

**OAKLAND UNIVERSITY WILLIAM BEAUMONT SCHOOL OF MEDICINE
PUBLICATION LIST
October - December 2020**

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Abbas A, Kadri AN, Okuno T, Elmariah S, Pibarot P, Camacho A, Selberg A, Mando R, Al-Azizi K, **Almany S**, Vivacqua A, Ternacle J, Christensen J, Waggoner T, Gheewala N, **Hanzel G**, Shannon F, Khalili H, Mack M and Pilgrim T (2020). "The impact of valvular hemodynamics post-TAVR for native aortic stenosis on 1-year outcomes: A multicenter international retrospective study." Journal of the American College of Cardiology 76(17): B43-B43.

[Full Text](#)

Department of Internal Medicine

Abbas A, Pibarot P, Hahn R, Ternacle J, Bax J, Xu K, Alu M, Rogers E, Mack M, Leon M and Thourani V (2020). "Impact of flow on the incidence and prognosis of prosthesis-patient mismatch following aortic valve replacement in the PARTNER 2 study and registry." Journal of the American College of Cardiology 76(17): B43-B44.

[Full Text](#)

Department of Internal Medicine

Abdel Motaleb AA, Tawfik YM, El-Mokhtar MA, Elkady S, El-Gazzar AF, **EISayed SK** and Awad SM (2020). "Cutaneous JAK expression in vitiligo." Journal of Cutaneous Medicine and Surgery: 1203475420972340.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Background: The Janus kinase-signal transducer and activator of transcription signaling pathway has been suggested as a promising therapeutic target in vitiligo. However, limited data is available on the cutaneous expression of JAK in vitiligo. AIM: This study is designed to analyze the cutaneous expression patterns of JAK1, 2, and 3 in vitiligo and investigate their relation to the disease clinical parameters. Methods: This case-control study recruited 24 patients having active vitiligo and 20 age, sex, and skin type-matched healthy volunteers. Skin biopsies were obtained from patients (lesional, perilesional and nonlesional) and controls for assessment of JAK1, 2, and 3 expression using RT-PCR. Results: JAK1 and JAK3 were overexpressed in patients' skin compared to control skin and showed a stepwise pattern of upregulation from control to nonlesional, perilesional and lesional skin. However, JAK3 showed much stronger expression. In contrast JAK2 expression showed no significant difference in any of lesional, perilesional or nonlesional skin compared to control skin. JAK1 and JAK3 expression levels showed no correlation with neither the disease activity nor severity. Conclusion: JAK1 and more prominently JAK3 are upregulated in vitiliginous skin and possibly contribute to the pathogenesis of the disease. Accordingly, selective JAK3/1 inhibition may provide a favorable therapeutic opportunity for vitiligo patients.

Al'Aref SJ, Singh G, Choi JW, Xu ZR, Maliakal G, van Rosendaal AR, Lee BC, Fatima Z, Andreini D, Bax JJ,

Cademartiri F, **Chinnaiyan K**, Chow BJW, Conte E, Cury RC, Feuchtner G, Hadamitzky M, Kim YJ, Lee SE, Leipsic JA, Maffei E, Marques H, Plank F, Pontone G, **Raff GL**, Villines TC, Weirich HG, Cho I, Danad I, Han D, Heo R, Lee JH, Rizvi A, Stuijzand WJ, Gransar H, Lu Y, Sung JM, Park HB, Berman DS, Budoff MJ, Samady H, Stone PH, Virmani R, Narula J, Chang HJ, Lin FY, Baskaran L, Shaw LJ and Min JK (2020). "A boosted ensemble algorithm for determination of plaque stability in high-risk patients on coronary CTA." JACC: Cardiovascular Imaging 13(10): 2162-2173.

[Request Form](#)

Department of Internal Medicine

Objectives: This study sought to identify culprit lesion (CL) precursors among acute coronary syndrome (ACS) patients based on qualitative and quantitative computed tomography-based plaque characteristics. Background: Coronary computed tomography angiography (CTA) has been validated for patient-level prediction of ACS. However, the applicability of coronary CTA to CL assessment is not known. Methods: Utilizing the ICONIC (Incident COroNary Syndromes Identified by Computed Tomography) study, a nested case-control study of 468 patients with baseline coronary CTA, the study included ACS patients with invasive coronary angiography-adjudicated CLs that could be aligned to CL precursors on baseline coronary CTA. Separate blinded core laboratories adjudicated CLs and performed atherosclerotic plaque evaluation. Thereafter, the study used a boosted ensemble algorithm (XGBoost) to develop a predictive model of CLs. Data were randomly split into a training set (80%) and a test set (20%). The area under the receiver-operating characteristic curve of this model was compared with that of diameter stenosis (model 1), high-risk plaque features (model 2), and lesion-level features of CL precursors from the ICONIC study (model 3). Thereafter, the machine learning (ML) model was applied to 234 non-ACS patients with 864 lesions to determine model performance for CL exclusion. Results: CL precursors were identified by both coronary angiography and baseline coronary CTA in 124 of 234 (53.0%) patients, with a total of 582 lesions (containing 124 CLs) included in the analysis. The ML model demonstrated significantly higher area under the receiver-operating characteristic curve for discriminating CL precursors (0.774; 95% confidence interval [CI]: 0.758 to 0.790) compared with model 1 (0.599; 95% CI: 0.599 to 0.599; $p < 0.01$), model 2 (0.532; 95% CI: 0.501 to 0.563; $p < 0.01$), and model 3 (0.672; 95% CI: 0.662 to 0.682; $p < 0.01$). When applied to the non-ACS cohort, the ML model had a specificity of 89.3% for excluding CLs. Conclusions: In a high-risk cohort, a boosted ensemble algorithm can be used to predict CL from non-CL precursors on coronary CTA. (c) 2020 by the American College of Cardiology Foundation.

Almahariq MF, **Chen PY**, Dekhne N and **Dilworth JT** (2020). "ASO author reflections: Omission of axillary lymph node dissection for breast cancer patients with residual N1 nodal disease following neoadjuvant chemotherapy: Not ready for primetime?" Annals of Surgical Oncology 27(Suppl 3): 869-870.

[Full Text](#)

Department of Radiation Oncology

Almahariq MF, Levitin R, Quinn TJ, **Jawad MS**, **Chen PY**, **Gustafson GS** and **Dilworth JT** (2020). "Omission of an axillary lymph node dissection is associated with inferior survival in patients with residual nodal disease following neoadjuvant chemotherapy." International Journal of Radiation Oncology Biology Physics 108(3): S152-S153.

[Full Text](#)

Department of Radiation Oncology

Almahariq MF, Quinn TJ, Kesarwani P, Kant S, Miller CR and **Chinnaiyan P** (2020). "Inhibition of colony-stimulating factor-1 receptor enhances the efficacy of radiotherapy and reduces immune suppression in glioblastoma." International Journal of Radiation Oncology Biology Physics 108(3): E569-E570.

[Full Text](#)

Department of Radiation Oncology

Anastasius M, Maggiore P, Huang A, Blanke P, Patel MR, Nørgaard BL, Fairbairn TA, Nieman K, Akasaka T, Berman DS, **Raff GL**, Hurwitz Koweek LM, Pontone G, Kawasaki T, Rønnow Sand NP, Jensen JM, Amano T, Poon M, Øvrehus KA, Sonck J, Rabbat MG, Mullen S, De Bruyne B, Rogers C, Matsuo H, Bax JJ and Leipsic J (2020). "The clinical utility of FFR(CT) stratified by age." Journal of Cardiovascular Computed Tomography. ePub Ahead of Print.

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Department of Internal Medicine

Background: CT coronary angiography (CTA) with Fractional Flow Reserve as determined by CT (FFR(CT)) is a safe alternative to invasive coronary angiography. A negative FFR(CT) has been shown to have low cardiac event rates compared to those with a positive FFR(CT). However, the clinical utility of FFR(CT) according to age is not known. Methods: Patients' in the ADVANCE (Assessing Diagnostic Value of Non-invasive FFRCT in Coronary Care) registry, were stratified into those ≥ 65 or < 65 years of age. The impact of FFR(CT) on clinical decision-making, as assessed by patient age, was determined by evaluating patient management using CTA results alone, followed by site investigators submitting a report on the treatment

plan based upon the newly provided FFR(CT) data. Outcomes at 1-year post CTA were assessed, including major adverse cardiovascular events (myocardial infarction, all-cause mortality or unplanned hospitalization for ACS leading to revascularisation) and total revascularisation. Positive FFR(CT) was deemed to be ≤ 0.8 . Results: FFR(CT) was calculated in 1849 (40.6%) subjects aged <65 and 2704 (59.4%) ≥ 65 years of age. Subjects ≥ 65 years were more likely to have anatomic obstructive disease on CTA ($\geq 50\%$ stenosis), compared to those aged <65 (69.7% and 73.2% respectively, $p = 0.008$). There was a similar graded increase in recommended and actual revascularisation with either CABG or PCI, with declining FFR(CT) strata for subjects above and below the age of 65. MACE and revascularisation rates were not significantly different for those \geq or <65 , regardless of FFR(CT) positivity or stenosis severity $<50\%$ or $\geq 50\%$. With a negative FFR(CT) result, and anatomical stenosis $\geq 50\%$, those \geq and <65 years of age, had similar rates of MACE (0.2% for both, $p = 0.1$) and revascularisation (8.7% and 10.4% respectively $p = 0.4$). Logistic regression analysis, with age as a continuous variable, and adjustment for Diamond Forrester Risk, baseline FFR(CT) and treatment (CABG, PCI, medical therapy), indicated a statistically significant, but small increase in the odds of a MACE event with increasing age (OR 1.04, 95% CI 1.006-1.08, $p = 0.02$). Amongst patients with a FFR(CT) > 0.80 , there was no effect of age on the odds of revascularisation. Conclusion: The findings of this study point to a low risk of MACE events or need for revascularisation in those aged \geq or <65 with a FFR(CT) >0.80 , despite the higher incidence of anatomic obstructive CAD in those ≥ 65 years. The findings show the clinical usefulness and outcomes of FFR(CT) are largely constant regardless of age.

Angus A, DeMare A and Iacco A (2020). "Evaluating outcomes for robotic-assisted inguinal hernia repair in males with prior urologic surgery: A propensity-matched analysis from a national database." *Surgical Endoscopy*. ePub Ahead of Print.

[Full Text](#)

*OUWB Medical Student Author
Department of Surgery*

Background: Controversy exists regarding the safety and effectiveness of minimally invasive inguinal hernia repairs in patients with a history of prior urologic pelvic operations (PUPO), such as a prostatectomy, which causes scarring and disruption of the retropubic tissue planes. Our study sought to examine whether a history of PUPO impacts surgical outcomes in males undergoing robotic-assisted inguinal hernia repair. Methods: The Americas Hernia Society Quality Collaborative (AHSQC) database was queried to identify male patients who underwent a robotic inguinal hernia repair with 30-day follow-up. A sub-query was performed to identify subjects within the cohort with a documented history of PUPO. Propensity score matching was subsequently utilized to evaluate for differences in intra-operative complications and short-term post-operative outcomes. Results: In total, 1664 male patients underwent robotic-assisted inguinal hernia repair, of whom 65 (3.9%) had a PUPO. After a 3:1 propensity score matching with hernia repair patients who did not have prior procedures, 195 (11.7%) males were included in the comparison cohort. There were no documented vascular, bladder, or spermatic cord injuries in either group. There was no difference in 30-day readmission rate (5% vs. 3%, respectively, $p = 0.41$). No hernia recurrences were recorded within the 30-day follow-up period in either group. There was no statistical difference in post-operative complications (including seroma formation, hematoma, and surgical site occurrences) between the two groups (14% vs. 8%, $p = 0.18$). Conclusions: In an experienced surgeon's hands, robotic-assisted minimally invasive inguinal hernia repair may be an alternative to open repair in patients with PUPO who were previously thought to be poor minimally invasive surgical candidates.

Anusim N, Antonios B, Gupta R, Jindal V, Khoury J and **Jaiyesimi I (2020).** "A population-based analysis of outcomes in patients with Enteropathy-Associated T-cell Lymphoma (EATL)." *American Journal of Hematology* 95: S3-S3.

[Full Text](#)

Department of Internal Medicine

Arden JD, Badanjek R, Hanna A, Wilson TG and **Wilson GD (2020).** "Correlation of prognostic biomarkers, CD44 and EGFR, with measures of cellular kinetics in p16 negative head and neck squamous cell carcinomas." *International Journal of Radiation Oncology Biology Physics* 108(3): E502-E502.

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Department of Radiation Oncology

Arden JD, **Gruner MF**, Vu CC, Marvin K, Ye H, **Nandalur SR**, **Al-Wahab Z**, Gadzinski J, Rakowski JA, **Field J**, **Rosen B** and **Jawad MS (2020).** "Outcomes after salvage radiation therapy for recurrent endometrial cancer in patients with no prior adjuvant therapy: An institutional review." *Advances in Radiation Oncology* 5(6): 1240-1247.

[Full Text](#)

*Department of Radiation Oncology
Department of Obstetrics & Gynecology*

OUWB Medical Student Author

Purpose: After definitive surgery, women with early-stage, low-risk endometrial cancer are observed. However, some will require salvage radiation therapy for recurrence. The purpose of this study was to evaluate our experience using salvage radiation for recurrent endometrial cancer in patients who did not receive upfront adjuvant therapy. Methods and Materials: Twenty-eight women with endometrial cancer who had undergone initial definitive hysterectomy without adjuvant therapy developed isolated local or regional recurrence and were treated with salvage radiation in our department from 2004 to 2018. Salvage radiation included whole pelvic radiation, vaginal brachytherapy, or both. Patient and tumor characteristics, treatment details, and toxicities were recorded and analyzed. Results: The median time to first recurrence was 1.7 years. First recurrences consisted of local recurrence in 23 patients, regional recurrence in 4, and both in 1. The median times from hysterectomy to first recurrence, local and regional, were 1.2 and 4.0 years, respectively. All patients underwent salvage radiation for management of their first recurrence. The median total equivalent dose in 2 Gy fractions for this treatment was 67.6 Gy (37.5–81.8 Gy). Two second recurrences occurred following salvage treatment, both local recurrence, at 6.5 and 13.5 months after radiation. The 2-year rates of local control, disease-free survival, and overall survival were 93%, 80%, and 88%, respectively. Treatment was well-tolerated, with low rates of gastrointestinal and genitourinary toxicity. Conclusions: In this group of patients, salvage radiation therapy for local or regional recurrence of endometrial cancer resulted in excellent control with low rates of acute and chronic toxicities.

Arden JD, Marvin K, **Nandalur SR, Al-Wahab Z, Field J**, Gadzinski J, Rakowski JA, **Rosen B** and **Jawad MS** (2020). "Sequencing of adjuvant chemoradiation for advanced stage endometrial cancer: Outcomes and toxicity profiles." *American Journal of Clinical Oncology* 43(11): 755-761.

[Full Text](#)

Department of Radiation Oncology

Department of Obstetrics & Gynecology

Objectives: Radiation is frequently added to chemotherapy for adjuvant treatment of advanced stage endometrial cancer. Multiple adjuvant therapy sequencing options exist, and little data is available to compare these. We compared outcomes and toxicities after "sandwich" chemoradiation (chemotherapy, then radiation, then chemotherapy) and nonsandwich sequences (chemotherapy then radiation, radiation then chemotherapy, or concurrent chemoradiation). Materials and Methods: We recorded baseline characteristics, adjuvant treatment details, clinical outcomes, and toxicities for stage III to IVA patients who underwent surgical staging followed by both adjuvant chemotherapy and radiation therapy at our institution. Effects of adjuvant treatment order (sandwich or nonsandwich) on these outcomes were analyzed. Toxicities were graded according to CTCAE v4.0. Results: We identified 107 patients with a median follow-up of 3.2 years. Five-year local, regional, and distant recurrence were 7%, 15%, and 33%; disease-free and overall survival were 61% and 68%, respectively. Outcomes did not differ by sequence group. The overall rate of acute toxicity did not differ by sequence group. The overall rate of chronic toxicity was significantly lower for sandwich patients ($P < 0.001$), as were overall rates of chronic genitourinary ($P = 0.048$) and gynecologic ($P < 0.001$) toxicities. There were no grade 4 or 5 acute or chronic toxicities. Conclusions: Advanced stage endometrial cancer is an aggressive disease and adjuvant chemotherapy and radiation therapy are indicated. Clinical outcomes were similar amongst the different sequences; however, sandwich therapy led to less chronic toxicity, offering an opportunity for improved quality of life in survivorship.

Arden JD, Marvin K, Ye H, Juratli L, **Nandalur SR, Al-Wahab Z, Field J**, Gadzinski J, Rakowski JA, **Rosen B** and **Jawad MS** (2020). "Combined adjuvant chemotherapy and radiation therapy improves disease-free survival for uterine serous cancer." *Advances in Radiation Oncology* 5(6): 1232-1239.

[Full Text](#)

Department of Radiation Oncology

Department of Obstetrics and Gynecology

Purpose: Uterine serous carcinoma (USC) is a rare but aggressive endometrial cancer histology. We reviewed outcomes for patients with USC to identify the best adjuvant treatment strategy. Methods and Materials: We retrospectively identified 162 patients with The International Federation of Gynecology and Obstetrics (FIGO) stage I-IVA USC treated at our institution. Baseline characteristics, treatment details, clinical outcomes, and toxicity data were recorded. Results: Median follow-up was 3.4 years (0.3-26 years). A variety of adjuvant therapy strategies were employed: 14% no adjuvant therapy, 28% radiation alone, 15% chemotherapy alone, and 43% combined chemotherapy and radiation. Distant metastasis was the most common type of recurrence (37% at 5 years). For patients with stage I-IVA disease, there were no significant differences in outcomes by treatment type. For patients with stage I-II disease (70% of the cohort), disease-free survival was significantly higher after chemotherapy (alone or with radiation therapy, $P = .005$) and after combined chemotherapy and radiation compared with all other treatments ($P = .025$). Toxicity outcomes were favorable, with minimal grade 3 and no grade 4 or 5 events. Conclusions: Patients with USC experience high rates of recurrence and mortality. Distant metastasis is the most common pattern

of failure for all stages. For patients with early-stage disease, combined chemotherapy and radiation improves 5-year disease-free survival compared with either single adjuvant treatment alone or no adjuvant treatment. The relatively large group of patients with USC included in this study may account for our ability to detect this improvement whereas clinical trials have failed to do so, possibly owing to the relatively small percentages of patients with USC enrolled. © 2020 The Authors

Arden JD, Quinn TJ, Wilson TG, Hanna A, Baschnagel AM and **Wilson GD** (2020). "CD44 expression is correlated with MTOR expression and p16 status in head and neck squamous cell carcinoma." International Journal of Radiation Oncology Biology Physics 108(3): E505-E505.

[Full Text](#)

Department of Radiation Oncology

Azouz H, **Gerrits P**, **Surhigh J** and Kalladi Puthanpurayil S (2020). "COVID-19 in an infant with congenital adrenal hyperplasia: A case report." Global Pediatric Health 7: 2333794x20958933.

Department of Pediatrics

In the midst of current SARS-CoV-2 pandemic, little is known about the implications of this new virus on patients with underlying chronic comorbidities. Herein, we present a case of a 5-week-old infant with congenital adrenal hyperplasia who acquired SARS-CoV-2 and recovered with minimal medical support.

Baecher-Lind L, Fleming AC, Bhargava R, Cox SM, Everett EN, Graziano SC, Katz NT, **Sims SM**, Morgan HK, Morosky CM, Sonn TS, Sutton JM, Royce CS and Assoc Prof Gynecology O (2020). "Medical education and safety as co-priorities in the Coronavirus Disease 2019 (COVID-19) Era: We can do both." Obstetrics and Gynecology 136(4): 830-834.

[Full Text](#)

Department of Internal Medicine

As hospitals and medical schools confronted coronavirus disease 2019 (COVID-19), medical students were essentially restricted from all clinical work in an effort to prioritize their safety and the safety of others. One downstream effect of this decision was that students were designated as nonessential, in contrast to other members of health care teams. As we acclimate to our new clinical environment and medical students return to the frontlines of health care, we advocate for medical students to be reconsidered as physicians-in-training who bring valuable skills to patient care and to maintain their status as valued team members despite surges in COVID-19 or future pandemics. In addition to the contributions students provide to medical teams, they also serve to benefit from the formative experiences of caring for patients during a pandemic rather than being relegated to the sidelines. In this commentary, we discuss factors that led to students' being excluded from this pandemic despite being required at the bedside during prior U.S. public health crises this past century, and we review educational principles that support maintaining students in clinical environments during this and future pandemics.

Bahado-Singh R, Hassan SS, Szymanska M and Sokol RJ (2020). "Starting a regional collaborative research group for COVID-19 in pregnancy: The Southern Michigan experience." Journal of Perinatal Medicine 48(9): 883-891.

[Full Text](#)

Department of Obstetrics & Gynecology

The outbreak of the SARS-CoV-2 elicited a surge in publications. Obstetric reports were with few exceptions characterized by small sample sizes with potentially limited generalizability. In this review, evidence suggests increased susceptibility to COVID-19 in pregnancy; common pregnancy comorbidities may help explain worse outcomes. While the risk of death is low, pregnancy may be associated with increased need for ventilation. Prematurity rates seem to be increased but may be accounted for in part by higher cesarean rates, to a large degree accounted for by elective decision to shorten the course of the labor. Though fetal/neonatal complication rates may be higher in the presence of COVID-19 infection, survival rates seem unaffected and vertical transmission is rare. As the outbreak continues in the USA with resurgence in many other western countries that achieved initial success in suppressing the virus, much remains to be learned. For example, the question related to the degree to pregnancy modifying symptomatology remains open. Currently, routine polymerase chain reaction testing remains limited by supply shortages possibly delaying diagnosis until later in the course of the disorder and thus altering the symptom complex at presentation. To add to the knowledge base, we initiated a regional COVID-19 in pregnancy collaborative observational study with a coordinating center, standardized data collection and a shared database. This was facilitated by a longstanding tradition of collaboration among regional obstetric services. Over an anticipated two-year study duration, we expect to study 400 documented and suspected COVID-19 pregnancies with time and site of services controls for cohort effect and high power to detect several adverse maternal/infant outcomes. We include a complete listing of variables in our database, which, along with our experience in setting up our regional collaborative, we hope and believe will be of use in other settings.

Bahl A, Van Baalen MN, Ortiz L, Chen N-W, Todd C, Milad M, Yang A, Tang J, Nygren M and Qu L (2020). "Early predictors of in-hospital mortality in patients with COVID-19 in a large American cohort." Internal & Emergency Medicine 15(8): 1485-1499.

[Full Text](#)

Department of Emergency Medicine

Department of Foundational Medical Studies (BH)

OUWB Medical Student Author

Baker N, Chao JN and Pearce ZD (2020). "Progressive eyelid swelling in a middle-aged man." JAMA Ophthalmology ePub Ahead of Print.

[Full Text](#)

Department of Ophthalmology

OUWB Medical Student Author

A man in his 40s presents with a recent history of pain and swelling over his right orbit and upper eyelid, and computed tomography shows a right supraorbital abscess with mass effect. What would you do next?

Barski M, Doberstein M, Hall S, Dudley D, Howard K, Tyburski L, Lenards ND, Hunzeker A, Olson A, Drake D, Chen PY, Gustafson GS, Jawad MS, Dilworth JT and Quinn TJ (2020). "The effect of collimator rotation on scatter contribution to organs at risk in breast cancer tangent fields." International Journal of Radiation Oncology Biology Physics 108(3): E320-E320.

[Full Text](#)

Department of Obstetrics & Gynecology

Department of Radiation Oncology

Bax AM, van Rosendael AR, Ma X, van den Hoogen IJ, Gianni U, Tantawy SW, Hollenberg EJ, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, Chinnaiyan K, Choi JH, Conte E, Marques H, de Araújo Gonçalves P, Gottlieb I, Hadamitzky M, Leipsic JA, Maffei E, Pontone G, Shin S, Kim YJ, Lee BK, Chun EJ, Sung JM, Lee SE, Virmani R, Samady H, Stone PH, Berman DS, Min JK, Narula J, Lin FY, Chang HJ and Shaw LJ (2020). "Comparative differences in the atherosclerotic disease burden between the epicardial coronary arteries: Quantitative plaque analysis on coronary computed tomography angiography." European Heart Journal Cardiovasc Imaging. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Aims: Anatomic series commonly report the extent and severity of coronary artery disease (CAD), regardless of location. The aim of this study was to evaluate differences in atherosclerotic plaque burden and composition across the major epicardial coronary arteries. Methods and Results: A total of 1271 patients (age 60 ± 9 years; 57% men) with suspected CAD prospectively underwent coronary computed tomography angiography (CCTA). Atherosclerotic plaque volume was quantified with categorization by composition (necrotic core, fibrofatty, fibrous, and calcified) based on Hounsfield Unit density. Per-vessel measures were compared using generalized estimating equation models. On CCTA, total plaque volume was lowest in the LCx (10.0 ± 29.4 mm³), followed by the RCA (32.8 ± 82.7 mm³; $P < 0.001$), and LAD (58.6 ± 83.3 mm³; $P < 0.001$), even when correcting for vessel length or volume. The prevalence of ≥ 2 high-risk plaque features, such as positive remodelling or spotty calcification, occurred less in the LCx (3.8%) when compared with the LAD (21.4%) or RCA (10.9%, $P < 0.001$). In the LCx, the most stenotic lesion was categorized as largely calcified more often than in the RCA and LAD (55.3% vs. 39.4% vs. 32.7%; $P < 0.001$). Median diameter stenosis was also lowest in the LCx (16.2%) and highest in the LAD (21.3%; $P < 0.001$) and located more distal along the LCx when compared with the RCA and LAD ($P < 0.001$). Conclusion: Atherosclerotic plaque, irrespective of vessel volume, varied across the epicardial coronary arteries; with a significantly lower burden and different compositions in the LCx when compared with the LAD and RCA. These volumetric and compositional findings support a diverse milieu for atherosclerotic plaque development and may contribute to a varied acute coronary risk between the major epicardial coronary arteries.

Berger DA, Chen NW, Miller JB, Welch RD, Reynolds JC, Pribble JM, Swor DR and Cares Surveillance G (2020). "Substantial variation exists in post-cardiac arrest outcomes across Michigan hospitals." Resuscitation. ePub Ahead of Print.

[Full Text](#)

Department of Emergency Medicine

Aim: Resuscitation from out of hospital cardiac arrest (OHCA) requires success across the entire chain of survival. Using a large state-wide registry, we characterized variation in clinical outcomes at hospital discharge in Michigan hospitals. Methods: We utilized the Michigan Cardiac Arrest Registry to Enhance Survival (CARES) and included adult OHCA subjects with return of spontaneous circulation (ROSC) from

2014 - 2017 that survived to hospital admission. 39 Michigan hospitals were included which managed >30 cases during the study period. Multilevel logistic regression, controlling for both subject characteristics and clustering of subjects within hospitals, assessed variation across hospitals in survival to hospital discharge and survival with cerebral performance category (CPC 1-2). Results: There were 5,486 CARES subjects that survived to hospital admission, and 4,690 met inclusion for analysis. Of 39 included hospitals, median survival to discharge was 31.3% (range 12.5%-46.7%) and median survival to discharge with CPC 1-2 was 25.0% (range 5.2%-42.2%). We identified 12-fold variation in the utilization of TTM by hospital (median 47.9%, range 6.7%-80.0%) for all admitted subjects. Similarly, there was nearly an eight-fold variation in LHC for all post-arrest subjects (median 22.1%, range 5.4%-42.2%). In multivariable analyses, median adjusted survival to discharge was 26.9% (range 18.1%-42.1%) and median adjusted survival to discharge with CPC 1-2 was 21.3% (range 9.6%-32.1%). Conclusion: We observed substantial variation in clinical outcomes at discharge between Michigan hospitals, including a four-fold range of survival and eight-fold range of survival with CPC 1-2. This variation was ameliorated but still persisted in adjusted modeling. Variation in post arrest survival by hospital was not fully explained by available covariates, which suggests the possibility of improving post-arrest clinical outcomes at some hospitals via quality improvement activities.

Bergin SP, Coles A, Calvert SB, Farley J, Powers JH, Zervos MJ, **Sims M**, Kollef MH, Durkin MJ, Kabchi BA, Donnelly HK, Bardossy AC, Greenshields C, Rubin D, Sun JL, Chiswell K, Santiago J, Gu P, Tenaerts P, Fowler VG, Jr. and Holland TL (2020). "PROPHETIC: Prospective Identification of Pneumonia in Hospitalized Patients in the ICU." *Chest* 158(6): 2370-2380.

[Full Text](#)

Department of Internal Medicine

Background: Pneumonia is the leading infection-related cause of death. The use of simple clinical criteria and contemporary epidemiology to identify patients at high risk of nosocomial pneumonia should enhance prevention efforts and facilitate development of new treatments in clinical trials. Research Question: What are the clinical criteria and contemporary epidemiology trends that are helpful in the identification of patients at high risk of nosocomial pneumonia? Study Design and Methods: Within the ICUs of 28 US hospitals, we conducted a prospective cohort study among adults who had been hospitalized >48 hours and were considered high risk for pneumonia (defined as treatment with invasive or noninvasive ventilatory support or high levels of supplemental oxygen). We estimated the proportion of high-risk patients who experienced the development of nosocomial pneumonia. Using multivariable logistic regression, we identified patient characteristics and treatment exposures that are associated with increased risk of pneumonia development during the ICU admission. Results: Between February 6, 2016, and October 7, 2016, 4,613 high-risk patients were enrolled. Among 1,464 high-risk patients (32%) who were treated for possible nosocomial pneumonia, 537 (37%) met the study pneumonia definition. Among high-risk patients, a multivariable logistic model was developed to identify key patient characteristics and treatment exposures that are associated with increased risk of nosocomial pneumonia development (c-statistic, 0.709; 95% CI, 0.686-0.731). Key factors associated with increased odds of nosocomial pneumonia included an admission diagnosis of trauma or cerebrovascular accident, receipt of enteral nutrition, documented aspiration risk, and receipt of systemic antibacterials within the preceding 90 days. Interpretation: Treatment for nosocomial pneumonia is common among patients in the ICU who are receiving high levels of respiratory support, yet more than one-half of patients who are treated do not fulfill standard diagnostic criteria for pneumonia. Application of simple clinical criteria may improve the feasibility of clinical trials of pneumonia prevention and treatment by facilitating prospective identification of patients at highest risk.

