglobinemia and acute anaemia, and blood film demonstrated evidence of oxidative haemolysis with bite cells. The patient was given a presumptive diagnosis of glucose-6-phosphate dehydrogenase (G6PD) deficiency and was managed conservatively with successful resolution of AHRF and stabilisation of haemoglobin level. Seven days after admission, she passed away due to subsequent complications; hence, follow-up G6PD level could not be obtained. Haemolytic anaemia and methemoglobinemia in the setting of recent rasburicase administration should raise clinical suspicion for G6PD deficiency. In non-emergent cases, patients should be screened prior to receiving rasburicase regardless of risk factors. Because rasburicase is often needed emergently, patients at high risk of tumour lysis syndrome should be screened early for G6PD deficiency.

Maerz T, Nepple JJ, Bedi A, **Zaltz I**, Belzile É, Beaulé PE, Sink EL, Clohisy JC and Group A (2021). "Sex differences in clinical outcomes following surgical treatment of femoroacetabular impingement." *Journal of Bone and Joint Surgery* 103(5): 415-423.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Sex-based differences in clinical outcomes following surgical treatment of femoroacetabular impingement remain largely uncharacterized; this prospective, multicenter study evaluated these differences both directly and adjusted for covariates. Methods: Hips undergoing surgical treatment of symptomatic femoroacetabular impingement were prospectively enrolled in a multicenter cohort. Patient demographics, radiographic parameters, intraoperatively assessed disease severity, and history of surgical procedures, as well as patient-reported outcome measures, were collected preoperatively and at a mean follow-up of 4.3 years. A total of 621 (81.6%) of 761 enrolled hips met the minimum 1 year of follow-up and were included in the analysis; 56.7% of analyzed hips were female. Univariate and multivariable statistics were utilized to assess the direct and adjusted differences in outcomes, respectively. Results: Male hips had greater body mass index and larger α angles. Female hips had significantly lower preoperative and postoperative scores across most patient-reported outcome measures, but also had greater improvement from preoperatively to postoperatively. The preoperative differences between sexes exceeded the threshold for the minimal clinically important difference of the modified Harris hip score (mHHS) and all Hip disability and Osteoarthritis Outcome Score (HOOS) domains except quality of life. Preoperative sex differences in mHHS, all HOOS domains, and Short Form-12 Health Survey physical function component score were greater than the postoperative differences. A greater proportion of female hips achieved the minimal clinically important difference for the mHHS, but male hips were more likely to meet the patient acceptable symptom state for this outcome. After adjusting for relevant covariates with use of multiple regression analysis, sex was not identified as an independent predictor of any outcome. Preoperative patient-reported outcome scores were a strong and highly significant predictor of all outcomes. Conclusions: Significant differences in clinical outcomes were observed between sexes in a large cohort of hips undergoing surgical treatment of femoroacetabular impingement. Despite female hips exhibiting lower baseline scores, sex was not an independent predictor of outcome or reoperation. LEVEL OF EVIDENCE: Prognostic Level II. See Instructions for Authors for a complete description of levels of evidence.

Mando R, **Michel A**, Waheed M, **Karabon P** and **Halalau A** (2021). "Is prediabetes too late? Normalization of hemoglobin A1C in prediabetes is not associated with improved outcomes." *Journal of the American College of Cardiology* 77(18): 1603-1603.

[Full Text](#)

OUWB Medical Student Author
Department of Internal Medicine

Mankuzhy NP, Almahariq MF, Ye H, **Amin M**, Stone B and **Krauss DJ** (2021). "Investigation of the prognostic significance of neuroendocrine differentiation in Gleason Score 7 to 10 prostate adenocarcinoma in patients with distant metastasis after definitive radiotherapy." *American Journal of Clinical Pathology* 155(6): 879-886.

[Request Form](#)

Department of Radiation Oncology

Department of Pathology

OUWB Medical Student Author

Objectives: We investigated the prognostic implications of neuroendocrine differentiation (NED) in prostate adenocarcinoma detected by chromogranin A (CgA) in patients who developed distant metastasis (DM) after radiotherapy. Methods: Patients with Gleason score 7 to 10 conventional acinar prostate adenocarcinoma treated with definitive radiotherapy and with core biopsy CgA staining completed were reviewed. Patients who developed DM, defined as disease beyond the primary tumor or pelvic lymph nodes, underwent detailed chart review. Statistical analysis included Kaplan-Meier estimates and descriptive statistics to compare based on quantification of CgA staining. Results: Thirty-five patients had confirmed DM. Twenty-five patients had less than 1% of cells staining positive for CgA, and 10 patients had more than 1%. Median overall survival (OS) time was 3.26 and 1.04 years, respectively ($P = .52$). Median cause-specific survival (CSS) was 6.15 and 1.04 years, respectively ($P = .21$). Fifty-six percent of patients with CgA less than 1% died of prostate cancer compared with 90% of those with CgA more than 1% ($P = .059$). There were no significant differences in sites of metastatic disease or administration of systemic therapies. Conclusions: No significant differences in OS and CSS were observed based on NED detected by CgA. Reduced median survival time and increased cancer-related death in cases with focal NED generates the hypothesis of inferior outcomes among patients with documented DM.

Mascarenhas AK, **Lucia VC**, **Kelekar A** and **Afonso NM** (2021). "Dental students' attitudes and hesitancy toward COVID-19 vaccine." *Journal of Dental Education*. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Department of Foundational Medical Studies (OU)

Background: Dentists are a group of providers who have been identified by CDC at high risk of exposure to COVID-19 through their contact with patients. This would apply to dental students as well. Thus, it is important to achieve high COVID-19 vaccination rates in this group. Further, as healthcare providers, they are entrusted with providing health recommendations and advocating for their patients, community, and profession, including vaccinations. Methods: Using ualtricsXM an online platform, in 2020, a survey was administered anonymously to dental students at three dental schools to assess the attitudes of dental students to the novel COVID-19 vaccine. Factors and reasons associated with vaccine hesitancy and acceptance toward the COVID-19 vaccine and likelihood of recommending and giving the vaccination to patients were assessed. Results: Nearly, all participants had positive attitudes toward vaccines in general, agreed they would likely be exposed to COVID-19, and personally knew someone who had COVID-19; however, only 56% are willing to take a COVID-19 vaccine as soon as an FDA-approved vaccine was available. Of those unwilling to take the vaccine, 63% reported they would take it if mandated by the health systems/dental school; however, 16.3% of the overall respondents would not take the COVID-19 vaccine even if mandated. Several factors are associated with vaccine acceptance and the likelihood of recommending the vaccination, such as trusting public health experts, concerns about side effects, and agreeing with vaccine mandates. Conclusion: Our results highlight the need for an educational curriculum about the safety and effectiveness to promote the uptake of COVID-19 vaccine.

McLaughlin SA, Lee MC, Feldman SM, Rosen B, Grignol VP, Wallace AM, Takabe K, Baron PL, Hill CRS, **Dekhne NS**, Dietz JR, Wehner PB, Buchanan CL, Gonzalez JE and Chen SL (2021). "Pegloprastide-based ratiometric fluorescence imaging detects intraoperative positive margins in real-time." *Annals of Surgical Oncology* 28(SUPPL 2): S230-S231.

[Full Text](#)

Department of Surgery

Mehta NK, Doerr K, Skipper A, Rojas-Pena E, **Dixon S** and **Haines DE** (2021). "Current strategies to minimize postoperative hematoma formation in patients undergoing cardiac implantable electronic device implantation: A review." *Heart Rhythm* 18(4): 641-650.

[Full Text](#)

Department of Internal Medicine

There are an increasing number of cardiac electronic device implants and generator changes with a longer patient life expectancy along with concomitant increase in antiplatelet and anticoagulant regimens, which can increase the incidence of pocket hematomas. We have conducted an in-depth analysis on the relevant literature, which is rife with varying definition of hematomas, on ways to reduce pocket hematomas. We have analyzed studies on periprocedural medication management, intraprocedural use of prohemostatic agents, and postprocedure role of compression devices.

Mehta NK, Strickling J, Mark E, Swineheart S, Puthumana J, Lavie CJ, **Haines DE** and **Franklin BA** (2021). "Beyond cardioversion, ablation and pharmacotherapies: Risk factors, lifestyle change and behavioral counseling strategies in the prevention and treatment of atrial fibrillation." *Progress in Cardiovascular Diseases* 66: 2-9.

[Full Text](#)

Department of Internal Medicine

Importance: It has been suggested that atrial fibrillation (AF) is the new cardiovascular disease epidemic of the 21st century. Clinical cardiology has largely focused on AF treatment and associated stroke prevention rather than preventing AF itself. To reduce the global consequences and associated costs of AF, it is critical to now embrace prevention as a priority. Proactively addressing the risk factors for AF and the underlying unhealthy lifestyle habits that contribute to them, using research-based counseling approaches, represents a complementary and adjunctive alternative in combatting this disease burden. Observations: Encouraging and sustaining patient involvement to reduce AF incidence and improve outcomes begins with screening to identify risk factors, unhealthy lifestyle habits, and characteristics associated with failed attempts at favorably modifying these causalities. Modulators of and common barriers to achieving risk reduction and lifestyle change include self-efficacy, social support, age, sex, marital and socioeconomic status, education, employment, and psychosocial factors such as depression, isolation, anxiety and chronic life stress. Focused behavioral counseling approaches, including assessing the patient's readiness to change, motivational interviewing and using the 5 A's (assess, advise, agree, assist, arrange), along with employing initial downscaled goals to overcome inertia, are proven methodologies to overcome these common barriers to favorably modifying risk factors and unhealthy lifestyle habits. Conclusions and Relevance: To complement and enhance the current armamentarium for the medical management of cardiac arrhythmias, there is an urgent need to proactively address the causative factors triggering new-onset, recurrent and persistent AF. Beyond the counseling skills of highly trained professionals (eg, psychiatrists, psychologists), this narrative review highlights the need for and potential impact on lifestyle modification that non-behavioral scientists, including internal medicine, cardiology, and allied health professionals, can have on the patients they serve.

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*. ePub Ahead of Print.

[Request Form](#)

Department of Urology

Introduction: 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.

Michel A, Mando R, **Waheed MAA**, **Halalau A** and Karabon P (2021). "Prediabetes associated with an increase in major adverse cardiovascular events." *Journal of the American College of Cardiology* 77(18): 14-14.

[Full Text](#)

*OUWB Medical Student Author
Department of Internal Medicine*

Mittal C, Diehl DL, Draganov PV, **Jamil LH**, Khalid A, Khara HS, Khullar V, Law R, Lo SK, Mathew A, Mirakhor E, Sedarat A, Sharma N, Sharzei S, Tavakkoli A, Thaker A, Thosani N, Yang D, Zelt C and Wagh MS (2021). "Practice patterns, techniques, and outcomes of flexible endoscopic myotomy for Zenker's diverticulum: A retrospective multicenter study." *Endoscopy* 53(4): 346-353.

[Request Form](#)

Department of Internal Medicine

Background: Flexible endoscopic myotomy has been increasingly performed for Zenker's diverticulum using various endoscopic techniques and devices. The main aims of this study were to assess practice patterns and compare outcomes of endoscopic myotomy for Zenker's diverticulum. Methods: Procedures performed at 12 tertiary endoscopy centers from 1/2012 to 12/2018 were reviewed. Patients (≥ 18 years) with Zenker's diverticulum who had dysphagia and/or regurgitation and underwent endoscopic myotomy were included. Outcomes assessed included technical success, clinical success, and adverse events. Results: 161 patients were included. Traditional endoscopic septotomy was performed most frequently (137/161, 85.1%) followed by submucosal dissection of the septum and myotomy (24/161, 14.9%). The hook knife (43/161, 26.7%) and needle-knife (33/161, 20.5%) were used most frequently. Overall, technical and clinical success rates were 98.1% (158/161) and 78.1% (96/123), respectively. Adverse events were noted in 13 patients (8.1%). There was no significant difference in technical and clinical success between traditional septotomy and submucosal dissection groups (97.1% vs. 95.8%, $P = 0.56$ and 75.2% vs. 90.9%, $P = 0.16$, respectively). Clinical success was higher with the hook knife (96.7%) compared with the needle-knife (76.6%) and insulated tip knife (47.1%). Outcomes were similar between centers performing >20 , 11-20, and ≤ 10 procedures. Conclusions: Flexible endoscopic myotomy is an effective therapy for Zenker's diverticulum, with a low rate of adverse events. There was no significant difference in outcomes between traditional septotomy and a submucosal dissection approach, or with centers with higher volume, though clinical success was higher with the hook knife.

Moysidis SN, Koulisis N, Adrean SD, Charles S, Chetty N, Chhablani JK, Cortes JC, Embabi SN, Gordon C, Gregori NZ, Habib A, Hamza H, Hassaan H, **Hassan TS**, Houghton O, Kadonosono K, Kusaka S, La Mantia A, Lai CC, Lumi X, Maeno T, Mahgoub MM, El Baha SM, Morales-Canton V, Nowara M, Okonkwo ON, Parolini B, Rezende FA, Rogalinska I, Rojas S, Steel DH, Stopa M, Wu AL, Yamada K, Yamada M and **Mahmoud TH** (2021). "Autologous retinal transplantation for primary and refractory macular holes and macular hole retinal detachments: The Global Consortium." *Ophthalmology* 128(5): 672-685.