Beyer M, Carzon J, **Otero RM**, Klausner HA and Keyes DC (2020). "A national survey of research associates programs to support graduate medical education." *Annals of Emergency Medicine* 76(4): S13-S14.

[Full Text](#)

Department of Emergency Medicine

Boike TP, Hochstedler K, Movsas B, **Stevens CW**, Kestin LL, Devisetty K, Dominello MM, **Grills IS**, Laucis AM, Matuszak MM, Hayman JA, Paximadis P, Schipper M and Jolly S (2020). "Predictors of early death or hospice in curative inoperable lung cancer patients." *International Journal of Radiation Oncology Biology Physics* 108(3): E120-E120.

[Full Text](#)

Department of Radiation Oncology

Brummett A (2020). "Secular clinical ethicists should not be neutral regarding the truth of all religious belief: An argument for a moral-metaphysical proceduralism." *The American Journal of Bioethics*. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Brummett A (2020). "Reaching across the 'deepest divide': Moral acquaintanceship, religion, and bioethics." The Heythrop Journal 61(4): 677-688.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Brummett A (2020). "Should positive claims of conscience receive the same protection as negative claims of conscience? Clarifying the asymmetry debate." Journal of Clinical Ethics 31(2), 136-42.

[Request Form](#)

Department of Foundational Medical Studies (OU)

Brummett A and Bach M (2020). "Dementia, beauty, and play: A way of seeing and being with the wearisome patient." Clinical Ethics. ePub Ahead of Print.

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Department of Foundational Medical Studies (OU)

Brummett A (2020). "The baffling babble of brain injury." Health Communication. ePub Ahead of Print.

[Request Form](#)

Department of Foundational Medical Studies (OU)

Brummett A (2020). "When conscientious objection run amok: A physician refusing HIV preventative to a bisexual patient." Clinical Ethics. ePub Ahead of Print.

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Department of Foundational Medical Studies (OU)

Brummett A (2020). "The prisoner dilemma: Inconsistent decisions for continuing life-sustaining treatment between a patient with very limited communication and their surrogate." Clinical Ethics. ePub Ahead of Print.

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Department of Foundational Medical Studies (OU)

Bryant JM, Hartsell WF, Tsai HK, Regine WF, Laramore GE, Chang J, **Stevens CW**, Vargas CE and Chuong MD (2020). "Proton beam therapy for abdominopelvic reirradiation: Outcomes from the proton collaborative group REG001-09 trial." International Journal of Radiation Oncology Biology Physics 108(3): E163-E164.

[Full Text](#)

Department of Radiation Oncology

Burke RM, Chen CJ, Ding DL, Buell TJ, Sokolowski JD, Lee CC, Kano H, Kearns KN, Tzeng SW, Yang HC, Huang PP, Kondziolka D, Ironside N, Mathieu D, Iorio-Morin C, **Grills IS**, Feliciano C, Barnett GH, Starke RM, Lunsford LD and Sheehan JP (2020). "Early obliteration of pediatric brain arteriovenous malformations after stereotactic radiosurgery: An international multicenter study." Journal of Neurosurgery: Pediatrics 26(4): 398-405.

[Request Form](#)

Department of Radiation Oncology

Objective: Stereotactic radiosurgery (SRS) is a treatment option for pediatric brain arteriovenous malformations (AVMs), and early obliteration could encourage SRS utilization for a subset of particularly radiosensitive lesions. The objective of this study was to determine predictors of early obliteration after SRS for pediatric AVMs. Methods: The authors performed a retrospective review of the International Radiosurgery Research Foundation AVM database. Obliterated pediatric AVMs were sorted into early (obliteration 24 months after SRS) and late (obliteration > 24 months after SRS) responders. Predictors of early obliteration were identified, and the outcomes of each group were compared. Results: The overall study cohort was composed of 345 pediatric patients with obliterated AVMs. The early and late obliteration cohorts were made up of 95 (28%) and 250 (72%) patients, respectively. Independent predictors of early obliteration were female sex, a single SRS treatment, a higher margin dose, a higher isodose line, a deep AVM location, and a smaller AVM volume. The crude rate of post-SRS hemorrhage was 50% lower in the early (3.2%) than in the late (6.4%) obliteration cohorts, but this difference was not statistically significant ($p = 0.248$). The other outcomes of the early versus late obliteration cohorts were similar, with respect to symptomatic radiation-induced changes (RICs), cyst formation, and tumor formation. Conclusions: Approximately one-quarter of pediatric AVMs that become obliterated after SRS will achieve this radiological endpoint within 24 months of initial SRS. The authors identified multiple factors associated with early

obliteration, which may aid in prognostication and management. The overall risks of delayed hemorrhage, RICs, cyst formation, and tumor formation were not statistically different in patients with early versus late obliteration.

Burwick RM, Yawetz S, Stephenson KE, Collier AY, Sen P, Blackburn BG, Kojic EM, Hirshberg A, Suarez JF, Sobieszczyk ME, Marks KM, Mazur S, Big C, Manuel O, Morlin G, Rose SJ, Naqvi M, Goldfarb IT, DeZure A, Telep L, Tan SK, Zhao Y, Hahambis T, Hindman J, Chokkalingam AP, Carter C, Das M, Osinusi AO, Brainard DM, Varughese TA, Kovalenko O, **Sims MD**, Desai S, Swamy G, Sheffield JS, Zash R and Short WR (2020).

"Compassionate use of remdesivir in pregnant women with severe COVID-19." Clinical Infectious Diseases. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

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

Cappell MS (2020). "Improving the safety of endoscopy in pregnancy: Approaching gravidity with gravitas." Digestive Diseases and Sciences 65(10): 2745-2748.

[Full Text](#)

Department of Internal Medicine

Carroll JD, Mack MJ, Vemulapalli S, Herrmann HC, Gleason TG, **Hanzel G**, Deeb GM, Thourani VH, Cohen DJ, Desai N, Kirtane AJ, Fitzgerald S, Michaels J, Krohn C, Masoudi FA, Brindis RG and Bavaria JE (2020). "STS-ACC TVT registry of transcatheter aortic valve replacement." Journal of the American College of Cardiology 76(21): 2492-2516.

[Full Text](#)

Department of Internal Medicine

The STS-ACC TVT Registry (Society of Thoracic Surgeons-American College of Cardiology Transcatheter Valve Therapy Registry) from 2011 to 2019 has collected data on 276,316 patients undergoing transcatheter aortic valve replacement (TAVR) at sites in all U.S. states. Volumes have increased every year, exceeding surgical aortic valve replacement in 2019 (72,991 vs. 57,626), and it is now performed in all U.S. states. TAVR now extends from extreme- to low-risk patients. This is the first presentation on 8,395 low-risk patients treated in 2019. In 2019, for the entire cohort, femoral access increased to 95.3%, hospital stay was 2 days, and 90.3% were discharged home. Since 2011, the 30-day mortality rate has decreased (7.2% to 2.5%), stroke has started to decrease (2.75% to 2.3%), but pacemaker need is unchanged (10.9% to 10.8%). Alive with acceptable patient-reported outcomes is achieved in 8 of 10 patients at 1 year. The Registry is a national resource to improve care and analyze TAVR's evolution. Real-world outcomes, site performance, and the impact of coronavirus disease 2019 will be subsequently studied.

Castelnuovo G, De Giorgio A, Manzoni GM, Treadway DC and **Mohiyeddini C** (2020). "Psychological, behavioral, and interpersonal effects and clinical implications for health systems of the Coronavirus (COVID-19) Pandemic: A call for research." Frontiers in Psychology 11: 2146.

[Full Text](#)

Department of Foundational Medical Studies (OU)

The novel coronavirus disease (COVID-19) emerged at the end of 2019 and was classified as a pandemic by the World Health Organization (WHO) on March 11, 2020. Both the COVID-19 emergency and the extraordinary measures to contain it have negatively affected the life of billions of people and have

threatened individuals and nations. One of the main goals of clinical and health psychology during this pandemic is to investigate the behavioral, cognitive, emotional, and psychobiological responses to the COVID-19 emergency as well as to the preventive measures that have been imposed by governments to limit the contagion, such as social isolation. Psychological research has the responsibility to deliver sound empirical evidence to inform public health policies and to support and advise governments and policymakers in their introduction of sustainable, feasible, and cost-efficient prevention and intervention guidelines. Hence, the goal of this call for research is to stimulate theoretical discussions and empirical investigations on the bio-psycho-social impacts of COVID-19 for individuals, groups, and nations. We invite contributions that address the challenges that the COVID-19 emergency has imposed on couples, families, and social systems. In addition, we call for studies that assess the specific effects of the COVID-19 pandemic on highly vulnerable populations such as children, adolescents, pregnant women, patients suffering from chronic and life-threatening conditions, healthcare workers, and elderly citizens. Papers focusing on the impact of emotion regulation and coping strategies are encouraged. Original research, data reports, study protocols, single case reports and community case studies, theoretical perspectives, and viewpoints are invited to help improve our understanding of the COVID-19 pandemic.

Castillo E, Castillo R, Vinogradskiy Y, **Nair G, Grills I, Guerrero T and Stevens C** (2020). "Technical note: On the spatial correlation between robust CT-ventilation methods and SPECT ventilation." Medical Physics 47(11): 5731-5738.

[Full Text](#)

Department of Radiation Oncology

Purpose: The computed tomography (CT)-derived ventilation imaging methodology employs deformable image registration (DIR) to recover respiratory motion-induced volume changes from an inhale/exhale CT image pair, as a surrogate for ventilation. The Integrated Jacobian Formulation (IJF) and Mass Conserving Volume Change (MCVC) numerical methods for volume change estimation represent two classes of ventilation methods, namely transformation based and intensity (Hounsfield Unit) based, respectively. Both the IJF and MCVC methods utilize subregional volume change measurements that satisfy a specified uncertainty tolerance. In previous publications, the ventilation images resulting from this numerical strategy demonstrated robustness to DIR variations. However, the reduced measurement uncertainty comes at the expense of measurement resolution. The purpose of this study was to examine the spatial correlation between robust CT-ventilation images and single photon emission CT-ventilation (SPECT-V). **Methods:** Previously described implementations of IJF and MCVC require the solution of a large scale, constrained linear least squares problem defined by a series of robust subregional volume change measurements. We introduce a simpler parameterized implementation that reduces the number of unknowns while increasing the number of data points in the resulting least squares problem. A parameter sweep of the measurement uncertainty tolerance, τ , was conducted using the 4DCT and SPECT-V images acquired for 15 non-small cell lung cancer patients prior to radiotherapy. For each test case, MCVC and IJF CT-ventilation images were created for 30 different uncertainty parameter values, uniformly sampled from the range (0.01, 0.25). Voxel-wise Spearman correlation between the SPECT-V and the resulting CT-ventilation images was computed. **Results:** The median correlations between MCVC and SPECT-V ranged from 0.20 to 0.48 across the parameter sweep, while the median correlations for IJF and SPECT-V ranged between 0.79 and 0.82. For the optimal IJF tolerance $\tau = 0.07$, the IJF and SPECT-V correlations across all 15 test cases ranged between 0.12 and 0.90. For the optimal MCVC tolerance $\tau = 0.03$, the MCVC and SPECT-V correlations across all 15 test cases ranged between -0.06 and 0.84. **Conclusion:** The reported correlations indicate that robust methods generate ventilation images that are spatially consistent with SPECT-V, with the transformation-based IJF method yielding higher correlations than those previously reported in the literature. For both methods, overall correlations were found to marginally vary for $\tau \in [0.03, 0.15]$, indicating that the clinical utility of both methods is robust to both uncertainty tolerance and DIR solution.

Chang S, Liu G, Zhao L, **Dilworth JT, Jawad MS, Yan D, Chen PY, Stevens CW, Li X, Kabolizadeh P and Ding X** (2020). "Spot-scanning proton arc therapy (SPArc) for left-sided breast irradiation." International Journal of Radiation Oncology Biology Physics 108(3): E73-E73.

[Full Text](#)

Department of Radiation Oncology

Chang S, Liu G, Zhao LW, **Dilworth JT, Zheng WL, Jawad S, Yan D, Chen P, Stevens C, Kabolizadeh P, Li XQ and Ding XF** (2020). "Feasibility study: Spot-scanning Proton Arc therapy (SPArc) for left-sided whole breast radiotherapy." Radiation Oncology 15(1).

[Full Text](#)

Department of Radiation Oncology

Background: This study investigated the feasibility and potential clinical benefit of utilizing a new proton treatment technique: Spot-scanning proton arc (SPArc) therapy for left-sided whole breast radiotherapy

(WBRT) to further reduce radiation dose to healthy tissue and mitigate the probability of normal tissue complications compared to conventional intensity modulated proton therapy (IMPT). Methods: Eight patients diagnosed with left-sided breast cancer and treated with breast-preserving surgery followed by whole breast irradiation without regional nodal irradiation were included in this retrospective planning. Two proton treatment plans were generated for each patient: vertical intensity-modulated proton therapy used for clinical treatment (vIMPT, gantry angle 10 degrees-30 degrees) and SPArc for comparison purpose. Both SPArc and vIMPT plans were optimized using the robust optimization of +/- 3.5% range and 5 mm setup uncertainties. Root-mean-square deviation dose (RMSD) volume histograms were used for plan robustness evaluation. All dosimetric results were evaluated based on dose-volume histograms (DVH), and the interplay effect was evaluated based on the accumulation of single-fraction 4D dynamic dose on CT50. The treatment beam delivery time was simulated based on a gantry rotation with energy-layer-switching-time (ELST) from 0.2 to 5 s. Results: The average D1 to the heart and LAD were reduced to 53.63 cGy and 82.25 cGy compared with vIMPT 110.38 cGy (p = 0.001) and 170.38 cGy (p = 0.001), respectively. The average V5Gy and V20Gy of ipsilateral lung was reduced to 16.77% and 3.07% compared to vIMPT 25.56% (p = 0.001) and 4.68% (p = 0.003). Skin3mm mean and maximum dose were reduced to 3999.38 cGy and 4395.63 cGy compared to vIMPT 4104.25 cGy (p = 0.039) and 4411.63 cGy (p = 0.043), respectively. A significant relative risk reduction (RNTCP = NTCPSPArc/NTCPvIMPT) for organs at risk (OARs) was obtained with SPArc ranging from 0.61 to 0.86 depending on the clinical endpoint. The RMSD volume histogram (RVH) analysis shows SPArc provided better plan robustness in OARs sparing, including the heart, LAD, ipsilateral lung, and skin. The average estimated treatment beam delivery times were comparable to vIMPT plans when the ELST is about 0.5 s. Conclusion: SPArc technique can further reduce dose delivered to OARs and the probability of normal tissue complications in patients treated for left-sided WBRT.

Chao J, Saleem S, Tausif HN, Levasseur K and Stec LA (2020). "Internuclear ophthalmoplegia as the first manifestation of pediatric-onset multiple sclerosis and concurrent Lyme Disease." *American Journal of Case Reports* 21: e925220.

[Full Text](#)

Department of Ophthalmology

Department of Emergency Medicine

OUWB Medical Student Author

Background: Internuclear ophthalmoplegia (INO) presents as a disruption of horizontal conjugate ocular movement and is an uncommon finding in the pediatric population. Its presence warrants a thorough evaluation to search for demyelinating, mass effect, inflammatory, or infectious etiologies. Case Report: A 15-year-old African American girl presented to the Emergency Department with acute horizontal binocular diplopia in left gaze. An ophthalmic examination revealed a right INO. She denied any fever, chills, or neck stiffness. Complete blood counts and a metabolic panel were unremarkable. Magnetic resonance imaging (MRI) of the brain and orbits revealed scattered pontine, periventricular, and subcortical white matter signal abnormalities within the left frontal lobe suggestive of active demyelination. MRI of the spinal column also demonstrated multiple areas of increased signal intensity from the C3 to C7-T1 region. Inflammatory and autoimmune studies were negative. However, her serum IgM and IgG studies were positive for *Borrelia burgdorferi* with negative CSF titers. Cerebrospinal fluid (CSF) analysis demonstrated mildly elevated glucose (82 mg/dL) and oligoclonal bands, but was otherwise unremarkable. She was started on intravenous methylprednisolone and ceftriaxone. She was subsequently diagnosed with pediatric-onset multiple sclerosis and started on disease-modifying therapy, with full resolution of diplopia and INO 2 weeks later. Conclusions: We present a case of INO presenting as the first manifestation of multiple sclerosis in a pediatric patient with a concurrent infectious etiology. A thorough evaluation can lead to earlier identification and treatment of underlying diseases.

Cheah C, Hajj Hussein I, El Othmani A, Rizvi SA, Sayeed Z and El-Othmani MM (2020). "Assessing preoperative risk factors with sex disparities in total joint arthroplasty patients and financial outcomes from the National Inpatient Sample Database." *The Journal of the American Academy of Orthopaedic Surgeons* 28(21): e969-e976.

[Full Text](#)

OUWB Medical Student Author

Department of Foundational Medical Studies (OU)

Introduction: Disparities in the healthcare system imply potential risks for vulnerable groups whose needs are not appropriately met. Total joint arthroplasty (TJA) is successful in treating end-stage arthritis, resulting in increased demand for the procedure, however remains underused in both sexes, especially in women. Although multiple studies assessed the differences in postoperative morbidities between sexes, there remains a lack in understanding patients' preoperative clinical profile and nonclinical demographics. The aim of this study is to provide a population-based epidemiologic assessment of preoperative risk factors and sex disparities and assess differences in outcomes following TJA. Methods: The National Inpatient Sample database from 2006 to 2011 was analyzed. Patients who underwent primary total knee and hip arthroplasty

were identified and stratified into two cohorts of male and female, and demographic data and comorbidities were collected. Postoperative complications, length of stay, total charges, and discharge destination were measured for matched cohorts. Results: Female patients present for TJAs at an older average age, are less likely to present with AIDS, alcohol abuse, coagulopathy, congestive heart failure, drug abuse, liver disease, peripheral vascular disease, and renal failure, and are more likely to present with anemia, autoimmune disorders, chronic obstructive pulmonary disease, depression, obesity, and valvular disease. Postoperatively, the average length of stay for female patients was markedly higher (3.52 versus 3.39) and a lower percentage went home (59% versus 73%). Overall, female patients experience greater odds of any complication while in-patient. Discussion: This study highlighted sex differences in areas that could account for the underuse of the procedure in both sexes, with women affected to a greater extent. Understanding these factors will help address the unmet needs of both sexes after TJA by encouraging future studies and provider education to ensure that all patients are able to access the necessary procedures for pain relief and functional improvement.

Chen S, **Yan D**, **Qin A**, Maniawski P, **Krauss DJ** and **Wilson GD** (2020). "Effect of uncertainties in quantitative (18) F-FDG PET/CT imaging feedback for intratumoral dose-response assessment and dose painting by number." *Medical Physics* 47(11): 5681-5692.

[Full Text](#)

Department of Radiation Oncology

Purpose: Intratumoral dose response can be detected using serial fluoro-2-deoxyglucose-(FDG) positron emission tomography (PET)/computed tomography (CT) imaging feedback during treatment and used to guide adaptive dose painting by number (DPbN). However, to reliably implement this technique, the effect of uncertainties in quantitative PET/CT imaging feedback on tumor voxel dose-response assessment and DPbN needs to be determined and reduced. Methods: Three major uncertainties, induced by (a) PET imaging partial volume effect (PVE) and (b) tumor deformable image registration (DIR), and (c) variation of the time interval between FDG injection and PET image acquisition (TI), were determined using serial FDG-PET/CT images acquired during chemoradiotherapy of 18 head and neck cancer patients. PET imaging PVE was simulated using the discrepancy between with and without iterative deconvolution-based PVE corrections. Effect of tumor DIR uncertainty was simulated using the discrepancy between two DIR algorithms, including one with and one without soft-tissue mechanical correction for the voxel displacement. The effect of TI variation was simulated using linear interpolation on the dual-point PET/CT images. Tumor voxel pretreatment metabolic activity ($SUV(0)$) and dose-response matrix (DRM) discrepancies induced by each of the three uncertainties were quantified, respectively. Adverse effects of tumor voxel $SUV(0)$ and DRM discrepancies on tumor control probability (TCP) in DPbN were assessed. Results: Partial volume effect and TI variations of 10 mins induced a mean \pm standard deviation (SD) of tumor voxel $SUV(0)$ discrepancies to be $-0.7\% \pm 9.2\%$ and $0\% \pm 4.8\%$, respectively. Tumor voxel DRM discrepancies induced by PVE, tumor DIR discrepancy, and TI variations were $0.6\% \pm 8.9\%$, $1.7\% \pm 9.1\%$, and $0\% \pm 7\%$, respectively. Partial volume effect induced $SUV(0)$ and DRM discrepancies correlated significantly with the tumor shape and FDG uptake heterogeneity. Tumor DIR uncertainty-induced DRM discrepancy correlated significantly with the tumor volume and shrinkage during treatment. Among the three uncertainties, PVE dominated the adverse effects on the TCP, with a mean \pm SD of TCP reduction to be $12.7\% \pm 9.8\%$ for all tumors if no compensation was applied for. Conclusions: Effect of uncertainties in quantitative FDG-PET/CT imaging feedback on intratumoral dose-response quantification was not negligible. These uncertainties primarily caused by PVE and tumor DIR were highly dependent on individual tumor shape, volume, shrinkage during treatment, and pretreatment SUV heterogeneity, which can be managed individually. The adverse effects of these uncertainties could be minimized by using proper PVE corrections and DIR methods and compensated for in the clinical implementation of DPbN.

Cifarelli CP, Vargo JA, Fang W, Liscak R, Guseynova K, Warnick RE, Lee CC, Yang HC, Borghei-Razavi H, Maiti T, Siddiqui ZA, **Yuan JC**, **Grills IS**, Mathieu D, Touchette CJ, Cordeiro D, Chiang V, Hess J, Tien CJ, Faramand A, Kano H, Barnett GH, Sheehan JP and Lunsford LD (2020). "Role of gamma knife radiosurgery in small cell lung cancer: A multi-institutional retrospective study of the international radiosurgery research foundation (IRRF)." *Neurosurgery* 87(4): 664-671.

[Full Text](#)

Department of Radiation Oncology

OUWB Medical Student Author

Background: Despite a high incidence of brain metastases in patients with small-cell lung cancer (SCLC), limited data exist on the use of stereotactic radiosurgery (SRS), specifically Gamma Knife™ radiosurgery (Elekta AB), for SCLC brain metastases. Objective: To provide a detailed analysis of SCLC patients treated with SRS, focusing on local failure, distant brain failure, and overall survival (OS). Methods: A multi-institutional retrospective review was performed on 293 patients undergoing SRS for SCLC brain metastases at 10 medical centers from 1991 to 2017. Data collection was performed according to individual

institutional review boards, and analyses were performed using binary logistic regression, Cox-proportional hazard models, Kaplan-Meier survival analysis, and competing risks analysis. Results: Two hundred thirty-two (79%) patients received SRS as salvage following prior whole-brain irradiation (WBRT) or prophylactic cranial irradiation, with a median marginal dose of 18 Gy. At median follow-up after SRS of 6.4 and 18.0 mo for surviving patients, the 1-yr local failure, distant brain failure, and OS were 31%, 49%, and 28%. The interval between WBRT and SRS was predictive of improved OS for patients receiving SRS more than 1 yr after initial treatment (21%, <1 yr vs 36%, >1 yr, $P = .01$). On multivariate analysis, older age was the only significant predictor for OS (hazard ratio 1.63, 95% CI 1.16-2.29, $P = .005$). Conclusion: SRS plays an important role in the management of brain metastases from SCLC, especially in salvage therapy following WBRT. Ongoing prospective trials will better assess the value of radiosurgery in the primary management of SCLC brain metastases and potentially challenge the standard application of WBRT in SCLC patients.

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Cloutier Barbour C, Danforth MD, Murphy H, Sleeper MM and **Kutinsky I** (2020). "Monitoring great ape heart health through innovative electrocardiogram technology: Training methodologies and welfare implications." *Zoo Biology* 39(6): 443-447.

[Full Text](#)

Department of Internal Medicine

Assessing and treating cardiovascular disease (or heart disease) is a growing concern for institutions housing great apes, as it is a major cause of mortality in all four taxa managed in human care. As part of a proactive monitoring plan, zoological managers and veterinarians often elect to perform electrocardiograms (ECGs) on their great ape populations. ECGs noninvasively evaluate cardiac electrical activity, and are thereby capable of providing information regarding heart function. This electrical signature is transcribed as a visual display of waveforms, referred to as telemetry strips, and can detect irregularities in heart rhythm, also known as arrhythmia. While traditional 6- or 12-lead ECGs are recommended periodically as part of a thorough heart performance evaluation, here we discuss the KardiaMobile (KM) device as an additional primate welfare tool. KM is a small, Food and Drug Administration-cleared, clinical-grade mobile ECG monitor that requires only 30 s of pressure to flag heart rate or arrhythmic abnormalities. We detail the training process and applicability to great apes in human care.

Conger A, Sperry BP, Cheney CW, Kuo K, Petersen R, **Randall D**, Salazar F, Cunningham S, Henrie AM, Bisson E, Kendall R, Teramoto M and McCormick ZL (2020). "Does the contrast dispersion pattern during fluoroscopically guided cervical transforaminal epidural steroid injection predict short-term pain and functional outcomes? An exploratory analysis of prospective cohort data." *Pain Medicine* 21(12): 3350-3359.

[Request Form](#)

OUIB Medical Student Author

Summary of Background Data: No study has evaluated the relationship between contrast dispersion patterns and outcomes after fluoroscopically guided cervical transforaminal epidural steroid injection (CTFESI). Objectives: Determine whether contrast dispersion patterns predict pain and functional outcomes after CTFESI. Methods: Secondary analysis of data collected during two prospective studies of CTFESI for the treatment of refractory radicular pain. Contrast dispersion patterns visualized by true anteroposterior (AP) projections during CTFESIs were categorized by flow: 1) completely external to the lateral border of the neuroforamen (zone 1); 2) within the neuroforamen but without entry into the lateral epidural space (zone 2); and 3) with extension into the lateral epidural space (zone 3). At baseline and at 1 month post-CTFESI, neck pain, arm pain, and "dominant index pain" (the greater of arm or neck pain) were evaluated using a numeric rating scale (NRS); physical function was assessed using the Five-Item Version of the Neck Disability Index (NDI-5). Results: One-month post-CTFESI, neck pain, arm pain, and "dominant index pain" reductions of $\geq 50\%$ were observed in 39.4% (95% confidence interval [CI], 28.2-51.8), 55.6% (95% CI, 43.0-67.5), and 44.1% (95% CI, 32.7-56.2) of participants, respectively. Regarding "dominant index pain," 72.7% (95% CI, 40.8-91.2), 39.4% (95% CI, 24.2-57.0), and 37.5% (95% CI, 20.5-58.2) of participants reported $\geq 50\%$ pain reduction when zone 1, zone 2, and zone 3 contrast flow patterns were observed. Contrast dispersion zone was not significantly associated with subgroup differences in neck pain, arm pain, or NDI-5 scores ($P > 0.05$). Conclusion: Improvements in pain and function 1 month after treatment with CTFESI did not differ significantly based on the contrast dispersion pattern. Future study is needed to confirm or refute these findings in other procedural settings, in broader patient populations, and with longer-term outcome assessment.

Conway RM, White GZ and **Thottam PJ** (2020). "The burden of laryngomalacia and its effects on caregivers: A support group survey evaluation." *International Journal of Pediatric Otorhinolaryngology* 138: 110368.

[Full Text](#)

Department of Surgery

Objective: To evaluate which factors may affect anxiety and child's health perception of parents with children

that have laryngomalacia. Study Design: Survey Study. Setting: "Coping with Laryngomalacia" - largest online laryngomalacia support group for parents with children who have laryngomalacia. Subjects and Methods: A survey was sent to support group member that gathered information regarding the patient's diagnosis and associated course of treatment and evaluated for parental anxiety and perceived health of their child. Analysis was performed to evaluate which variables are associated with increased parental anxiety and worsened perceived child's health. Results: Data was gathered on 434 patients. All caregivers reported some level of anxiety due to the diagnosis and 64% felt completely anxious. Parents who saw an increased number of physicians prior to a pediatric ENT rated their child with poorer health ($p < .05$). Those that felt their concerns were brushed off initially reported increased anxiety ($p < .05$). If the child was admitted to the hospital, ICU, required intubation, had feeding troubles, required a feeding tube, or underwent pH monitoring, the patient was rated to have poorer health per the parents ($p < .05$). Conclusion: Laryngomalacia causes a significant burden on patients and their families due to the eating problems, feeding problems, hospital stay, and other various conditions associated with the disease. Caregivers should take a more modern and compassionate approach to management and diagnosis.

Cowan B, Oska S, Arianpour K, Svider PF, Bojrab D and Hong RS (2020). "A systematic review of cochlear implantation in temporal bone fractures and the significance of otic capsule involvement." Otology & Neurotology 41(10): 1309-1315.

[Full Text](#)

*OUWB Medical Student Author
Department of Surgery*

Degaga TK, Zenebe AM, Wirtu AT, Woldehawariat TD, Dellie ST and **Gemechu JM (2020).** "Anatomographic variants of sphenoid sinus in Ethiopian population." Diagnostics 10(11): 970.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Neurosurgeons often neglect the sphenoid sinus due to its deep location and difficulties in accessing during surgical interventions. Disease of the sphenoid sinus is difficult to diagnose since its presenting symptoms are difficult to recognize. Moreover, compared with other paranasal sinuses, the sphenoid sinus is considered the most variable air sinus in terms of its degree of pneumatization, number and position of inter-sinus septa, and its relationship with the surrounding anatomical structures. Anatomical variations of the sphenoid sinus are significant from a neurosurgical point of view. Understanding of these variations and its relationships with surrounding structures such as the internal carotid artery, optic nerve, and pituitary gland are clinically relevant to minimize injuries associated with surgical procedures that involve sphenoid sinus. We implemented principles of imaging using computed tomography to elucidate any anatomical variations of the sphenoid sinus in the Ethiopian population. We conducted a prospective study in 200 patients with ages 18-79, who underwent scans of the sphenoid sinus at the Tikur Anbessa Referral Teaching Hospital in 2017-2018. Our findings revealed an incidence of anatomographical variations in terms of pneumatization that varied between 2-50%. These variants include 2% conchal, 25.5% presellar, 50% sellar, and 22.5% postsellar pneumatization. We also demonstrated anatomographic variants in terms of septation, 77.5% single complete septa, 11.5% single incomplete, 10% double septa, and 1% absence of septa. In summary, the sellar pneumatization was found to be the most clinically relevant anatomographic variant among Ethiopians participating in the study, of which 90% were tomographically single septated. These variants must be taken into consideration during trans-sphenoidal surgery and knowledge of the variations has clinical implication in minimizing injuries during invasive surgical procedures involving the sphenoid sinus.

Delgado MR, Tilton A, Carranza-Del Río J, Dursun N, Bonikowski M, Aydin R, Maciag-Tymecka I, Oleszek J, **Dabrowski E**, Grandoulier AS and Picaut P (2020). "Efficacy and safety of abobotulinumtoxinA for upper limb spasticity in children with cerebral palsy: A randomized repeat-treatment study." Developmental Medicine and Child Neurology. ePub Ahead of Print.

[Full Text](#)

Department of Physical Medicine & Rehabilitation

Aim: To assess the efficacy and safety of repeat abobotulinumtoxinA injections in reducing upper limb spasticity in children with cerebral palsy (CP). Method: This was a double-blind, repeat-cycle study (NCT02106351) in children with CP (2-17y). Children were randomized to receive 2U/kg (control), 8U/kg, or 16U/kg abobotulinumtoxinA injections into the target muscle group (wrist or elbow flexors) and additional muscles alongside occupational therapy via a home-exercise therapy program (HETP; minimum five 15min sessions/wk). Children received 8U/kg or 16U/kg plus HETP in cycles 2 to 4. Results: During cycle 1, 210 children (126 males, 84 females; mean age [SD] 9y [4y 5mo], range 2-17y; n=70/group) had at least one upper limb abobotulinumtoxinA injection and 209 complied with the HETP. At week 6 of cycle 1, children in the 8U/kg or 16U/kg groups had significantly lower Modified Ashworth scale scores versus the 2U/kg group (primary outcome: treatment differences of -0.4 [$p=0.012$] and -0.7 [$p<0.001$] respectively). All groups

improved on Physician Global Assessment and children in all groups achieved their treatment goals at least as expected. Therapeutic benefits were sustained during cycles 2 to 4; muscular weakness was the only treatment-related adverse event reported in at least one child/group (4.3% and 5.7% vs 1.4% respectively). Interpretation: Treatment with 8U/kg or 16U/kg abobotulinumtoxinA significantly reduced upper limb spasticity versus the 2U/kg control dose. Therapeutic benefits of abobotulinumtoxinA plus HETP were sustained with repeat treatment cycles.

Desai TK and Chey WD (2020). "Epidemiology and the impact of therapies on the outcome of COVID-19 in patients with inflammatory bowel disease response." American Journal of Gastroenterology 115(10): 1726-1726.

[Full Text](#)

Department of Internal Medicine

Desai TK and Chey WD (2020). "Response to Skole et al." The American Journal of Gastroenterology 115(10): 1726.

[Full Text](#)

Department of Internal Medicine

Devisetty K, Griffith K, Boike TP, Moran JM, Radawski J, Nettleton JL, **Dilworth JT**, Walker EM, Hayman JA, Jaggi R, Pierce LJ and Vicini FA (2020). "Trends in close margin status and radiation therapy boost in early stage breast cancer treated with breast conserving therapy." International Journal of Radiation Oncology Biology Physics 108(3): E37-E38.

[Full Text](#)

Department of Radiation Oncology

Dhar N, Dhar S, Timar R, Lucas S, Lamb LE and **Chancellor MB** (2020). "De novo urinary symptoms associated with COVID-19: COVID-19-associated cystitis." Journal of Clinical Medicine Research 12(10): 681-682.

[Full Text](#)

Department of Urology

Doherty D, Thompson K, **Loftus S, Mi M**, Riley-Doucet C, Yao L, Paul J, Fouladbaksh, J (2020). "An interprofessional education workshop focusing on pain management and prescription opioid abuse." Journal of Interprofessional Education and Practice. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Medical Library

Dong LK, Shields RA, Subramanian S, Lee R, Wa CA, **Ruby AJ** and **Hassan TS** (2020). "Features and outcomes of eyes that underwent surgical repair of rhegmatogenous retinal detachments after being treated for acute endophthalmitis." Retina. ePub Ahead of Print.

[Full Text](#)

Department of Ophthalmology

Purpose: To evaluate the etiology, clinical course, and outcomes of eyes that suffered post-endophthalmitis rhegmatogenous retinal detachments (RRD). Methods: A retrospective, consecutive case series was conducted of patients managed at Associated Retinal Consultants P.C. from January 2013 to December 2019. Patients were identified as having had endophthalmitis by ICD-9/10 codes. Those with endophthalmitis and/or RRD not managed at ARC were excluded. Results: Charts of 413 patients were reviewed and 19 met inclusion criteria. Incidence of RRD following infectious endophthalmitis was 4.6%. The most common inciting events for endophthalmitis was intravitreal injection (9 of 19) and cataract surgery (7 of 19). Fifteen of 19 patients were treated with an injection of intravitreal antibiotics and 4 underwent immediate vitrectomy with antibiotic injection. Biopsy cultures were obtained in 18 of 19 patients and yielded positive growth in 12 (66.7%). Seventeen of the 19 eyes were operable. Final retinal reattachment rate was 88.2% (15 of 17). Mean final logMAR visual acuity (VA) was 1.58 (Snellen 20/765). Factors associated with worse final VA after surgical repair included preceding intravitreal injection (p=0.001), streptococcus species (p=0.024), presence of proliferative vitreoretinopathy (p=0.015), and use of silicone oil during primary RRD repair (p=0.010). Conclusions: Rhegmatogenous retinal detachments following endophthalmitis occur infrequently. Though the majority of eyes can be repaired surgically, visual outcomes are often poor, particularly in eyes that were infected with streptococcal species and had associated PVR.

Emfinger CH, **Fahey K**, Zhu L, Zhang SW, Xu YM, Stafford JM and Yu SS (2020). "Sex-specific effect of cholesteryl ester transfer protein in murine HDL function." Journal of Womens Health 29(12): A24-A24.

[Full Text](#)

OUWB Medical Student Author

Eng M, **Abbas A**, Hahn R, Wang DD, Eleid M and O'Neill W (2020). "Real world outcomes with small (20-mm) balloon expandable sapien 3 valves compared to larger valves (23-, 26-, and 29-mm)." Journal of the American College of Cardiology 76(17): B64-B64.

[Full Text](#)

Department of Internal Medicine

Fairbairn TA, Dobson R, Hurwitz-Koweek L, Matsuo H, Norgaard BL, Rønnow Sand NP, Nieman K, Bax JJ, Pontone G, **Raff G**, **Chinnaiyan KM**, Rabbat M, Amano T, Kawasaki T, Akasaka T, Kitabata H, Binukrishnan S, Rogers C, Berman D, Patel MR, Douglas PS and Leipsic J (2020). "Sex differences in coronary computed tomography angiography–derived fractional flow reserve: Lessons from ADVANCE." JACC: Cardiovascular Imaging 13(12): 2576-2587.

[Full Text](#)

Department of Internal Medicine

Objectives: This study is to determine the management and clinical outcomes of patients investigated with coronary computed tomography angiography (CCTA)–derived fractional flow reserve (FFRCT) according to sex. Background: Women are underdiagnosed with conventional ischemia testing, have lower rates of obstructive coronary artery disease (CAD) at invasive coronary angiography (ICA), yet higher mortality compared to men. Whether FFRCT improves sex-based patient management decisions compared to CCTA alone is unknown. Methods: Subjects with symptoms and CAD on CCTA were enrolled (2015 to 2017). Demographics, symptom status, CCTA anatomy, coronary volume to myocardial mass ratio (V/M), lowest FFRCT values, and management plans were captured. Endpoints included reclassification rate between CCTA and FFRCT management plans, incidence of ICA demonstrating obstructive CAD ($\geq 50\%$ stenosis) and revascularization rates. Results: A total of 4,737 patients ($n = 1,603$ females, 33.8%) underwent CCTA and FFRCT. Women were older (age 68 ± 10 years vs. 65 ± 10 years; $p < 0.0001$) with more atypical symptoms (41.5% vs. 33.9%; $p < 0.0001$). Women had less obstructive CAD (65.4% vs. 74.7%; $p < 0.0001$) at CCTA, higher FFRCT (0.76 ± 0.10 vs. 0.73 ± 0.10 ; $p < 0.0001$), and lower likelihood of positive FFRCT ≤ 0.80 for the same degree stenosis ($p < 0.0001$). A positive FFRCT ≤ 0.80 resulted in equal referral to ICA ($n = 510$ [54.5%] vs. $n = 1,249$ [56.5%]; $p = 0.31$), but more nonobstructive CAD ($n = 208$ [32.1%] vs. $n = 354$ [24.5%]; $p = 0.0003$) and less revascularization ($n = 294$ [31.4%] vs. $n = 800$ [36.2%]; $p < 0.0001$) in women, unless the FFRCT was ≤ 0.75 where revascularization rates were similar ($n = 253$ [41.9%] vs. $n = 715$ [46.4%]; $p = 0.06$). Women have a higher V/M ratio (26.17 ± 7.58 mm³/g vs. 24.76 ± 7.22 mm³/g; $p < 0.0001$) that is associated with higher FFRCT independent of degree stenosis ($p < 0.001$). Predictors of revascularization included stenosis severity, FFRCT, symptoms, and V/M ratio ($p < 0.001$) but not female sex ($p = 0.284$). Conclusions: FFRCT differs between the sexes, as women have a higher FFRCT for the same degree of stenosis. In FFRCT-positive CAD, women have less obstructive CAD at ICA and less revascularization, which is associated with higher V/M ratio. The findings suggest that CAD and FFRCT variations by sex need specific interpretation as these differences may affect therapeutic decision making and clinical outcomes. (Assessing Diagnostic Value of Non-invasive FFRCT in Coronary Care [ADVANCE]; NCT02499679)

Faure PA, **Zaltz I**, Côté K, Pelet S, Forsythe C, Beaulé PE and Belzile EL (2020). "Morscher Osteotomy through surgical dislocation approach for true femoral neck lengthening with greater trochanter transposition." The Journal of Bone and Joint Surgery 102(21S Suppl 1): 66-72.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Young adults presenting with hip pain can be affected by proximal femoral growth disturbances as seen in Legg-Calvé-Perthes disease (LCPD) or as a complication of surgical treatment of developmental dysplasia of the hip (DDH). In 1988, Morscher proposed a novel femoral neck lengthening osteotomy to address these issues. The purpose of this study was to evaluate the effectiveness and safety of the Morscher osteotomy as a procedure to complement the well-documented surgical hip dislocation, to increase femoral offset, to distalize the greater trochanter, and to increase the overall limb length. Methods: This study was a retrospective case series from 3 hip-preservation-expert surgeons. Morscher osteotomies performed through a surgical dislocation approach by 3 surgeons between January 2008 and September 2019 were reviewed. Fifteen patients with a median age at surgery of 17 years (range, 13 to 28 years) and a minimum follow-up of 3 months (until union) were included. Surgical indications, clinical findings, comparative radiographic analyses including the change in horizontal femoral offset and the position of the greater trochanter, and complications were assessed. Results: Surgical indications included DDH and LCPD. The horizontal femoral offset improved in all patients, to a median of 32.5 mm (range, 4 to 46.4 mm). The articular-trochanteric distance increased to >5 mm in all patients. Limb length improved by a median of 11.5 mm (range, 3 to 30 mm). Complementary periacetabular osteotomy was performed in 14 patients. The lateral center-edge angle and the acetabular index improved in patients with an associated periacetabular

osteotomy, to a median of 28.2° (range, 9° to 37.7°) and 7.9° (range, 0° to 20°), respectively. Two patients demonstrated osteoarthritis progression from Tönnis stage 0 to stage 1, and 6 patients had a decrease of the joint space. Complications included 1 pulmonary embolism, 1 case of asymptomatic fibrous union of the greater trochanter, and 1 transient sciatic nerve palsy. Conclusions: The time-tested Morscher osteotomy indicated for complex proximal femoral reconstruction is effective in increasing horizontal femoral offset, distalization of the greater trochanter, and limb length. Combining the Morscher osteotomy with the versatility of surgical hip dislocation and the improved coverage capacity of periacetabular osteotomy proved complementary in the arsenal of hip preservation.

Fisher R, Bennett MJ, Paternoster R, Karabon P, **Devlin W** and **Swor R** (2020). "Utility of abnormal head computed tomography in predicting outcome in out-of-hospital cardiac arrest victims." [Therapeutic Hypothermia and Temperature Management](#). ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Department of Emergency Medicine

Head computed tomography (HCT) is often performed postcardiac arrest to assess for hypoxic-ischemic brain injury. Our primary objective was to assess whether cerebral edema (CE) on early HCT is associated with poor survival and neurologic outcome after out-of-hospital cardiac arrest (OHCA). We included subjects from a prospectively collected database of OHCA adults who received targeted temperature management at two hospitals from July 2009 to July 2018. We included cases if an emergency department (ED) HCT was performed. Patient demographics and cardiac arrest variables were collected. HCT results were abstracted from radiology reports. HCT findings were categorized as no acute disease, evidence of CE, or excluded (bleed, tumor, and stroke). Outcomes were survival to discharge or dichotomized discharge cerebral performance category (CPC) of 1-2 (good neurologic outcome) versus 3-5 (poor neurologic outcome). Univariate and multivariate analyses were performed. There were 425 OHCA, of which 315 had ED HCT with 277 cases included. Patients were predominately male (65.0%), average age of 60.9 years and average body mass index of 30.5. Of all cases, 44 (15.9%) showed CE on computed tomography. Univariate analysis demonstrated that CE was associated with 9.2-fold greater odds of poor outcome (odds ratio [OR]: 9.23; 95% confidence interval [CI] 1.73-49.2) and 9.1-fold greater odds of death (OR: 9.09, 95% CI 2.4-33.9). In adjusted analysis, CE was associated with a poor CPC outcome (adjusted odds ratios [AOR]: 14.9, 95% CI 2.49-88.4), and death (AOR: 13.7, 95% CI 3.26-57.4). Adjusted survival analysis demonstrated that patients with CE on HCT had 3.6-fold greater hazard of death than those without CE (hazard ratios 3.56, 95% CI 2.34-5.41). The results identify that CE on HCTs early in the postarrest period in OHCA patients is strongly associated with poor rates of survival and neurologic outcome. Prospective work is needed to further define the role of early HCT in postarrest neuroprognostication.

Folberg R and Higginbotham EJ (2020). "Introduction to the ophthalmologists-in-training COVID-19 editorials." [American Journal of Ophthalmology](#) 220: A1-A1.

[Request Form](#)

Department of Ophthalmology

Gaines NL, Lavin JE, and **Gilleraan JP** (2020). "Stress Incontinence," In S Quallich and M Lajiness (ed). [The Nurse Practitioner in Urology](#) Cham: Springer International Publishing. pp: 271-285.

[Full Text](#)

Department of Urology

Gannon J, Pollock AJ, Allen DB and Kling PJ (2020). "A practical screening tool to predict early childhood obesity risk: Examining a birth cohort." [Clinical Pediatrics](#) ePub Ahead of Print: 9922820971006.

[Full Text](#)

OUIWB Medical Student Author

Children obese at the age of 5 years are at greater risk of lifelong obesity. Because certain risks of obesity can be identified in early infancy, a tool for obesity risk prediction in early life would be clinically useful. We investigated predictors of obesity risk in a novel, prospectively collected healthy birth cohort recruited for demographic risks to develop iron deficiency at 1 year, a cohort leveraged because risk factors for iron deficiency and obesity overlap. Obesity at the age of 5 years was defined as age- and sex-specific body mass index Z-score (zBMI) >2SD. For each child, obesity risk factors were summed. Of 10 total risk factors, the following 4 key risks were identified: maternal obesity, maternal diabetes, large for gestational age, or breastfeeding <6 months. Childhood obesity was predicted by either ≥3 total number of risks (P < .033), any key risk (P < .002), or summing key risks (P < .0001). In clinical practice, summing early life risk factors may be a useful strategy for preemptive counseling.

Gjeorgjievski M, Imam Z, **Cappell MS**, **Jamil LH** and Kahaleh M (2020). "A comprehensive review of endoscopic

management of sleeve gastrectomy leaks." *Journal of Clinical Gastroenterology*. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

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

Glasser DB, Parikh R, Lum F and **Williams GA** (2020). "Intravitreal anti-vascular endothelial growth factor cost savings achievable with increased bevacizumab reimbursement and use." *Ophthalmology* 127(12): 1688-1692.

[Full Text](#)

Department of Ophthalmology

Purpose: To model Medicare Part B and patient savings associated with increased bevacizumab payment and use for intravitreal anti-vascular endothelial growth factor (VEGF) therapy. Design: Cost analysis. Participants: Intelligent Research in Sight (IRIS®) Registry data. Methods: Medicare claims and IRIS® Registry data were used to calculate Medicare Part B expenditures and patient copayments for anti-VEGF agents with increasing reimbursement and use of bevacizumab relative to ranibizumab and aflibercept. Main Outcome Measures: Medicare Part B costs and patient copayments for anti-VEGF agents in the Medicare fee-for-service population. Results: Increasing bevacizumab reimbursement to \$125.78, equalizing the dollar margin with aflibercept, would result in Medicare Part B savings of \$468 million and patient savings of \$119 million with a 10% increase in bevacizumab market share. Conclusions: Increased use of bevacizumab achievable with increased reimbursement to eliminate the financial disincentive to its use would result in substantial savings for the Medicare Part B program and for patients receiving anti-VEGF intravitreal injections. Eliminating the financial disincentive to use of lower-cost anti-vascular endothelial growth factor agents would increase their utilization and significantly reduce Medicare Part B and patient out-of-pocket costs.

Golas VL, Lao KM, Misuraca MS, **Li W**, Marrone MG, **Kanaan HD** and **Zhang PL** (2020). "The clinical features of overlap syndrome (ANCA-associated crescentic glomerulonephritis AACGN and immune complex-mediated glomerulonephritis) are similar to those of AACGN alone." *International Urology and Nephrology*. ePub Ahead of Print.

[Full Text](#)

Department of Pathology

OUWB Medical Student Author

The overlap syndromes of anti-neutrophil cytoplasmic antibodies (ANCA)-associated crescentic glomerulonephritis (AACGN) and variants of immune complex mediated glomerulopathy (ICMGN) have been reported. But very few have compared AACGN alone with the overlap syndromes (AACGN plus ICMGN). The aim of this retrospective study was to make that comparison, following serum creatinine (sCr) to determine whether the two groups (AACGN-only group versus overlap group) would behave differently over time. We identified 14 cases with dual diagnoses of AACGN and various ICMGN in the overlap group. Data were collected and compared with 15 randomly selected AACGN-only cases over the similar period of time. The overlap syndrome represented 0.35% of our overall biopsies (14/4049). All 14 patients were ANCA positive and had crescentic formation. The percentage of crescents in the biopsies ranged from 10 to 78%. ICMGN included the following: membranoproliferative glomerulonephritis, post-infectious glomerulonephritis, membranous glomerulopathies, idiopathic mesangial proliferative glomerulonephritis, lupus nephritis, and IgA nephropathy. With the exception one biopsy revealing lupus nephritis class III, most of the ICMGN were mild. When compared to the AACGN-only group, there were no significant differences in clinical and histologic indices including age, percent of crescents, and sCr (on biopsy days, and over the

follow-up periods), although the numbers of follow-up cases were limited over time. Our findings suggest that AACGN was the dominant disease process in the majority of overlap syndromes between AACGN and ICMGN, similar to the clinical processes of AACGN-only disease, therefore, the AACGN in overlap syndrome cases should be the main target for clinical management.

Goldman JJ, **Huynh KA**, Elfalal W, Chaiyasate K and **Fahim DK** (2020). "Cervical spine and craniocervical junction reconstruction with a vascularized fibula free flap." *World Neurosurgery* 144: 34-38.

[Full Text](#)

Department of Neurosurgery

OUWB Medical Student Author

Background: Long-term stabilization of the cervical spine after extensive multilevel tumor resection is difficult to achieve. The current standard approach of instrumentation combined with allograft or nonvascularized autograft is limited in settings of increased risk of nonunion or delayed union (i.e., prior radiation therapy or poorly vascularized wound beds). Case Description: We report the first time to our knowledge that a vascularized fibular free flap has been used to reconstruct the cervical column across 5 vertebral levels, from the craniocervical junction to the lower cervical spine. We describe a transoral approach to the area and compare this method with other reconstructive options. Conclusions: Vascularized bone grafting is a viable alternative to achieve lasting stability because of hastened fusion time, limited reliance on osseous remodeling, and incorporation into the axial skeleton with strut strength.

Goldstein JA and **Dixon SR** (2020). "Mechanically supported PCI for ischemic cardiomyopathy reawakening of hibernating myocardium." *Catheterization and Cardiovascular Interventions* 96(4): 771-772.

[Full Text](#)

Department of Internal Medicine

Gomez-Rojas O, Hafeez A, Gandhi N, **Berghea R** and **Halalau A** (2020). "Bilateral vertebral artery dissection: A case report with literature review." *Case Reports in Medicine* 2020: 8180926.

[Full Text](#)

Department of Internal Medicine

OUWB Medical Student Author

Vertebral artery dissection (VAD) is a rare cause of ischemic stroke in young patients. The largely nonspecific symptoms and delayed presentation pose a serious diagnostic challenge. Medical management with either anticoagulation or antiplatelet therapy is recommended, but there are no reports of successful dual therapy. We report a case of spontaneous bilateral vertebral artery dissections (VADs) treated with both anticoagulation and antiplatelet therapy and a literature review on clinical presentation and the current medical and surgical management options. A 37-year-old healthy female presented to the emergency department with worsening neck pain and headache for two weeks despite over-the-counter medication, block therapy, yoga, and deep tissue neck massage. She denied any trauma but admitted to multiple roller coaster rides over the past few months. CT angiography was concerning for VADs, and MRI brain revealed multiple strokes in the left posterior inferior cerebellar artery (PICA) territory. Cerebral arteriography confirmed the diagnosis of VADs. The patient was initiated on warfarin, along with atorvastatin and aspirin. She was discharged home with no complications and followed up with neurology as an outpatient. MR angiography after three months revealed complete resolution of the dissection. The patient did not report any bleeding complications from dual therapy.

Gordan JD, Kennedy EB, Abou-Alfa GK, Beg MS, Brower ST, Gade TP, Goff L, Gupta S, Guy J, **Harris WP**, **Iyer R**, **Jaiyesimi I**, Jhawer M, Karippot A, Kaseb AO, Kelley RK, Knox JJ, Kortmanský J, Leaf A, Remak WM, Shroff RT, Sohal DPS, Taddei TH, Venepalli NK, Wilson A, Zhu AX and Rose MG (2020). "Systemic therapy for advanced hepatocellular carcinoma: ASCO guideline." *Journal of Clinical Oncology* 38(36): 4317-4345.

[Full Text](#)

Department of Physical Medicine & Rehabilitation

Department of Internal Medicine

Purpose: To develop an evidence-based clinical practice guideline to assist in clinical decision making for patients with advanced hepatocellular carcinoma (HCC). Methods: ASCO convened an Expert Panel to conduct a systematic review of published phase III randomized controlled trials (2007-2020) on systemic therapy for advanced HCC and provide recommended care options for this patient population. Results: Nine phase III randomized controlled trials met the inclusion criteria. Recommendations: Atezolizumab + bevacizumab (atezo + bev) may be offered as first-line treatment of most patients with advanced HCC, Child-Pugh class A liver disease, Eastern Cooperative Oncology Group Performance Status (ECOG PS) 0-1, and following management of esophageal varices, when present, according to institutional guidelines. Where there are contraindications to atezolizumab and/or bevacizumab, tyrosine kinase inhibitors sorafenib or lenvatinib may be offered as first-line treatment of patients with advanced HCC, Child-Pugh class A liver

disease, and ECOG PS 0-1. Following first-line treatment with atezo + bev, and until better data are available, second-line therapy with a tyrosine kinase inhibitor may be recommended for appropriate candidates. Following first-line therapy with sorafenib or lenvatinib, second-line therapy options for appropriate candidates include cabozantinib, regorafenib for patients who previously tolerated sorafenib, or ramucirumab (for patients with α -fetoprotein \geq 400 ng/mL), or atezo + bev where patients did not have access to this option as first-line therapy. Pembrolizumab or nivolumab are also reasonable options for appropriate patients following sorafenib or lenvatinib. Consideration of nivolumab + ipilimumab as an option for second-line therapy and third-line therapy is discussed. Further guidance on choosing between therapy options is included within the guideline. Additional information is available at www.asco.org/gastrointestinal-cancer-guidelines.

Grossman P, Sukul D, Seth M, **Shannon F**, Chetcuti S and Deeb GM (2020). "The relationship between hospital joint Commission Comprehensive Stroke Center Certification (CSCC) and stroke reporting in the National TVT Registry: The Michigan TAVR (MI TAVR) collaborative experience." Journal of the American College of Cardiology 76(17): B53-B54.

[Full Text](#)

Department of Surgery

Grunberger G (2020). "Continuous glucose monitoring: Musing on our progress in memory of Dr. Andrew Jay Drexler." Journal of Diabetes 12(10): 772-774.

[Full Text](#)

Department of Internal Medicine

Grzywacz VP, Levitin R, Porter E, Siddiqui ZA, Thompson A, **Grills IS**, **Chinnaiyan P** and **Guerrero TM** (2020). "Analysis of parotid and lacrimal gland radiation dose in hippocampal-avoiding whole brain radiation therapy." International Journal of Radiation Oncology Biology Physics 108(3): E368-E369.

[Full Text](#)

Department of Radiation Oncology

Grzywacz VP, Quinn TJ, **Reitemeier PJ**, Navin MC, **Hamstra DA**, **Anderson JM**, **Stevens CW** and **Kabolizadeh P** (2020). "Third party insurance providers and initial rejection of proton therapy." International Journal of Radiation Oncology Biology Physics 108(3): E420-E420.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Department of Radiation Oncology

Department of Internal Medicine

Gupta S, Bartolozzi AR, Miller L, Morgan C, Anyangwe V and **Cavinatto L** (2020). "Preoperative estimated width of the patellar tendon for anterior cruciate ligament reconstruction." Journal of Knee Surgery 33(12): 1213-1218.

[Full Text](#)

Department of Orthopaedic Surgery

This study aims to compare the actual patellar tendon width with the skin and magnetic resonance imaging (MRI) measurements and to describe a more accurate method to predict the actual patellar tendon width before anterior cruciate ligament reconstruction (ACLR). Thirty-nine patients undergoing primary ACLR were identified. Patients with patellar tendon width of less than 30mm by skin or MRI measurements were excluded from the study. The actual patellar tendon width was measured as an intraoperative reading taken after surgical exposure. Mean difference between the skin and actual measurement and mean difference between the MRI and actual measurement was calculated. Paired t-test was run to determine any significant differences. A difference was also calculated between the actual measurement and the average sum of skin and MRI measurements for each patient. Skin thickness was compared to Delta (Delta = preincision skin measurement of patellar tendon width minus postincision actual measurement) by Spearman's correlation test. Mean difference between skin and actual measurements was 2.5mm, with $p = 0.001$. Mean difference between MRI and actual measurement was -2.7mm with $p = 0.001$. However, the mean difference between the actual and the average sum of skin and MRI measurements was 0.13mm with $p = 0.76$. The Pearson's correlation coefficient, $r(s)$, between average sum of skin and MRI measurements and the actual measurement was 0.6 with $p = 0.001$. There was no correlation found between the skin thickness and Delta. This study indicates that there is a significant difference between the actual patellar tendon width and the measurement of the tendon taken using a ruler on the skin or using MRI image software. However, the average sum of skin and MRI measurements, which is not significantly different from the actual width, can accurately predict the actual patellar tendon width before ACLR. The study reflects level IV evidence.

Haider MA, **Burks FN**, Cassell A and Jalloh M (2020). "The role of organizations like IVUmed in developing centers of excellence." Current Bladder Dysfunction Reports 15(4): 352-361.

[Full Text](#)

Department of Urology

Purpose: As healthcare disparity gaps continue to grow across the globe, so too are the efforts aimed at addressing them. Here we review the most common platforms currently used in global health and advantages and disadvantages of each. We highlight international organizations that have prioritized health system strengthening and long-term sustainability and apply the lessons learned from these endeavors to propose mechanisms for developing centers of excellence in low- and middle-income countries. Health system strengthening must be prioritized in international urologic endeavors. Without recognizing this as a fundamental goal, well-intentioned efforts are bound to have only short-term benefit and suboptimal use of valuable resources and will neglect a critical opportunity to promote local self-sufficiency and sustainable improvement in patient outcomes.

Halalau A, Imam Z, Karabon P, **Mankuzhy N**, Shaheen A, **Tu J** and **Carpenter C** (2020). "External validation of a clinical risk score to predict hospital admission and in-hospital mortality in COVID-19 patients." Annals of Medicine 53(1): 78-86.

[Full Text](#)

Department of Internal Medicine

OUWB Medical Student Author

Background: Identification of patients with novel coronavirus disease 2019 (COVID-19) requiring hospital admission or at high-risk of in-hospital mortality is essential to guide patient triage and to provide timely treatment for higher risk hospitalized patients. Methods: A retrospective multi-centre (8 hospital) cohort at Beaumont Health, Michigan, USA, reporting on COVID-19 patients diagnosed between 1 March and 1 April 2020 was used for score validation. The COVID-19 Risk of Complications Score was automatically computed by the EHR. Multivariate logistic regression models were built to predict hospital admission and in-hospital mortality using individual variables constituting the score. Validation was performed using both discrimination and calibration. Results: Compared to Green scores, Yellow Scores (OR: 5.72) and Red Scores (OR: 19.1) had significantly higher odds of admission (both $p < .0001$). Similarly, Yellow Scores (OR: 4.73) and Red Scores (OR: 13.3) had significantly higher odds of in-hospital mortality than Green Scores (both $p < .0001$). The cross-validated C-Statistics for the external validation cohort showed good discrimination for both hospital admission ($C = 0.79$ (95% CI: 0.77-0.81)) and in-hospital mortality ($C = 0.75$ (95% CI: 0.71-0.78)). Conclusions: The COVID-19 Risk of Complications Score predicts the need for hospital admission and in-hospital mortality patients with COVID-19. Key points: Can an electronic health record generated risk score predict the risk of hospital admission and in-hospital mortality in patients diagnosed with coronavirus disease 2019 (COVID-19)? In both validation cohorts of 2,025 and 1,290 COVID-19, the cross-validated C-Statistics showed good discrimination for both hospital admission ($C = 0.79$ (95% CI: 0.77-0.81)) and in-hospital mortality ($C = 0.75$ (95% CI: 0.71-0.78)), respectively. The COVID-19 Risk of Complications Score may help predict the need for hospital admission if a patient contracts SARS-CoV-2 infection and in-hospital mortality for a hospitalized patient with COVID-19.