[Full Text](#)

Department of Ophthalmology

Purpose: To report the anatomic and functional outcomes of autologous retinal transplantation (ART). Design: Multicenter, retrospective, interventional, consecutive case series. Participants: One hundred thirty eyes of 130 patients undergoing ART for the repair of primary and refractory macular holes (MHs), as well as combined MH-rhegmatogenous retinal detachment (MH-RRD), between January 2017 and December 2019. Methods: All patients underwent pars plana vitrectomy and ART, with surgeon modification of intraoperative variables. A large array of preoperative, intraoperative, and postoperative data was collected. Two masked reviewers graded OCT images. Multivariate statistical analysis and subgroup analysis were performed. Main Outcome Measures: Macular hole closure rate, visual acuity (VA), external limiting membrane and ellipsoid zone (EZ) band integrity, and alignment of neurosensory layers (ANL) on OCT. Results: One hundred thirty ART surgeries were performed by 33 vitreoretinal surgeons worldwide. Patient demographics were: mean age of 63 +/- 6.3 years, 58% female, 41% White, 23% Black, 19% Asian, and 17% Latino. Preoperative VA was 1.37 +/- 0.12 logarithm of the minimum angle of resolution (logMAR; Snellen equivalent, approximately

20/500), which improved significantly to 1.05 +/- 0.09 logMAR (Snellen equivalent, approximately 20/225; $P < 0.001$) after surgery (mean follow-up, 8.6 +/- 0.8 months). Autologous retinal transplantation was performed for primary MH repair in 27% of patients ($n = 35$), for refractory MH in 58% of patients ($n = 76$; mean number of previous surgeries, 1.6 +/- 0.2), and for MH-RRD in 15% of patients ($n = 19$). Mean maximum MH diameter was 1470 +/- 160 mm, mean minimum diameter was 840 +/- 94 mm, and mean axial length was 24.6 +/- 3.2 mm. Overall, 89% of MHs closed (78.5% complete; 10% small eccentric defect), with a 95% closure rate in MH-RRD (68.4% complete; 26.3% small eccentric defect). Visual acuity improved by at least 3 lines in 43% of eyes and by at least 5 lines in 29% of eyes. Reconstitution of the EZ ($P = 0.02$) and ANL ($P = 0.01$) on OCT were associated with better final VA. Five cases of ART graft dislocation (3.8%), 5 cases of postoperative retinal detachment (3.8%), and 1 case of endophthalmitis (0.77%) occurred. Conclusions: In this global experience, patients undergoing ART for large primary and refractory MHs and MH-RRDs achieved good anatomic and functional outcomes, with low complication rates despite complex surgical pathologic features.

Moysidis SN, Koulisis N, Rao P, Govindaraju VK, **Gamsky S, Mahmoud TH, Randhawa S, Faia LJ, Wolfe JD, Drenser KA, Ruby AJ, Garretson BR, Hassan TS, Williams GA, Trese MT and Capone A, Jr.** (2021). "Peripheral retinal angiographic findings in macular telangiectasis type 2." *Retina* 41(3): 480-486.

[Full Text](#)

OUWB Medical Student Author

Department of Ophthalmology

Purpose: To evaluate the retinal periphery in patients with idiopathic juxtafoveal telangiectasis or macular telangiectasis Type 2 (MacTel2), using widefield fluorescein angiography. Methods: Single-center, retrospective, observational case series of 50 eyes of 50 patients with MacTel2 and 50 eyes of 50 age-matched controls. Results: Thirty-seven eyes in the MacTel2 group (74%) showed peripheral capillary nonperfusion or dropout, compared with 37 eyes in the control group (74%, $P = 1.0$). Morphologically, the MacTel2 group trended toward having a higher proportion of pruning-type capillary dropout (44%) compared with controls (28%), but this was not statistically significant ($P = 0.12$). Patients with MacTel2 had a higher incidence of microaneurysms compared with controls (MacTel2 56%; controls 42%; $P = 0.048$), independent of age or systemic risk factors. There was no difference in the incidence of venous-venous shunts (MacTel2 10%; controls 10%; $P = 1.0$), arteriovenous shunts (MacTel2 14%; controls 18%; $P = 0.60$), venous tortuosity (MacTel2 60%; controls 66%; $P = 0.58$), or arterial tortuosity (MacTel2 54%; controls 68%; $P = 0.20$), which was mild in most cases. Conclusion: We note a high incidence of peripheral vascular and retinal findings in both patients with MacTel2 and age-matched controls, using widefield fluorescein angiography. Patients with MacTel2 had significantly more microaneurysms, independent of age or other systemic risk factors.

Mulhem E, Oleszkowicz A and Lick D (2021). "3219 hospitalised patients with COVID-19 in Southeast Michigan: A retrospective case cohort study." *BMJ Open* 11(4): e042042.

[Full Text](#)

Department of Family Medicine and Community Health

Objective: To report the clinical characteristics of patients hospitalised with COVID-19 in Southeast Michigan. Design Retrospective cohort study. Setting: Eight hospitals in Southeast Michigan. Participants 3219 hospitalised patients with a positive SARS-CoV-2 infection by nasopharyngeal PCR test from 13 March 2020 until 29 April 2020. Main Outcomes Measures: Outcomes were discharge from the hospital or in-hospital death. Examined predictors included patient demographics, chronic diseases, home medications, mechanical ventilation, in-hospital medications and timeframe of hospital admission. Multivariable logistic regression was conducted to identify risk factors for in-hospital mortality. Results: During the study period, 3219 (90.4%) patients were discharged or died in the hospital. The median age was 65.2 (IQR 52.6-77.2) years, the median length of stay in the hospital was 6.0 (IQR 3.2-10.1) days, and 51% were female. Hypertension was the most common chronic disease, occurring in 2386 (74.1%) patients. Overall mortality rate was 16.0%. Blacks represented 52.3% of patients and had a mortality rate of 13.5%. Mortality was highest at 18.5% in the prepeak hospital COVID-19 volume, decreasing to 15.3% during the peak period and to 10.8% in the postpeak period. Multivariable regression showed increasing odds of in-hospital death associated with older age (OR 1.04, 95% CI 1.03 to 1.05, $p < 0.001$) for every increase in 1 year of age and being male (OR 1.47, 95%

CI 1.21 to 1.81, $p < 0.001$). Certain chronic diseases increased the odds of in-hospital mortality, especially chronic kidney disease. Administration of vitamin C, corticosteroids and therapeutic heparin in the hospital was associated with higher odds of death. Conclusion: In-hospital mortality was highest in early admissions and improved as our experience in treating patients with COVID-19 increased. Blacks were more likely to get admitted to the hospital and to receive mechanical ventilation, but less likely to die in the hospital than whites.

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, Maduro JH and MacDonald SM (2021). "Proton therapy for breast cancer: A consensus statement from the Particle Therapy Cooperative Group (PTCOG) Breast Cancer Subcommittee." *International Journal of Radiation Oncology Biology Physics*. ePub Ahead of Print.

[Full Text](#)

Department of Radiation Oncology

Radiotherapy plays an important role in the multidisciplinary management of breast cancer. Recent years have seen improvements in breast cancer survival as well as a greater appreciation of potential long-term morbidity associated with the dose and volume of irradiated organs. Proton therapy reduces the dose to non-target 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 treatment outcomes achieved with photon radiotherapy. There remains considerable heterogeneity in proton patient selection and techniques, and the rapid technological advances in the field have potential to impact evidence evaluation given the long latency period for breast cancer radiotherapy 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.

Ngo H, Dandu C, Gibney B and **Kuang S** (2021). "Nernst equation and its clinical correlation." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: The Nernst equation, regularly taught in medical physiology, is essential to understand the electrophysiology of the cell membrane. However, many students feel that the equation is not useful in clinical practice due to the lack of correlation made between the underlying physiology and clinical manifestations of ion imbalance in many resources. Through a comprehensive review of physiology textbooks, we noticed that frequently used textbooks, except for Physiology by Linda S. Costanzo (6ed), merely introduce the equation briefly. Even in Costanzo, the equation is mentioned as an aside during a clinical case of hyperkalemia. Hence, the aim of this presentation is to fill this gap by addressing the important clinical correlation of the equation (i.e., its role in helping students to understand the potentially life-threatening K^+ imbalance – hyperkalemia and hypokalemia). Method: Step-by-step logical reasoning with graphical illustrations, which are not available in Costanzo's textbook. Results: Five logical steps together thoroughly unfold how K^+ imbalance should be understood with the application of the Nernst equation. Steps 1 to 3 are illustrated in Figure 1 and steps 4 to 5 in Figure 2. Conclusions: Nernst equation is the focal point that connects all concepts of chemical gradient, equilibrium potential, resting membrane potential, and excitability of a cell together. Besides its primary role to illustrate the relationship between an equilibrium potential of an ion and its chemical gradient, Nernst equation is also essential to understanding the K^+ imbalance, a potentially life-threatening condition if left untreated.

O'Connell TF, **Trivax J** and **Franklin BA** (2021). "Omega-3 fatty acid supplementation in the primary and secondary prevention of cardiovascular events new insights." *Journal of Cardiopulmonary Rehabilitation and Prevention* 41(3): 137-140.

[Full Text](#)

Department of Internal Medicine

Omega-3 fatty acid (O-3FA) supplementation has garnered interest since cardioprotective properties of

dietary fish consumption were observed. In the general population, O-3FA supplementation has not improved cardiovascular outcomes. However, icosapent ethyl, a high-dose, purified form of eicosapentaenoic acid, has demonstrated additive cardioprotection to statins in high-risk patients with elevated triglycerides. Copyright

Osto M, **Rehman R** and Ko A (2021). "A rare presentation of acute respiratory distress due to diffuse large B-cell lymphoma of the tongue base." *Cureus* 13(5): e15124.

[Full Text](#)

OUWB Medical Student Author

Primary diffuse large B-cell lymphoma of the tongue base (BOT) is an extremely rare entity with only a few cases described in the English literature to date. The incidence of BOT non-Hodgkin's lymphoma (NHL) increases with age, most commonly after the sixth decade of life with no observed gender differences. Our patient presented with a six-month history of right neck swelling, one-month history of dysphagia, a change in voice, and ultimately acute airway distress, which led to a tracheostomy. We report an extremely rare case of a diffuse large B-cell lymphoma presenting with airway distress. The patient was treated using rituximab-cyclophosphamide-doxorubicin-vincristine-prednisone (R-CHOP) chemotherapy, a five-day steroid course, and one intrathecal methotrexate. The patient recovered completely and is alive at the time of this writing. NHLs occur more commonly in patients like ours with a prior history of congenital immunodeficiency and celiac disease, exposure to radiation, acquired immune deficiency syndrome, rheumatoid arthritis, or Sjogren's syndrome. Most reported cases of BOT NHLs may cause dysphagia, pharyngeal foreign body sensation, or progressive dyspnea. This case highlights that although NHL of the tongue is a very rare entity, it should not be overlooked and should always be in the differential diagnosis among various benign and malignant tumors and may cause rapid respiratory deterioration.

Page TP (2021). "Intraoperative wavefront aberrometry to determine planar endpoint for the repositioning of vaulted accommodative IOLs." *Journal of Cataract and Refractive Surgery* 47(4): 542-546.

[Full Text](#)

Department of Ophthalmology

Accommodative intraocular lenses (IOLs) are suitable options for patients desiring less dependence on spectacles after cataract surgery. Accommodative IOLs do not require diffractive optics and, therefore, might be used in a wider range of patients who have mild comorbidities or wish to avoid photopsia associated with diffractive IOLs. However, a small percentage of patients have experienced vault, or capsular contraction syndrome (CCS), due to fibroblastic metaplasia of lens epithelial cells. Early detection of CCS might be managed with Nd:YAG capsulotomy; however, accommodative IOLs with significant CCS have required viscodissection of the fibrosis and placement of a capsular tension ring. A challenge with this maneuver is using the operating microscope to determine whether the accommodative IOL has returned to planar position. This article describes a new technique using serial intraoperative wavefront aberrometry measurements of lenticular astigmatism during accommodative IOL repositioning to determine a planar endpoint in the reduction of vault.

Page TP, Sr., Werner L, Ellis N and Heczko JB (2021). "Capsular tension ring explant complication rate comparison using Miyake-Apple video analysis." *Journal of Cataract and Refractive Surgery* 47(6): 786-791.

[Full Text](#)

Department of Ophthalmology

Purpose: To compare the complication rate and time required to explant standard capsular tension rings (CTRs) vs suture-guided CTRs (SGCTRs). Setting: Intermountain Ocular Research Center, John A. Moran Eye Center, University of Utah, Salt Lake City, Utah. Design: Experimental study. Methods: Eight cadaver eyes were prepared using standard Miyake-Apple protocol with digital video recording. A 4 clock-hour zonular dialysis was created, followed by a capsulorhexis, hydrodissection, and CTR (n = 4) or SGCTR (n = 4) implantation. With the CTR hidden from view by the overlying iris, ophthalmic surgical instruments were used to remove the CTRs. Time required to remove the CTR and any complications were recorded. A limit of 180 seconds was imposed to determine inability to remove the CTR. Results: In the standard CTR group (n = 4), removal was associated with high rates of complication (100%). Complications included capsular tears (n = 2), dialysis extension (n = 1), and inadvertent intracapsular cataract extraction (n = 1). The SGCTR group

had no complications associated with removal (n = 4). Time required to explant a CTR was significantly reduced from 164.5 seconds with standard CTRs to 6.9 seconds with SGCTRs (P = .001). Conclusions: Attempts to remove a standard CTR from the capsular bag was met with a high complication rate. The addition of suture to the leading eyelet of the CTR prior to implantation significantly reduced the time and effort required to remove the CTR and was associated with a significant reduction in complication rates.

Pakray A, Hayden N, **Sokhandon F** and **Olsen J** (2021). "Detection and intervention of clinically masquerading inferior mesenteric artery AVMs." *Case Reports in Radiology* 2021: 8854806.

[Full Text](#)

Department of Diagnostic Radiology and Molecular Imaging

We demonstrate a rare case of inferior mesenteric artery arteriovenous malformations leading to ischemic colitis in a 76-year-old female. Our patient presented with three months of nausea, vomiting, and diarrhea. Colonoscopy displayed diffuse mucosal vascular congestion while CTA and MRA displayed AVMs in the region of the IMA; however, cohesive clinical agreement on AVM from multiple specialties was difficult given its rare occurrence and nonspecific clinical, histopathologic, and directly visualized findings. The three noted dominant AVMs were eventually selected with coil and liquid embolization with successful cessation of symptoms and no major complications. Our discussion focuses on intervention and stressing the importance of radiologic findings, as IMA AVMs, rarely present as ischemic colitis and therefore can clinically masquerade as other etiologies.

Park P, Chang V, Yeh HH, Schwalb JM, Nerenz DR, Schultz LR, Abdulkhak MM, **Easton R**, **Perez-Cruet M**, Kashlan ON, Oppenlander ME, Szerlip NJ, Swong KN and Aleem IS (2021). "Impact of Michigan's new opioid prescribing laws on spine surgery patients: Analysis of the Michigan Spine Surgery Improvement Collaborative." *Journal of Neurosurgery: Spine* 34(3): 531-536.

[Request Form](#)

Department of Neurosurgery

Department of Orthopaedic Surgery

Objective: In 2017, Michigan passed new legislation designed to reduce opioid abuse. This study evaluated the impact of these new restrictive laws on preoperative narcotic use, short-term outcomes, and readmission rates after spinal surgery. Methods: Patient data from 1 year before and 1 year after initiation of the new opioid laws (beginning July 1, 2018) were queried from the Michigan Spine Surgery Improvement Collaborative database. Before and after implementation of the major elements of the new laws, 12,325 and 11,988 patients, respectively, were treated. Results: Patients before and after passage of the opioid laws had generally similar demographic and surgical characteristics. Notably, after passage of the opioid laws, the number of patients taking daily narcotics preoperatively decreased from 3783 (48.7%) to 2698 (39.7%; $p < 0.0001$). Three months postoperatively, there were no differences in minimum clinically important difference (56.0% vs 58.0%, $p = 0.1068$), numeric rating scale (NRS) score of back pain (3.5 vs 3.4, $p = 0.1156$), NRS score of leg pain (2.7 vs 2.7, $p = 0.3595$), satisfaction (84.4% vs 84.7%, $p = 0.6852$), or 90-day readmission rate (5.8% vs 6.2%, $p = 0.3202$) between groups. Although there was no difference in readmission rates, pain as a reason for readmission was marginally more common (0.86% vs 1.22%, $p = 0.0323$). Conclusions: There was a meaningful decrease in preoperative narcotic use, but notably there was no apparent negative impact on postoperative recovery, patient satisfaction, or short-term outcomes after spinal surgery despite more restrictive opioid prescribing. Although the readmission rate did not significantly increase, pain as a reason for readmission was marginally more frequently observed.

Partiali B, **Oska S**, **Barbat A** and **Folbe A** (2021). "The representation of women and underrepresented minorities in emergency medicine: A look into resident diversity." *American Journal of Emergency Medicine* 44: 241-243.

[Full Text](#)

OUWB Medical Student Author

Department of Surgery

Partiali B, **Oska S**, **Touriel RB**, **Delise A**, **Barbat A** and **Folbe A** (2021). "Gender disparity in speakers at a major academic emergency medicine conference." *Emergency Medicine Journal* 38(5): 379-380.

[Full Text](#)

OUWB Medical Student Author
Department of Surgery

Background: Although women make up a substantial portion of the workforce in emergency medicine, they remain under-represented in academia. Methods: This study investigates trends in the representation of female speakers at the American College of Emergency Physicians scientific assembly - the largest academic emergency medicine conference in the world. Publication profiles, speaking duration and gender composition of speakers were collected and compared over a 3-year period. Results: The authors described increased representation of female speakers at the conference from 2016 to 2018, as well as an upward trend in women's actual speaking time. Conclusion: This upward trend in women's representation may translate to more opportunities for female engagement in academic emergency medicine. Despite the increasing representation of women, male speakers outnumbered female speakers all 3 years, demonstrating that a speaker gender gap persists in academic emergency medicine.

Parzen JS, **Li XQ**, Zheng WL, **Ding XF** and **Kabolizadeh P** (2021). "Proton therapy for skull-base chordomas and chondrosarcomas: Initial R=results from the Beaumont Proton Therapy Center." *Cureus* 13(5): 15278.

[Full Text](#)

Department of Radiation Oncology

Background: Skull-base chordomas and chondrosarcomas are rare tumors that arise directly adjacent to important critical structures. Appropriate management consists of maximal safe resection followed by postoperative dose-escalated radiation therapy. Proton beam therapy is often employed in this context to maximize the sparing of organs at risk, such as the brainstem and optic apparatus. Methods: This is a single-institutional experience treating skull-base chordomas and chondrosarcomas with postoperative pencil beam scanning proton therapy. We employed a simultaneous integrated boost to the gross tumor volume (GTV) for increased conformality. Demographic, clinicopathologic, toxicity, and dosimetry information were collected. Toxicity was assessed according to Common Terminology Criteria for Adverse Events (CTCAE), v. 4.0. Results: Between 2017 and 2020, 13 patients were treated with postoperative proton therapy. There were 10 patients with chordoma (77%) and three with chondrosarcoma (23%). A gross total resection was achieved in six (60%) patients with chordoma and one patient with chondrosarcoma (33%). Nine patients (69%) received postoperative therapy, whereas four (31%) received treatment at recurrence/progression following reexcision. The median dose to the GTV was 72.4 cobalt-Gray equivalents (range, 70.0 to 75.8). The mean GTV was 3.4 cc (range, 0.2-38.7). There were no grade 3 or greater toxicities. One patient developed grade 2 temporal lobe necrosis. At 10.7 months' median follow-up (range, 2.1-30.6), the rates of local control and overall survival were 100%. Conclusions: Proton beam therapy with pencil beam scanning and simultaneous integrated boost to the GTV affords excellent early local control with the suggestion of low morbidity. This method deserves consideration as an optimal method for limiting dose to adjacent organs at risk and delivering clinically effective doses to the treatment volume.

Parzen JS, Vayntraub A, Squires B, Almahariq MF, Thompson AB, **Robertson JM**, **Kabolizadeh P** and Quinn TJ (2021). "A population-based analysis of chemoradiation versus radiation alone in the definitive treatment of patients with stage I-II squamous cell carcinoma of the anus." *Journal of Gastrointestinal Oncology* 12(2): 831-844.

[Full Text](#)

Department of Radiation Oncology

Background: The optimal management of patients with stage I-II squamous cell carcinoma (SCC) of the anus is controversial. The current study evaluates the efficacy of combined chemotherapy and radiation therapy (CRT) versus radiation therapy (RT) alone in the treatment of these patients using the Surveillance, Epidemiology, and End Results (SEER) registries. Methods: SEER 18 Custom Data registries were queried for patients with stage I-II SCC of the anus. Univariate analysis (UVA) and multivariable analysis (MVA) using Kaplan-Meier and Cox proportional hazards regression modeling were performed. Propensity-score matched analysis with inverse probability of treatment weighting (IPTW) was used to account for indication bias. Results: A total of 4,288 patients with stage I-II disease were identified, of whom 3,982 (93%) underwent CRT and 306 (7%) underwent RT. Median follow-up was 42 months. Approximately 30.8% had T1 disease and 69.2% had T2-T3 disease. The IPTW-adjusted 5-year overall survival (OS) was 76.7%, with no significant differences between the CRT and RT groups (77% vs. 73.5%, P=0.33). On multivariate IPTW-adjusted analysis, the lack of association between CRT use and OS was upheld (HR, 0.84, 95% CI, 0.65-1.08, P=0.2). On

subgroup analyses, 5-year OS was 86% with CRT (n=1,216) and 84.2% with RT (n=103) (P=0.74) in stage I (T1N0) patients, while 5-year OS was 72.8% with CRT (n=2,766) and 66.4% with RT (n=203) (P=0.13) in stage II (T2-3N0) patients. CRT was associated with improved median OS in stage II patients (119 months vs. not reached, P=0.04). Conclusions: The current study suggests that omission of concurrent chemotherapy is not associated with inferior OS in patients with stage I SCC of the anus. However, combined chemoradiation was superior to radiation alone in patients with stage II disease. Prospective evidence is needed to optimize clinical decision-making in this patient population.

Patel SN, Starr MR, Obeid A, Ryan EH, Ryan C, Forbes NJ, Soares RR, Ammar M, Patel LG, **Capone A, Jr.**, Emerson GG, Joseph DP, Elliott D, Regillo CD, Gupta OP, Hsu J, Yonekawa Y and Primary Retinal Detachment Outcomes Study G (2021). "Characteristics and surgical outcomes of rhegmatogenous retinal detachment in older adults: A multicenter comparative cohort study." *Retina* 41(5): 947-956.

[Full Text](#)

Department of Ophthalmology

Purpose: To describe characteristics and outcomes of primary rhegmatogenous retinal detachment in older adults (age \geq 80). Methods: Consecutive patients with rhegmatogenous retinal detachment undergoing pars plana vitrectomy (PPV), scleral buckling (SB), or PPV/SB in the Primary Retinal Detachment Outcomes Study were evaluated. Outcome measures included single surgery anatomic success and visual acuity. Results: Of 2,144 patients included, 125 (6%) were 80 years or older. Compared with younger patients (age 40-79), older adults were more likely to be pseudophakic (P < 0.001), have macula-off detachments (P < 0.001), and have preoperative proliferative vitreoretinopathy (P = 0.02). In older adults, initial surgery was PPV in 73%, PPV/SB in 27%, and primary SB in 0%. Single surgery anatomic success was 78% in older adults compared with 84% in younger patients (P = 0.03). In older adults, single surgery anatomic success was 74% for PPV and 91% for PPV/SB (P = 0.03). The final mean logMAR was lower for older adults (0.79 [20/125] vs. 0.40 [20/40], [P < 0.001]). In older adults, the final mean logMAR for eyes that underwent PPV was 0.88 (20/160) compared with 0.50 (20/63) for PPV/SB (P = 0.03). Conclusion: Octogenarians and nonagenarians presented with relatively complex pseudophakic rhegmatogenous retinal detachments. Single surgery anatomic success and visual outcomes were worse compared with younger patients, and PPV/SB had better outcomes compared with PPV alone.

Peterson EL, **Chittick PJ** and Richardson CL (2021). "Decreasing voriconazole requirement in a patient after extracorporeal membrane oxygenation discontinuation: A case report." *Transplant Infectious Diseases* 23(3): e13545.

[Full Text](#)

Department of Internal Medicine

Patients receiving extracorporeal membrane oxygenation (ECMO) may display large decreases in drug concentrations due to increases in volume of distribution and drug binding to ECMO circuits, tubing, oxygenator, and coating materials. We report a case of a critically ill male with a 10-month status post-deceased donor renal transplant and being treated with voriconazole for suspected aspergillosis. Initially, multiple dose increases, up to 11.3 mg/kg/dose, were required while on ECMO therapy to obtain goal voriconazole trough concentrations between 2 and 5.5 mcg/mL. The patient's voriconazole dose requirement subsequently decreased to 7.3 mg/kg/dose after ECMO discontinuation, which represented a 45% reduction in voriconazole dose requirement. Based upon this experience, voriconazole appears to bind to artificial surfaces on ECMO devices. In addition to close monitoring of trough levels, it may be appropriate to empirically reduce the voriconazole dose in patients after ECMO discontinuation.

Piche JD, Muscatelli SR, **Waheed MAA**, Patel RD and Aleem IS (2021). "Robotic navigation system utilization for percutaneous sacroiliac screw placement: Surgical setup and technique." *Journal of Spine Surgery* 7(2): 197-203.

[Full Text](#)

OUIB Medical Student Author

Sacroiliac joint (SIJ) pathology is a common cause of significant pain and disability, and operative treatment consisting of SIJ fusion can be performed in cases where non-operative measures fail to provide sustained relief. Through the years, SIJ fusion has evolved from an open invasive procedure, to more recently, being performed through minimally invasive techniques. Intraoperative navigation systems and robotic guidance are becoming popularized for SIJ fusion, as well as other routine and complex spinal cases. The utility of

navigation and robotics is the enhanced ability of the surgeon to place instrumentation more accurately, with less dissection, blood loss, and overall operative time. We present a technique guide for robotic instrumented SIJ fusion with intraoperative navigation that we have put into practice at our institution and found to be very beneficial to patients for the above reasons. We describe the setup and utilization of these technologies intraoperatively, and provide specific case examples to highlight our technique. The described methods have been found to be effective and reproducible, allowing for minimally invasive SIJ screw placement with high accuracy and safety. We emphasize that utilizing intraoperative navigation and robotics is not meant to substitute for surgeon knowledge of case steps or anatomy, but rather to enhance safety and efficacy. To our knowledge, robotic SIJ fusion has not been previously described in the literature.

Pratt RL (2021). "Hyaluronan and the fascial frontier." *International Journal of Molecular Sciences* 22(13): 6845.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Qadir R, Sculthorpe NF, Todd T and Brown EC (2021). "Effectiveness of resistance training and associated program characteristics in patients at risk for type 2 diabetes: A systematic review and meta-analysis." *Sports Medicine Open* 7(1): 38.

[Full Text](#)

OUWB Medical Student Author

Background: Resistance training (RT) is an effective intervention for glycemic control and cardiometabolic health in individuals with type 2 diabetes (T2D). However, the use of RT in individuals at risk for T2D to prevent or delay the onset of T2D, and RT program characteristics that are most effective are still unknown. The purpose of this review is to determine the effects of RT on cardiometabolic risk factors in those at risk for T2D and to examine RT program characteristics associated with intervention effectiveness. Methods: PubMed, Cochrane, Web of Science, and Embase databases were systematically searched for published controlled trials that compared cardiometabolic outcomes in adults with cardiometabolic risk for those that underwent an RT intervention with those that did not. A systematic review and meta-analysis was conducted to determine the effect of RT on glycosylated hemoglobin (HbA1c), fasting plasma glucose (FPG), body fat percentage (BF%), total cholesterol (TC), high-density lipoprotein (HDL), low-density lipoprotein (LDL), and triglycerides (TG). Additional analyses examined effects of intervention duration and dietary intervention on FPG and TG. Results: Fourteen trials with 668 participants were included. For RT compared to controls, the standardized mean difference (SMD) was -1.064 for HbA1c (95% confidence interval [CI] -1.802 to -0.327; $p=0.005$), -0.99 for FPG (95% CI -1.798 to -0.183; $p=0.016$), -0.933 for TC (95% CI -1.66 to -0.206; $p=0.012$), -0.840 for BF% (95% CI -1.429 to -0.251; $p=0.005$), -0.693 for HDL (95% CI -1.230 to -0.156; $p=0.011$), -1.03 for LDL (95% CI -2.03 to -0.050; $p=0.039$), and -0.705 for TG (95% CI -1.132 to -0.279; $p=0.001$). Conclusions: RT is beneficial for improving glycemic control, BF%, and blood lipids in those at risk for diabetes. The addition of a dietary component did not result in larger reductions in FPG and TG than RT alone.