Han JE, Chang J, Rosen L, Hartsell W, Tsai H, Chen J, Mishra MV, **Krauss D**, Choi JI, Simone CB and Hasan S (2020). "Treatment interruptions affect biochemical failure rates in prostate cancer patients treated with proton beam therapy: Report from the multi-institutional proton collaborative group registry." Clinical and Translational Radiation Oncology 25: 94-101.

[Full Text](#)

Department of Radiation Oncology

Introduction: To date, no studies examining the effect of treatment interruptions (TI) with proton beam therapy (PBT) have been published. The goal of our study was to determine the predictors of TI amongst patients with prostate cancer (PCa) treated with PBT and to determine whether TI are associated with biochemical failure (BF). We hypothesized that any correlation between TI and biochemical control would be more pronounced in high risk groups. Methods: Data for 4278 patients with PCa was obtained from the prospectively collected Proton Collaborative Group (PCG) data registry. Univariate and multivariate logistic regression analysis (MVA) was used to model possible predictors of BF. A subset analysis was performed for high risk patients treated with ADT and PBT. Finally, propensity score (PS) analysis was performed to account for any indication bias caused by lack of randomization. Results: Total treatment duration (OR, 1.05 [1.04-1.06]; $p < 0.001$) increased the likelihood of TI on MVA. TI did not have a statistically significant correlation with BF (OR, 1.44 [0.86-2.39]; $p = 0.162$) amongst PS matched patients. However, on subset analyses of high risk group patients with PS matching, there was a trend towards worse BF in patients with TI (OR 3.85; 95%CI (0.96-15.44); $p = 0.057$). Conclusion: In the first analysis of its kind, the results suggest that TI in high risk PCa patients treated with PBT and ADT have worse BF rates. Interventions such as increased patient education, proper maintenance of proton facilities, and decreasing total treatment duration

with alternative fractionation schedules may help avoid the unintended negative effects on tumor control due to TI. However, future analyses on a larger patient population is needed.

Handelsman Y, Jellinger PS, Guerin CK, Bloomgarden ZT, Brinton EA, Budoff MJ, Davidson MH, Einhorn D, Fazio S, Fonseca VA, Garber AJ, **Grunberger G**, Krauss RM, Mechanick JI, Rosenblit PD, Smith DA and Wyne KL (2020). "Consensus statement by the American Association of Clinical Endocrinologists and American College of Endocrinology on the management of dyslipidemia and prevention of cardiovascular disease algorithm - 2020 executive summary." Endocrine Practice 26(10): 1196-1224.

[Full Text](#)

Department of Internal Medicine

The treatment of lipid disorders begins with lifestyle therapy to improve nutrition, physical activity, weight, and other factors that affect lipids. Secondary causes of lipid disorders should be addressed, and pharmacologic therapy initiated based on a patient's risk for atherosclerotic cardiovascular disease (ASCVD). Patients at extreme ASCVD risk should be treated with high-intensity statin therapy to achieve a goal low-density lipoprotein cholesterol (LDL-C) of <55 mg/dL, and those at very high ASCVD risk should be treated to achieve LDL-C <70 mg/dL. Treatment for moderate and high ASCVD risk patients may begin with a moderate-intensity statin to achieve an LDL-C <100 mg/dL, while the LDL-C goal is <130 mg/dL for those at low risk. In all cases, treatment should be intensified, including the addition of other LDL-C-lowering agents (i.e., proprotein convertase subtilisin/kexin type 9 inhibitors, ezetimibe, colesevelam, or bempedoic acid) as needed to achieve treatment goals. When targeting triglyceride levels, the desirable goal is <150 mg/dL. Statin therapy should be combined with a fibrate, prescription-grade omega-3 fatty acid, and/or niacin to reduce triglycerides in all patients with triglycerides \geq 500 mg/dL, and icosapent ethyl should be added to a statin in any patient with established ASCVD or diabetes with \geq 2 ASCVD risk factors and triglycerides between 135 and 499 mg/dL to prevent ASCVD events. Management of additional risk factors such as elevated lipoprotein(a) and statin intolerance is also described.

Hansen TWR, **Maisels M**, Ebbesen F, Vreman HJ, Stevenson DK, Wong RJ and Bhutani VK (2020). "Sixty years of phototherapy for neonatal jaundice: from serendipitous observation to standardized treatment and rescue for millions...Newman TB. Blinded by the light? Possible phototherapy downsides." Journal of Perinatology 40(10): 1582-1583.

[Request Form](#)

Department of Pediatrics

Hanzel GS and Gersh BJ (2020). "Transcatheter aortic valve replacement in low-risk, young patients: Natural expansion or cause for concern?" Circulation 142(14): 1317-1319.

[Full Text](#)

Department of Internal Medicine

Harris T, Bugescu R, Kelly J, Makela A, Sotzen M, Sisk C, Atkin G, **Pratt R**, Crockett E and Leininger G (2020). "DLK1 expressed in mouse orexin neurons modulates anxio-depressive behavior but not energy balance." Brain Sciences 10(12).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Lateral hypothalamic area (LHA) neurons expressing the neuropeptide orexin (OX) are implicated in obesity and anxio-depression. However, these neurons release OX as well as a host of other proteins that might contribute to normal physiology and disease states. We hypothesized that delta-like homolog 1 (DLK1), a protein reported to be co-expressed by all OX neurons, contributes to the regulation of energy balance and/or anxio-depression. Consistent with previous reports, we found that all rat OX neurons co-express DLK1. Yet, in mice and humans only a subset of OX neurons co-expressed DLK1. Since human OX-DLK1 distribution is more similar to mice than rats, mice are a comparable model to assess the human physiologic role of DLK1. We therefore used a viral lesion strategy to selectively delete DLK1 within the LHA of adult mice (DLK1(Null)) to reveal its role in body weight and behavior. Adult-onset DLK1 deletion had no impact on body weight or ingestive behavior. However, DLK1(Null) mice engaged in more locomotor activity than control mice and had decreased anxiety and depression measured via the elevated plus maze and forced swim tests. These data suggest that DLK1 expression via DLK1-expressing OX neurons primarily contributes to anxio-depression behaviors without impacting body weight.

Hooper RC, Nasser JS, **Huetteman HE**, Mack SJ and Chung KC (2020). "Postoperative follow-up time and justification in prospective hand surgery research: a systematic review." Journal of Hand Surgery: European Volume 45(9): 899-903.

[Full Text](#)

OUWB Medical Student Author

We systematically reviewed prospective studies for five hand procedures to analyse postoperative follow-up time, clinical or radiographic plateau, and whether the authors provide justification for times used. Demographic data, outcomes and mean follow-up were analysed. A total of 188 articles met our inclusion criteria. The mean postoperative follow-up time among these studies were carpal tunnel release, 21 months (range 1.5–111); cubital tunnel release, 27 months (2.5–46); open reduction and internal fixation for the distal radius fracture, 24 months (3–120); thumb carpometacarpal joint arthroplasty, 64 months (8.5–228); and flexor tendon repair, 25 months (3–59). Authors provided justification for follow-up intervals in 10% of these reports. We conclude that most prospective clinical studies in hand surgery do not properly justify follow-up length. Clinically unnecessary follow-up is costly without much benefit. In prospective research, we believe justified postoperative follow-up is essential, based on expected time to detect clinical plateau, capture complications and determine the need for secondary surgery. Level of evidence: III

Horowitz BN, **Kutinsky IB** and Linde A (2020). "Species-spanning echocardiography: Cardiovascular insights from across the animal kingdom." *Current Cardiology Reports* 22(12): 165.

[Full Text](#)

Department of Internal Medicine

Purpose of Review: The objective of this review is to present comparative echocardiography as a source of insights for human cardiovascular medicine. Recent Findings: We present echocardiographic examples of high impact human cardiovascular pathologies, including valvular, vascular, conduction, and myocardial disorders, in a wide range of species in varying environments. Unique features associated with comparative echocardiographic assessments are linked to human cardiology, including natural animal models of resistance and vulnerability. The cardiovascular vulnerabilities and strengths of other species can be a source of invaluable insights for human healthcare professionals. Echocardiography is playing a key role in bridging human and veterinary cardiology. Consequently, species-spanning echocardiography can deliver novel insights for human medicine.

Hristov AC, Comfere NI, Vidal CI and **Sundram U** (2020). "Kappa and lambda immunohistochemistry and in situ hybridization in the evaluation of atypical cutaneous lymphoid infiltrates." *Journal of Cutaneous Pathology* 47(11): 1103-1110.

[Full Text](#)

Department of Pathology

Background: Atypical cutaneous lymphoid infiltrates are challenging lesions in dermatopathology. We present a summary of the literature regarding kappa and lambda immunohistochemistry (IHC) and in situ hybridization (ISH) in the evaluation of atypical cutaneous or mucosal lymphoid infiltrates. Methods: Relevant articles from 1967 to 2018 in the English language were identified and summarized. In the absence of larger studies, case series of $n \geq 3$ were included. Results: Sixty-three articles assessing kappa and lambda IHC and/or ISH were identified. Most focused on marginal zone lymphomas. Other lymphomas included follicle center lymphoma, diffuse large B-cell lymphoma, chronic lymphocytic leukemia/small lymphocytic lymphoma, mantle cell lymphoma, lymphoplasmacytic lymphoma, plasmablastic lymphoma, multiple myeloma, monoclonal gammopathy of undetermined significance, and polyneuropathy, organomegaly, endocrinopathy, monoclonal protein, skin changes (POEMS). Non-neoplastic lesions included reactive lymphoid hyperplasia, cutaneous plasmacytosis, connective tissue disease, IgG4-related disease, acrodermatitis chronic atrophicans, Zoon balanitis, dermatitides, and infiltrates around epithelial dysplasias/neoplasias. Conclusion: Kappa and lambda IHC and ISH are useful tools in the evaluation of cutaneous B-cell lymphomas and plasma cell neoplasms. The literature supports that the detection of light-chain restriction by IHC and ISH is one of the most useful findings in the differential diagnosis of reactive lymphoid hyperplasia vs B-cell lymphoma with plasmacytic differentiation.

Imam Z, Odish F, Gill I, O'Connor D, Armstrong J, **Vanood A**, **Ibironke O**, Hanna A, **Ranski A** and **Halalau A** (2020). "Circulating trimethyllysine and risk of acute myocardial infarction in patients with suspected stable coronary heart disease." *Journal of Internal Medicine* 288(4): 469-476.

[Full Text](#)

Department of Internal Medicine

OUIB Medical Student Author

Background The carnitine precursor trimethyllysine (TML) is associated with progression of atherosclerosis, possibly through a relationship with trimethylamine-N-oxide (TMAO). Riboflavin is a cofactor in TMAO synthesis. We examined prospective relationships of circulating TML and TMAO with acute myocardial infarction (AMI) and potential effect modifications by riboflavin status. Methods By Cox modelling, risk associations were examined amongst 4098 patients (71.8% men) with suspected stable angina pectoris. Subgroup analyses were performed according to median plasma riboflavin. Results During a median follow-up of 4.9 years, 336 (8.2%) patients experienced an AMI. The age- and sex-adjusted hazard ratio (HR) (95% CI) comparing the 4th vs. 1st TML quartile was 2.19 (1.56-3.09). Multivariable adjustment for

traditional cardiovascular risk factors and indices of renal function only slightly attenuated the risk estimates [HR (95% CI) 1.79 (1.23-2.59)], which were particularly strong amongst patients with riboflavin levels above the median (P-int = 0.035). Plasma TML and TMAO were strongly correlated ($r(s) = 0.41; P < 0.001$); however, plasma TMAO was not associated with AMI risk in adjusted analyses [HR (95% CI) 0.81 (0.58-1.14)]. No interaction between TML and TMAO was observed. Conclusion Amongst patients with suspected stable angina pectoris, plasma TML, but not TMAO, independently predicted risk of AMI. Our results motivate further research on metabolic processes determining TML levels and their potential associations with cardiovascular disease. We did not adjust for multiple comparisons, and the subgroup analyses should be interpreted with caution.

Imam Z, Odish F, Gill I, O'Connor D, Armstrong J, **Vanood A, Ibronke O, Hanna A, Ranski A and Halalau A** (2020). "Older age and comorbidity are independent mortality predictors in a large cohort of 1305 COVID-19 patients in Michigan, United States." *Journal of Internal Medicine* 288(4): 469-476.

[Full Text](#)

Department of Internal Medicine

OUWB Medical Student Author

Introduction: Higher comorbidity and older age have been reported as correlates of poor outcomes in COVID-19 patients worldwide; however, US data are scarce. We evaluated mortality predictors of COVID-19 in a large cohort of hospitalized patients in the United States. Design: Retrospective, multicenter cohort of inpatients diagnosed with COVID-19 by RT-PCR from 1 March to 17 April 2020 was performed, and outcome data evaluated from 1 March to 17 April 2020. Measures included demographics, comorbidities, clinical presentation, laboratory values and imaging on admission. Primary outcome was mortality. Secondary outcomes included length of stay, time to death and development of acute kidney injury in the first 48-h. Results: The 1305 patients were hospitalized during the evaluation period. Mean age was 61.0 ± 16.3 , 53.8% were male and 66.1% African American. Mean BMI was 33.2 ± 8.8 kg m⁻². Median Charlson Comorbidity Index (CCI) was 2 (1-4), and 72.6% of patients had at least one comorbidity, with hypertension (56.2%) and diabetes mellitus (30.1%) being the most prevalent. ACE-I/ARB use and NSAIDs use were widely prevalent (43.3% and 35.7%, respectively). Mortality occurred in 200 (15.3%) of patients with median time of 10 (6-14) days. Age > 60 (aOR: 1.93, 95% CI: 1.26-2.94) and CCI > 3 (aOR: 2.71, 95% CI: 1.85-3.97) were independently associated with mortality by multivariate analyses. NSAIDs and ACE-I/ARB use had no significant effects on renal failure in the first 48 h. Conclusion: Advanced age and an increasing number of comorbidities are independent predictors of in-hospital mortality for COVID-19 patients. NSAIDs and ACE-I/ARB use prior to admission is not associated with renal failure or increased mortality.

Ionescu F, **Jaiyesimi I**, Petrescu I, Lawler PR, Castillo E, Munoz-Maldonado Y, Imam Z, Narasimhan M, **Abbas AE, Konde A and Nair GB** (2020). "Association of anticoagulation dose and survival in hospitalized COVID-19 patients: A retrospective propensity score-weighted analysis." *European Journal of Haematology*. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Background: Hypercoagulability may contribute to COVID-19 pathogenicity. The role of anticoagulation (AC) at therapeutic (tAC) or prophylactic doses (pAC) is unclear. Objectives: We evaluated the impact on survival of different AC doses in COVID-19 patients. Methods: Retrospective, multi-center cohort study of consecutive COVID-19 patients hospitalized between March 13 and May 5, 2020. Results: A total of 3480 patients were included (mean age, 64.5 years [17.0]; 51.5% female; 52.1% black and 40.6% white). 18.5% (n = 642) required intensive care unit (ICU) stay. 60.9% received pAC (n = 2121), 28.7% received ≥ 3 days of tAC (n = 998), and 10.4% (n = 361) received no AC. Propensity score (PS) weighted Kaplan-Meier plot demonstrated different 25-day survival probability in the tAC and pAC groups (57.5% vs 50.7%). In a PS-weighted multivariate proportional hazards model, AC was associated with reduced risk of death at prophylactic (hazard ratio [HR] 0.35 [95% confidence interval {CI} 0.22-0.54]) and therapeutic doses (HR 0.14 [95% CI 0.05-0.23]) compared to no AC. Major bleeding occurred more frequently in tAC patients (81 [8.1%]) compared to no AC (20 [5.5%]) or pAC (46 [2.2%]) subjects. Conclusions: Higher doses of AC were associated with lower mortality in hospitalized COVID-19 patients. Prospective evaluation of efficacy and risk of AC in COVID-19 is warranted.

Jagsi R, Griffith KA, Vicini F, Boike T, Burmeister J, Dominello MM, **Grills I**, Hayman JA, Moran JM, Paximadis P, Radawski JD, Walker EM and Pierce LJ (2020). "Toward improving patients' experiences of acute toxicity from breast radiotherapy: Insights from the analysis of patient-reported outcomes in a large multicenter cohort." *Journal of Clinical Oncology* 38(34): 4019-4029.

[Request Form](#)

Department of Radiation Oncology

Purpose: Understanding acute toxicities after whole-breast radiotherapy is important to inform patients,

guide treatment decisions, and target supportive care. We evaluated patient-reported outcomes prospectively collected from a cohort of patients with breast cancer. Methods: We describe the maximal toxicity reported by 8,711 patients treated between 2012 and 2019 at 27 practices. Multivariable models identified characteristics associated with (1) breast pain, (2) bother from itching, stinging/burning, swelling, or hurting of the treated breast, and (3) fatigue within 7 days of completing whole-breast radiotherapy. Results: Moderate or severe breast pain was reported by 3,233 (37.1%): 1,282 (28.9%) of those receiving hypofractionation and 1,951 (45.7%) of those receiving conventional fractionation. Frequent bother from at least one breast symptom was reported by 4,424 (50.8%): 1,833 (41.3%) after hypofractionation and 2,591 (60.7%) after conventional fractionation. Severe fatigue was reported by 2,008 (23.1%): 843 (19.0%) after hypofractionation and 1,165 (27.3%) after conventional fractionation. Among patients receiving hypofractionated radiotherapy, younger age ($P < .001$), higher body mass index (BMI; $P < .001$), Black ($P < .001$) or other race ($P = .002$), smoking status ($P < .001$), larger breast volume ($P = .002$), lack of chemotherapy receipt ($P = .004$), receipt of boost treatment ($P < .001$), and treatment at a nonteaching center predicted breast pain. Among patients receiving conventionally fractionated radiotherapy, younger age ($P < .001$), higher BMI ($P = .003$), Black ($P < .001$) or other race ($P = .002$), diabetes ($P = .001$), smoking status ($P < .001$), and larger breast volume ($P < .001$) predicted breast pain. Conclusion: In this large observational data set, substantial differences existed according to radiotherapy dose fractionation. Race-related differences in pain existed despite controlling for multiple other factors; additional research is needed to understand what drives these differences to target potentially modifiable factors. Intensifying supportive care may be appropriate for subgroups identified as being vulnerable to greater toxicity.

Jahshan A, Quinn TJ, Johnson MC, **Mankuzhy N**, Almahariq MF, Barski M, Ye H, **Guerrero TM**, **Stevens CW** and **Grills IS** (2020). "Dose-escalated radiation therapy with a simultaneous integrated boost with or without adjuvant immunotherapy for locally advanced non-small cell lung cancer." International Journal of Radiation Oncology, Biology, Physics 108(3): e95-e95.

[Full Text](#)

Department of Radiation Oncology
OUWB Medical Student Author

Kache S, Patel S, Chen NW, **Qu L** and **Bahl A** (2020). "Doomed peripheral intravenous catheters: Bad Outcomes are similar for emergency department and inpatient placed catheters: A retrospective medical record review." Journal of Vascular Access. ePub Ahead of Print.

[Request Form](#)

Department of Emergency Medicine
Department of Foundational Medical Studies (BH)

Introduction: The survivorship of peripheral intravenous catheters (PIVCs) placed in hospitalized patients is shockingly poor and leads to frequent reinsertions. We aimed to evaluate differences in failure rates and IV insertion practices for PIVCs that are placed in the emergency department (ED) compared to those placed in the inpatient (IP) setting. Methods: We conducted a retrospective electronic medical record review of PIVC survival at a single-site suburban, academic tertiary care referral center with 130,000 annual ED visits and 1100 inpatient beds. Adult patients admitted requiring at least one PIVC were included. The primary outcome was incidence of premature failure of PIVCs. Secondary outcomes included dwell time, completion of therapy, catheter diameter, and site of insertion as they relate to PIVC survival. Results: Between January 2018 and July 2019, 90,743 IV catheters were included from 47,272 unique patient encounters in which 35,798 and 54,945 catheters were placed in the ED and IP units, respectively. There was no significant difference in failure rate between the ED and IP PIVCs, with 53.1% of ED PIVCs failing and 53.4% of IP PIVCs failing ($p = 0.35$). Mean dwell time for ED PIVCs was 3.4 days compared to a mean of 3.2 days for IP placed PIVCs ($p < 0.001$). 48% of ED PIVCs achieved completion of therapy at the first insertion compared to 59% of IP PIVCs ($p < 0.001$). The antecubital fossa and forearm had the lowest failure rate of 53% and 50%, respectively, and 22 gauge PIVCs had the highest failure rate of 60.5%. Conclusion: PIVCs have similar poor survival rates regardless of ED versus IP location of the insertion. The forearm and antecubital fossa sites should be preferentially used. Smaller diameter (22G) catheters have highest complications and poorest survival regardless of site of insertion. Larger diameter catheters (18 or 20 gauge) may offer improved outcomes.

Kadri AN, Elmariah S, Al-Azizi K, **Hanzel G**, Shannon F, Potluri S, Schaffer J, **Ali A**, Khodor S, Camacho A, Selberg A, Szerlip M, Mack M and **Abbas A** (2020). "Post-procedural versus discharge echocardiogram hemodynamics post-valve-in-valve transcatheter aortic valve replacement: A multi-center trial." Journal of the American College of Cardiology 76(17): B61-B62.

[Full Text](#)

Department of Internal Medicine

Kadri AN, **Hanzel G, Shannon F**, Elmariah S, Al-Azizi K, Khodor S, Ali A, Camacho A, Selberg A, Harrington K, Vivacqua A, Szerlip M, Mack M and **Abbas A** (2020). "Concomitant invasive versus echocardiographic mean gradients in degenerated surgical aortic valve prostheses: A multicenter study." Journal of the American College of Cardiology 76(17): B62-B63.

[Full Text](#)

Department of Internal Medicine

Department of Surgery

Kadri AN, Khodor S, Ali A, Nusairat L, Mahmood A, Nahhas G, Dabbous S, Spears J, **Jafri S** and Werns S (2020). "National trends of tobacco, alcohol, and drug use in patients admitted with acute myocardial infarction." Cardiovascular Revascularization Medicine. ePub Ahead of Print.

[Full Text](#)

Department of Urology

Background: Acute myocardial infarction (AMI) is a significant health and economic burden in the US. Tobacco, alcohol, and drug use are established risk factors. We sought to evaluate the national trend of use of each substance in patients admitted with AMI. Methods: We used the National Inpatient Sample between 2005 and 2017. We included adult patients hospitalized with AMI. International Classification of Diseases, Ninth and Tenth Revisions codes were used to define tobacco, alcohol, cocaine, opioid, cannabis and other drug use. Trends of each substance use were assessed using multivariable Poisson regression, and were expressed as annual percent change (APC) with their 95% confidence intervals (CIs). Results: A total of 10,796,844 hospitalizations with AMI were included. Among all substances used, tobacco was the most common (32.7%), followed by alcohol (3.2%). Between 2005 and 2017, the prevalence ratio of tobacco use increased from 21.5% to 44.5% with an APC +6.2% (95%CI 6.2%-6.2%). Tobacco users had more percutaneous coronary intervention (41%vs25%) and coronary artery bypass surgery (6.9%vs4.9%), $p < 0.001$. Further, there were positive trends in alcohol (APC +3.1%; 95%CI 3.0%-3.2%), opioid (APC +9.0%; 95%CI 8.7%-9.2%), cannabis (APC + 7.2; 95% CI 7%-7.4%), and combined all drug use (+7.1%; 95%CI 7%-7.2%). Meanwhile, there was a slight negative trend in cocaine use. Conclusions: This analysis outlines the national trends of substance use in patients admitted with AMI and reveals an increasing prevalence of tobacco use, alcohol and drug use. More effective cessation measures are necessary to reduce the risk for AMI and its burden on the healthcare system and economy.

Kaufman CS, Cross MJ, Barone JL, Dekhne NS, Devisetty K, **Dilworth JT**, Edmonson DA, Eladoumikhachi FG, Gass JS, Hall WH, 3rd, Hong RL, Kuske RR, Patton BJ, Perelson C, Phillips RF, Smith AB, Smith LA, Tafra L and Lebovic GS (2020). "A three-dimensional bioabsorbable tissue marker for volume replacement and radiation planning: A multicenter study of surgical and patient-reported outcomes for 818 patients with breast cancer." Annals of Surgical Oncology. ePub Ahead of Print.

[Full Text](#)

Department of Radiation Oncology

Background: Accurate identification of the tumor bed after breast-conserving surgery (BCS) ensures appropriate radiation to the tumor bed while minimizing normal tissue exposure. The BioZorb(®) three-dimensional (3D) bioabsorbable tissue marker provides a reliable target for radiation therapy (RT) planning and follow-up evaluation while serving as a scaffold to maintain breast contour. Methods: After informed consent, 818 patients (826 breasts) implanted with the BioZorb(®) at 14 U.S. sites were enrolled in a national registry. All the patients were prospectively followed with the BioZorb(®) implant after BCS. The data collected at 3, 6, 12, and 24 months included all demographics, treatment parameters, and provider/patient-assessed cosmesis. Results: The median follow-up period was 18.2 months (range, 0.2-53.4 months). The 30-day breast infection rate was 0.5 % of the patients (n = 4), and re-excision was performed for 8.1 % of the patients (n = 66), whereas 2.6 % of the patients (n = 21) underwent mastectomy. Two patients (0.2 %) had local recurrence. The patient-reported cosmetic outcomes at 6, 12, and 24 months were rated as good-to-excellent by 92.4 %, 90.6 %, and 87.3 % of the patients, respectively and similarly by the surgeons. The radiation oncologists reported planning of target volume (PTV) reduction for 46.2 % of the patients receiving radiation boost, with PTV reduction most commonly estimated at 30 %. Conclusions: This report describes the first large multicenter study of 818 patients implanted with the BioZorb(®) tissue marker during BCS. Radiation oncologists found that the device yielded reduced PTVs and that both the patients and the surgeons reported good-to-excellent long-term cosmetic outcomes, with low adverse effects. The BioZorb(®) 3D tissue marker is a safe adjunct to BCS and may add benefits for both surgeons and radiation oncologists.

Kelsch R, **Saon M, Sutherland E, Tech K** and Al-Katib S (2020). "Discrepant reporting style preferences between clinicians and radiologists." Current Problems in Diagnostic Radiology. ePub Ahead of Print.

[Full Text](#)

Department of Diagnostic Radiology and Molecular Imaging

OUWB Medical Student Author

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

Kerndt Connor C, Nessel T, Bills John A, Shareef Zaid A, **Balinski A** and Mistry D (2020). "Cardiac metastasis of lingual squamous cell carcinoma, a systematic review of presentation, management, and outcomes." Circulation 142(Suppl_3): A13127-A13127.

[Full Text](#)

OUWB Medical Student Author

Khanna AK, Bergese SD, Jungquist CR, Morimatsu H, Uezono S, Lee S, Ti LK, Urman RD, McIntyre R, Tornero C, Dahan A, Saager L, Weingarten TN, Wittmann M, Auckley D, Brazzi L, Le Guen M, **Soto R**, Schramm F, Ayad S, Kaw R, Di Stefano P, Sessler DI, Uribe A, Moll V, Dempsey SJ, Buhre W, Overdyk FJ and Collaborators PG (2020). "Prediction of opioid-induced respiratory depression on inpatient wards using continuous capnography and oximetry: An international prospective, observational trial." Anesthesia and Analgesia 131(4): 1012-1024.

[Full Text](#)

Department of Anesthesiology

Background: Opioid-related adverse events are a serious problem in hospitalized patients. Little is known about patients who are likely to experience opioid-induced respiratory depression events on the general care floor and may benefit from improved monitoring and early intervention. The trial objective was to derive and validate a risk prediction tool for respiratory depression in patients receiving opioids, as detected by continuous pulse oximetry and capnography monitoring. Methods: Prediction of Opioid-induced respiratory Depression In patients monitored by capnoGraphY (PRODIGY) was a prospective, observational trial of blinded continuous capnography and oximetry conducted at 16 sites in the United States, Europe, and Asia. Vital signs were intermittently monitored per standard of care. A total of 1335 patients receiving parenteral opioids and continuously monitored on the general care floor were included in the analysis. A respiratory depression episode was defined as respiratory rate ≤ 5 breaths/min (bpm), oxygen saturation $\leq 85\%$, or end-tidal carbon dioxide ≤ 15 or ≥ 60 mm Hg for ≥ 3 minutes; apnea episode lasting >30 seconds; or any respiratory opioid-related adverse event. A risk prediction tool was derived using a multivariable logistic regression model of 46 a priori defined risk factors with stepwise selection and was internally validated by bootstrapping. Results: One or more respiratory depression episodes were detected in 614 (46%) of 1335 general care floor patients (43% male; mean age, 58 +/- 14 years) continuously monitored for a median of 24 hours (interquartile range [IQR], 17-26). A multivariable respiratory depression prediction model with area under the curve of 0.740 was developed using 5 independent variables: age ≥ 60 (in decades), sex, opioid naivety, sleep disorders, and chronic heart failure. The PRODIGY risk prediction tool showed significant separation between patients with and without respiratory depression ($P < .001$) and an odds ratio of 6.07 (95% confidence interval [CI], 4.44-8.30; $P < .001$) between the high- and low-risk groups. Compared to patients without respiratory depression episodes, mean hospital length of stay was 3 days longer in patients with ≥ 1 respiratory depression episode (10.5 +/- 10.8 vs 7.7 +/- 7.8 days; $P < .0001$) identified using continuous oximetry and capnography monitoring. Conclusions: A PRODIGY risk prediction model, derived from continuous oximetry and capnography, accurately predicts respiratory depression episodes in patients receiving opioids on the general care floor. Implementation of the PRODIGY score to determine the need for continuous monitoring may be a first step to reduce the incidence and consequences of respiratory compromise in patients receiving opioids on the general care floor.