Quindry JC and **Franklin BA** (2021). "Exercise preconditioning as a cardioprotective phenotype." *American Journal of Cardiology* 148: 8-15.

[Full Text](#)

Department of Internal Medicine

Cardiovascular disease (CVD) is potentiated by risk factors including physical inactivity and remains a leading cause of morbidity and mortality. Although regular physical activity does not reverse atherosclerotic coronary disease, precursory exercise improves clinical outcomes in those experiencing life-threatening CVD events. Exercise preconditioning describes the cardioprotective phenotype whereby even a few exercise bouts confer short-term multifaceted protection against acute myocardial infarction. First described decades ago in animal investigations, cardioprotective mechanisms responsible for exercise preconditioning have been identified through reductionist preclinical studies, including the upregulation of endogenous antioxidant enzymes, improved calcium handling, and enhanced bioenergetic regulation during a supply-demand mismatch. Until recently, translation of this research was only inferred from clinically-directed animal models of exercise involving ischemia-reperfusion injury, and reinforced by the gene products of exercise preconditioning that are common to mammalian species. However, recent clinical investigations confirm that exercise preconditions the human heart. This discovery means that simply the initiation of a

remedial exercise regimen in those with abnormal CVD risk factor profiles will provide immediate cardioprotective benefits and improved clinical outcomes following acute cardiac events. In conclusion, the prophylactic biochemical adaptations to aerobic exercise are complemented by the long-term adaptive benefits of vascular and architectural remodeling in those who adopt a physically active lifestyle.

Rapp A, **Sun M**, Weissman H, **Perez-Cruet MJ** and **Fahim DK** (2021). "Pre-operative patient education does not necessarily reduce length of stay or pain after spinal surgery." Interdisciplinary Neurosurgery: Advanced Techniques and Case Management 24: 101044.

[Full Text](#)

Department of Neurosurgery

OUWB Medical Student Author

Background: Previous research has shown pre-operative education may have a beneficial impact on postoperative recovery for elective surgery including: reduced length of hospital stay, improved post-operative pain management, and improved patient satisfaction. Objective: We conducted a retrospective study to elucidate the impact of pre-operative education on Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) scores, postoperative pain, and length of stay (LOS) following spinal surgery. Methods: A retrospective matched case control study was conducted between patients who participated in pre-operative education (n = 113) and those who did not (n = 116). Univariate analysis through a Two-Samples Independent T-Test was conducted for postoperative pain and LOS. Multivariate analysis for LOS was evaluated using Poisson Generalized Estimating Equation (GEE) Standard Errors regression while pain multivariate analysis was conducted using a linear GEE regression model. HCAHPS univariate and multivariate analyses were also performed. Results: Univariate analysis showed no statistically significant difference with LOS (3.58 days vs. 3.63 days, p = 0.85) and post-operative pain (4.65 vs. 4.59, p = 0.80). Multivariate analysis of HCAHPS metrics revealed patients who attended the preoperative education class reported statistically significant lower "how well your pain was controlled" responses (-36p = 0.024) as well as "staff effort in including the patient in treatment decisions" responses (-37p = 0.046). Conclusions: According to our data preoperative education prior to spinal surgery does not necessarily result in improved pain management, shorter length of stay, or higher patient satisfaction. Prospective research may help determine the proper measures that can improve the likelihood of achieving the intended results.

Rassi A, Todorich B, **Faia LJ**, **Trese M**, **Drenser K** and **Capone A, Jr.** (2021). "Congenital toxoplasmosis associated with tractional retinal detachment." Retinal Cases & Brief Reports 15(3): 243-245.

[Full Text](#)

Department of Ophthalmology

Purpose: We report a case of congenital toxoplasmosis associated with retinal detachment. Methods: A 9-month-old white boy presented a unilateral tractional retina detachment associated with congenital toxoplasmosis retinochoroiditis. Results: The diagnosis is supported by positive IgG (>400) for toxoplasmosis and intracranial calcification on magnetic resonance imaging, along with positive family history of Toxoplasma infection in the mother. Conclusion: Tractional retinal detachment is an infrequent and unconventional presentation of congenital Toxoplasma infection. Inflammatory interference with normal sequence of vitreous development may explain pathogenesis of tractional retinal detachments in the setting of congenital ocular toxoplasmosis.

Ray TN, Lanni DJ, Parkhill MR, **Duong TV**, Pickett SM and Burgess-Proctor AK (2021). "Interpersonal violence victimization among youth entering college: A preliminary analysis examining the differences between LGBTQ and Non-LGBTQ youth." Violence and Gender 8(2): 67-73.

[Request Form](#)

OUWB Medical Student Author

Evidence from the literature suggests that lesbian, gay, bisexual, transgender, and queer (LGBTQ) people are at greater risk of experiencing sexual victimization (SV) and intimate partner physical violence (IPPV) than their heterosexual and cisgender peers. Although there has been a plethora of recent research investigating the victimization experiences among LGBTQ adults, little research has examined victimization among LGBTQ youth. The current study consists of a preliminary analysis that compares the prevalence rates of SV and IPPV between LGBTQ and non-LGBTQ youth entering college. First-year students at a large Midwestern university

were asked to complete an online questionnaire containing comprehensive measures of SV and IPPV. Results suggested that LGBTQ youth (n = 41) experienced higher rates of nearly every type of violent victimization when compared with their non-LGBTQ peers (n = 350). These results support previous research, which suggests LGBTQ people are at increased risk to be sexually and physically victimized. The results also extended the extant literature by utilizing a subsample of LGBTQ youth, among whom there is a particular dearth of research, relative to adults. This research is a step toward understanding the types of victimization experiences encountered by LGBTQ youth and provides descriptive details that may help to inform future research, school policy, and interventions aimed at improving the safety, health, and well-being of the LGBTQ community.

Rehman R, Aoun M, Levitin R, Quinn T and Kabolizadeh P (2021). "Perivascular epithelioid cell tumor of the buttock region." *Cureus* 13(5): e15252.

[Full Text](#)

OUWB Medical Student Author

Department of Radiation Oncology

Perivascular epithelioid cell neoplasms, also known as PEComas, are a group of rare mesenchymal tumors that have a perivascular distribution and have no known counterpart to normal cells. The PEComa grouping includes angiomyolipomas, lymphangiomyomatosis, clear cell (sugar) tumors at extrapulmonary and intrapulmonary sites, clear cell myomelanocytic tumor of the falciiform ligament/ligamentum teres among others. These rare tumors most commonly arise in the uterus. Here, we present an unusual case of malignant PEComa arising in the buttock region.

Rehman R, Saadat SB, Tran DH, Constantinescu S and Qamruzzaman Y (2021). "Recurrent hyperhemolysis syndrome in sickle cell disease." *Cureus* 13(5): 14991.

[Full Text](#)

OUWB Medical Student Author

Sickle cell disease is a disorder of hemoglobin. The abnormal hemoglobin S disrupts blood flow, thereby resulting in acute painful sickle cell crisis. These episodes frequently prompt packed red blood cell transfusions to replace a patient's functional hemoglobin stores. Production of alloantibodies and autoantibodies to these transfusions can result in a rare, but serious, complication known as hyperhemolysis syndrome. Hyperhemolysis syndrome presents several challenges in regard to its acute management and the consequent difficulties in finding future compatible blood products. We report a case of recurrent hyperhemolysis syndrome. Both episodes occurred following orthopedic procedures, and the recurrent episode proved refractory to multiple treatments.

Rehman R, Squires B, Osto M, Quinn T and Kabolizadeh P (2021). "Hidradenocarcinoma of the abdominal wall treated with wide surgical excision and adjuvant radiotherapy." *Cureus* 13(4): e14724.

[Full Text](#)

Department of Radiation Oncology

OUWB Medical Student Author

Hidradenocarcinomas are rare malignant sweat gland tumors that typically arise in the head and neck area. To the best of our knowledge, this is the only reported instance of hidradenocarcinoma of the abdominal wall as well as the first case arising from a region of prior trauma. A 72-year-old female presented with a left abdominal wall lesion, which she had first noticed after an injury to the area. Initially, the lesion remained stable in size, after which it became mildly pruritic, progressive in size, and expressive of a clear, non-odorous discharge. Imaging demonstrated a heterogeneous cystic density. Surgical pathology revealed a malignant dermal adnexal neoplasm composed of pleomorphic polygonal cells and focal intracytoplasmic lumina lined by eosinophilic cuticles, as well as areas of ductal differentiation, apocrine differentiation, and mucinous metaplasia. Surgical excision of the mass was performed, followed by adjuvant external beam radiotherapy (EBRT). The patient had no long-term toxicities or clinical evidence of local disease recurrence as of one year post-surgery and six months post-EBRT. Early diagnosis and treatment are essential to improving outcomes in patients with hidradenocarcinomas. Frequent follow-up is equally important, as these tumors have high recurrence rates.

Rimner A, Wu AJ and **Grills IS** (2021). "What Is the impact of hippocampus avoidance-prophylactic cranial irradiation on neurocognitive preservation?" Journal of Thoracic Oncology 16(5): 722-724.

[Full Text](#)

Department of Radiation Oncology

Roach VA and **Attardi SM** (2021). "Twelve tips for applying Moore's Theory of Transactional Distance to optimize online teaching." Medical Teacher. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Roach VA, Mi M, Mussell J, Van Nuland SE, Lufler RS, DeVeau KM, Dunham SM, Husmann P, Herriott HL, Edwards DN, Doubleday AF, Wilson BM and Wilson AB (2021). "Correlating spatial ability with anatomy assessment performance: A meta-analysis." Anatomical Sciences Education 14(3): 317-329.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Medical Library

Interest in spatial ability has grown over the past few decades following the emergence of correlational evidence associating spatial aptitude with educational performance in the fields of science, technology, engineering, and mathematics. The research field at large and the anatomy education literature on this topic are mixed. In an attempt to generate consensus, a meta-analysis was performed to objectively summarize the effects of spatial ability on anatomy assessment performance across multiple studies and populations. Relevant studies published within the past 50 years (1969–2019) were retrieved from eight databases. Study eligibility screening was followed by a full-text review and data extraction. Use of the Mental Rotations Test (MRT) was required for study inclusion. Out of 2,450 screened records, 15 studies were meta-analyzed. Seventy-three percent of studies (11 of 15) were from the United States and Canada, and the majority (9 of 15) studied professional students. Across 15 studies and 1,245 participants, spatial ability was weakly associated with anatomy performance ($r_{pooled} = 0.240$; CI at 95% = 0.09, 0.38; $P = 0.002$). Performance on spatial and relationship-based assessments (i.e., practical assessments and drawing tasks) was correlated with spatial ability, while performance on assessments utilizing non-spatial multiple-choice items was not correlated with spatial ability. A significant sex difference was also observed, wherein males outperformed females on spatial ability tasks. Given the role of spatial reasoning in learning anatomy, educators are encouraged to consider curriculum delivery modifications and a comprehensive assessment strategy so as not to disadvantage individuals with low spatial ability.

Rosado M, Serena T, **Pui J** and Parmely J (2021). "A case report of a ruptured Meckel's Diverticulum with ectopic gastric and pancreatic tissue with negative computed tomography." International Journal of Surgery Case Reports 83: 105994.

[Full Text](#)

Department of Pathology

Introduction: A Meckel's diverticulum is a rare but known cause of an acute abdomen and can often be confused for acute appendicitis on physical examination. It is caused by an incomplete closure of the omphalomesenteric duct. It is present in 2% of the population and only 2% of those patients are symptomatic. Case Presentation: This is the case of a sixty-four-year-old male presented to the surgical clinic at request of his primary care physician with concern for acute appendicitis. The patient had a CT A/P with IV contrast performed two days prior to his office visit for the same pain which was non-diagnostic. The patient was taken to the operating room and found to have Meckel's Diverticulitis which was managed by laparoscopic hand-assisted small bowel resection and anastomosis. The patient had an uncomplicated postoperative course. Pathology demonstrated ulcerated gastric mucosa and pancreatic tissue. Discussion: Symptomatic Meckel's diverticulum is managed with small bowel resection versus diverticulectomy based on characteristics of the diverticulum. The most common type of ectopic tissue is gastric followed by pancreatic. It is rare to find both types of tissue together. Conclusion: This case describes an unusual case of a rare acute surgical pathology with non-diagnostic imaging and labs. This case also describes an exceedingly rare histopathology of a Meckel's Diverticulum with the presence of both ectopic gastric and pancreatic tissues.

Rosinsky PJ, Yelton MJ, Ankem HK, Meghpara MB, Maldonado DR, Shapira J, **Yelton BR**, Lall AC and Domb BG (2021). "Petrochanteric calcifications in patients with greater trochanteric pain syndrome: Description, prevalence, and correlation with intraoperatively diagnosed hip abductor tendon injuries." *American Journal of Sports Medicine*. ePub Ahead of Print.