Kim DH, Hwang RW, Lee GH, **Joshi R**, **Baker KC**, Arnold P, Sasso R, **Park D** and **Fischgrund J** (2020). "Response to Letter to the Editor regarding, "potential significance of facet joint fusion or posteromedial fusion observed on CT imaging following attempted posterolateral or posterior interbody fusion"." Spine Journal 20(11): 1890-1891.

[Full Text](#)

Department of Orthopaedic Surgery

OUWB Medical Student Author

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 (2020). "Impact of age on coronary artery plaque progression and clinical outcome: A PARADIGM substudy." Journal of Cardiovascular Computed Tomography. ePub Ahead of Print.

[Request Form](#)

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. CLINICAL TRIAL REGISTRATION: URL: <http://www.clinicaltrials.gov>. Unique identifiers: NCT02803411.

Kim CM, Silverman BR, **Cortes C** (2020). "The challenges and opportunities of sustaining academia-sponsored community service programs for latinx youth during the COVID-19 pandemic." Journal of Hispanic Higher Education 1538192720980294.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Kishan A, Levin-Epstein R, Romero T, Wong JK, Dess R, Moran B, Merrick G, Tran P, Stish B, **Krauss D**, Wedde T, Stock R, Tward J, Horwitz E and Tendulkar R (2020). "Patterns of clinical progression in radiorecurrent high risk prostate cancer and impact of initial treatment selection." International Journal of Radiation Oncology Biology Physics 108(2): E22-E22.

[Full Text](#)

Department of Radiation Oncology

Klein M, Bacher J, Barth S, Atrzadeh F, Siebenhaller K, Ferreira I, Beisken S, Posch AE, Carroll KC, Wunderink RG, Qi C, Wu F, Hardy DJ, Patel R and **Sims MD** (2020). "Multicenter evaluation of the Unyvero platform for testing bronchoalveolar lavage fluid." Journal of Clinical Microbiology. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Bronchoalveolar lavage (BAL) culture is a standard, though time consuming, approach for identifying microorganisms in severe lower respiratory tract infections. Sensitivity of BAL culture is relatively low and prior antimicrobial therapy decreases the sensitivity further, leading to overuse of empiric 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 ~4.5 hours. 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 agreement with culture 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*, positive percent agreement with standard testing was 87.5%. Antibiotic resistance marker results were compared to standard antibiotic susceptibility testing to determine positive predictive values (PPVs). PPVs ranged from 80-100%, 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 suggests significant clinical value for choosing appropriate antibiotics and for antibiotic stewardship.

Klement RJ, Sonke JJ, Allgauer M, Andratschke N, Appold S, Belderbos J, Belka C, Blanck O, Dieckmann K, Eich

HT, Mantel F, Eble M, Hope A, Grosu AL, Nevinny-Stickel M, Semrau S, Sweeney RA, Horner-Rieber J, Werner-Wasik M, Engenhardt-Cabillic R, Ye H, **Grills I** and Guckenberger M (2020). "Correlating dose variables with local tumor control in stereotactic body radiation therapy for early-stage non-small cell lung cancer: A modeling study on 1500 individual treatments." International Journal of Radiation Oncology Biology Physics 107(3): 579-586.

[Full Text](#)

Department of Radiation Oncology

Background: Large variation regarding prescription and dose inhomogeneity exists in stereotactic body radiation therapy (SBRT) for early-stage non-small cell lung cancer. The aim of this modeling study was to identify which dose metric correlates best with local tumor control probability to make recommendations regarding SBRT prescription. Methods and Materials: We combined 2 retrospective databases of patients with non-small cell lung cancer, yielding 1500 SBRT treatments for analysis. Three dose parameters were converted to biologically effective doses (BEDs): (1) the (near-minimum) dose prescribed to the planning target volume (PTV) periphery (yielding BEDmin); (2) the (near-maximum) dose absorbed by 1% of the PTV (yielding BEDmax); and (3) the average between near-minimum and near-maximum doses (yielding BEDave). These BED parameters were then correlated to the risk of local recurrence through Cox regression. Furthermore, BED-based prediction of local recurrence was attempted by logistic regression and fast and frugal trees. Models were compared using the Akaike information criterion. Results: There were 1500 treatments in 1434 patients; 117 tumors recurred locally. Actuarial local control rates at 12 and 36 months were 96.8% (95% confidence interval, 95.8%-97.8%) and 89.0% (87.0%-91.1%), respectively. In univariable Cox regression, BEDave was the best predictor of risk of local recurrence, and a model based on BEDmin had substantially less evidential support. In univariable logistic regression, the model based on BEDave also performed best. Multivariable classification using fast and frugal trees revealed BEDmax to be the most important predictor, followed by BEDave. Conclusions: BEDave was generally better correlated with tumor control probability than either BEDmax or BEDmin. Because the average between near-minimum and near-maximum doses was highly correlated to the mean gross tumor volume dose, the latter may be used as a prescription target. More emphasis could be placed on achieving sufficiently high mean doses within the gross tumor volume rather than the PTV covering dose, a concept needing further validation.

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** (2020). "Clinical outcomes and treatment course of eyes with neovascular age-related macular degeneration following the development of endophthalmitis." Retina. ePub Ahead of Print.

[Full Text](#)

Department of Ophthalmology

OUWB Medical Student Author

Purpose: To evaluate the neovascular age-related macular degeneration (nAMD) course after endophthalmitis. Methods: Multicenter, retrospective series. Results: From 4/2013-10/2018, 196,598 intravitreal anti-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 intra-procedure variable and endophthalmitis incidence. Seventy-two patients (96%) were treated with intravitreal tap & inject (vs 3 with pars plana vitrectomy). After endophthalmitis resolution, 17 patients (22.7%) were not re-treated for nAMD (inactive disease - 10 cases; follow-up 115±8.4 weeks). Patients required less frequent anti-VEGF injections post-infection (7.4±0.61 weeks vs 11.5±1.8 weeks; p=0.004). LogMAR visual acuity (VA) pre-infection was 0.585±0.053 (~20/77). It worsened with endophthalmitis (1.67±0.08, ~20/935; p<0.001) and again on POD1 (1.94±0.064, Count Fingers; p<0.001), but improved after re-initiating nAMD therapy (1.02±0.11, ~20/209; p<0.001). Better VA on post-endophthalmitis week 1 (p=0.002) and reinitiation of nAMD treatment (p=0.008) were associated with better final VA, streptococcal culture with worse VA (p=0.028). The post-endophthalmitis treatment interval was associated with the anti-VEGF drug (aflibercept = ranibizumab > bevacizumab; p<0.001). Conclusions: Patients with nAMD required fewer injections after endophthalmitis, suggesting a biological change in disease activity. nAMD became quiescent in 13.3% of eyes. Most achieved better outcomes with anti-VEGF reinitiation.

Kus KJB and Ruiz ES (2020). "Wound dressings – A practical review." Current Dermatology Reports 9(4): 298-308.

[Request Form](#)

OUWB Medical Student Author

Purpose of Review: There are currently thousands of wound dressing products and materials available on the market. Despite the wide selection, there is no universally superior dressing, which prompts healthcare providers to choose materials that are most suitable to each particular case. This review provides an overview of various types of wound dressings, suggested uses, and recent advancements. Recent Findings: Modern dressings have evolved to encompass an expansive array of semipermeable films and foams,

hydrofibers, hydrogels, hydrocolloids, and alginates. Recent studies have investigated new technologies such as electrospun biopolymer nanofibers to create sprayable dressings while also exploring new roles for traditional materials such as honey and other non-synthetic derivatives. Summary: Wound presentations are diverse and require unique materials to best accommodate their respective healing processes. Future research is aimed at improving versatility and effectiveness of existing wound dressings while also investigating innovative therapeutic approaches to better manage challenging, non-healing wounds.

LaBan M (2020). "Regarding "Female office workers with moderate neck pain have increased anterior positioning of the cervical spine and stiffness of the upper trapezius myofascial tissues in sitting position"." *PM&R* 12(10): 1060.

[Full Text](#)

Department of Physical Medicine and Rehabilitation

LaBan MM (2020). "The initial appearance of neurofibromatosis with the onset of pregnancy." *PM&R*. ePub Ahead of Print.

[Full Text](#)

Department of Physical Medicine and Rehabilitation

Lamb LE, Dhar N, Timar R, Wills M, Dhar S and **Chancellor MB** (2020). "COVID-19 inflammation results in urine cytokine elevation and causes COVID-19 associated cystitis (CAC)." *Medical Hypotheses* 145: 110375.

[Full Text](#)

Department of Urology

Coronavirus disease 2019 (COVID-19) causes a wide range of symptoms, including several unexpected symptoms such as loss of taste, skin changes, and eye problems. We recently observed patients with documented COVID-19 develop de novo severe genitourinary symptoms, most notably urinary frequency of ≥ 13 episodes/24 h and nocturia ≥ 4 episodes/night. We call these associated urinary symptoms COVID-19 associate cystitis (CAC). COVID-19 severity is associated with inflammation. We collected urine samples from COVID-19 patients, including patients with CAC, and found elevation of proinflammatory cytokines also in the urine. It has been previously shown that patients with urinary incontinence and ulcerative interstitial cystitis/bladder pain syndrome have elevated urinary inflammatory cytokines compared to normal controls. We therefore hypothesize that CAC, with presentation of de novo severe urinary symptoms, can occur in COVID-19 and is caused by increased inflammatory cytokines that are released into the urine and/or expressed in the bladder. The most important implications of our hypothesis are: 1) Physician caring for COVID-19 patients should be aware of COVID-19 associate cystitis (CAC); 2) De novo urinary symptoms should be included in the symptom complex associated with COVID-19; and 3) COVID-19 inflammation may result in bladder dysfunction.

Laskowski EP (2020). "Picture of the month." *Clinical Pediatrics* 59(12): 1129.

[Full Text](#)

Department of Pediatrics

Ledvina A, Hamilton J, **Clark C**, **Bastani A**, **Otero R**, **Ziadeh J**, **Ditkoff J** and **Swor R** (2020). "Preliminary report of drive through COVID-19 screening process in a large suburban hospital." *Annals of Emergency Medicine* 76(4): S127-S127.

[Full Text](#)

Department of Emergency Medicine

OUIB Medical Student Author

Lee AA, Rao K, Limsrivilai J, Gilliland M, **Malamet B**, Briggs E, Young VB and Higgins PDR (2020). "Temporal gut microbial changes predict recurrent clostridiodes difficile infection in patients with and without ulcerative colitis." *Inflammatory Bowel Diseases* 26(11): 1748-1758.

[Full Text](#)

OUIB Medical Student Author

Background: Ulcerative colitis (UC) carries an increased risk of primary and recurrent *Clostridiodes difficile* infection (rCDI), and CDI is associated with UC flares. We hypothesized that specific fecal microbial changes associate with UC flare and rCDI. Methods: We conducted a prospective observational cohort study of 57 patients with (IC and CDI, CDI only, and UC only). Stool samples were collected at baseline, at the end of antibiotic therapy, and after reconstitution for 16S rRNA sequencing. The primary outcomes were recurrent UC flare and rCDI. Logistic regression and Lasso models were constructed for analysis. Results: There were 21 (45.7%) patients with rCDI, whereas 11 (34.4%) developed UC flare. Patients with rCDI demonstrated significant interindividual ($P = 0.008$) and intraindividual differences ($P = 0.004$) in community structure by Jensen-Shannon distance (JSD) compared with non-rCDI. Two cross-validated Lasso regression models predicted risk of rCDI: a baseline model with female gender, hospitalization for UC in the

past year, increased Ruminococcaceae and Verrucomicrobia, and decreased Eubacteriaceae, Enterobacteriaceae, Lachnospiraceae, and Veillonellaceae (AuROC, 0.94); and a model 14 days after completion of antibiotics with female gender, increased Shannon diversity, Ruminococcaceae and Enterobacteriaceae, and decreased community richness and Faecalibacterium (AuROC, 0.9). Adding JSD between baseline and post-treatment samples to the latter model improved fit (AuROC, 0.94). A baseline model including UC hospitalization in the past year and increased Bacteroidetes was associated with increased risk for UC flare (AuROC, 0.88). Conclusion: Fecal microbial features at baseline and after therapy predict rCDI risk in patients with and without UC. These results may help risk stratify patients to guide management.

Lee DM, **Berger DA**, Wloszczynski PA, **Karabon P**, **Qu L** and **Burla MJ** (2020). "Assessing the impact of resuscitation residents on the treatment of cardiopulmonary resuscitation patients." *American Journal of Emergency Medicine* 41: 46-50.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Department of Emergency Medicine

Department of Medical Education

Background: The management of cardiac arrest patients receiving cardiopulmonary resuscitation (CPR) is an essential aspect of emergency medicine (EM) training. At our institution, we have a 1-month Resuscitation Rotation designed to augment resident training in managing critical patients. The objective of this study is to compare 30-day mortality between cardiac arrest patients with resuscitation resident (RR) involvement versus patients without. Our secondary outcome is to determine if RR involvement altered rates of initiating targeted temperature management (TTM). Methods: This study was conducted at a single site tertiary care Level-1 trauma center with an Emergency Department (ED) census of nearly 130,000 visits per year. Data was collected from 01/01/2015 to 01/01/2018 using electronic medical records via query. Patients admitted with cardiac arrest were separated into two groups, one with RR involvement and one without. Initial rhythm of ventricular fibrillation/tachycardia (VFIB/VTACH), 30-day mortality, history of coronary artery disease (CAD), and initiation of TTM were compared. Statistical analysis was performed. Results: Out of 885 patient encounters, 91 (10.28%) had RR participation. There was no statistical difference in 30-day mortality between patients with RR involvement compared to those without (71.42% vs 66.36%; $P = 0.3613$). However, TTM was initiated more in the RR group (20.70% vs 8.86%; $P = 0.0025$). Patients who received TTM also had a lower 30-day mortality compared to those without TTM (52.94% vs 70.87%; $P = 0.0020$). Patients who were older and had no history of CAD were also noted to have a statistically significant higher 30-day mortality. All other variables were not statistically significant. Conclusion: Resuscitation resident involvement with the care of cardiac arrest patients had no impact in 30-day mortality. However, the involvement of RR was associated with a statistically significant increase in the initiation of TTM. One limitation is that RR participated in 10.28% of the cases analyzed herein, thus the two arms are unbalanced in size. Future work may investigate if the increase in TTM in the RR involved cases may portend improved rates of neurologically intact survival or more rapid achievement of goal temperatures.

Lee SE, Sung JM, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Chun EJ, Conte E, Gottlieb I, Hadamitzky M, Kim YJ, Lee BK, Leipsic JA, Maffei E, Marques H, de Araújo Gonçalves P, Pontone G, Shin S, Stone PH, Samady H, Virmani R, Narula J, Berman DS, Shaw LJ, Bax JJ, Lin FY, Min JK and Chang HJ (2020). "Per-lesion versus per-patient analysis of coronary artery disease in predicting the development of obstructive lesions: The Progression of Atherosclerotic Plaque Determined by Computed Tomographic Angiography Imaging (PARADIGM) study." *International Journal of Cardiovascular Imaging* 36(12): 2357-2364.

[Full Text](#)

Department of Internal Medicine

To determine whether the assessment of individual plaques is superior in predicting the progression to obstructive coronary artery disease (CAD) on serial coronary computed tomography angiography (CCTA) than per-patient assessment. From a multinational registry of 2252 patients who underwent serial CCTA at a ≥ 2 -year inter-scan interval, patients with only non-obstructive lesions at baseline were enrolled. CCTA was quantitatively analyzed at both the per-patient and per-lesion level. Models predicting the development of an obstructive lesion at follow up using either the per-patient or per-lesion level CCTA measures were constructed and compared. From 1297 patients (mean age 60 ± 9 years, 43% men) enrolled, a total of 3218 non-obstructive lesions were identified at baseline. At follow-up (inter-scan interval: 3.8 ± 1.6 years), 76 lesions (2.4%, 60 patients) became obstructive, defined as $> 50\%$ diameter stenosis. The C-statistics of Model 1, adjusted only by clinical risk factors, was 0.684. The addition of per-patient level total plaque volume (PV) and the presence of high-risk plaque (HRP) features to Model 1 improved the C-statistics to 0.825 [95% confidence interval (CI) 0.823-0.827]. When per-lesion level PV and the presence of HRP were added to Model 1, the predictive value of the model improved the C-statistics to 0.895 [95% CI 0.893-0.897]. The model utilizing per-lesion level CCTA measures was superior to the model utilizing per-patient level

CCTA measures in predicting the development of an obstructive lesion ($p < 0.001$). Lesion-level analysis of coronary atherosclerotic plaques with CCTA yielded better predictive power for the development of obstructive CAD than the simple quantification of total coronary atherosclerotic burden at a per-patient level.

Lee SE, Sung JM, Andreini D, Al-Mallah MH, Budoff MJ, Cademartiri F, **Chinnaiyan K**, Choi JH, Chun EJ, Conte E, Gottlieb I, Hadamitzky M, Kim YJ, Lee BK, Leipsic JA, Maffei E, Marques H, Goncalves PD, Pontone G, Shin S, Stone PH, Samady H, Virmani R, Narula J, Berman DS, Shaw LJ, Bax JJ, Lin FY, Min JK and Chang HJ (2020). "Sex differences in compositional plaque volume progression in patients with coronary artery disease." JACC - Cardiovascular Imaging 13(11): 2386-2396.

[Full Text](#)

Department of Internal Medicine

Objectives: This study sought to explore sex-based differences in total and compositional plaque volume (PV) progression. **Background:** It is unclear whether sex has an impact on PV progression in patients with coronary artery disease (CAD). **Methods:** The study analyzed a prospective multinational registry of consecutive patients with suspected CAD who underwent 2 or more clinically indicated coronary computed tomography angiography (CTA) at 2-year intervals. Total and compositional PV at baseline and follow-up were quantitatively analyzed and normalized using the analyzed total vessel length. Multivariate linear regression models were constructed. **Results:** Of the 1,255 patients included (median coronary CTA interval 3.8 years), 543 were women and 712 were men. Women were older (62 +/- 9 years of age vs. 59 +/- 9 years of age; $p < 0.001$) and had higher total cholesterol levels (195 +/- 41 mg/dl vs. 187 +/- 39 mg/dl; $p = 0.002$). Prevalence of hypertension, diabetes, and family history of CAD were not different (all $p > 0.05$). At baseline, men possessed greater total PV (31.3 mm³ [interquartile range (IQR): 0 to 121.8 mm³] vs. 56.7 mm³ [IQR: 6.8 to 152.1 mm³] $p = 0.005$), and there was an approximately 9-year delay in women in developing total PV than in men. The prevalence of high-risk plaques was greater in men than women (31% vs. 20%; $p < 0.001$). In multivariate analysis, after adjusting for age, clinical risk factors, medication use, and total PV at baseline, despite similar total PV progression rates, female sex was associated with greater calcified PV progression ($b = 2.83$; $p = 0.004$) but slower noncalcified PV progression ($b = -3.39$; $p = 0.008$) and less development of high-risk plaques ($b = -0.18$; $p = 0.049$) than in men. **Conclusions:** The compositional PV progression differed according to sex, suggesting that comprehensive plaque evaluation may contribute to further refining of risk stratification according to sex. (c) 2020 by the American College of Cardiology Foundation.

Legbo JN, Ameh EA and **Novotny NM** (2020). "Necrotizing fasciitis," In EA Ameh, SW Bickler, K Lakhoo, BC Nwomeh and D Poenaru (ed). Pediatric Surgery: A Comprehensive Textbook for Africa. Cham: Springer International Publishing. pp: 219-228.

[Full Text](#)

Department of Surgery

Necrotizing fasciitis is a rapidly progressing skin and soft tissue infection that carries an extremely high morbidity and mortality if not addressed in an expeditious manner. Even when it is attended to with appropriate aggressiveness, the morbidity and mortality are unfortunately still high. The sub-Saharan Africa prevalence is much higher than previously thought. Herein we describe the pathophysiology, elements of diagnosis, and current evidence-based approach to treatment that includes aggressive resuscitation, wide surgical debridement (often multiple debridements), and broad spectrum antibiotics covering the polymicrobial nature of the disease.

Lerchenfeldt S, Attardi SM, Pratt RL, Sawarynski KE and Taylor TAH (2020). "Twelve tips for interfacing with the new generation of medical students: iGen." Medical Teacher: 1-6.

[Full Text](#)

Department of Foundational Medical Studies (OU)

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

Lerchenfeldt S and Taylor TAH (2020). "Best practices in peer assessment: Training tomorrow's physicians to obtain and provide quality feedback [Response to Letter]." Advances in Medical Education and Practice 11: 851-852.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Lewis H, Samanta D, Örsell J-L, Bosanko KA, Rowell A, Jones M, Dale RC, Taravath S, Hahn CD, Krishnakumar D, Chagnon S, Keller S, Hagebeuk E, Pathak S, Bebin EM, **Arndt DH**, Alexander JJ, Mainali G, Coppola G and Maclean J (2020). "Epilepsy and electroencephalographic abnormalities in SATB2-associated syndrome." [Pediatric Neurology](#) 112: 94-100.

[Full Text](#)

Department of Pediatrics

Background: Seizures are an under-reported feature of the SATB2-associated syndrome phenotype. We describe the electroencephalographic findings and seizure semiology and treatment in a population of individuals with SATB2-associated syndrome. Methods: We performed a retrospective review of 101 individuals with SATB2-associated syndrome who were reported to have had a previous electroencephalographic study to identify those who had at least one reported abnormal result. For completeness, a supplemental survey was distributed to the caregivers and input from the treating neurologist was obtained whenever possible. Results: Forty-one subjects were identified as having at least one prior abnormal electroencephalography. Thirty-eight individuals (93%) had epileptiform discharges, 28 (74%) with central localization. Sleep stages were included as part of the electroencephalographies performed in 31 individuals (76%), and epileptiform activity was recorded during sleep in all instances (100%). Definite clinical seizures were diagnosed in 17 individuals (42%) with a mean age of onset of 3.2 years (four months to six years), and focal seizures were the most common type of seizure observed (42%). Six subjects with definite clinical seizures needed polytherapy (35%). Delayed myelination and/or abnormal white matter hyperintensities were seen on neuroimaging in 19 individuals (61%). Conclusions: Epileptiform abnormalities are commonly seen in individuals with SATB2-associated syndrome. A baseline electroencephalography that preferably includes sleep stages is recommended during the initial evaluation of all individuals with SATB2-associated syndrome, regardless of clinical suspicion of epilepsy.

Li X, Ding X, Zheng W, Liu G, Janssens G, Souris K, Montero AB, **Yan D, Stevens CW** and **Kabolizadeh P** (2020). "A novel linear energy transfer integrated spot-scanning proton arc therapy algorithm: Feasibility study and clinical potential." [International Journal of Radiation Oncology Biology Physics](#) 108(3): S187-S187.

[Full Text](#)

Department of Radiation Oncology

Liu G, **Li X**, Zhao L, Zheng W, **Qin A**, Zhang S, **Stevens C, Yan D, Kabolizadeh P** and **Ding X** (2020). "A novel energy sequence optimization algorithm for efficient spot-scanning proton arc (SPArc) treatment delivery." [Acta Oncologica](#) 59(10): 1178-1185.

[Full Text](#)

Department of Radiation Oncology

Background: Spot-scanning proton arc therapy (SPArc) has been proposed to improve dosimetric outcome and to simplify treatment workflow. To efficiently deliver a SPArc plan, it's crucial to minimize the number of energy layer switches (ELS) a sending because of the magnetic hysteresis effect. In this study, we introduced a new SPArc energy sequence optimization algorithm (SPArc_seq) to reduce ascended ELS and to investigate its impact on the beam delivery time (BDT). Method and materials: An iterative energy layer sorting and re-distribution mechanism following the direction of the gantry rotation was implemented in the original SPArc algorithm (SPArc_orig). Five disease sites, including prostate, lung, brain, head neck cancer (HNC) and breast cancer were selected to evaluate this new algorithm. Dose-volume histogram (DVH) and plan robustness were used to assess the plan quality for both SPArc_seq and SPArc_orig plans. The BDT evaluations were analyzed through two methods: 1. fixed gantry angle delivery (BDTfixed) and 2. An in-house dynamic arc scanning controller simulation which considered of gantry rotation speed, acceleration and deceleration (BDTarc). Results: With a similar total number of energy layers, SPArc_seq plans provided a similar nominal plan quality and plan robustness compared to SPArc_orig plans. SPArc_seq significantly reduced the number of ascended ELS by 83% (19 vs. 115), 70% (16 vs. 64), 82% (19 vs. 104), 80% (19 vs. 94) and 70% (9 vs. 30), which effectively shortened the BDTfixed by 65% (386 vs. 1091 s), 61% (235 vs. 609 s), 64% (336 vs. 928 s), 48% (787 vs. 1521 s) and 25% (384 vs. 511 s) and shortened BDTarc by 54% (522 vs. 1128 s), 52% (310 vs. 645 s), 53% (443 vs. 951 s), 49% (803 vs. 1583 s) and 26% (398 vs. 534 s) in prostate, lung, brain, HNC and breast cancer, respectively. Conclusions: The SPArc_seq optimization algorithm could effectively reduce the BDT compared to the original SPArc algorithm. The improved efficiency of the SPArc_seq algorithm has the potential to increase patient throughput, thereby reducing the operation cost of proton therapy.

Lucas JP, **Allen M, Nguyen BK**, Svider PF, **Folbe AJ** and Carron M (2020). "Orbital roof fractures: An evidence-based approach." [Facial Plastic Surgery and Aesthetic Medicine](#) 22(6): 471-480.

[Full Text](#)

Department of Surgery
OUWB Medical Student Author

Importance: There is controversy surrounding the management of orbital roof fractures. Guidelines with regard to when to operate and type of reconstruction are lacking. Categorizing these data will help clinicians make informed decisions about the management of orbital roof fractures and avoid preventable complications. **Objective:** To perform a systematic review evaluating underlying causes, associated complications, and management of orbital roof fractures including reconstructive options in the general population of children and adults. **Evidence Review:** A systematic review using the PubMed, EmBase, Cochrane, and MEDLINE databases identified relevant studies for inclusion. Studies were included from 1987 to 2017. Demographics, symptoms, management, reconstruction, and outcomes were reported following preferred reporting items for systematic reviews and meta-analyses guidelines. Inclusion criteria included articles discussing management of traumatic orbital roof fractures across all ages. Included studies were assessed for level of evidence. **Findings:** Forty-seven studies encompassing 526 patients met inclusion criteria. There were 28 case reports, 15 retrospective case series and 4 retrospective cohort studies. The most common etiologies were motor vehicle accidents (39.5%), falls (30.3%), and assault (11.8%). Periorbital ecchymosis, exophthalmos, and dystopia were the most common initial symptoms. In total, 60.0% of patients underwent surgical repair and 40% of patients were managed conservatively. The most common surgical approach was bicoronal (94.8%), followed by a superolateral orbital rim approach and transpalpebral (5.1%). A variety of grafting materials were utilized, including titanium miniplates (46.2%), bone graft (37.7%), porous polyethylene (2.8%), and silastic implants (2.8%). Overall patients undergoing surgery were adults with clinical symptoms including exophthalmos, diplopia, and gaze restriction as well as patients with dura exposure. Most patients undergoing surgery were those with concomitant fractures. The most common fractures among the surgical patients were frontal bone (32.2%), ethmoid (25.2%), and zygomaticomaxillary complex/zygoma (12.2%). **Conclusions and Relevance:** Management of orbital roof fractures varies based on individual clinical features including the presence of exophthalmos, gaze restriction, and concomitant injuries such as dural tears. Surgically, bicoronal approaches were performed most commonly along with reconstruction utilizing titanium miniplates. Conservative management was more common among the pediatric population. This systematic review demonstrates both conservative and surgical measures can lead to positive outcomes in appropriately selected patients.

Lucas JP, **Allen M**, Siegel B and Gonik N (2020). "Diagnosis and management of congenital floor of mouth masses: A systematic review." *International Journal of Pediatric Otorhinolaryngology*. ePub Ahead of Print.

[Full Text](#)

OUWB Medical Student Author

Objectives: Determine the utility of preoperative imaging and the optimal course of management for congenital floor of mouth (FOM) cysts in infants. **Methods:** A systematic review of the literature was performed conforming to PRISMA guidelines. Pubmed, Embase and Cochrane Library databases were queried to identify cases of infants with congenital floor of mouth masses. Patient demographics, presenting findings, imaging, management, complications, and outcomes were determined. **Results:** 85 patients were evaluated. 98% of patients presented at 16 months of age or younger. The most common presenting symptom was submental mass or swelling, 31.3%. Among the patients that underwent imaging, the suspected diagnosis obtained from imaging findings was consistent with the final pathologic diagnosis 59% of the time reported and inaccurate 34% of the time. There were multiple definitive treatment modalities described in the literature review including surgical excision, 82.3%, marsupialization, 12.9%, chemical injection 2.3%, sclerotherapy 1.2%,% and radiation, 1.2%. Recurrence rate after initial definitive treatment was as follows, surgical excision, 8.8%, marsupialization, 80%, sclerotherapy, 100%, chemical injection, 50%, and radiation, 100%. **Conclusion:** Preoperative imaging studies should not be relied upon alone to determine suspected pathology and subsequent management in pediatric patients with FOM masses. It may be beneficial for these patients to undergo primary surgical excision regardless of imaging studies or suspected pathology. Needle aspiration offers limited addition to pathologic diagnosis and should only be performed in the setting of acute symptomatic management. Surgical excision should be considered as definitive treatment modality in all patients with FOM masses, regardless of the suspected diagnosis of ranula. Further multi-institutional cohort studies could be invaluable to elucidate definitive treatment guidelines in this patient population.

Lucia VC, Kelekar A and Afonso NM (2020). "COVID-19 vaccine hesitancy among medical students." *Journal of Public Health*. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Background: Medical students are among the group of frontline healthcare providers likely to be exposed to COVID-19 patients. It is important to achieve high COVID-19 vaccination coverage rates in this group as soon as a vaccine is available. As future healthcare providers, they will be entrusted with providing vaccine

recommendations and counseling vaccine-hesitant patients. Methods: This project used self-report to assess vaccine hesitancy and acceptance among medical students towards the novel COVID-19 vaccine. Results: Nearly all participants had positive attitudes towards vaccines and agreed they would likely be exposed to COVID-19; however, only 53% indicated they would participate in a COVID-19 vaccine trial and 23% were unwilling to take a COVID-19 vaccine immediately upon FDA approval. Students willing to immediately take the vaccine were more likely to trust public health experts, have fewer concerns about side effects and agree with vaccine mandates ($P < 0.05$). Concern for serious side effects was independently predictive of lower odds of intent to participate in a COVID-19 vaccine trial (AOR = 0.41, $P = 0.01$). Conclusion: This is the first study to evaluate COVID-19 vaccine hesitancy among US medical students and highlights the need for an educational curriculum about the safety and effectiveness to promote uptake of the COVID-19 vaccine.

Maerz T, Newton MD, Fleischer M, Hartner SE, Gawronski K, Junginger L and **Baker KC** (2020). "Traumatic joint injury induces acute catabolic bone turnover concurrent with articular cartilage damage in a rat model of posttraumatic osteoarthritis." Journal of Orthopaedic Research. ePub Ahead of Print.

[Full Text](#)

Department of Orthopaedic Surgery

Assess acute alterations in bone turnover, microstructure, and histomorphometry following noninvasive anterior cruciate ligament rupture (ACLR). Twelve female Lewis rats were randomized to receive noninvasive ACLR or Sham loading ($n = 6/\text{group}$). In vivo μCT was performed at 3, 7, 10, and 14 days postinjury to quantify compartment-dependent subchondral (SCB) and epiphyseal trabecular bone remodeling. Near-infrared (NIR) molecular imaging was used to measure in vivo bone anabolism (800 CW BoneTag) and catabolism (Cat K 680 FAST). Metaphyseal bone remodeling and articular cartilage morphology was quantified using ex vivo μCT and contrast-enhanced μCT , respectively. Calcein-based dynamic histomorphometry was used to quantify bone formation. OARSI scoring was used to assess joint degeneration, and osteoclast number was quantified on TRAP stained-sections. ACLR induced acute catabolic bone remodeling in subchondral, epiphyseal, and metaphyseal compartments. Thinning of medial femoral condyle (MFC) SCB was observed as early as 7 days postinjury, while lateral femoral condyles (LFCs) exhibited SCB gains. Trabecular thinning was observed in MFC epiphyseal bone, with minimal changes to LFC. NIR imaging demonstrated immediate and sustained reduction of bone anabolism (similar to 15%-20%), and a similar to 32% increase in bone catabolism at 14 days, compared to contralateral limbs. These findings were corroborated by reduced bone formation rate and increased osteoclast numbers, observed histologically. ACLR-injured femora had significantly elevated OARSI score, cartilage thickness, and cartilage surface deviation. ACL rupture induces immediate and sustained reduction of bone anabolism and overactivation of bone catabolism, with mild-to-moderate articular cartilage damage at 14 days postinjury.

Mahan MC, Yu CC, Shields R, van Holsbeeck M and **Zaltz I** (2020). "Impingement-free hip flexion in asymptomatic young adult women." Journal of Bone and Joint Surgery 102(21S): 22-26.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Ultrasound-assisted measurement of hip flexion has demonstrated that hip flexion has been historically overestimated in men. To our knowledge, assessment of hip flexion in women using similar methods has not been reported. Establishing normative values for hip flexion is vital to aid diagnosis, management, and future research. Therefore, we asked 2 questions: (1) At what range of midsagittal hip flexion do soft-tissue impingement and femoroacetabular abutment occur in asymptomatic young adult women? (2) Do radiographic findings on a supine anteroposterior pelvic radiograph correlate with ultrasound-assisted measurements of hip flexion? Methods: Fifty-five asymptomatic adult women volunteers (107 hips) underwent ultrasound-assisted assessment of hip flexion. Hip flexion was recorded at the initiation of labral contact and at bone-on-bone contact. Recorded motion was correlated with common radiographic measurements of hip morphology as observed on a supine anteroposterior pelvic radiograph. Results: The mean age of the subjects was 26 ± 3 years (range, 21 to 35 years), and the mean body mass index was $23 \pm 3 \text{ kg/m}^2$ (range, 17 to 31.6 kg/m^2). Mean impingement-free and maximum midsagittal passive flexion were $72 \text{ degrees} \pm 8 \text{ degrees}$ (95% confidence interval [CI], 70 degrees to 74 degrees) and $101 \text{ degrees} \pm 11 \text{ degrees}$ (95% CI, 99 degrees to 103 degrees), respectively. There were no significant correlations between radiographic measurements of hip morphology and ultrasound-measured hip range of motion. Conclusions: Observed hip flexion in the asymptomatic hips of young women is substantially less than has been historically reported. Morphologic features that are measurable on anteroposterior pelvic radiographs do not correlate with ultrasound-measured hip flexion. Diagnosis of hip disorders and treatments that are designed to alter hip range of motion should be based on normative data. Future studies regarding surgical restoration and/or preservation of hip flexion should be based on an understanding of normal hip range of motion.

Maine GN, Lao KM, Krishnan SM, Afolayan-Oloye O, Fatemi S, Kumar S, VanHorn L, Hurand A, **Sykes E** and **Sun Q** (2020). "Longitudinal characterization of the IgM and IgG humoral response in symptomatic COVID-19 patients using the Abbott Architect." Journal of Clinical Virology 133: 104663.

[Full Text](#)

Department of Pathology

Background: Antibody testing has recently emerged as an option to assist with determining exposure to SARS-CoV-2, the causative agent of COVID-19. Elucidation of the kinetics and duration of the humoral response is important for clinical management and interpreting results from serological surveys. Objectives: Here we evaluated the clinical performance of Abbott SARS-CoV-2 IgM and IgG assays, as well as the longitudinal dynamics of the antibody response in symptomatic COVID-19 patients. Study Design and Results: The diagnostic specificity was 100 % for IgM and 99.67 % for IgG using 300 pre-COVID-19 serum specimens. Using 1349 sequential serum samples collected up to 168 days post symptom onset from 427 PCR-confirmed individuals, clinical test sensitivity of the SARS-CoV-2 IgM assay was 24.6 % at ≤7 days, 75.3 % at 8-14 days, 95.0 % at 15-21 days, and 96.0 % at 4-5 weeks (peak test sensitivity). The median duration of time for IgM seroconversion was 10 days. IgM levels declined steadily 4-5 weeks after symptom onset, and the positive rate dropped to 30.8 % at >3 months. The diagnostic sensitivity for the SARS-CoV-2 IgG assay post symptom onset was 23.2 % at ≤7 days, 69.5 % at 8-14 days, 93.6 % at 15-21 days, and 99.6 % at 4-5 weeks (peak test sensitivity). The median duration of time for IgG seroconversion was 11.5 days. During the convalescent phase of the infection, a decline in the IgG level was observed in patients who were followed for >100 days. Despite that decline, 92.3 % of the patient cohort remained IgG positive 3-6 months following symptom onset. Conclusions: This study demonstrates the Abbott IgM assay against SARS-CoV-2 is detected slightly earlier compared to IgG, with both tests exhibiting excellent overall sensitivity and specificity. In symptomatic patients who test negative by PCR for a SARS-CoV-2 infection, assessing IgM and IgG antibodies can aid in supporting a diagnosis of COVID-19.

Maisels MJ, Kring EA and Coffey MP (2020). "Heme catabolism and bilirubin production in readmitted jaundiced newborns." Journal of Pediatrics 226: 285-288.

[Request Form](#)

Department of Pediatrics

We measured end-tidal CO levels in 50 jaundiced newborns readmitted for phototherapy at age 54-244 hours. The median end-tidal CO level was 1.55 ppm, suggesting that hemolysis is not the primary contributor to the hyperbilirubinemia in many readmitted newborns. © 2020 Elsevier Inc.

Mando R, Elmariah S, **Hanzel G**, Camacho A, Selberg A, Al-Azizi K, Kadri AN, Christensen J, Szerlip M, **Almany S**, Vivacqua A, Mack M, **Hanson I**, Shannon F and **Abbas A** (2020). "Invasive versus echocardiographic gradients post valve-in-valve TAVR: A multicenter trial." Journal of the American College of Cardiology 76(17): B40-B41.

[Full Text](#)

Department of Internal Medicine

Mankuzhy N, **Jahshan A**, Quinn TJ, Almahariq MF, **Qu L** and **Grills IS** (2020). "An efficient and objective method for identifying radiation-related cardiac toxicity after definitive conventional radiation for locally advanced non-small cell lung cancer." International Journal of Radiation Oncology, Biology, Physics 108(3): e84-e84.

[Full Text](#)

Department of Foundational Medical Studies (BH)

Department of Radiation Oncology

OUWB Medical Student Author

Mankuzhy NP, Almahariq MF, Ye H, **Amin M**, Stone B and **Krauss DJ** (2020). "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. ePub Ahead of Print.

[Full Text](#)

Department of Pathology

Department of Radiation Oncology

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.

Marlow ED, **Faia LJ**, **Wu D**, Farley N and **Randhawa S** (2020). "Paraneoplastic ocular sarcoidosis in the setting of recurrent rectal carcinoid tumor diagnosed by F18-fluorodeoxyglucose PET CT." *American Journal of Ophthalmology Case Reports* 20.

[Full Text](#)

Department of Ophthalmology

Department of Diagnostic Radiology and Molecular Imaging

Purpose: Nuclear medicine imaging can provide a noninvasive means of distinguishing inflammatory mass lesions from oncologic intraocular tumors. Observation: We report a case of paraneoplastic ocular sarcoidosis with choroidal mass lesions that was initially concerning for choroidal metastasis of a primary carcinoid tumor. PET CT was utilized with two different tracers to characterize the choroidal mass as being FDG-avid, consistent with a sarcoid-like lesion, and lacking the Gallium (Ga-68) DOTATAE uptake of carcinoid tumor metastases. Conclusions and Importance: Functional imaging is valuable to distinguish clinically similar inflammatory versus oncologic intraocular pathology.

McCullough PA and **Goldstein JA** (2020). "A novel strategy to prevent contrast nephropathy: "Continuous hemodiafiltration"." *Catheterization and Cardiovascular Interventions* 96(6): 1182-1183.

[Full Text](#)

Department of Internal Medicine

Key Points: Pre-procedural "at risk" assessment for Contrast Induced Acute Kidney Injury (CI-AKI). Pre-procedural volume expansion is essential. Contrast Minimus: Practice "As Low as Reasonably Allowable". Fewer views, minimal contrast per-injection and utilization of adjunctive direct coronary imaging. No left ventriculography or aortography. Optimize Renal Hemodynamics: Pre-procedural treatment of systemic venous-renal congestion. Avoidance of intra-procedural hypotension.

McFarlane M, Hochstedler K, Laucis AM, Sun Y, Chowdhury A, Matuszak MM, Hayman JA, Bergsma DP, Boike TP, Kestin LL, Movsas B, **Grills IS**, Dominello MM, Dess RT, Schonewolf CA, Spratt DE, Pierce LJ, Paximadis P, Jolly S and Schipper M (2020). "Predictors of pneumonitis after lung cancer radiotherapy." *International Journal of Radiation Oncology Biology Physics* 108(3): S139-S139.

[Full Text](#)

Department of Radiation Oncology

Mehta A, Kondamudi N, Laukkanen JA, Wisloff U, **Franklin BA**, Arena R, Lavie CJ and Pandey A (2020). "Running away from cardiovascular disease at the right speed: The impact of aerobic physical activity and cardiorespiratory fitness on cardiovascular disease risk and associated subclinical phenotypes." *Progress in Cardiovascular Disease* 63(6): 762-774.

[Full Text](#)

Department of Internal Medicine

Higher levels of physical activity (PA) and cardiorespiratory fitness (CRF) are associated with lower risk of incident cardiovascular disease (CVD). However, the relationship of aerobic PA and CRF with risk of atherosclerotic CVD outcomes and heart failure (HF) seem to be distinct. Furthermore, recent studies have raised concerns of potential toxicity associated with extreme levels of aerobic exercise, with higher levels of coronary artery calcium and incident atrial fibrillation noted among individuals with very high PA levels. In contrast, the relationship between PA levels and measures of left ventricular structure and function and risk of HF is more linear. Thus, personalizing exercise levels to optimal doses may be key to achieving beneficial outcomes and preventing adverse CVD events among high risk individuals. In this report, we provide a comprehensive review of the literature on the associations of aerobic PA and CRF levels with risk of adverse CVD outcomes and the preceding subclinical cardiac phenotypes to better characterize the optimal exercise dose needed to favorably modify CVD risk.

Miller P, **Xiao AY**, Kung VL, Sibley RK, Higgins JP, Kambham N, Charu V, Lenihan C, Uber AM, Talley EM, Arora N, Walavalkar V, Laszik ZG, Nast CC and Troxell ML (2020). "Progression of proliferative glomerulonephritis with monoclonal IgG deposits in pediatric patients." *Pediatric Nephrology*. ePub Ahead of Print.

[Full Text](#)

OUWB Medical Student Author

Background: Proliferative glomerulonephritis with monoclonal IgG deposits (PGNMID) is a glomerular disease defined by non-organized glomerular deposits of heavy and light chain-restricted immunoglobulin and is rarely reported in children. Methods: We characterized a series of nine pediatric patients from two academic centers with biopsy-proven PGNMID and additionally describe two patients with monotypic IgG in the setting of IgM deposition. Results: Each patient presented with hematuria and/or proteinuria; however, only five had elevated serum creatinine. Prodromal or concurrent infection was identified in six patients, low C3 in five, and alternate complement pathway gene variants in two. No monoclonal serum proteins were identified in five tested patients. Seven patients had monotypic deposits composed of IgG3- λ , two showed IgG3- κ , and one each IgG1 and IgG3 with lambda dominance in the setting of IgM deposition. The glomerular pattern was predominantly mesangial proliferative or membranoproliferative glomerulonephritis (MPGN). Treatment and outcomes were variable; four patients have recent PGNMID diagnoses and therefore minimal follow up, one had relatively stable kidney function for over a decade, and six experienced kidney failure, with four receiving transplants. Recurrent deposits of the same isotype were identified in five of six transplanted kidneys, corresponding to three of four transplanted patients. One of these patients developed PGNMID recurrences in three separate kidney allografts over a 20-year disease course. Conclusions: Our study emphasizes the need for upfront IgG subclass investigation in pediatric mesangial or MPGN with IgG deposition and monotypic or biased light-chain staining. Furthermore, this pediatric experience suggests expanded pathogenic considerations in PGNMID. Graphical abstract.

Mourad W, **Wiater JM**, **Wiater BP** and **Martusiewicz A** (2020). "Baseplate options for reverse total shoulder arthroplasty." Current Reviews in Musculoskeletal Medicine 13(6): 769-775.

[Full Text](#)

Department of Orthopaedic Surgery

Purpose of Review: Baseplate fixation has been known to be the weak link in reverse total shoulder arthroplasty (RTSA). A wide variety of different baseplates options are currently available. This review investigates the recent literature to present the reader with an overview of the currently available baseplate options and modes of fixation. Recent Findings: The main elements that differentiate baseplates are the central fixation element, the size of the baseplate, the shape, the backside geometry, whether or not an offset central fixation exists, the number of peripheral screws, and the availability of peripheral augmentation. The wide array of baseplate options indicates that no particular design has proven superiority. As such, surgeons should be aware of their options and choose an implant that the surgeon is comfortable with and one that best suits the individual patient anatomy. With the growing number of RTSA procedures and registries with long-term follow-up, future investigations will hopefully delineate the ideal baseplate design to optimize survivorship.

Mulhem E, Brown I and Song K (2020). "Electronic health record reminder effect on hepatitis C antibody screening." Journal of the American Board of Family Medicine 33(6): 1016-1019.

[Request Form](#)

Department of Family Medicine and Community Health

In the United States, national guidelines recommend screening adults born between 1945 and 1965 for hepatitis C, but screening rates in this population continue to be low. We added a hepatitis C screening reminder to the Epic Electronic Health Record and educated physicians on the use of the Health Maintenance section in Epic. We assessed the effect of this intervention on the completion of screening hepatitis C antibody tests. We examined data from 2 years before and after the addition of the reminder. Completed hepatitis C antibody testing increased from 733 to 6502, and the rate of positive testing decreased from 5.9% to 2.0%. Implementing the electronic health record reminder and educating providers on the routine use of the Health Maintenance section increased hepatitis C screening for at risk adults.

Mustafa S, Zafar M, Langnas E, Shahbaz A, Vira A and **Hanson I** (2020). "Effect of sympathetic renal denervation on heart failure with reduced ejection fraction: A systematic review and meta-analysis." Journal of the American College of Cardiology 76(17): B181-B181.

[Full Text](#)

Department of Internal Medicine

Nair GB, Galban CJ, Al-Katib S, Podolsky R, van den Berge M, **Stevens C** and Castillo E (2020). "An assessment of the correlation between robust CT-derived ventilation and pulmonary function test in a cohort with no respiratory symptoms." British Journal of Radiology: 20201218.

[Request Form](#)

Department of Internal Medicine

Department of Radiation Oncology

Objective: To evaluate CT-ventilation imaging (CTVI) within a well-characterized, healthy cohort with no

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

Navin MC, **Wasserman JA** and Opel DJ (2020). "Reasons to accept vaccine refusers in primary care." *Pediatrics* 156(6).

[Full Text](#)

Department of Foundational Medical Studies (OU)

Nepple JJ, **Zaltz I**, Larson CM, Beaulé PE, Kim YJ, Millis MB, Sierra RJ, Clohisy JC and Group A (2020). "Surgical treatment of femoroacetabular impingement: Hip arthroscopy versus surgical hip dislocation: A propensity-matched analysis." *The Journal of Bone and Joint Surgery* 102(21S Suppl 1): 51-58.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Surgical treatment of femoroacetabular impingement (FAI) continues to evolve and is most commonly approached with either hip arthroscopy (HA) or surgical dislocation (SD) of the hip. The purpose of this study was to compare the outcomes of similar patients undergoing surgical treatment of FAI with either HA or SD. Methods: A prospective multicenter cohort study of patients undergoing primary surgical treatment of FAI was performed. Follow-up at a minimum of 1 year (mean, 4.3 years) was available for 621 hips (81.7%), including 399 procedures with HA and 222 procedures with SD. Propensity scores were calculated and reflect the likelihood of surgical treatment with HA versus SD for a given set of covariates. Propensity scores allowed 1:1 matching to identify similar patients at baseline. After propensity matching, 128 matched pairs of patients who underwent HA and 128 matched pairs of those who underwent SD were included in the study. The primary outcome was the postoperative modified Harris hip score (mHHS); secondary outcomes included the Hip disability and Osteoarthritis Outcome Score (HOOS), the University of California Los Angeles (UCLA) activity score, and the Short Form-12 (SF-12) physical and mental subscores, as well as the rate of persistent symptoms, revision surgery, and total hip arthroplasty (THA). Results: After propensity matching, the 2 groups exhibited similar distributions of all of the covariates that were included in the model. Both groups demonstrated significant improvements in all patient-reported outcomes (PROs). The final mHHS was not significantly different between the 2 matched groups (81.3 for the HA group versus 80.2 for the SD group, $p = 0.67$). Likewise, the HOOS pain subscale was similar at the time of final follow-up (77.6 versus 80.5, respectively, $p = 0.32$). No difference between the HA group and the SD group was identified in the rate of THA (0% and 3.1%, respectively, $p = 0.41$) and revision surgery (7.8% and 10.9%, respectively, $p = 0.35$); overall rates of persistent symptoms were 21.9% for the HA group and 24.4% for the SD group ($p = 0.55$). Conclusions: In a propensity-matched analysis of patients who were treated with either approach, patients undergoing HA or SD demonstrated similar outcomes at a mean of 4 years postoperatively. Level of Evidence: Therapeutic Level II. See Instructions for Authors for a complete description of levels of evidence.

Nguyen A, Patel AA, Chandra V and Nazerali RS (2020). "Ultrasound guided liposuction for superficialization of difficult to access arteriovenous fistulas." *Journal of Plastic, Reconstructive & Aesthetic Surgery* 73(11): 2086-2102.

[Full Text](#)

OUWB Medical Student Author

Nguyen BK, Svider PF, Hsueh WD and **Folbe AJ** (2020). "Perioperative analgesia for sinus and skull-base surgery." *Otolaryngologic Clinics of North America* 53(5): 789-802.

[Full Text](#)

Department of Surgery

OUWB Medical Student Author

Perioperative analgesic management is multifaceted, and an individualized approach should be taken with each patient. Preoperative discussion of the plan for pain control and the patient's postoperative

expectations is a necessary facet for optimal outcomes of analgesia. There is the potential for significant abuse and development of dependence on opioids. Nonopioids, such as nonsteroidal anti-inflammatory drugs, acetaminophen, and gabapentinoids, provide reliable alternatives for analgesic management following sinus and skull-base surgery. There is a paucity of literature regarding perioperative pain regimens for sinus and skull-base surgery, and the authors hope that this review serves as a valuable tool for otolaryngologists.

Ogunyemi D, Haltigin C, Vallie S and **Ferrari TM** (2020). "Evolution of an obstetrics and gynecology interprofessional simulation-based education session for medical and nursing students." Medicine 99(43): 1-7.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Simulation and objective structured clinical examination assessment of learners can teach clinical skills proficiency in a safe environment without risk to patients. Interprofessional simulation-based education (IPSE) contributes to a transformation in students' understanding of teamwork and professional roles. Long term outcomes for stimulation and IPSE sessions, are less well studied. We hypothesized that a progressive interprofessional education simulation program incorporating both faculty and interprofessional student collaboration would improve medical students' knowledge retention, comfort with procedural skills, positive teamwork and respectful interaction between students. An Obstetrics and Gynecology IPSE for medical and nursing students (NS) was developed in collaboration between a school of medicine and a school of nursing from 2014 to 2017. By 2017, content included from 2014 to 2016, medical students completed attitude, knowledge, and perception surveys both pre and immediately post simulation, at 4 months, and 8 months. In 2017; all students completed self-assessments and received faculty-assessments. The program trained 443 medical and 136 NS. Medical students' knowledge, comfort, and interest increased significantly post simulation. Outcome scores decreased but were still significantly improved at 4 months but nearly dissipated by 8 months. There were no significant differences between medical and NS self-assessment or faculty-assessment scores regarding IUD insertion, cervical examination, or contraception quiz scores. Medical students' birth simulation self-assessment versus faculty-assessment scores were 8.6 vs 8.9, $P < .001$. Simulation improved students' short-term medical knowledge, comfort, and perception with some long-term persistence at 4-8 months. Medical and NS learned obstetrics and gynecology skills in a collaborative environment and in role-specific situations. Medical students had the opportunity to learn from NS. Positive teamwork and respectful interaction occurred between the students.

Oska S, Lerma E and **Topf J** (2020). "A picture is worth a thousand views: A triple crossover trial of visual abstracts to examine their impact on research dissemination." Journal of Medical Internet Research 22(12): e22327.

[Full Text](#)

Department of Surgery

OUWB Medical Student Author

Background: A visual abstract is a graphic summary of a research article's question, methods, and major findings. Although they have a number of uses, visual abstracts are chiefly used to promote research articles on social media. Objective: This study aimed to determine if the use of visual abstracts increases the visibility of nephrology research shared on Twitter. Methods: A prospective case-control crossover study was conducted using 40 research articles published in the American Journal of Nephrology (AJN). Each article was shared by the AJN Twitter account in 3 formats: (1) the article citation, (2) the citation with a key figure from the article, and (3) the citation with a visual abstract. Tweets were spaced 2 weeks apart to allow washout of the previous tweet, and the order of the tweets was randomized. Dissemination was measured via retweets, views, number of link clicks, and Altmetric scores. RESULTS: Tweets that contained a visual abstract had more than twice as many views as citation-only tweets (1351, SD 1053 vs 639, SD 343) and nearly twice as many views as key figure tweets (1351, SD 1053 vs 732, SD 464). Visual abstract tweets had 5 times the engagements of citation-only tweets and more than 3.5 times the engagements of key figure tweets. Visual abstract tweets were also associated with greater increases in Altmetric scores as compared to citation-only tweets (2.20 vs 1.05). Conclusions: The use of visual abstracts increased visibility of research articles on Twitter, resulting in a greater number of views, engagements, and retweets. Visual abstracts were also associated with increased Altmetric scores as compared to citation-only tweets. These findings support the broader use of visual abstracts in the scientific community. Journals should consider visual abstracts as valuable tools for research dissemination.

Oska S, Yeager DG, Zarbo A, Friedman BJ and Shwayder T (2020). "Ataxia telangiectasia and melanoma: The role of dermatology in ataxia telangiectasia." Journal of the American Academy of Dermatology 83: AB209-AB209.

[Full Text](#)

OUWB Medical Student Author

Oska SR, **Chaiyasate K** and Lu SM (2020). "Fore! A 10-year analysis of golf-related facial fractures." Plastic and

[Reconstructive Surgery](#) 8(10): e3128.

[Full Text](#)

Department of Surgery

OUWB Medical Student Author

Background: Over 30 million people in the United States play golf, which, while considered a low-impact sport, involves balls and clubs moving >100 miles/h (>160.93 km/h), creating potential for a significant facial trauma. The objective of this study was to characterize the epidemiology of golf-related facial fractures in the United States. Methods: The National Electronic Injury Surveillance System, which records injuries from approximately 100 US emergency departments, was queried for golf-related facial fractures from 2009 to 2018. Entries were tabulated for mechanism of injury and fracture location. Age, gender, seasonality of injury, type of fracture, and injury mechanism were analyzed using SPSS. Because of the different nature and management of pediatric fractures, we looked at pediatric patients as a distinct subgroup. Results: There were 114 reported cases of golf-related craniofacial fractures in patients 2-91 years of age with male predominance (73.7%). This rate extrapolates to an estimated 3,850 ED presentations. Although accounting for about 10% of total players, patients under 18, commonly referred to as "junior golfers," comprised 55.3% of the cohort. Nasal fractures (25.4%), skull fractures (23.7%), unspecified facial fractures (17.5%), and mandible fractures (10.5%) predominated, which most commonly result from clubs (63.2%), balls (23.7%), and falls (11.4%). Conclusions: Facial fractures resulting from golf clubs and balls may not be as common as in other traditionally identified "high-impact sports," but they affect pediatric patients disproportionately and with a greater morbidity. Parents and children engaging the sport should be aware of the risk of head trauma, especially with any form of off-course participation.

Page TP, Werner L, Ellis N and Heczko JB (2020). "Capsular tension ring explant complication rate comparison using Miyake-Apple video analysis." [Journal of Cataract and Refractive Surgery](#). ePub Ahead of Print.

[Request Form](#)

Department of Ophthalmology

Purpose: To compare the complication rate and time required to explant standard capsular tension rings (CTR) versus suture-guided capsular tension rings (SGCTR). Setting: IORC, John A. Moran Eye Center, University of Utah. Design: Experimental study. Methods: Eight cadaver eyes were prepared using standard Miyake-Apple protocol with digital video recording. A four 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, removal was associated with high rates of complication (100%). Complications included capsule 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 SGCTR (p = 0.001). Conclusion: 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.

Pamplona MD, **Ysunza PA**, Telich-Tarriba J, Chavez-Serna E, Villate-Escobar P, Sterling M and Cardenas-Mejia A (2020). "Diagnosis and treatment of speech disorders in children with Moebius syndrome." [International Journal of Pediatric Otorhinolaryngology](#) 138(11): 110316.

[Full Text](#)

Department of Physical Medicine & Rehabilitation

Background: Moebius syndrome (MS) is characterized by congenital bilateral paralysis of the facial and abducens nerves. Clinical features include feeding problems, dysarthria, dysphagia, sialorrhea, strabismus, and lack of facial expression. Patients with MS frequently present with dysphagia during infancy. Further on during childhood a severe speech disorder is a common feature. However, articulation deficits in patients with MS are scarcely reported in the related scientific literature. Objective: The aim of this study is to describe speech deviations, intelligibility and sialorrhea in patients with MS. Material and methods: Eighty-seven patients with MS were prospectively studied. Age ranged from 4 to 18 years. A complete Speech and Language Pathology (SLP) evaluation was performed in all cases. The evaluation focused on articulation placement, sialorrhea and intelligibility of speech. Results: Sialorrhea was detected in 23% of the patients. Abnormal articulation placement of bilabial phonemes was observed in 68% of the patients. Another 50% of the patients presented with articulation placement errors in other phonemes. Intelligibility was classified as adequate in 18% of the cases. Mildly affected intelligibility was found in 51% of the patients. Speech was considered moderately unintelligible in 20% of the cases. Unintelligible speech was found in 11% of the patients. Conclusions: From the results of this prospective study it can be concluded that a high percentage of patients with MS are at high risk of presenting with moderate to severe speech disorders. Thus, an early

SLP intervention should be provided for this population in order to enhance speech development and reducing the risk of severe oral communication impairments.

Pamplona MDC and **Ysunza PA** (2020). "Speech pathology telepractice for children with cleft palate in the times of COVID-19 pandemic." International Journal of Pediatric Otorhinolaryngology 138: 110318.

[Full Text](#)

Department of Physical Medicine & Rehabilitation

Objective: To study whether providing Speech and Language Pathology (SLP) interventions by telepractice (TP) could effectively improve speech performance in children with cleft palate (CCP). Methods: Forty-three CCP were treated with TP intervention in 45 min sessions, 2 times per week for a period of one month. Children ages ranged 4-12 years ($X = 7.04$; $SD = 2.59$). All children presented with velopharyngeal insufficiency (VPI) and compensatory articulation (CA) after palatal repair. TP was provided in small groups (5-6 children) following the principles of the Whole Language Model (WLM). Severity of CA was evaluated by a standardized scale at the onset and at the end of the TP period. Results: At the onset of the TP intervention period, 84% of the patients demonstrated severe CA. At the end of the TP period there was a significant improvement in severity of CA ($p < 0.001$). Conclusion: The results of this study suggests that TP can be a safe and reliable tool for improving CA. Considering that the COVID-19 pandemic will radically modify the delivery of Health Care services in the long term, alternate modes of service delivery should be studied and implemented.