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OUWB Medical Student Author

Background: Petrochanteric calcifications can be found in patients with greater trochanteric pain syndrome (GTPS). A systematic description of the types and prevalence of these calcifications has not been undertaken. Furthermore, there is conflicting evidence regarding their association with abductor tendon injuries. Purpose: (1) To describe the various types and prevalence of petrochanteric calcifications in patients presenting for the surgical management of recalcitrant GTPS. (2) To evaluate the association of the various calcifications with intraoperatively diagnosed hip abductor tendon injuries, including tendinosis, partial-thickness tears, and full-thickness tears. Study Design: Cross-sectional study; Level of evidence, 3. Methods: Patients undergoing surgical management for GTPS, in isolation or as an ancillary procedure during hip arthroscopy for femoroacetabular impingement, between April 2008 and February 2020 were included. Of these, 85 procedures were isolated treatment of GTPS and the remaining 628 were ancillary to hip arthroscopy. Radiographs were scrutinized for the presence of petrochanteric calcifications. The hip abductor tendon status was intraoperatively classified as intact, partial-thickness tear, or full-thickness tear. The prevalence and correlation of the various radiographic findings in relation to the intraoperatively classified tendon condition were analyzed via the odds ratio (OR). Results: Surgery was performed on 713 hips with recalcitrant GTPS. No tear was found in 340 hips (47.7%), 289 hips (40.5%) had a partial-thickness tear, and 84 hips (11.8%) had a full-thickness tear. Radiographically, 102 hips (14.3%) demonstrated proximally directed enthesophytes, and 34 (4.8%) had distally directed enthesophytes. In addition, 75 hips (10.5%) had amorphous calcifications, 47 (6.6%) had isolated ossicles, and 110 (15.4%) had surface irregularities. The presence of any calcification was associated with partial-thickness tears (OR, 1.67 [95% CI, 1.21-2.21]; P = .002) and full-thickness tears (OR, 6.40 [95% CI, 3.91-10.47]; P <.001). Distally directed enthesophytes (OR, 10.18 [95% CI, 3.08-33.63]; P <.001) and proximally directed enthesophytes (OR, 8.69 [95% CI, 4.66-16.21]; P <.001) were the findings with the highest OR for the presence of any type of tear. Distally directed enthesophytes were the findings with the highest OR for a full-thickness tear (OR, 15.79 [95% CI, 7.55-33.06]; P <.001). Isolated ossicles were the findings with the highest OR for a partial-thickness tear (OR, 1.73 [95% CI, 0.96-3.13]; P =.070). Conclusion: Petrochanteric calcifications were common radiographic findings in patients with GTPS and can help guide management in these patients. Proximally and distally directed enthesophytes were strong predictors for the presence of a hip abductor tendon tear, and specifically a full-thickness tear, and increasing size of the findings was associated with more severe tendon injuries

Sahebjam S, Forsyth PA, Tran ND, Arrington JA, Macaulay R, Etame AB, Walko CM, Boyle T, Peguero EN, Jaglal M, Mokhtari S, Enderling H, Raghunand N, Gatewood T, Long W, Dzierzeski JL, Evernden B, Robinson T, Wicklund MC, Kim S, Thompson ZJ, Chen DT, **Chinnaiyan P** and Yu HHM (2021). "Hypofractionated stereotactic re-irradiation with pembrolizumab and bevacizumab in patients with recurrent high-grade gliomas: Results from a phase I study." *Neuro-oncology* 23(4): 677-686.

[Request Form](#)

Department of Radiation Oncology

Background: Radiotherapy may synergize with programmed cell death 1 (PD1)/PD1 ligand (PD-L1) blockade. The purpose of this study was to determine the recommended phase II dose, safety/tolerability, and preliminary efficacy of combining pembrolizumab, an anti-PD1 monoclonal antibody, with hypofractionated stereotactic irradiation (HFSRT) and bevacizumab in patients with recurrent high-grade gliomas (HGGs). Methods: Eligible subjects with recurrent glioblastoma or anaplastic astrocytoma were treated with pembrolizumab (100 or 200 mg based on dose level Q3W) concurrently with HFSRT (30 Gy in 5 fractions) and bevacizumab 10 mg/kg Q2W. Results: Thirty-two patients were enrolled (bevacizumab-naive, n = 24; bevacizumab-resistant, n = 8). The most common treatment-related adverse events (TRAEs) were proteinuria (40.6%), fatigue (25%), increased alanine aminotransferase (25%), and hypertension (25%). TRAEs leading to discontinuation occurred in 1 patient who experienced a grade 3 elevation of aspartate aminotransferase. In the bevacizumab-naive cohort, 20 patients (83%) had a complete response or partial response. The median overall survival (OS) and progression-free survival (PFS) were 13.45 months (95% CI: 9.46-18.46) and 7.92

months (95% CI: 6.31-12.45), respectively. In the bevacizumab-resistant cohort, PR was achieved in 5 patients (62%). Median OS was 9.3 months (95% CI: 8.97-18.86) with a median PFS of 6.54 months (95% CI: 5.95-18.86). The majority of patients (n = 20/26; 77%) had tumor-cell/tumor-microenvironment PD-L1 expression <1%. Conclusions: The combination of HFSRT with pembrolizumab and bevacizumab in patients with recurrent HGG is generally safe and well tolerated. These findings merit further investigation of HFSRT with immunotherapy in HGGs.

Said A, Sahlieh A and Sayed L (2021). "A comparative analysis of the efficacy and safety of therapeutic interventions in phlegmasia cerulea dolens." *Phlebology* 36(5): 392-400.

[Request Form](#)

Department of Internal Medicine

Objective: Present an institution's experience in management of phlegmasia cerulea dolens (PCD) with a review of the literature. Methods: Beaumont Health's electronic record database was queried between July 2009 and November 2019 for inpatients with PCD. A comprehensive chart review was performed to verify the accuracy of the diagnosis and extract relevant parameters. Medians and proportions are reported. Results: 22 patients met the criteria for PCD. 59% females. Median age 65 years (interquartile range [IQR] 22). Obesity was present in 45% of patients. 18 patients underwent either a single modality (55.5%) or a multimodality therapeutic approach (44.5%). Limb amputation was required in a third of patients who underwent catheter-directed thrombolysis or percutaneous thrombectomy alone. Death was highest after percutaneous thrombectomy alone (66%) followed by pharmacomechanical catheter-directed thrombolysis alone (50%). Conclusion: Percutaneous interventions have become the mainstay in management of PCD as demonstrated in this large retrospective analysis and supported by literature review.

Salahou A, Rahmon D and Fedorowicz M (2021). "Medical students confront racism and systemic oppression amidst a global pandemic." *Academic Medicine* 96(5): E18.

[Full Text](#)

OUWB Medical Student Author

Schlachter DM-B and Black EH (2021). "Transcanalicular laser-assisted dacryocystorhinostomy," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). *Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery*. Cham: Springer International Publishing. pp: 589-591.

[Full Text](#)

Department of Ophthalmology

Advances in endoscopic and fiberoptic technology have led to the development of innovative, minimally invasive approaches for lacrimal surgery. Lacrimal endoscopy, endocanalicular drilling, trephination, electrocauterization, and endocanalicular laser-assisted dacryocystorhinostomy (ELADCR) are techniques being used to treat nasolacrimal duct obstruction. In the endocanalicular laser-assisted DCR, a laser fiberoptic probe (Fig. 40.1) is inserted in the punctum and advanced along the canaliculus to the nasolacrimal sac. Once in the sac, the laser is used to make the osteotomy between the sac and middle meatus. Advantages of the ELADCR approach include avoidance of an external scar, improved hemostasis, limited intranasal instrumentation and tissue dissection, decreased operative time, and presumably faster recovery. A variety of lasers have been used in this method, including the argon laser, the holmium (HO):YAG laser, the potassium titanyl phosphate (KTP):YAG laser, the neodymium (Nd):YAG laser, the erbium (Er):YAG laser, and more recently, the diode laser. The diode laser, with a 600-micron fiberoptic probe, is a portable, semiconductor contact laser of 810 nm wavelength that achieves efficient tissue dissection and instant vaporization. The laser coagulates blood vessels with minimal damage to adjacent structures, giving surgeons an alternative method for DCR surgery.

Schott JP, **Dixon SR** and **Goldstein JA** (2021). "Disparate impact of severe aortic and mitral regurgitation on left ventricular dilation." *Catheterization and Cardiovascular Interventions* 97(6): 1301-1308.

[Full Text](#)

Department of Internal Medicine

In asymptomatic severe aortic (AR) and mitral regurgitation (MR), left ventricular (LV) dimension criteria were established to guide timing of valve replacement to prevent irreversible LV dysfunction. Given both lesions

are primary LV volume overload "leaks", it might be expected that both lesions would induce similar impact on the LV and result in equivalent dimension criteria for intervention. However, the dimension-based intervention criteria for AR versus MR (developed through natural history studies), differ markedly. The pathophysiological foundations for such discordance have neither been fully elucidated nor emphasized. This case-based treatise compares the two regurgitant lesions with respect to: (a) "total regurgitant circuits"; (b) "driving pressures" resulting in LV volume overload from each respective "leak"; and (c) volume and afterload wall stresses imposed on the LV. Key points The "total circuits" of volume overload differ: The AR circuit includes the LV and systemic vasculature, whereas MR includes the LV ejecting into the left atrium/pulmonary veins and systemic circulation. The "driving pressure" of regurgitation and afterload are high with AR and low with MR. Differing "total circuits" and "driving pressures" impose disparate wall stresses upon the LV. Parallel and serial sarcomere replication occurs in AR, while only serial replication occurs in MR. It therefore follows that for regurgitation of similar severities, AR results in greater LV dilation at the point of irreversible myocardial dysfunction compared to MR. These considerations may explain, at least in part, the disparate dimension criteria employed for valve intervention for severe AR vs MR.

Shah KL, Patel S, **Hanson I, Williamson B, Kutinsky I, Dixon S, Haines DE and Mehta NK** (2021). "Navigating inferior vena cava filters in invasive cardiology procedures: A systematic review." Journal of Cardiovascular Electrophysiology 32(5): 1440-1448.

[Full Text](#)

Department of Internal Medicine

Background: Transfemoral venous access (TFV) is the cornerstone of minimally invasive cardiac procedures. Although the presence of inferior vena cava filters (IVCFs) was considered a relative contraindication to TFV procedures, small experiences have suggested safety. We conducted a systematic review of the available literature on cardiac procedural success of TFV with IVCF in-situ. Methods: Two independent reviewers searched PubMed, EMBASE, SCOPUS, and Google Scholar from inception to October 2020 for studies that reported outcomes in patients with IVCFs undergoing TFV for invasive cardiac procedures. We investigated a primary outcome of acute procedural success and reviewed the pooled data for patient demographics, procedural complications, types of IVCF, IVCF dwell time, and procedural specifics. Results: Out of the 120 studies initially screened, 8 studies were used in the final analysis with a total of 100 patients who underwent 110 procedures. The most common IVCF was the Greenfield Filter (36%), 60% of patients were males and the mean age was 67.8 years. The overall pooled incidence of acute procedural success was 95.45% (95% confidence interval = 89.54-98.1) with no heterogeneity ($I^2 = 0\%$, $p = 1$) and there were no reported filter-related complications. Conclusion: This systematic review is the largest study of its kind to demonstrate the safety and feasibility of TFV access in a variety of cardiac procedures in the presence of IVCF.

Shaheen KW, Topf J and Chaiyasate K (2021). "A few thoughts about Ian Thomas Jackson." Plastic and Reconstructive Surgery 147(5): 1251-1252.

[Full Text](#)

Department of Surgery

Department of Internal Medicine

Sharma J, Joshi R, Al-Hakim MM and Wang AM (2021). "An unusual case of non-traumatic perilymphatic fistula with acute presentation." Clinical Neuroradiology. ePub Ahead of Print.

[Full Text](#)

OUIWB Medical Student Author

Department of Neurology

Department of Diagnostic Radiology and Molecular Imaging

Shepard MJ, Xu ZY, Kearns K, Li C, Chatrath A, Sheehan K, Sheehan D, Faramand A, Niranjana A, Kano H, Gurewitz J, Bernstein K, Liscak R, Guseynova K, **Grills IS**, Parzen JS, Cifarelli CP, Rehman AA, Atik A, Bakhsheshian J, Zada G, Chang E, Giannotta S, Speckter H, Wu SM, Kondziolka D, Golfinos JG, Mathieu D, Lee CC, Warnick RE, Lunsford LD and Sheehan JP (2021). "Stereotactic radiosurgery for atypical (World Health Organization II) and anaplastic (World Health Organization III) meningiomas: Results From a multicenter, international cohort study." Neurosurgery 88(5): 980-988.

[Request Form](#)

Department of Radiation Oncology

Background: Atypical and anaplastic meningiomas have reduced progression-free/overall survival (PFS/OS) compared to benign meningiomas. Stereotactic radiosurgery (SRS) for atypical meningiomas (AMs) and anaplastic meningiomas (malignant meningiomas, MMs) has not been adequately described. Objective: To define clinical/radiographic outcomes for patients undergoing SRS for AM/MMs. Methods: An international, multicenter, retrospective cohort study was performed to define clinical/imaging outcomes for patients receiving SRS for AM/MMs. Tumor progression was assessed with response assessment in neuro-oncology (RANO) criteria. Factors associated with PFS/OS were assessed using Kaplan-Meier analysis and a Cox proportional hazards model. Results: A total of 271 patients received SRS for AMs (n = 233, 85.9%) or MMs (n = 38, 14.0%). Single-fraction SRS was most commonly employed (n = 264, 97.4%) with a mean target dose of 14.8 Gy. SRS was used as adjuvant treatment (n = 85, 31.4%), salvage therapy (n = 182, 67.2%), or primary therapy (1.5%). The 5-yr PFS/OS rate was 33.6% and 77.0%, respectively. Increasing age (hazard ratio (HR) = 1.01, P < .05) and a Ki-67 index > 15% (HR = 1.66, P < .03) negatively correlated with PFS. MMs (HR = 3.21, P < .05), increased age (HR = 1.04, P = .04), and reduced KPS (HR = 0.95, P = .04) were associated with shortened OS. Adjuvant versus salvage SRS did not impact PFS/OS. A shortened interval between surgery and SRS improved PFS for AMs (HR = 0.99, P = .02) on subgroup analysis. Radiation necrosis occurred in 34 (12.5%) patients. Five-year rates of repeat surgery/radiation were 33.8% and 60.4%, respectively. Conclusion: AM/MMs remain challenging tumors to treat. Elevated proliferative indices are associated with tumor recurrence, while MMs have worse survival. SRS can control AM/MMs in the short term, but the 5-yr PFS rates are low, underscoring the need for improved treatment options for these patients.

Sherman SL, Rund JM, **Hinckel BB** and Farr J (2021). "Patellar instability," In Brittberg M and Slynarski K (ed). Lower Extremity Joint Preservation: Techniques for Treating the Hip, Knee, and Ankle. Cham: Springer International Publishing. pp: 231-254.

[Full Text](#)

Department of Orthopaedic Surgery

The evaluation and management of patellofemoral instability is complex and multifactorial. Variability in patient symptoms and the pathology of the underlying bony and soft tissue make it difficult to form precise treatment guidelines and recommendations for individual patients. Risk stratification through recognition of key anatomic and biomechanical factors, functional ability, and patient-specific goals is critical for selection of nonoperative versus operative treatment. This chapter presents a comprehensive approach to the work-up and treatment of patellofemoral instability. Our goal is to integrate anatomy, biomechanics, clinical examination, and imaging studies to guide physicians toward evidence-based recommendations.

Shields RA, Cheng OT and **Wolfe JD** (2021). "Iatrogenic vitreous hemorrhage, subretinal hemorrhage, and branch retinal vein occlusion after YAG laser vitreolysis for symptomatic vitreous floaters." Ophthalmology 128(4): 616.

[Full Text](#)

Department of Ophthalmology

Siddens JD, Kim JM and **Gladstone GJ** (2021). "Acquired ptosis: Classification and evaluation," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery. Cham: Springer International Publishing. pp: 295-306.

[Full Text](#)

Department of Ophthalmology

Blepharoptosis, or ptosis, is a unilateral or bilateral droop of the upper eyelid with the patient's head in the fully upright position and eyes in primary gaze. Patients often seek medical attention because of visual obstruction or cosmetic deformity caused by ptotic lids. Ptosis is often recognized by friends or family but some cases may be seen only by a physician. Ptosis may be an isolated condition, or it may occur from a number of different causes.

Siddens JD, Kim JM and **Gladstone GJ** (2021). "Management of acquired ptosis," In Servat JJ, Black EH, Nesi FA, Gladstone GJ and Calvano CJ (ed). Smith and Nesi's Ophthalmic Plastic and Reconstructive Surgery. Cham: Springer International Publishing. pp: 307-322.

[Full Text](#)

Department of Ophthalmology

Ptosis repair is one of the most challenging problems faced by oculoplastic surgeons. There is no single procedure that will suffice for every case, and there is a considerable difference of opinion as to which procedure is the best. Many different techniques have been discussed and tried, and it appears that the procedure of choice rests with the experience of the surgeon and the needs of the patient. In this chapter, the four most common surgical methods of approaching ptosis—frontalis suspension, levator advancement, the Fasanella-Servat operation, and Müller's muscle-conjunctival resection—are discussed.

Siddiqui M, **Abuelroos D, Qu LH**, Jackson RE and **Berger DA** (2021). "Emergency department urosepsis and abdominal imaging." *Cureus* 13(4): e14752.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Department of Emergency Medicine

OUWB Medical Student Author

Introduction: Insufficient attention has been directed towards urosepsis. Notably, no protocols or clinical decision rules currently exist outlining the appropriate use of imaging in uroseptic patients. The primary objective of our study was to retrospectively evaluate uroseptic emergency department (ED) patients who underwent abdominal imaging, to report the proportion of patients with imaging findings necessitating emergent surgical consultation. Methods: We retrospectively identified 1142 patients \geq 18 years of age that presented to the ED from January 2009 to December 2012 with ICD9 code indicative of urosepsis. All included patients underwent ED-ordered abdominal computerized tomography (CT) or retroperitoneal ultrasound (US). Imaging and urinalysis (UA) results were categorized. We report proportions with odds ratios and 95% confidence intervals. Results: Of 1142 patients, we excluded 80 for neg UA, 167 for $<$ 2 SIRS (systemic inflammatory response syndrome), 320 for positive blood cultures, and 37 for incomplete data. This yielded 538 patients which the authors reviewed the results of the CT or US to determine the proportion who required emergent surgical consultation and who underwent surgical or interventional procedure. There were 243 (45%) that had CT or US results that necessitated emergency surgical consultation, of those 180 (33%) underwent surgical or interventional procedure. Similar rates of emergency surgical consultation occurred when sub-divided by positive versus equivocal UA, with 43% and 47%, respectively. Conclusions: Forty-five percent of our abdominally imaged urosepsis cohort had imaging findings that necessitated emergent surgical consultation, with a similar proportion in the subset with positive versus equivocal UA. The utility of abdominal imaging in this population should be studied prospectively.

Sivandzade F, Alqahtani F and **Cucullo L** (2021). "Impact of chronic smoking on traumatic brain microvascular injury: An in vitro study." *Journal of Cellular and Molecular Medicine*. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Traumatic brain injury (TBI) is a major reason of cerebrovascular and neurological damage. Premorbid conditions such as tobacco smoking (TS) can worsen post-TBI injuries by promoting vascular endothelial impairments. Indeed, TS-induced oxidative stress (OS) and inflammation can hamper the blood-brain barrier (BBB) endothelium. This study evaluated the subsequence of chronic TS exposure on BBB endothelial cells in an established in vitro model of traumatic cell injury. Experiments were conducted on confluent TS-exposed mouse brain microvascular endothelial cells (mBMEC-P5) following scratch injury. The expression of BBB integrity-associated tight junction (TJ) proteins was assessed by immunofluorescence imaging (IF), Western blotting (WB) and quantitative RT-PCR. We evaluated reactive oxygen species (ROS) generation, the nuclear factor 2-related (Nrf2) with its downstream effectors and several inflammatory markers. Thrombomodulin expression was used to assess the endothelial haemostatic response to injury and TS exposure. Our results show that TS significantly decreased Nrf2, thrombomodulin and TJ expression in the BBB endothelium injury models while increased OS and inflammation compared to parallel TS-free cultures. These data suggest that chronic TS exposure exacerbates traumatic endothelial injury and abrogates the protective antioxidative cell responses. The downstream effect was a more significant decline of BBB endothelial viability, which could aggravate subsequent neurological impairments.

Smythe MA, Burns C, Liu Q and Garwood CL (2021). "Potential dexamethasone-direct oral anticoagulant drug

interaction: Is this a concern in COVID?" [Annals of Pharmacotherapy](#). ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Objective: To evaluate the literature on a potential dexamethasone-direct oral anticoagulant (DOAC) drug interaction and provide management considerations with COVID hypercoagulability. Data Sources: A search of EMBASE, PubMed, and Google Scholar (January 1990 to May 2021), limited to the English language, using applicable search terms resulted in 137 articles, with 21 relevant articles included. Regulatory agency and clinical guidance documents were also reviewed. Study Selection and Data Extraction: Included articles describe in vitro or in vivo animal or human data for dexamethasone induction of cytochrome P450 (CYP) 3A4 or P-glycoprotein (P-gp). DATA Synthesis: Dexamethasone has the potential to interact with the DOACs via CYP3A4 and/or P-gp induction. Only apixaban and rivaroxaban have CYP3A4 metabolism. Dexamethasone can increase CYP3A4 activity by up to 70% and reduce the area under the concentration-time curve (AUC) of CYP3A4 substrates by >40%, which is consistent with criteria for a weak CYP inducer. In rodents, dexamethasone P-gp induction is associated with AUC reductions of 20% to 50%. Human data are lacking. Relevance to Patient Care and Clinical Practice: Severe COVID-19 infection is associated with hypercoagulability. Although heparins are the preferred anticoagulants for hospitalized COVID-19 patients, DOACs are being utilized. Dexamethasone is recommended for hospitalized COVID-19 patients requiring supplemental oxygen. The concurrent use of dexamethasone and apixaban or rivaroxaban in such patients carries the potential for reduced anticoagulant effect during a state of heightened thrombotic risk. Conclusions: Concurrent use of dexamethasone and apixaban or rivaroxaban in hospitalized COVID-19 patients with laboratory evidence of COVID coagulopathy should be avoided until higher-quality data are available.

Snajdar E, Ajo AR, Rosen K, Miller R, Mohammed S, Gordon C, **Pui JC** and McIntosh G (2021). "Primary malignant melanoma of the urinary bladder." [Cureus](#) 13(3): 14067.

[Full Text](#)

Department of Pathology

There are only 30 reported cases of primary malignant melanoma of the bladder in the literature so far. Of those, 17 cases were reported as deceased within three years of presentation. Our case reported here is that of a 78-year-old female who presented with a new-onset incontinence and intermittent hematuria. She had no evidence of primary melanoma anywhere else in her body. The patient was treated with cystectomy and ileal conduit with plans for adjuvant chemotherapy. Unfortunately, the patient succumbed to her disease with diffuse metastatic involvement within 16 months of presentation.

Sonmez Ince M and **Banka A** (2021). "Syndrome of inappropriate antidiuretic hormone secretion in a patient with pituitary apoplexy." [BMJ Case Reports](#) 14(2): e236787.

[Full Text](#)

Department of Internal Medicine

Pituitary apoplexy (PA) is an endocrine emergency presenting with headache, visual and hormonal disturbances. Syndrome of inappropriate antidiuretic hormone secretion (SIADH) is rare after PA. A 64-year-old woman presented with acute frontal headache and nausea with normal neurological examination. Labs included normal sodium and creatinine. Echo showed new-onset congestive heart failure (CHF) and MRI of the brain revealed PA. She had normal cortisol levels and low thyroid stimulating hormone with normal thyroxine (T 4) levels. During her hospitalisation, patient developed hyponatraemia. Initially, this was attributed to CHF and she was treated with tolvaptan with normalisation of sodium. One week later, she was readmitted with diarrhoea and hyponatraemia. She was euvolaemic on examination indicating compensated CHF. Despite fluid challenge, patient had no improvement of sodium levels. The diagnosis of SIADH was made. Clinicians should suspect SIADH in patients with hyponatraemia in the setting of PA with normal T 4 and cortisol levels.

Spillinger A, Allen M, Karabon P, Hojjat H, Shenouda K, **Hussein IH, Jacob JT**, Svider PF and **Folbe AJ** (2021). "Cost-effectiveness of routine type and screens in select endonasal skull base surgeries." [Journal of Neurological Surgery, Part B: Skull Base](#). ePub Ahead of Print.

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OUWB Medical Student Author
Department of Foundational Medical Studies (OU)
Department of Neurosurgery
Department of Surgery

Objective: The study aimed to evaluate the cost-effectiveness of obtaining preoperative type and screens (T/S) for common endonasal skull base procedures, and determine patient and hospital factors associated with receiving blood transfusions. Study Design: Retrospective database analysis of the 2006 to 2015 National (nationwide) Inpatient Sample and cost-effectiveness analysis. Main Outcome Measures: Multivariate regression analysis was used to identify factors associated with transfusions. A cost-effectiveness analysis was then performed to determine the incremental cost-effectiveness ratio (ICER) of obtaining preoperative T/S to prevent an emergency-release transfusion (ERT), with a willingness-to-pay threshold of \$1,500. Results: A total of 93,105 cases were identified with an overall transfusion rate of 1.89%. On multivariate modeling, statistically significant factors associated with transfusion included nonelective admission (odds ratio [OR]: 2.32; 95% confidence interval [CI]: 1.78-3.02), anemia (OR: 4.42; 95% CI: 3.35-5.83), coagulopathy (OR: 4.72; 95% CI: 2.94-7.57), diabetes (OR: 1.45; 95% CI: 1.14-1.84), liver disease (OR: 2.37; 95% CI: 1.27-4.43), pulmonary circulation disorders (OR: 3.28; 95% CI: 1.71-6.29), and metastatic cancer (OR: 5.85; 95% CI: 2.63-13.0; $p < 0.01$ for all). The ICER of preoperative T/S was \$3,576 per ERT prevented. One-way sensitivity analysis demonstrated that the risk of transfusion should exceed 4.12% to justify preoperative T/S. Conclusion: Routine preoperative T/S does not represent a cost-effective practice for these surgeries using nationally representative data. A selective T/S policy for high-risk patients may reduce costs.

Starr MR, Obeid A, Ryan EH, Ryan C, Ammar M, Patel LG, Forbes NJ, **Capone A, Jr.**, Emerson GG, Joseph DP, Elliott D, Gupta OP, Regillo CD, Hsu J, Yonekawa Y and Primary Retinal Detachment Outcomes Study G (2021). "Retinal detachment with inferior retinal breaks: Primary vitrectomy versus vitrectomy with scleral buckle " *Retina* 41(3): 525-530.

[Full Text](#)

Department of Ophthalmology

Introduction: Rhegmatogenous retinal detachments with inferior retinal breaks are believed to have a higher risk of recurrent rhegmatogenous retinal detachment. This study compared anatomic and visual outcomes between primary pars plana vitrectomy (PPV) and combination PPV with scleral buckle (PPV/SB) for rhegmatogenous retinal detachments with inferior retinal breaks. Methods: This is an analysis of the Primary Retinal Detachment Outcomes study, a multi-institutional cohort study of consecutive primary rhegmatogenous retinal detachment surgeries from January 1, 2015, through December 31, 2015. The primary outcome was single-surgery success rate. Only eyes with inferior retinal breaks (one break in the detached retina between five and seven o'clock) were included. Results: There were 238 eyes that met the inclusion criteria, 95 (40%) of which underwent primary PPV and 163 (60%) that underwent combined PPV/SB. The single-surgery success rate was 76.8% for PPV and 87.4% for PPV/SB ($P = 0.0355$). This remained significant on multivariate analysis ($P = 0.01$). Subgroup analysis showed that a superior single-surgery success rate of PPV/SB was especially noted in phakic eyes (85.2% vs. 68.6%; $P = 0.0464$). Conclusion: Retinal detachment with inferior retinal breaks had a higher single-surgery success rate if treated with PPV/SB compared with PPV alone, particularly in phakic eyes.