Park K, Lew D, Chapman C, Wachsmann A, Bloom M, Bancila L, Perry R, Wang Q, **Jamil L**, Pandol S and Lo SM (2020). "Feasibility and safety study of 22-gauge endoscopic ultrasound (EUS) needles for portal vein sampling in a swine model." Endoscopy International Open 08(11): E1717-E1724.

[Full Text](#)

Department of Internal Medicine

Background and Study Aims: Endoscopic ultrasound (EUS) has been used for portal vein sampling in patients with pancreaticobiliary cancers for enumerating circulating tumor cells but is not yet a standard procedure. Further evaluation is needed to refine the methodology. Therefore, we evaluated the feasibility and safety of 19-gauge (19G) versus a 22-gauge (22 G) EUS fine-needle aspiration needles for portal vein sampling in a swine model. Methods: Celiotomy was performed on two farm pigs. Portal vein sampling occurred transhepatically. We compared 19G and 22G needles coated interiorly with saline, heparin or ethylenediaminetetraacetic acid (EDTA). Small-(10mL) and large-(25mL) volume blood collections were evaluated. Two different collection methods were tested: direct-to-vial and suction syringe. A bleeding risk trial for saline-coated 19G and 22G needles was performed by puncturing the portal vein 20 times. Persistent bleeding after 3 minutes was considered significant. Results: All small-volume collection trials were successful except for 22G saline-coated needles with direct-to-vial method. All large-volume collection trials were successful when using suction syringe; direct-to-vial method for both 19G and 22G needles were unsuccessful. Collection times were shorter for 19G vs. 22G needles for both small and large-volume collections ($P < 0.05$). Collection times for saline-coated 22G needles were longer compared to heparin/EDTA-coated ($P < 0.05$). Bleeding occurred in 10% punctures with 19G needles compared to 0% with 22G needles. Conclusion: The results of this animal study demonstrate the feasibility and the safety of using 22G needles for portal vein sampling and can form the basis for a pilot study in patients.

Parzen JS, Hartsell W, Chang J, Apisarnthanarax S, Molitoris J, Durci M, Tsai H, Urbanic J, Ashman J, Vargas C, **Stevens C** and **Kabolizadeh P** (2020). "Hypofractionated proton beam radiotherapy in patients with unresectable liver tumors: multi-institutional prospective results from the Proton Collaborative Group." Radiation Oncology 15(1): 255.

[Full Text](#)

Department of Radiation Oncology

Background: Recent advances in radiotherapy techniques have allowed ablative doses to be safely delivered to inoperable liver tumors. In this setting, proton beam radiotherapy (PBT) provides the means to escalate radiation dose to the target volume while sparing the uninvolved liver. This study evaluated the safety and efficacy of hypofractionated PBT for liver tumors, predominantly hepatocellular carcinoma (HCC) and intrahepatic cholangiocarcinoma (ICC). Methods: We evaluated the prospective registry of the Proton Collaborative Group for patients undergoing definitive PBT for liver tumors. Demographic, clinicopathologic, toxicity, and dosimetry information were compiled. Results: To date, 63 patients have been treated at 9 institutions between 2013 and 2019. Thirty (48%) had HCC and 25 (40%) had ICC. The median dose and biological equivalent dose (BED) delivered was 58.05 GyE (range 32.5-75) and 80.5 GyE (range 53.6-100), respectively. The median mean liver BED was 13.9 GyE. Three (4.8%) patients experienced at least one grade ≥ 3 toxicity. With median follow-up of 5.1 months (range 0.1-40.8), the local control (LC) rate at 1 year was 91.2% for HCC and 90.9% for ICC. The 1-year LC was significantly higher (95.7%) for patients receiving BED greater than 75.2 GyE than for patients receiving BED of 75.2 GyE or lower (84.6%),

p = 0.029). The overall survival rate at 1 year was 65.6% for HCC and 81.8% for ICC. Conclusions: Hypofractionated PBT results in excellent LC, sparing of the uninvolved liver, and low toxicity, even in the setting of dose-escalation. Higher dose correlates with improved LC, highlighting the importance of PBT especially in patients with recurrent or bulky disease.

Parzen JS, **Stevens CW** and **Kabolizadeh P** (2020). "Multi-institutional prospective registry of hypofractionated proton beam radiotherapy in patients with unresectable liver tumors." International Journal of Radiation Oncology Biology Physics 108(3): E603-E603.

[Full Text](#)

Department of Radiation Oncology

Patel F, **Benjamin JS** and Gadiwala S (2020). "Acute torticollis in a 3-year-old child: Think outside the neck." Pediatrics in Review 41(11): 596-598.

[Full Text](#)

Department of Emergency Medicine

Peterson EL, **Chittick PJ** and Richardson CL (2020). "Decreasing voriconazole requirement in a patient after extracorporeal membrane oxygenation discontinuation: A case report." Transplant Infectious Disease. ePub Ahead of Print.

[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.

Peyronnet B, Greenwell T, Gray G, Khavari R, Thiruchelvam N, Capon G, Ockrim J, Lopez-Fando L, **Gillera J**, Fournier G, Van Koeveeringe GA and Van Der Aa F (2020). "Current use of the artificial urinary sphincter in adult females." Current Urology Reports 21(12): 53.

[Full Text](#)

Department of Urology

Purpose of Review: The aim of the present report was to review the recent evidences regarding the use of artificial urinary sphincter (AUS) in adult females. Recent Findings: While the excellent functional outcomes of AUS in female patients with stress urinary incontinence (SUI) due to intrinsic sphincter deficiency (ISD) have been reported for decades, its use has remained confidential in most countries likely due to its challenging implantation and inherent morbidity. Over the past few years, laparoscopic and, more recently, robotic techniques of AUS implantation in female patients have been described with promising perioperative outcomes. As a result, the use of AUS has increased in several countries. The indications are mostly recurrent or persistent SUI after previous anti-incontinence procedures and neurogenic SUI. Owing to its unique potential to restore continence while maintaining low outlet resistance during the voiding phase, AUS may be of special interest in female patients with detrusor underactivity. High level of evidence data from trials which are underway, along with developments in robotic surgery and technological refinements of the device, may well, almost 50 years after its introduction, give to the AUS its momentum as a major contributor in the female SUI armamentarium. While the use of AUS in female patients has been restricted to some countries and a few high-volume centers, it has started spreading again over the past few years, thanks to the rise of minimally invasive approaches which facilitate its implantation, and this is yielding promising outcomes.

Pickens C, Wunderink RG, Qi C, Mopuru H, Donnelly H, Powell K and **Sims MD** (2020). "A multiplex polymerase chain reaction assay for antibiotic stewardship in suspected pneumonia." Diagnostic Microbiology and Infectious Disease 98(4): 115179.

[Full Text](#)

Department of Internal Medicine

Background: Multiplexed molecular rapid diagnostic tests (RDTs) may allow for rapid and accurate diagnosis of the microbial etiology of pneumonia. However, little data are available on multiplexed RDTs in pneumonia and their impact on clinical practice. Methods: This retrospective study analyzed 659 hospitalized patients

for microbiological diagnosis of suspected pneumonia. Results: The overall sensitivity of the Unyvero LRT Panel was 85.7% (95% CI 82.3-88.7) and the overall specificity was 98.4% (95% CI 98.2-98.7) with a negative predictive value of 97.9% (95% CI 97.6-98.1). The LRT Panel result predicted no change in antibiotics in 12.4% of cases but antibiotic de-escalation in 65.9% (405/615) of patients, of whom 278/405 (69%) had unnecessary MRSA coverage and 259/405 (64%) had unnecessary *P. aeruginosa* coverage. Interpretation: In hospitalized adults with suspected pneumonia, use of an RDT on respiratory samples can allow for early adjustment of initial antibiotics, most commonly de-escalation.

Pinatti LM, Sinha HN, Brummel CV, Goudsmit CM, Geddes TJ, **Wilson GD**, Akervall JA, Brenner CJ, Walline HM and Carey TE (2020). "Association of human papillomavirus integration with better patient outcomes in oropharyngeal squamous cell carcinoma." Head and Neck. ePub Ahead of Print.

[Full Text](#)

Department of Radiation Oncology

Background: The molecular drivers of human papillomavirus-related head and neck squamous cell carcinoma (HPV + HNSCC) are not entirely understood. This study evaluated the relationship between HPV integration, expression of E6/E7, and patient outcomes in p16+ HNSCCs. Methods: HPV type was determined by HPV PCR-MassArray, and integration was called using detection of integrated papillomavirus sequences polymerase chain reaction (PCR). We investigated whether fusion transcripts were produced by reverse transcriptase polymerase chain reaction (RT-PCR). E6/E7 expression was assessed by quantitative RT-PCR. We assessed if there was a relationship between integration and E6/E7 expression, clinical variables, or patient outcomes. Results: Most samples demonstrated HPV integration, which sometimes resulted in a fusion transcript. HPV integration was positively correlated with age at diagnosis and E6/E7 expression. There was a significant difference in survival between patients with vs without integration. Conclusions: Contrary to previous reports, HPV integration was associated with improved patient survival. Therefore, HPV integration may act as a molecular marker of good prognosis.

Possley D, **Baker E**, **Baker K** and **Khalil JG** (2020). "Surface modification techniques to enhance osseointegration of spinal implants." The Journal of the American Academy of Orthopaedic Surgeons 28(22): e988-e994.

[Full Text](#)

Department of Orthopaedic Surgery

Biomechanical function, specifically implantation technique and immediate surgical fixation, of orthopaedic implants is the primary consideration during the development of orthopaedic implants. Biologic and material characteristics are additional factors to include in the design process because of the direct impact on short- and long-term implant performance. The body's initial interaction with implant materials can affect protein- and cell-based function, thereby either promoting or impeding osseointegration. An understanding and inclusion of the biologic response, material surface morphology, and material surface chemistry in implant design is crucial because these factors ultimately determine implant function and patient outcomes. Highlighting the biologic- and material-related advantages and inadequacies of current and potential implant materials as well as applications may guide further research and development of implant materials and designs.

Qin A, Chen S, Liu G, **Li X**, Zheng W, **Deraniyagala RL**, **Kabolizadeh P**, **Stevens CW**, **Yan D** and **Ding X** (2020). "The feasibility and accuracy of utilizing CBCT and Generative-Adversarial-Network (GAN) to perform proton treatment dose evaluation for lung and head and neck patients." International Journal of Radiation Oncology Biology Physics 108(3): S41-S42.

[Full Text](#)

Department of Radiation Oncology

Quinn TJ and **Kabolizadeh P** (2020). "Rectal cancer in young patients: incidence and outcome disparities." J Gastrointestinal Oncology 11(5): 880-893.

[Full Text](#)

Department of Radiation Oncology

Background: There is an alarming rise in incidence among young patients with rectal cancer. The National Cancer Database (NCDB) and Surveillance, Epidemiology, and End Results Analysis (SEER) databases may help identify population level disparities in incidence and cancer-related outcomes. Methods: A total of 197,178 patients within the SEER 18 registry and 221,886 patients from the NCDB database with rectal cancer were evaluated in this retrospective cohort study. The analyzed cohort consisted of young (<50), white or African American patients. Indication bias was mitigated by conducting inverse probability of treatment weighted analysis using binary logistic regression modeling to determine propensity score for being white or African American. Results: A total of 6,144 young patients were identified from the SEER 18 registry and a total of 17,819 young patients were identified from the NCDB. From 1990 to 2016, there was a significant change in rectal cancer incidence, with a steadily increasing APC of 3.06 (P<0.05). The was no

overall change in age-adjusted APC among young African American patients (APC 0.00, P=1); however, there was a significant increase among young white patients (APC 2.97, P<0.05). There was an increased incidence for both stage III and IV among young rectal cancer patients, with an age-adjusted APC of 5.35 and 3.83, respectively (P<0.05). After propensity score matching and inverse probability of treatment weighting, young African Americans had worse overall survival in both the NCDB and SEER (HR 1.1-1.3, P<0.05) databases. This disparity was also seen for cancer-specific survival (HR 1.5, P=0.002).

Conclusions: The current study adds to the growing body of literature demonstrating an alarming increase in incidence of rectal cancer among young patients. Moreover, the incidence appears to be increasing particularly among young white patients and driven by stage III disease.

Randall D, Jee Y, Vanood A and **Mayo D** (2020). "Atypical presentation of periprosthetic joint infection after total knee arthroplasty due to *Parvimonas micra*." Arthroplasty Today 6(4): 901-905.

[Full Text](#)

Department of Orthopaedic Surgery

There is limited literature reporting the oral pathogen *Parvimonas micra* as the causative organism of periprosthetic joint infection. Previous reports demonstrate septic arthritis in native or prosthetic joints due to *P. micra* in elderly or immunocompromised patients associated with tooth abscess and periodontal disease. Our case report is unique because it describes a healthy individual with recurrent gingivitis developing periprosthetic joint infection after total knee arthroplasty as the result of isolated *P. micra*. Her clinical symptom presented early and manifested as progressive stiffness only. Timely aspiration resulted in early diagnosis, but the patient still underwent 2-stage revision with a more constrained implant. To prevent the risk of infection by oral pathogens such as *P. micra*, dental history should be thoroughly investigated, and any lingering periodontal infection should be addressed before any arthroplasty operation.

Riebe D, Baggish AL, **Franklin BA**, Jaworski CA and Thompson PD (2020). "The new ACSM recommendations for preventing cardiovascular events at fitness facilities." ACSM's Health and Fitness Journal 24(6): 10-17.

[Full Text](#)

Department of Internal Medicine

Roach VA, Mi MS, Mussell J, Van Nuland SE, Lufler RS, DeVeau KM, Dunham SM, Husmann P, Herriott HL, Edwards DN, Doubleday AF, Wilson BM and Wilson AB (2020). "Correlating spatial ability with anatomy assessment performance: A meta-analysis." Anatomical Sciences Education. ePub Ahead of Print.

[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 ($r(\text{pooled}) = 0.240$; 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.

Rossi T, Bacherini D, Caporossi T, Telani S, Iannetta D, Rizzo S, Moysidis SN, Koullis N, **Mahmoud TH** and Ripandelli G (2020). "Macular hole closure patterns: An updated classification." Graefes' Archive for Clinical and Experimental Ophthalmology 258(12): 2629-2638.

[Full Text](#)

Department of Ophthalmology

Background: The classification of macular hole closure patterns (MHCPs) currently relies on time domain OCT allowing only "open" and "closed" statuses or is based on inner foveal contour shape. Both classification types give no information on retinal layer reconstitution. Novel sophisticated surgical techniques lead to previously unknown MHCPs, outdating existing classifications and urging new ones. The

purpose of the present study is to introduce a new classification allowing proper description of all MHCPs resulting from newer surgeries and based on the restoration of retinal layers. Methods: Retrospective analysis of patients undergoing MH surgery with five different surgical techniques was performed. MHCPs were classified according to spectral domain optical coherence tomography (SD-OCT). Type 0: open MH (0A: flat margin, 0B: elevated, 0C: oedematous); type 1: closed MHs (1A: reconstitution all retinal layers; 1B interruption of the external layers; 1C interruption of internal layers); type 2: MH closed with autologous or heterologous filling tissue interrupting the normal foveal layered anatomy (2A: filling tissue through all layers; 2B reconstitution of normal inner retinal layers; 2C reconstitution of normal outer retinal layers; 2D H-shaped bridging of filling tissue). Results: Closure rate was 95.2% (241/253). Surgical technique and vision correlated to closure pattern ($p < 0.001$). Type 1 MHCPs had the best post-operative visual acuity (VA) compared with type 2 and type 0 ($p < 0.001$). MHCPs 1A and 1C performed better than all others. MHCP at months 1 and 3 changed in 42/254 (16.5%) and remained stable in 212/254 (83.5%). Improvement in vision was higher in eyes with shifting closure pattern (0.57 ± 0.33 vs 0.51 ± 0.48 logMAR; $p 0.021$). Conclusion: MHCP classification based on retinal layer restoration properly comprises post-operative anatomic morphologies. MHCPs correlate the surgical technique and post-operative visual outcomes.

Rowe RJ, Bahner I, Belovich AN, Bonaminio G, Brenneman A, Brooks WS, Chinn C, El-Sawi N, Haudek SB, Haight M, **McAuley R**, Slivkoff MD and Vari RC (2020). "Evolution and revolution in medical education: Health System Sciences (HSS)." Medical Science Educator: 1-6.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Safian RD (2020). "RESPONSE: Incremental mental toughness training." Journal of the American College of Cardiology 76(16): 1908-1909.

[Full Text](#)

Department of Internal Medicine

Said A, Kraft P and Sayed L (2020). "Delayed yet successful mechanical thrombectomy for phlegmasia cerulea dolens in a limb with severe arterial disease and May-Thurner Syndrome." Case Reports in Vascular Medicine. ePub Ahead of Print: 8866030.

[Full Text](#)

Department of Internal Medicine

Phlegmasia cerulea dolens (PCD) is a rare but life-threatening complication of acute deep venous thrombosis that lacks consensus regarding the approach to management. We present a case of PCD developing shortly after a spinal surgery and manifesting as acute swelling and discoloration in a leg with existing severe atherosclerotic arterial disease. The patient's critical limb ischemia was completely and rapidly reversed by percutaneous mechanical thrombectomy using the ClotTriever device despite a delay in treatment. An underlying iliac vein compression "May-Thurner" syndrome was discovered using intravascular ultrasound and treated with angioplasty. This case identifies mechanical thrombectomy using the ClotTriever system as a possible effective and safe treatment for PCD.

Said A, Sahlieh A and Sayed L (2020). "A comparative analysis of the efficacy and safety of therapeutic interventions in phlegmasia cerulea dolens." Phlebology: 268355520975581.

[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.

Said A and Sayed L (2020). "Percutaneous thrombectomy of Impella-associated iliac artery thrombosis using the FlowTriever system." Clinical Case Reports 8(12): 2645-2649.

[Full Text](#)

Department of Internal Medicine

Percutaneous thrombectomy using the FlowTriever system is a potentially safe and effective alternative to

surgery in cases of Impella-associated peripheral arterial thrombosis.

Salari K, Porter E, Levitin R, Siddiqui ZA, Thompson A, **Deraniyagala RL** and **Guerrero TM** (2020). "Validation of deep-learning based auto-segmentation of the lens, optic nerves, and chiasm for stereotactic radiosurgery." International Journal of Radiation Oncology Biology Physics 108(3): E784-E785.

[Full Text](#)

Department of Radiation Oncology

Sangal RB (2020). "Auto-titrating CPAP for the treatment of obstructive sleep apnea in children: APAP and CPAP pressures were not that close." Journal of Clinical Sleep Medicine 16(10): 1823-1823.

[Request Form](#)

Department of Family Medicine and Community Health

Sankar WN and **Zaltz I** (2020). "Single-incision extraperiosteal triple innominate osteotomy: Outcomes of an updated technique." Journal of Pediatric Orthopedics 40(10): e1005-e1009.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Since its original description, the triple pelvic osteotomy has undergone several modifications and refinements most often utilizing 3 or 2 incisions. Recently, a single-incision extraperiosteal technique has been described; however, little data exist on the outcomes of this procedure. Methods: All patients undergoing single-incision triple osteotomy from 2 centers were retrospectively reviewed. Demographic data, underlying diagnosis, and preoperative radiographic data were recorded. Intraoperative details including estimated blood loss and type of postoperative immobilization were noted. Over the follow-up period, complications were recorded as were radiographic outcomes including lateral center edge angle, acetabular index, migration percentage, continuity of Shenton's line, and time to union. Results: Twenty-eight hips (in 24 patients) underwent surgery at a mean age of 9.3 years (range, 6.5 to 13.8 y). Diagnoses included Trisomy 21 (9), developmental dysplasia of the hip (5), Charcot-Marie-Tooth (3), and neuromuscular disease (9) among others. The mean estimated blood loss was 135 mL (± 98 mL) and most patients were immobilized in an abduction brace or single-leg spica cast for an average of 7.6 ± 2.2 weeks after surgery before weight-bearing was advanced. At a mean follow-up of 3.0 ± 2.2 years, the lateral center edge angle improved from an average of 1 ± 14 degrees preoperatively to 35 ± 7 degrees, the acetabular index from 27 ± 11 degrees to 2 ± 5 degrees, and the migration percentage from $44 \pm 21\%$ to $3 \pm 5\%$. Fourteen hips had frank instability before surgery and 20 had a break in Shenton's line >5 mm. At most recent follow-up, all but 1 hip was stable (93%) and all had restoration of Shenton's line (100%). Radiographic union occurred at a mean of 14 weeks (± 11 wk). One patient developed an ischial nonunion that underwent further surgery, 1 had premature closure of the triradiate cartilage, and 1 patient with transverse myelitis developed Charcot arthropathy. There were no other complications in this series. Conclusions: In this dual-center retrospective series, the single-incision triple innominate osteotomy was extremely effective for improving acetabular coverage and stabilizing unstable hips in a variety of underlying diagnoses with an acceptably low rate of complications.

Sawarynski K and **Gould DJ** (2020). "A foundational science department's transition to an online community." Medical Science Educator 30(4): 1389-1391.

[Full Text](#)

Department of Foundational Medical Studies (OU)

Like many medical school department's around the world, we needed to pivot, almost instantly to an online community. As a large and diverse foundational science department, grounded in a culture of collegiality and collaboration, we faced a host of challenges beyond immediate remote teaching. Of paramount concern to departmental leadership was—how do we maintain our culture while working remotely? © 2020, International Association of Medical Science Educators.

Scherzer ZA, Alvarez C, Renner JB, Murphy LB, Schwartz TA, Jordan JM, Golightly YM and Nelson AE (2020). "Effects of comorbid cardiovascular disease and diabetes on hand osteoarthritis, pain, and functional state transitions: The Johnston County Osteoarthritis Project." Journal of Rheumatology 47(10): 1541-1549.

[Full Text](#)

OUWB Medical Student Author

Objective: The purpose of this study is to examine the course of hand osteoarthritis (HOA) and its relationship with cardiovascular disease (CVD) and diabetes (DM). Methods: Data were collected at 3 timepoints from 845 Johnston County Osteoarthritis Project participants (two-thirds women, one-third African Americans, mean age 60 yrs) with and without HOA, CVD, or DM. A diagnosis of radiographic HOA (rHOA) required a Kellgren-Lawrence severity grade of ≥ 2 in at least 3 joints in each hand. A 4-state progressive model included transitions based on rHOA and pain or function as defined using the Australian/Canadian

HOA Index (AUSCAN). Markov multistate models estimated HR (aHR) and 95% CI for associations between DM or CVD and specific state transitions, adjusting for baseline and time-varying covariates. Results: Participants with DM (vs those without DM) were more likely to experience worsening pain with rHOA. Individuals who had or developed CVD (vs those who did not) were significantly less likely to experience symptomatic improvement, regardless of rHOA status. Those with DM or CVD (vs those without these comorbidities) were less likely to experience improvement in function, although this was statistically significant only for those with DM and no rHOA. Conclusion: Overall, having or developing DM and/or CVD reduced the likelihood of symptomatic and functional improvement over time, suggesting an effect of comorbid CVD and DM on the clinical and radiographic course of HOA. Additional studies are needed to confirm these findings.

Schott JP, Mertens AN, Bloomingdale R, O'Connell TF, **Gallagher MJ**, **Dixon S** and **Abbas AE** (2020). "Transthoracic echocardiographic findings in patients admitted with SARS-CoV-2 infection." Echocardiography 37(10): 1551-1556.

[Full Text](#)

Department of Internal Medicine

Introduction: Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2)-infected patients commonly have elevated troponin and D-dimer levels, but limited imaging exists to support most likely etiologies in efforts to avoid staff exposure. The purpose of this study was to report transthoracic echocardiographic (TTE) findings in SARS-CoV-2 patients with correlating troponin and D-dimer levels. Methods: We identified 66 SARS-CoV-2 patients (mean age 60 ± 15.7 years) admitted within a large, eight-hospital healthcare system over a 6-week period with a TTE performed. TTE readers were blinded to laboratory data with intra-observer and inter-observer analysis assessed. Results: Sixty-six of 1780 SARS-CoV-2 patients were included and represented a high-risk population as 38 (57.6%) were ICU-admitted, 47 (71.2%) had elevated D-dimer, 41 (62.1%) had elevated troponin, and 25 (37.9%) died. Right ventricular (RV) dilation was present in 49 (74.2%) patients. The incidence and average D-dimer elevation was similar between moderate/severe vs. mild/no RV dilation (69.6% vs 67.6%, $P = 1.0$; 3736 ± 2986 vs 4141 ± 3351 ng/mL, $P = .679$). Increased left ventricular (LV) wall thickness was present in 46 (69.7%) with similar incidence of elevated troponin and average troponin levels compared to normal wall thickness (66.7% vs 52.4%, $P = .231$; 0.88 ± 1.9 vs 1.36 ± 2.4 ng/mL, $P = .772$). LV dilation was rare ($n = 6$, 9.1%), as was newly reduced LV ejection fraction ($n = 2$, 3.0%). Conclusion: TTE in SARS-CoV-2 patients is scarce, technically difficult, and reserved for high-risk patients. RV dilation is common in SARS-CoV-2 but does not correlate with elevated D-dimer levels. Increased LV wall thickness is common, while newly reduced LV ejection fraction is rare, and neither correlates with troponin levels.

Seymour ZA, **Hamstra DA**, Daignault-Newton S, Thompson A, Sanda MG, Michalski JM, Zietman AL, Kuban DA, Ciezki JP, Kaplan ID, Collins SP, Suy S, Mantz CA, Chang P, Chen RC and Fuller DB (2020). "External validation of early Quality of Life (QOL) declines correlated with late QOL after intensity modulated, low dose rate brachytherapy, or stereotactic radiation for prostate cancer within a prospective trial." International Journal of Radiation Oncology, Biology, Physics 108(3): S69-S69.

[Full Text](#)

Department of Radiation Oncology

Sharrak A, Nguyen T and **Karabon P** (2020). "Industry research payments to urologists: The first 5 years of open payments research data." Journal of Urology 204(3): 408-410.

[Request Form](#)

Department of Medical Studies

OUIB Medical Student Author

Sharrak A, Yoskowitz R, Karabon P and **Lerchenfeldt S** (2020). "Understanding opioid addiction in the Chaldean community: A brief report." Journal of Immigrant and Minority Health. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

OUIB Medical Student Author

Sims MD, **Maine GN**, Childers KL, Podolsky RH, Voss DR, Berkiw-Scenna N, Oh J, Heinrich KE, Keil H, **Kennedy RH** and **Homayouni R** (2020). "COVID-19 seropositivity and asymptomatic rates in healthcare workers are associated with job function and masking." Clinical Infectious Diseases. ePub Ahead of Print.

[Full Text](#)

Department of Internal Medicine

Department of Foundational Medical Studies (OU)

Department of Pathology

Background: Although the risk of exposure to SARS-CoV-2 is higher for frontline healthcare workers, not all personnel have similar risks. Determining infection rate is difficult due to the limits on testing and the high rate of asymptomatic individuals. Detection of antibodies against SARS-CoV-2 may be useful for determining prior exposure to the virus and assessing mitigation strategies, such as isolation, masks, and other protective equipment. Methods: An online assessment that included demographic, clinical, and exposure information and a blood sample was collected from 20,614 participants out of ~43,000 total employees at Beaumont Health, which includes eight hospitals distributed across the Detroit metropolitan area in southeast Michigan. The presence of anti-SARS-CoV-2 IgG was determined using the EUROIMMUN assay. Results: A total of 1,818 (8.8%) participants were seropositive between April 13 and May 28, 2020. Among the seropositive individuals, 44% reported that they were asymptomatic during the month prior to blood collection. Healthcare roles such as phlebotomy, respiratory therapy, and nursing/nursing support exhibited significantly higher seropositivity. Among participants reporting direct exposure to a COVID-19 positive individual, those wearing an N95/PAPR mask had a significantly lower seropositivity rate (10.2%) compared to surgical/other masks (13.1%) or no mask (17.5%). Conclusions: Direct contact with COVID-19 patients increased the likelihood of seropositivity among employees but study participants who wore a mask during COVID-19 exposures were less likely to be seropositive. Additionally, a large proportion of seropositive employees self-reported as asymptomatic. (Funded by Beaumont Health and by major donors through the Beaumont Health Foundation)ClinicalTrials.gov number NCT04349202.

Smith CP and **Chancellor MB** (2020). "Botulinum toxin treatment in urological disorders," In B Jabbari (ed). Botulinum Toxin Treatment in Surgery, Dentistry, and Veterinary Medicine. Cham: Springer International Publishing. pp: 297-308.

[Full Text](#)

Department of Urology

Botulinum toxin (BoNT) injection has been widely accepted by the urology and urogynecology medical communities as a safe and effective treatment for refractory urinary incontinence based on two decades of published literature. Currently, there are two approved genitourinary indications for botulinum toxin within the United States. OnabotulinumtoxinA (onaBoNTA) 200 units for the treatment of urinary incontinence due to detrusor overactivity associated with a neurologic condition (e.g., spinal cord injury, multiple sclerosis) in adults who have an inadequate response to or are intolerant to an anticholinergic medication was approved by the FDA in 2011. In addition, onaBoNTA 100 units for the treatment of overactive bladder with symptoms of urinary incontinence, urgency, and frequency, in adult patients who have an inadequate response to or are intolerant to an anticholinergic medication was approved by the FDA in 2013. We will update the reader on the latest application of botulinum toxin for urologic indications with a focus on bladder injections as well as on potential uses of BoNT in the prostate and pelvic floor.

Snyder M, Vadas J, Musselwhite J, Halford R, **Wilson G, Stevens C** and **Yan D** (2020). "Technical note: FLASH radiotherapy monitor chamber signal conditioning." Medical Physics. ePub Ahead of Print.