Stewart MT, **Haines DE**, Miklavčič D, Kos B, Kirchhof N, Barka N, Mattison L, Martien M, Onal B, Howard B and Verma A (2021). "Safety and chronic lesion characterization of pulsed field ablation in a porcine model." *Journal of Cardiovascular Electrophysiology* 32(4): 958-969.

[Full Text](#)

Department of Internal Medicine

Background: Pulsed field ablation (PFA) has been identified as an alternative to thermal-based ablation systems for treatment of atrial fibrillation patients. The objective of this Good Laboratory Practice (GLP) study was to characterize the chronic effects and safety of overlapping lesions created by a PFA system at intracardiac locations in a porcine model. Methods: A circular catheter with nine gold electrodes was used for overlapping low- or high-dose PFA deliveries in the superior vena cava (SVC), right atrial appendage (RAA), and right superior pulmonary vein (RSPV) in six pigs. Electrical isolation was evaluated acutely and chronic lesions were assessed via necropsy and histopathology after 4-week survival. Acute and chronic

safety data were recorded peri- and post-procedurally. Results: No animal experienced ventricular arrhythmia during PFA delivery, and there was no evidence of periprocedural PFA-related adverse events. Lesions created in all anatomies resulted in electrical isolation postprocedure. Lesions were circumferential, contiguous, and transmural, with all converting into consistent lines of chronic replacement fibrosis, regardless of trabeculated or smooth endocardial surface structure. Ablations were non-thermally generated with only minimal post-delivery temperature rises recorded at the electrodes. There was no evidence of extracardiac damage, stenosis, aneurysms, endocardial disruption, or thrombus. Conclusion: PFA deliveries to the SVC, RAA, and RSPV resulted in complete circumferential replacement fibrosis at 4-week postablation with an excellent chronic myocardial and collateral tissue safety profile. This GLP study evaluated the safety and efficacy of a dosage range in preparation for a clinical trial and characterized the non-thermal nature of PFA. Periodicals LLC

Tantisattamo E and Maggiore U (2021). "Returning to dialysis after kidney allograft loss: Conflicting survival benefit beyond transplant-naïve maintenance dialysis patients." *Journal of Nephrology*. ePub Ahead of Print.

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Department of Internal Medicine

Tantisattamo E, Polpichai N, Eguchi N, Leelaviwat N, Udomkittivorakul N, Seo H, Songtanin B, Lopimpisuth C, Saowapa S and Vutthikraivit P (2021). "Pre-transplant obesity and post-transplant hypertension: Time-dependent effect of kidney transplantation." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Internal Medicine

Background: and Aims Obesity is associated with poor clinical outcomes including cardiovascular (CV) diseases, but it becomes protective for mortality in end-stage kidney disease population as the so-called reverse epidemiology. After successful kidney transplant (KT), association between obesity and transplant outcomes is conflicting. Hypertension (HTN) is one of the leading causes of CV morbidities and mortality in kidney transplant recipients (KTR). We aim to examine this association between pre-KT obesity and post-KT HTN over several post-KT periods. Method: This is a single center retrospective cohort including KTR who received KT between 2012 and 2015. The study population were divided into 3 groups: normal weight, overweight, and obesity based on pre-KT body mass index (BMI) of <25, 25 - <30, and ≥ 30 kg/m², respectively. Association of the BMI categories with post-KT systolic and diastolic HTN defined as SBP ≥ 130 and DBP ≥ 80 mmHg, respectively was examined by multivariable Cox proportional hazard regression analysis with a time-dependent effect at 4, 12, 24, 36, and 48 weeks post-KT. Results: Of 105 patients, mean age \pm SD was 54 \pm 12 and 61% was female. Patients with normal weight, overweight, and obesity were account for 32%, 31%, and 36%, respectively and their corresponding mean BMI were 21.44 \pm 2.37, 27.32 \pm 1.38, and 34.27 \pm 3.53 kg/m². There was no statistically significant difference in the risk of developing SHTN and DHTN at 4, 12, 24, and 36 weeks post-KT. However, at 48-week post-KT, only obese, but not overweight had significant higher the risk for SHTN (HRobese 2.29, p 0.017, 95% CI 1.160, 4.51; HROverweight 1.24, p 0.571, 95% CI 0.60, 2.56) after adjusted for age, gender, type of KT, and immunosuppression. For obesity-DHTN association, both obese and overweight groups had 308% and 154% significantly greater risk for DHTN in multivariable analysis, respectively (HRobese 4.08, p 0.002, 95% CI 1.66, 10.00 and HROverweight 2.54, p 0.046, 95% CI 1.02, 6.35). Conclusion: Obesity at the time of KT was associated with increased risk of SHTN at the long-term, but not short-term post-KT; whereas overweight increased risk of both SHTN and DHTN at the long-term-post-KT. Immunologic or non-immunologic during short-term post-KT may contribute to these associations and further studies are required to elucidate the mechanism.

Taranikanti V (2021). "Hyperhomocysteinemia and risk of atherosclerosis, cardiovascular disease and cancer: A concise update," In Waly MI (ed). *Nutritional Management and Metabolic Aspects of Hyperhomocysteinemia*. Cham: Springer International Publishing. pp: 157-165.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Homocysteine is a sulfur-containing amino acid obtained from the metabolism of methionine. Dietary methionine is converted to S-adenosylmethionine and is demethylated to S-adenosylhomocysteine and

homocysteine. Under conditions of protein deficient diet, intracellularly homocysteine is metabolized by one of two pathways: re-methylation and trans-sulfuration where vitamin B12 and folic acid participate as cofactors respectively. In the folate cycle, the enzyme methionine synthase and vitamin B12 as well as the enzyme 5,10-methylenetetrahydrofolate reductase are required. Folate enters the re-methylation cycle and is converted to 5-methyltetrahydrofolate, an important methyl donor in the conversion of homocysteine to methionine. Remethylation reactions also occur in the liver in which the enzyme betaine homocysteine methyltransferase, transfers a methyl group to homocysteine via the demethylation of betaine to dimethylglycine [1]. Therefore, disruption of S-adenosylmethionine -dependent transmethylation reactions leads to high concentrations of homocysteine in the blood and has been associated with deleterious effects. The normal level of homocysteine ranges between 5–15 μM , however in diseased conditions it can range from 50 μM in mild cases to 500 μM in severe cases [2]. The etiology of cancer is multifactorial. Studies have established a close association between cancer and hyperhomocystinemia [3]. Genetic & environmental factors play an important role in its pathogenesis. High levels of homocysteine are found in epigenetic regulation of DNA silencing and posttranslational modification of histones [3]. Specifically, the carcinogenic potential of hyper homocystinemia is dependent on the detoxification pathways in homocysteine metabolism, venous thromboembolism, deficiency of folate and/or polymorphisms. In this chapter, the role of homocysteine on atherosclerosis, cardiovascular disease and cancer is discussed.

Taranikanti V, Faraj M and France J (2021). "Anatomy of corona mortis: A high risk yet rare lesson for medical students." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: Knowledge of retro-pubic pelvic vascular anatomy and in particular the "Corona Mortis" (CMOR) is important to prevent vascular catastrophes during surgery. It is not very uncommon to find CMOR in routine dissections and during surgeries. However, it being a harbinger of a surgical disaster is not known to many medical students. CMOR also known as "crown of death" is the space posterior to the superior ramus of the pubis where there is anastomosis between the external iliac, inferior epigastric and aberrant obturator vessels. Anomalous obturator vessels in the retro-pubic region are at risk of getting accidentally injured during groin or pelvic surgeries. Injury to these vessels can result in significant hemorrhage which may pose difficulty in achieving hemostasis. Hence, anatomical knowledge of these variations are important for surgeons and interventional radiologists. The aim is to increase the awareness of this important anatomical vascular landmark to medical students and highlight its clinical implications during surgical and radiological procedures. Materials and Methods: Among 38 hemisected pelvises dissected between years 2018-2020, the origin and course of the obturator artery as traced for anatomic variations. Anatomical illustrations of the retro-pubic area were created and digital subtraction angiography images were obtained to supplement the findings and further implicate the clinical importance of this region. Results: We found aberrant obturator arteries in 8 pelvises (21.05 %). In 4 hemi-pelvises (9.5 %), the obturator artery originated from the inferior epigastric artery. The Computed Tomography (CT) and Digital Subtraction Angiography (DSA) images show the aberrant obturator artery arising from the inferior epigastric artery. Such obturator arteries are especially prone to injury during laparoscopic herniorrhaphy during dissection of the Bogros' space and mesh stapling onto Cooper's ligament. Once cut, the obturator artery retracts into the retro-pubic space and results in hemorrhage that is difficult to control. In certain pelvic fractures with uncontrolled bleeding and hemodynamic instability, angio-embolization is the preferred modality of treatment. Knowledge of the aberrant obturator artery is essential for interventional radiologists in order to accurately identify and embolize the source of the bleeding. Conclusion: Given the wide-scope clinical significance that CMOR exhibits across medical specialties, knowledge regarding this vascular anatomic variation of the obturator artery is a crucial teaching topic for medical students as well as clinicians who will likely be exposed to such cases during clinical rotations and residency

Taranikanti V and Schimmel N (2021). "Viewing Inguinal anatomy through a different lens: Its relevance in an integrated curriculum." *The FASEB Journal* 35(S1).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Introduction: Across the USA, clinical integration early on in the preclinical years of medical school is

becoming the norm. It is not uncommon to see surgeons participating in integrated sessions and introducing the anatomical terms necessary for laparoscopic surgery to first and second year medical students. Anatomical structures imperative to the success of laparoscopic surgery include the myopectineal orifice, iliopubic tract, inferior epigastric vessels, inguinal triangle, umbilical folds, the transversalis fascia, Cooper's Ligament, preperitoneal space Triangle of Pain and Triangle of Doom. However, some of these anatomical structures and terminologies are totally alien to medical students. Studies have shown a very steep learning curve associated with laparoscopic hernia repair, ranging from 50 to 250 cases (Hope and Pfeifer, 2020). Therefore, it is long overdue to reconsider the anatomy taught during the preclinical years of medical school. The aim of this presentation is to address the current anatomical teaching of the inguinal region and consider what additional anatomy could be emphasized in an integrated curriculum. Materials and Methods: We have created illustrations that incorporate pertinent anatomical structures from posterior, medial, superior and anterior views of the inguinal region using online software. Additionally, we have acquired operative surgical images for comparison. Results: By utilizing both traditional anatomical teachings and these illustrations, students will better understand the overall inguinal anatomy and, furthermore, will be able to apply their knowledge during clinical years. Conclusion: With an increased emphasis on clinically integrated curriculum at schools like OUWB, it is necessary to update anatomical teachings with the current surgical trends. While laparoscopic hernia repair need not be taught explicitly, an introduction to the anatomical structures relevant to it could greatly improve the learning curve faced by residents and surgeons alike.

Touriel R, Dunne R, **Swor R** and Kowalenko T (2021). "A pilot study: Emergency medical services–related violence in the out-of-hospital setting in southeast Michigan." *Journal of Emergency Medicine* 60(4): 554-559.

[Full Text](#)

OUWB Medical Student Author

Department of Emergency Medicine

Background: Emergency Medical Services (EMS) personnel in the out-of-hospital setting continue to be at high risk for violence, in spite of continued research on a national scale. Objective: Our aim was to determine the prevalence and type of violence perpetrated against Southeast Michigan EMS personnel, and characteristics of victims in the out-of-hospital setting. Methods: EMS personnel from urban and suburban counties in Southeastern Michigan were surveyed online about their experience with violence, including description and outcomes, while working in the out-of-hospital setting within the previous 6 months. Gift card incentive and recruitment scripts were provided and read to participants. This was a pilot study that was limited to 150 respondents and ran for 3 months. Descriptive statistical analysis was done with an odds ratio, p value, and two-sample independent t-test analysis. Results: There were 137 surveys respondents. Most respondents, 75 of 128 (58.6%) reported being a victim of violence within the previous 6 months. Perpetrators were primarily patients and occasionally family members. Substance abuse or mental health issues were frequently associated with violence. Although not common, women reported violence perpetrated by a coworker more often than men (odds ratio 5.17; 95% confidence interval 1.67–16.0). Only 55 of 117 respondents (47.0%) felt that the training did an adequate job protecting them from violence. Conclusions: More than one-half of responding EMS personnel experienced work-related violence within the previous 6 months in Southeast Michigan. This high rate of violence supports the need for additional research and policies that ensure the safety of EMS providers in this region.

Tran AQ, Zhang-Nunes SX, Cahill K, Alabiad CR, Shriver EM, Ho T, Weinberg DA, Couch SM, **Schlachter DM**, Nguyen J and Wester ST (2021). "Thyroid eye disease with choroidal folds." *Orbit* 40(3): 206-214.

[Request Form](#)

Department of Ophthalmology

Purpose: To determine the clinical course of patients with chorioretinal folds (CRF) in thyroid eye disease (TED). Methods: A multi-center retrospective case series of patients with TED who developed CRF. Results: Ten patients (17 eyes) with CRF related to TED were identified. The mean age of presentation was 59.3 ± 8.3 years old. The majority of patients were male (70%), hyperthyroid (70%), hyperopic (53%), had a history of radioactive iodine (60%), and currently on methimazole treatment (30%). Three patients (3 eyes) had unilateral involvement of CRF with bilateral TED. The average clinical activity score was 3.6 ± 2.1 at the time of presentation. The most commonly enlarged extraocular muscles were medial (76%), inferior (64%),

superior (64%) and lateral rectus (35%). Compressive optic neuropathy was seen in 47% of eyes. Treatment included oral prednisone (70%), orbital decompression (59%), thyroidectomy (20%) and tocilizumab (10%). The CRF did not resolve over a follow up period of 24.7 ± 23.7 months in 70% of eyes. There was no significant difference in average axial length (25.7 ± 4.9 mm) and optic nerve to optic strut distance (37.8 ± 3.9 mm) between patients with CRF and the eight age- and sex-matched TED control patients without CRF ($p = 0.81$ and 0.65 respectively). A univariable and multivariable analysis found an enlarged inferior rectus as a factor in TED patients with persistent CRF. Conclusions: CRF are often an indicator of visually threatening situations and often do not resolve despite treatment of TED.

Tukel MR, Adelman MJ, **Gladstone GJ** and Appleford C (2021). "Nonintestinal type adenocarcinoma of the ethmoid sinus with unusual cribriform histologic pattern." *Ophthalmic Plastic and Reconstructive Surgery* 37(3): E123.

[Full Text](#)

Department of Ophthalmology

Vanood A, Santhakumar S and **Said A** (2021). "Repeat intravenous r-tPA administration four days after initial thrombolytic therapy for recurrent ischemic stroke: A case report and review of literature." *Interdisciplinary Neurosurgery* 23: 100937.

[Full Text](#)

Department of Neurology

Department of Internal Medicine

OUIB Medical Student Author

Stroke is a significant source of morbidity and mortality within the United States. The current standard of care for treatment of acute ischemic stroke is intravenous recombinant tissue-type plasminogen activator (IV r-tPA). However, IV r-tPA is contraindicated within 3 months of a previous stroke due to concern for symptomatic intracerebral hemorrhage (sICH). We describe the case of a 77-year-old female who developed aphasia and right-sided quadrantanopsia and was found to have a calcified embolus in the M3 branch of her left middle cerebral artery. She was given IV r-tPA with subsequent symptom resolution and no MRI evidence of acute or subacute infarct. 4 days after index stroke, she had recurrence of her symptoms, receiving a second dose of IV r-tPA. She improved clinically. Non-contrast CT 24 hours afterwards showed minimal foci of intraparenchymal hemorrhage without midline shift or mass effect. She remained neurologically stable and improved significantly with inpatient rehabilitation.

Vanood A, Sharrak A, Karabon P and **Fahim DK** (2021). "Industry-sponsored research payments in neurosurgery - Analysis of the open payments database from 2014 to 2018." *Neurosurgery* 88(3): E250-E258.

[Request Form](#)

OUIB Medical Student Author

Department of Neurosurgery

Background: The Open Payments Database (OPD) started in 2013 to combat financial conflicts of interest between physicians and medical industry. Objective: To evaluate the first 5 yr of the OPD regarding industry-sponsored research funding (ISRF) in neurosurgery. Methods: The Open Payments Research Payments dataset was examined from 2014 to 2018 for payments where the clinical primary investigator identified their specialty as neurosurgery. Results: Between 2014 and 2018, a \$106.77 million in ISRF was made to 731 neurosurgeons. Fewer than 11% of neurosurgeons received ISRF yearly. The average received \$140 000 in total but the median received \$30,000. This was because the highest paid neurosurgeon received \$3.56 million. A greater proportion ISRF was made to neurosurgeons affiliated with teaching institutions when compared to other specialties (26.74% vs 20.89%, $P = .0021$). The proportion of the total value of ISRF distributed to neurosurgery declined from 0.43% of payments to all specialties in 2014 to 0.37% in 2018 ($P < .001$), but no steady decline was observed from year to year. Conclusion: ISRF to neurosurgeons comprises a small percentage of research payments made to medical research by industry sponsors. Although a greater percentage of payments are made to neurosurgeons in teaching institutions compared to other specialties, the majority is given to neurosurgeons not affiliated with a teaching institution. A significant percentage of ISRF is given to a small percentage of neurosurgeons. There may be opportunities for more neurosurgeons to engage in industry-sponsored research to advance our field as long as full and complete disclosures can always be made.

Vira A and **Hanson I** (2021). "Rapidly progressing purulent pericarditis caused by neisseria meningitides infection." Journal of the American College of Cardiology 77(18): 1954-1954.

[Full Text](#)

Department of Internal Medicine

Vira A, Mustafa S and **Silverman A** (2021). "Acquired gerbode defect and severe aortic regurgitation following surgical aortic valve replacement treated with percutaneous approach." Journal of the American College of Cardiology 77(18): 2375-2375.

[Full Text](#)

Department of Internal Medicine

Warkentin TE, **Smythe MA**, Ali MA, **Aslam N**, Sheppard JAI, Smith JW, Moore JC, Arnold DM and Nazy I (2021). "Serotonin-release assay-positive but platelet factor 4-dependent enzyme-immunoassay negative: HIT or not HIT?" American Journal of Hematology 96(3): 320-329.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Department of Internal Medicine

IgG-specific and polyspecific PF4-dependent enzyme-immunoassays (EIAs) have exceptionally high sensitivity ($\geq 99\%$) for diagnosis of heparin-induced thrombocytopenia (HIT), a drug reaction caused by platelet-activating antibodies detectable by serotonin-release assay (SRA). The IgG-specific EIAs are recommended for screening, as their high sensitivity is accompanied by relatively high specificity vis-à-vis polyspecific EIAs. We investigated the frequency of SRA-positive/EIA-negative (SRA+/EIA-) HIT, prompted by referral to our reference HIT laboratory of serial blood samples from a patient ("index case") with false-negative IgG-specific EIAs. Despite initial clinical suspicion for HIT, repeat negative IgG-specific EIAs prompted heparin resumption, which triggered recurrent thrombocytopenia and near-fatal cardiac arrest, indicating likely post-heparin HIT-associated anaphylactoid reaction. Further investigations revealed a strong-positive SRA, whether performed with heparin alone, PF4 alone, or PF4/heparin, with inhibition by Fc receptor-blocking monoclonal antibody (indicating IgG-mediated platelet activation); however, five different IgG-specific immunoassays yielded primarily negative (or weak-positive) results. To investigate the frequency of SRA+/EIA- HIT, we reviewed the laboratory and clinical features of patients with this serological profile during a 6-year period in which our reference laboratory investigated for HIT using both SRA and IgG-specific EIA. Although ~0.2% of 8546 patients had an SRA+/EIA- profile, further review of 15 such cases indicated clerical/laboratory misclassification or false-positive SRA in all, with no SRA+/EIA- HIT case identified. We conclude that while SRA+/EIA- HIT is possible—as shown by our index case—this clinical picture is exceptionally uncommon. Moreover, the requirement for a positive EIA is a useful quality control maneuver that reduces risk of reporting a false-positive SRA result.

Watchko JF and **Maisels MJ** (2021). "Exchange transfusion in Rh haemolytic disease." Vox Sanguinis. ePub Ahead of Print.

[Full Text](#)

Department of Pediatrics

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. ePub Ahead of Print.

[Full Text](#)

Department of Orthopaedic Surgery

OUIB 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. Level of evidence: Level IV; Case Series.

Yan Y, Basij M, Garg A, Varrey A, **Alhousseini A**, Hsu R, Hernandez-Andrade E, Romero R, Hassan SS and Mehrmohammadi M (2021). "Spectroscopic photoacoustic imaging of cervical tissue composition in excised human samples." *PLoS ONE* 16(3 March): 0247385.

[Full Text](#)

Department of Obstetrics & Gynecology

Objective: Cervical remodeling is an important component in determining the pathway of parturition; therefore, assessing changes in cervical tissue composition may provide information about the cervix's status beyond the measurement of cervical length. Photoacoustic imaging is a non-invasive ultrasound-based technology that captures acoustic signals emitted by tissue components in response to laser pulses. This optical information allows for the determination of the collagen-to-water ratio (CWR). The purpose of this study was to compare the CWR evaluated by using spectroscopic photoacoustic (sPA) imaging in cervical samples obtained from pregnant and non-pregnant women. Methods: This cross-sectional study comprised cervical biopsies obtained at the time of hysterectomy ($n = 8$) and at the scheduled cesarean delivery in pregnant women at term who were not in labor ($n = 8$). The cervical CWR was analyzed using a fiber-optic light-delivery system integrated to an ultrasound probe. The photoacoustic signals were acquired within the range of wavelengths that cover the peak absorption of collagen and water. Differences in the CWR between cervical samples from pregnant and non-pregnant women were analyzed. Hematoxylin and eosin and Sirius Red stains were used to compare the collagen content of cervical samples in these two groups. Results: Eight cervix samples were obtained after hysterectomy, four from women <41 years of age and four from women ≥ 43 years of age; all cervical samples ($n = 8$) from pregnant women were obtained after 37 weeks of gestation at the time of cesarean section. The average CWR in cervical tissue samples from pregnant women was 18.7% (SD 7.5%), while in samples from non-pregnant women, it was 55.0% (SD 20.3%). There was a significantly higher CWR in the non-pregnant group compared to the pregnant group with a p-value <0.001. A subgroup analysis that compared the CWR in cervical samples from pregnant women and non-pregnant women ≤ 41 years of age (mean 46.3%, SD 23.1%) also showed a significantly higher CWR ($p < 0.01$). Lower collagen content in the pregnancy group was confirmed by histological analysis, which revealed the loss of tissue composition, increased water content, and collagen degradation. Conclusion: The proposed bimodal ultrasound and sPA imaging system can provide information on the biochemical composition of cervical tissue in pregnant and non-pregnant women. Photoacoustic imaging showed a higher collagen content in cervical samples from non-pregnant women as compared to those from pregnant women, which matched with the histological analysis. This novel imaging method envisions a new potential for a sensitive diagnostic tool in the evaluation of cervical tissue composition.

Yu JS, Carlton R, Agashivala N, **Hassan T** and Wykoff CC (2021). "Brolucizumab vs aflibercept and ranibizumab for neovascular age-related macular degeneration: A cost-effectiveness analysis." *Journal of Managed Care Specialty*

Pharmacy 27(6): 743-752.

[Full Text](#)

Department of Ophthalmology

Background: Age-related macular degeneration (AMD) is a leading cause of blindness worldwide and is the most common cause of blindness in developed countries. Despite anti-VEGF therapy demonstrating improvements in visual and anatomical outcomes, unmet needs remain. Brolucizumab-dbl (ie, brolucizumab), a VEGF inhibitor for treatment of neovascular (wet) AMD and recently approved by the FDA for its treatment of wet AMD, attempts to mitigate treatment burden through less frequent injections. Objective: To assess the incremental cost-effectiveness of brolucizumab compared with aflibercept and ranibizumab, given similar costs per injection and the potential for longer dosing intervals based on phase 3 clinical trial data. Methods: A Markov model was developed to model the treatment of wet AMD patients with brolucizumab vs aflibercept and vs ranibizumab over a lifetime time horizon (base case) and 5-year time horizon (scenario analysis). The Markov model consisted of 3 primary health states: on treatment, off treatment, and death. Markov substates (5 total) described visual acuity (VA) ranging from no vision impairment to blindness. These VA-based substates were defined by best-corrected visual acuity (BCVA) values measured using Early Treatment Diabetic Retinopathy Study letters. Fixed-dosing regimens for each therapy were included in the model: dosing every 4 weeks (q4w) for the first 3 months followed by dosing q8w/q12w for brolucizumab, dosing q4w for the first 3 months followed by dosing q8w for aflibercept, and q4w for ranibizumab. Results: In the base case, brolucizumab was less costly than aflibercept (\$63,614 vs \$72,189), and brolucizumab generated 0.0079 more quality-adjusted life-years (QALYs) than aflibercept (4.580 vs 4.572). Lower total costs with brolucizumab were driven by reduced drug costs (\$56,432 vs \$64,057), reduced administration costs (\$6,013 vs \$6,825), and reduced monitoring costs (\$1,168 vs \$1,306). When evaluating the cost-effectiveness of brolucizumab over a 5-year time horizon, brolucizumab was less costly than aflibercept (\$44,644 vs \$50,772) and generated an additional 0.0049 QALYs (2.953 vs 2.948). Additionally, brolucizumab was less costly than ranibizumab (\$63,614 vs \$128,163) and generated 0.0078 more QALYs than ranibizumab (4.580 vs 4.572) in the base case. Lower total costs with brolucizumab were driven by reduced drug costs (\$56,432 vs \$114,516), reduced administration costs (\$6,013 vs \$11,541), and reduced monitoring costs (\$1,168 vs \$2,107). When evaluating the cost-effectiveness of brolucizumab over a 5-year time horizon, brolucizumab was less costly than ranibizumab (\$44,644 vs \$89,665), and brolucizumab generated an additional 0.0046 QALYs (2.953 vs 2.948). Conclusions: Brolucizumab can be cost saving and cost-effective compared with aflibercept and ranibizumab in the treatment of wet AMD.

Zimmer M, Gill I, Anusim N and **Gaikazian SS** (2021). "Epstein-Barr virus induced haemophagocytic lymphohistiocytosis." *BMJ Case Reports* 14(5): e241348.

[Full Text](#)

Department of Internal Medicine

Haemophagocytic lymphohistiocytosis (HLH) is a rare condition of uncontrolled immune activation as a result of an inherited genetic defect or in response to malignancy, autoimmune disease, rheumatological disease, AIDS infection or post-transplant immunosuppression. Described here is the case of a 19-year-old Caucasian man who presented with complaints of worsening fever, new-onset jaundice and lethargy after failing treatment for suspected infectious mononucleosis. Physical examination was significant for fever and splenomegaly while laboratory results revealed transaminitis, cytopenia, indirect hyperbilirubinaemia and elevated ferritin, raising the likelihood of both autoimmune haemolytic anaemia and HLH. He tested positive for Epstein-Barr virus (EBV), and bone marrow biopsy revealed hypercellular marrow with haemophagocytosis and no evidence of malignancy. High dose steroids were initiated with significant improvement in haemoglobin, resulting in a final diagnosis of HLH secondary to acute EBV infection. The patient was discharged on continued high-dose prednisone with planned taper and consideration of outpatient rituximab therapy for 4 weeks. High clinical suspicion and prompt evaluation were critical to early treatment and decreased morbidity.