[Full Text](#)

Department of Radiation Oncology

Purpose: Recent studies of ultra-high dose rate FLASH radiotherapy show a substantial reduction of damage to normal tissue cells when compared with conventional radiotherapy. Most, if not all, of these FLASH studies have taken place using either custom research equipment or heavily modified linacs with external dosimetric control. To simplify our preclinical research efforts, we wish to deliver FLASH with a minimally modified linac using the internal dosimetric system. Methods: To enable the built-in monitor chambers to terminate a FLASH beam, we reversibly modified an Elekta linear accelerator previously fit with a high dose rate electron (HDRE) system to include additional resistance in the signal path from the monitor chambers to the dose control system. To produce the FLASH beam, we altered the energy calibration tables of a decommissioned HDRE beam to functionally produce a photon mode beam current exiting through the electron window of the linac. We then used the machine modifications to assist in beam tuning and to calibrate the monitor chambers for FLASH delivery. We employed a radiochromic film for external dosimetry and preliminary tests of monitor chamber dosimetric stability. Results: We identified attenuation values and distributions that reduced the overall signal from the monitor chambers to the dose control system such that the system could terminate the beam without input from external monitoring circuits. Calibration of the control system resulted in 12 MU per second, constituting roughly 180 Gy at the mylar window. Preliminary tests indicate a linear MU to dose relationship at FLASH dose rates, but we encountered challenges in both dose resolution and repeatability of beam termination. Conclusions: The addition of attenuation in the control system path from the monitor chambers is fundamentally identical to current HDRE system design and was achieved without significant modification of the accelerator. Preliminary results indicate that current-generation monitor chambers could potentially govern FLASH radiotherapy, but overall beam and monitor chamber stability issues may necessitate machine modifications to achieve desired dosimetric accuracy.

Soud M, SayedAhmad Z, Kajy M, Alahdab F, Darmoch F, Al-Khadra Y, Pacha HM, Sattar Y, Ullah W, King F, Saad AB, Alhatemi G, Hakim Z, Ali OA, **Glazier JJ** and Alraies MC (2020). "The efficacy and safety of transradial and transfemoral approach in treatment of coronary chronic total occlusion: a systematic review and meta-analysis." Expert Review of Cardiovascular Therapy 18(11): 809-817.

[Request Form](#)

Department of Internal Medicine

Background: The clinical efficacy and safety of transradial (TR) percutaneous coronary intervention (PCI) in comparison to transfemoral (TF) for chronic total occlusion (CTO) is not well studied in literature. Objectives: We sought to study the outcome and complications associated with TR compared with TF for CTO interventions. Methods: After a systematic literature search was done in PubMed and EMBASE, we performed a meta-analysis of studies comparing TF and TR for CTO PCI. Results: Twelve studies with 19,309 patients were included. Compared to those who has TF access, individuals who were treated via TR approach had statistically significant lower access complication rates [odds ratio (OR): 0.33; 95% confidence interval (CI): 0.22 to 0.49; $p < 0.0001$]. The procedural success was in the favor of TR method (OR: 1.4; 95% CI: 1.31-1.51; $p < 0.0001$). The incidence of major adverse cardiovascular and cerebrovascular events (MACCE) and contrast-induced nephropathy were similar in both groups. Conclusion: When compared with TF access interventions in CTO PCI; the TR approach appears to be associated with far less access-site complications, higher procedural success, and comparable MACCE.

Spillinger A, Park K, **Shenouda K** and **Folbe AJ** (2020). "Endoscopic management of postradiation skull base osteoradionecrosis." International Forum of Allergy & Rhinology 10(12): 1329-1333.

[Full Text](#)

Department of Surgery

OUWB Medical Student Author

Sponagel J, Zhang SS, Jones J, **Chinnaiyan P**, Rubin J and Ippolito J (2020). "Sex differences in redox state underlie glutamine dependency in male glioblastoma." Neuro-Oncology 22: 221-221.

[Full Text](#)

Department of Radiation Oncology

Squires BS, Quinn TJ, **Nandalur SR** and **Jawad MS** (2020). "Adjuvant radiotherapy improves overall survival when added to surgery and chemotherapy for endometrial carcinosarcoma: A surveillance, epidemiology, and end results analysis." International Journal of Radiation Oncology Biology Physics 108(3): E459-E459.

[Full Text](#)

Department of Radiation Oncology

Stem MS, Todorich B and **Williams GA** (2020). "Enzymatic vitreolysis," In Chang A, Mieler WF and Ohji M (ed). Macular Surgery: Current Practice and Trends. Singapore: Springer Singapore. pp: 189-200.

[Full Text](#)

Department of Ophthalmology

Disorders of the vitreoretinal interface, such as vitreomacular traction and macular hole, are relatively common. Treatment options for these conditions include observation, pneumatic vitreolysis, enzymatic vitreolysis with ocriplasmin, and/or vitrectomy. In this chapter, we discuss the role of enzymatic vitreolysis in treating patients with vitreomacular traction or macular hole. We begin with a review of the normal anatomy of the vitreoretinal interface and the optical coherence tomography-based definitions of vitreomacular disorders. The preclinical, clinical, and post-marketing studies of ocriplasmin are summarized. Finally, we discuss important clinical factors to consider when deciding whether or not to use ocriplasmin to treat patients with vitreomacular disorders.

Stussman B, **Williams A**, Snow J, Gavin A, Scott R, Nath A and Walitt B (2020). "Characterization of post-exertional malaise in patients with myalgic encephalomyelitis/chronic fatigue syndrome." Frontiers in Neurology 11: 1025.

[Full Text](#)

OUWB Medical Student Author

Background: Myalgic encephalomyelitis/chronic fatigue syndrome is characterized by persistent and disabling fatigue, exercise intolerance, cognitive difficulty, and musculoskeletal/joint pain. Post-exertional malaise is a worsening of these symptoms after a physical or mental exertion and is considered a central feature of the illness. Scant observations in the available literature provide qualitative assessments of post-exertional malaise in patients with myalgic encephalomyelitis/chronic fatigue syndrome. To enhance our understanding, a series of outpatient focus groups were convened. Methods: Nine focus groups totaling 43 patients who reported being diagnosed with myalgic encephalomyelitis/chronic fatigue syndrome were held between November 2016 and August 2019. Focus groups queried post-exertional malaise in daily life and participants' retrospective memory of post-exertional malaise that followed an exercise provocation with a

cardiopulmonary exercise test. Data analysis followed the grounded theory method to systematically code and categorize the data to find meaningful patterns. A qualitative software package was used to move text into categories during data coding. Results: A wide range of symptoms were attributed to exertion both in daily lives and following cardiopulmonary exercise testing. While three core symptoms emerged (exhaustion, cognitive difficulties, and neuromuscular complaints), participants' descriptions were notable for their unique individual variations. Of 18 participants who responded to questions centered around symptoms following a cardiopulmonary exercise test, 17 reported that symptoms started within 24 h and peaked in severity within 72 h following the cardiopulmonary exercise test. Patients described post-exertional malaise as interfering with their ability to lead a "normal" life. Conclusion: The experience of post-exertional malaise in myalgic encephalomyelitis/chronic fatigue syndrome varies greatly between individuals and leads to a diminished quality of life. myalgic encephalomyelitis/chronic fatigue syndrome patients describe post-exertional malaise as all-encompassing with symptoms affecting every part of the body, difficult to predict or manage, and requiring complete bedrest to fully or partially recover. Given the extensive variability in patients, further research identifying subtypes of post-exertional malaise could lead to better targeted therapeutic options.

Svider PF, Setzen M, Ow R, **Folbe AJ**, Eloy JA and Johnson AP (2020). "Incorporation of telemedicine by rhinologists: The COVID-19 pandemic and beyond." American Journal of Otolaryngology 41(6): 102567.

[Full Text](#)

Department of Surgery

Objectives: The current analysis queries rhinologists' attitudes about the use of telemedicine, including the degree to which it has impacted practice patterns during the COVID-19 pandemic. Our objective was to survey rhinologists and understand the extent to which telemedicine serves as a rejoinder to in-person consultation: appreciation of relevant factors may be important in planning for present and future considerations. Methods: A 14-question anonymous survey sent out to the American Rhinologic Society (ARS) membership in April 2020. It included demographic factors and detailed questions examining the extent of telemedicine use. Numerous topics including the degree of use, satisfaction with services, and utility of services were evaluated. Results: There were 134 respondents. Most reported seeing $\leq 30\%$ of typical in-person volume, with 14.8% not seeing any patients at all. 88.1% used telemedicine; 82.0% reported some level of satisfaction with telemedicine. The vast majority utilized platforms employing audio and video (83.3%), and a plurality reported spending 5-15 min on calls. Numerous reasons were cited for the use of telemedicine, including significant public health benefits amid the crisis (89.7%). Only 12.0% of respondents reported using telemedicine for hospital consultation. Conclusion: Rhinologists have embraced telemedicine during the COVID-19 pandemic in an attempt to improve accessibility, patient satisfaction, and revenue stream. When utilized appropriately, this technology obviates the need for seeing at-risk patients and performing procedures such as nasal endoscopy. Only a minority of rhinologists was dissatisfied, viewing this as a temporary fix during the pandemic.

Swarup I, **Zaltz I**, Robustelli S and Sink E (2020). "Outcomes of periacetabular osteotomy for borderline hip dysplasia in adolescent patients." Journal of Hip Preservation Surgery 7(2): 249-255.

[Full Text](#)

Department of Orthopaedic Surgery

Treatment of borderline acetabular dysplasia (lateral center edge angle $\geq 18^\circ$) remains controversial, and there is a paucity of literature focusing on outcomes in adolescent patients. The purpose of this study was to evaluate the outcomes of a periacetabular osteotomy (PAO) as surgical management of borderline acetabular dysplasia in adolescent patients. We performed a retrospective review of prospectively collected data and included patients ≤ 21 years of age that underwent PAO for borderline acetabular dysplasia. All patients had a minimum of 1-year follow-up. Outcomes were assessed using modified Harris Hip Scores (mHHS), Hip Outcome Scores (HOS) and international Hip Outcome Tool (iHOT-33). Descriptive and univariate statistical analyses were performed. This study included 33 adolescent patients (35 hips) with symptomatic, borderline acetabular dysplasia. The majority of patients was female (32 patients, 97%); half of all patients reported a history of hip pain for over 1 year; and seven patients had previous hip arthroscopy. In addition to PAO, seven hips (20%) underwent a concurrent hip arthroscopy at the time of surgery. There were significant improvements in mean mHHS, HOS-activities of daily living (ADL), HOS-Sport and iHOT-33 scores after surgery ($P < 0.01$). Minimal clinically important difference in outcome scores was achieved for over 90% of patients at a minimum of 1-year follow-up. Borderline acetabular dysplasia is a major cause of hip pain in adolescent patients. Patients with symptomatic borderline acetabular dysplasia report a significant benefit after a PAO to correct structural hip instability.

Talia N, **Berger D**, Chen NW, Purekar M, **Qu LH**, **Swor RA** and **Otero R** (2020). "Lactate expression category and mortality in emergency department patients with severe sepsis and septic shock." Circulation 142(24): E500-E500.

[Request Form](#)

Department of Emergency Medicine

Department of Foundational Medical Studies (BH)

Tanaka S, Inoue M, Inoue T, Yamakawa T, Uchio E, Grewal DS, **Mahmoud TH** and Kadonosono K (2020). "Autologous retinal transplantation as a primary treatment for large chronic macular holes." Retina 40(10): 1938-1945.

[Full Text](#)

Department of Ophthalmology

Purpose: To report the outcomes of autologous neurosensory retinal transplant as a primary treatment for patients with large chronic macular holes and evaluate the safety and feasibility of the procedure. Design: Retrospective study, consecutive case series. Methods: We reviewed seven patients with a primary chronic large macular hole, who underwent autologous neurosensory retinal transplant. Mean preoperative minimum and maximum hole diameters were 643 μm and 1214 μm , respectively. Changes in visual acuity were measured postsurgery, and optical coherence tomography, fluorescein angiography, and microperimetry-3 were analyzed after the procedure. Results: Closure of the macular hole was achieved in all seven eyes in the study. At 1 year post-surgery, there was significant improvement in mean visual acuity (LogMAR 1.10 vs. 0.68, $P = 0.001$). Optical coherence tomography showed that all grafts had formed attachments to the retinal epithelial cells of the recipient retina. Mean preoperative ellipsoid zone defect was $1,089 \pm 403.8 \mu\text{m}$ (range, 918-1,329 μm) which further decreased to $921 \pm 129.1 \mu\text{m}$ (range, 670-1,201 μm) at final follow up ($P = 0.09$). Microperimetry-3 testing indicated retinal sensitivity in the graft in five eyes. Conclusion: Autologous retinal transplantation may help rebuild the macular structure resulting in functional improvement for eyes with primary chronic large macular hole.

Ternacle J, Pibarot P, Herrmann H, Kodali S, Leipsic J, Blanke P, Jaber W, Mack M, Clavel MA, Salaun E, Bernier M, Beaudoin J, Khaliq O, Weissman N, Douglas P, Bax J, Dahou A, Xu K, Alu M, Rogers E, Leon M, Thourani V, **Abbas A** and Hahn R (2020). "Incidence and impact of prosthesis-patient mismatch after aortic valve replacement in the PARTNER 2 trial and registry." Journal of the American College of Cardiology 76(17): B202-B203.

[Full Text](#)

Department of Internal Medicine

Thombare AS, **Maine G** and **Sykes E** (2020). "Nausea, vomiting, fatigue, and hyponatremia in a 7-year-old boy." Clinical Chemistry 66(10): 1272-1275.

[Full Text](#)

Department of Pathology

Thompson AB and **Hamstra DA** (2020). "Rectal spacer usage with proton radiation therapy for prostate cancer." International Journal of Radiation Oncology Biology Physics 108(3): 644-648.

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Department of Radiation Oncology

Todd BR, **Patel K**, Chen N, **Prewitt N** and **Shah P** (2020). "Risk factors for mortality in emergency medicine morbidity and mortality cases." Annals of Emergency Medicine 76(4): S100-S100.

[Full Text](#)

Department of Emergency Medicine

OUWB Medical Student Author

Tom A, **Powers JM** and Chaiyasate K (2020). "Safe and efficient removal of massive head and neck vascular malformations using vessel sealing energy devices." Journal of Craniofacial Surgery. ePub Ahead of Print.

[Full Text](#)

Department of Surgery

Department of Pathology

Large vascular malformations (VMs) pose several difficult clinical challenges to the plastic surgeon. Traditionally surgical dissection was labor-intensive and required a significant amount of time and technique. The advent of more advanced vessel sealing devices has resulted in easier vascular and lymphatic control during resection surgery. The authors present 2 cases of large VMs resected using newer energy devices. First, an infant who was born with a large neck AVM that was acutely bleeding requiring immediate control. The authors utilized the Impact Ligasure device to perform a subtotal resection, stabilize the patient, and returned for definitive resection in the future. In the second case, an adult male with a large complex tongue/lip AVM, presented for elective resection. He underwent staged sclerotherapy, followed by resection using the Harmonic Scalpel. The use of vessel sealing devices allows for a safe and efficient resection for a previously difficult surgery.

Travers B, **Jones S**, **Bastani A**, **Opsommer M**, Beydoun A, Karabon P and **Donaldson D** (2020). "Assessing

geriatric patients with head injury in the emergency department using the novel level III trauma protocol." [American Journal of Emergency Medicine](#). ePub Ahead of Print.

[Full Text](#)

Department of Emergency Medicine

OUWB Medical Student Author

Introduction: Intracranial injury in elderly patients presenting with minor head trauma is often overlooked in the emergency department (ED). Our suburban community-based level II trauma hospital developed and implemented the level III trauma protocol (L3TP) in January 2016 to better evaluate and diagnose intracranial injury in elderly patients presenting with minor head trauma after a fall. The L3TP requires that the ED physician immediately assess all patients meeting the following criteria 1) Age \geq 65 years old. 2) Currently taking any anticoagulant or antiplatelet agents. 3) Presenting in the ED with a potential head injury after a fall. The ED physician determines if these high-risk patients require emergent imaging, obviating the need for trauma team activation unless an intracranial hemorrhage (ICH) is found. The purpose of this study was to assess the impact of the novel L3TP on resource utilization and patient outcome. Methods: Our retrospective cohort study included patients who met the L3TP inclusion criteria and had an ICH diagnosed by non-contrast computed tomography (CT). We compared patients triaged by the L3TP (January to December 2017) to patients triaged before the L3TP was implemented (January to August 2015) in order to assess the impact of the L3TP on resource utilization and patient outcome. The data was analyzed using two independent samples t-tests and Chi-square tests. Results: Patients triaged by the L3TP had a significantly shorter average length of time from arrival in the ED to CT (level III trauma 0.64 h vs control 2.37 h, (d = 1.73; 95% CI = 1.42, 2.04), $p \leq 0.0001$) and ED length of stay (level III trauma 2.55 h vs control 4.72 h, (d = 2.17; 95% CI = 1.21, 3.13), $p \leq 0.0001$). There was insufficient evidence to conclude that there was any difference in health outcomes between the control and level III trauma groups. Conclusion: The L3TP is an effective and resource efficient protocol that quickly identifies ICH in elderly patients without activating the trauma team for every elderly patient presenting to the ED with a potential head injury after a fall.

Tseng YD, Mohindra P, Pankuch M, McGee LA, Rossi CJ, Flampouri S, Hajj C, Molitoris JK, Chang JHC, Tsai HK, **Stevens CW**, Rosen LR, Vargas CE and Hartsell WF (2020). "Selection of mediastinal lymphoma patients for proton therapy in a prospective multi-institutional registry: Concordance with the ILROG Guidelines." [International Journal of Radiation Oncology Biology Physics](#) 108(3): S140-S140.

[Full Text](#)

Department of Radiation Oncology

Tuan H, **Yu L**, Yin L, Lo Sicco K and Shapiro J (2020). "Prediction of therapeutic outcomes of female pattern hair loss patients based on clinical features with application of artificial intelligence." [Journal of the American Academy of Dermatology](#). ePub Ahead of Print.

[Request Form](#)

Department of Pathology

Vakharia P, **Xie M** and **Al-Hakim MM** (2020). "Facial nerve palsy after temporal artery biopsy." [Skinmed](#) 18(1): 54-55.

[Request Form](#)

Department of Neurology

OUWB Medical Student Author

Department of Pathology

A 79-year-old woman presented to the emergency room with a chief complaint of headache of 1 month's duration. Her medical history consisted of hypertension, congestive heart failure, anemia, chronic kidney disease, and hyperlipidemia. She reported the headache as waxing and waning, and occurring bilaterally in the frontal and occipital regions. On examination, she was found to have mild right-sided ptosis and possible early right-sided papilledema. She was also found to have bilateral shoulder tenderness and scalp tenderness. She denied double vision, vision changes, or jaw claudication.

Vanood A, Ah Lee Y, **Leleszi E** and **Krishnan A** (2020). "Symptomatic neurocutaneous melanosis: mild clinical onset in a teenager." [BMJ Case Reports](#): 1-5.

[Full Text](#)

Department of Pediatrics

Department of Diagnostic Radiology and Molecular Imaging

OUWB Medical Student Author

Neurocutaneous melanosis (NCM) is a rare disorder characterised by giant or multiple melanocytic nevi and meningeal melanosis or melanoma. Onset of neurological symptoms is typically in children younger than 2 years and can be rapidly fatal. We present the case of a 13-year-old adopted girl presenting with numerous

congenital melanocytic nevi and a seizure. She had no significant previous neurological history. Electroencephalogram showed epileptiform discharges over the right frontal region. MRI of the brain showed T1 hyperintensity in the bilateral amygdala and anterior temporal lobes with corresponding hyperintensity on T2 and fluid attenuated inversion recovery. There was no hydrocephalus. Along with the history of nevi, these imaging findings were concerning for NCM. The patient is being managed with levetiracetam and trametinib and shows no further neurological decline at 1-year follow-up, providing prognostic hope in this case of NCM.

Vayntraub A, Quinn TJ and **Deraniyagala RL** (2020). "Merkel cell carcinoma is associated with improved survival with use of radiation therapy and worse survival with chemotherapy: A SEER analysis." International Journal of Radiation Oncology Biology Physics 108(3): E13-E13.

[Request Form](#)

Department of Radiation Oncology

Vishweswaraiah S, Swierkowska J, Ratnamala U, Mishra NK, Guda C, Chettiar SS, Johar KR, Mrugacz M, Karolak JA, Gajecka M and **Radhakrishna U** (2019). "Epigenetically dysregulated genes and pathways implicated in the pathogenesis of non-syndromic high myopia." Scientific Reports 9(1): 4145.

[Full Text](#)

Department of Obstetrics & Gynecology

Myopia, commonly referred to as nearsightedness, is one of the most common causes of visual disability throughout the world. It affects more people worldwide than any other chronic visual impairment condition. Although the prevalence varies among various ethnic groups, the incidence of myopia is increasing in all populations across globe. Thus, it is considered a pressing public health problem. Both genetics and environment play a role in development of myopia. To elucidate the epigenetic mechanism(s) underlying the pathophysiology of high-myopia, we conducted methylation profiling in 18 cases and 18 matched controls (aged 4-12 years), using Illumina MethylationEPIC BeadChips array. The degree of myopia was variable among subjects, ranging from -6 to -15D. We identified 1541 hypermethylated CpGs, representing 1745 genes (2.0-fold or higher) (false discovery rate (FDR) $p \leq 0.05$), multiple CpGs were $p < 5 \times 10^{-8}$ with a receiver operating characteristic area under the curve (ROC-AUC) ≥ 0.75 in high-myopia subjects compared to controls. Among these, 48 CpGs had excellent correlation (AUC ≥ 0.90). Herein, we present the first genome-wide DNA methylation analysis in a unique high-myopia cohort, showing extensive and discrete methylation changes relative to controls. The genes we identified hold significant potential as targets for novel therapeutic intervention either alone, or in combination.

Vlasschaert C, **Topf JM** and Hiremath S (2020). "Proliferation of papers and preprints during the Coronavirus Disease 2019 Pandemic: Progress or problems with peer review?" Advances in Chronic Kidney Disease 27(5): 418-426.

[Full Text](#)

Department of Surgery

The Coronavirus Disease 2019 (COVID-19) pandemic has spread exponentially throughout the world in a short period, aided by our hyperconnected world including global trade and travel. Unlike previous pandemics, the pace of the spread of the virus has been matched by the pace of publications, not just in traditional journals, but also in preprint servers. Not all publication findings are true, and sifting through the firehose of data has been challenging to peer reviewers, editors, as well as to consumers of the literature, that is, scientists, healthcare workers, and the general public. There has been an equally exponential rise in the public discussion on social media. Rather than decry the pace of change, we suggest the nephrology community should embrace it, making deposition of research into preprint servers the default, encouraging prepublication peer review more widely of such preprint studies, and harnessing social media tools to make these actions easier and seamless.

Wang D, Champion-Lyons E, Neyens R, Bohm N, Caddell B and Babic N (2020). "The effect of sample handling on free valproic acid levels." Journal of Applied Laboratory Medicine. ePub Ahead of Print.

[Full Text](#)

Department of Pathology

Background: Valproic acid (VPA) is a broad-spectrum anticonvulsant drug. Under normal conditions, this drug is highly protein bound. However, in patients with hypoalbuminemia, the free fraction can increase substantially while the total VPA levels remain in therapeutic range. The neurologic activity and toxicity of the drug are directly related to free drug levels. Methods: Our in-house free VPA assay was validated using 20 patient samples obtained from a reference laboratory (RL1). It was further evaluated by parallel testing with RL1 using samples collected from our patients. Subsequently, sample handling effects were investigated by comparing free VPA levels measured in our laboratory to 3 selected RLs with different sample transportation conditions. Results: No significant bias was observed between the in-house assay (y)

and RL1 (x) assay in free VPA measurement ($y = 1.12x + 0.072$, $r = 0.994$). However, patient samples collected in our institution and sent to RL1 revealed significant negative bias ($y = 0.776x - 3.861$, $r = 0.954$). A large discrepancy in free VPA levels was further observed from identical aliquots of the same samples transported to 3 RLs in different conditions. Conclusions: Our study demonstrated that sample handling has significant impact on free VPA levels. The observed magnitude of variation exceeds a clinically acceptable limit and could alter clinical decisions.

Ward EP, Bartolone SN, **Chancellor MB**, **Peters KM** and Lamb LE (2020). "Proteomic analysis of bladder biopsies from interstitial cystitis/bladder pain syndrome patients with and without Hunner's lesions reveals differences in expression of inflammatory and structural proteins." *BMC Urology* 20(1): 180.

[Full Text](#)

Department of Urology

Background: Interstitial cystitis/bladder pain syndrome is a bladder disease usually characterized by pain, urgency, and frequency. Interstitial cystitis is currently classified into two subtypes, with and without Hunner's lesions. However, the underlying etiology of interstitial cystitis and its subtypes are largely unknown. Methods: To better understand the biological changes in the bladder of interstitial cystitis/bladder pain syndrome patients, we directly analyzed bladder tissue of interstitial cystitis patients, both those with Hunner's lesions and those without. Proteins in the bladder biopsies were analyzed using nanoscale high-performance liquid chromatography-tandem mass spectrometry. Disease subgroups were compared and significantly expressed proteins were mapped using STRING to determine protein associations and functions. Results: We found that patients with Hunner's lesions had significant increases in inflammatory and endoplasmic reticulum stress proteins, with a decrease in cellular adhesive proteins, compared to patients without Hunner's lesions. These patients also exhibited a decrease in proteins associated with the Rap1 signaling pathway, which regulates cell proliferation and wound healing. When comparing diseased and non-disease-apparent tissue in patients with Hunner's lesions, diseased tissue exhibited a decrease in ubiquitination proteins. Conclusions: In summary, there are significant differences in protein expression found in the bladders of interstitial cystitis patients with and without Hunner's lesions, indicating a disturbance in proteins associated with cellular adhesion, proliferation, protein processing, and wound healing.

Wasserman JA, Navin MC, **Drzyzga V** and Gibb TS (2020). "Practising what we preach: Clinical ethicists' professional perspectives and personal use of advance directives." *Journal of Medical Ethics*. ePub Ahead of Print.

[Full Text](#)

Department of Foundational Medical Studies (OU)

OUWB Medical Student Author

The field of clinical bioethics strongly advocates for the use of advance directives to promote patient autonomy, particularly at the end of life. This paper reports a study of clinical bioethicists' perceptions of the professional consensus about advance directives, as well as their personal advance care planning practices. We find that clinical bioethicists are often sceptical about the value of advance directives, and their personal choices about advance directives often deviate from what clinical ethicists acknowledge to be their profession's recommendations. Moreover, our respondents identified a pluralistic set of justifications for completing treatment directives and designating surrogates, even while the consensus view focuses on patient autonomy. Our results suggest important revisions to academic discussion and public-facing advocacy about advance care planning.

Weir-McCall JR, Branch K, Ferencik M, Blankstein R, Choi AD, Ghoshhajra BB, **Chinnaiyan K**, Parwani P, Nicol E and Nieman K (2020). "Highlights of the 15th annual scientific meeting of the Society of Cardiovascular Computed Tomography." *Journal of Cardiovascular Computed Tomography* 14(6): 466-470.

[Full Text](#)

Department of Internal Medicine

The 15th Society of Cardiovascular Computed Tomography (SCCT) annual scientific meeting (ASM) welcomed 770 digital attendees from 44 countries, over 2 days, with a program that included 30 sessions across three simultaneously streaming channels, 10 exhibitors and a diverse range of scientific abstracts. In addition, #SCCT2020 generated >5900 tweets from nearly 700 engaged social media participants resulting in an estimated 38 million digital impressions and becoming #1 trending medical meeting in social media in the world during the meeting time period. This article summarizes the many themes and topics of presentation and discussion in this meeting, and the many technical advances that are likely to impact future clinical practice in cardiovascular computed tomography.

Wiater JM, Levy JC, Wright SA, Brockmeier SF, Duquin TR, Wright JO and Codd TP (2020). "Prospective, blinded, randomized controlled trial of stemless versus stemmed humeral components in anatomic total shoulder arthroplasty: Results at short-term follow-up." *The Journal of Bone and Joint Surgery* 102(22): 1974-1984.

[Full Text](#)

Department of Orthopaedic Surgery

Background: Stemless humeral components for anatomic total shoulder arthroplasty (aTSA) have several reported potential benefits compared with stemmed implants. However, we are aware of no Level-I, randomized controlled trials (RCTs) that have compared stemless implants with stemmed implants in patients managed with aTSA. We sought to directly compare the short-term clinical and radiographic outcomes of stemless and stemmed implants to determine if the stemless implant is noninferior to the stemmed implant. Methods: We performed a prospective, multicenter, single-blinded RCT comparing stemless and short-stemmed implants in patients managed with aTSA. Range-of-motion measurements and American Shoulder and Elbow Surgeons (ASES), Single Assessment Numeric Evaluation (SANE), and Constant scores were obtained at multiple time points. Device-related complications were recorded. Radiographic evaluation for evidence of loosening, fractures, dislocation, or other component complications was performed. Statistical analysis for noninferiority was performed at 2 years of follow-up for 3 primary end points: ASES score, absence of device-related complications, and radiographic signs of loosening. All other data were compared between cohorts at all time points as secondary measures. Results: Two hundred and sixty-five shoulders (including 176 shoulders in male patients and 89 shoulders in female patients) were randomized and received the allocated treatment. The mean age of the patients (and standard deviation) was 62.6 ± 9.3 years, and 99% of the shoulders had a primary diagnosis of osteoarthritis. At 2 years, the mean ASES score was 92.5 ± 14.9 for the stemless cohort and 92.2 ± 13.5 for the stemmed cohort (p value for noninferiority test, <0.0001), the proportion of shoulders without device-related complications was 92% (107 of 116) for the stemless cohort and 93% (114 of 123) for the stemmed cohort (p value for noninferiority test, 0.0063), and no shoulder in either cohort had radiographic signs of loosening. Range-of-motion measurements and ASES, SANE, and Constant scores did not differ significantly between cohorts at any time point within the 2-year follow-up. Conclusions: At 2 years of follow-up, the safety and effectiveness of the stemless humeral implant were noninferior to those of the stemmed humeral implant in patients managed with aTSA for the treatment of osteoarthritis. These short-term results are promising given the potential benefits of stemless designs over traditional, stemmed humeral components.

Wiczorek M, Otero R, Knight S, Ziadeh K, Blumline J, Rollins Z, Littmann H, Hufstader R and Swor R (2020). "Outcomes for patients with congestive heart failure and chronic kidney disease receiving fluid resuscitation for severe sepsis or septic shock." *Annals of Emergency Medicine* 76(4): S121-S121.

[Full Text](#)

Department of Emergency Medicine

OUWB Medical Student Author

Willis BL, Radford NB, Barlow CE, Leonard D, **Franklin BA** and DeFina LF (2020). "Divergent association of high levels of physical activity with cardiac versus noncardiac arterial calcification." *American Heart Journal*. ePub Ahead of Print: 10-13.

[Full Text](#)

Department of Internal Medicine

Wilson GD, Wilson TG, Hanna A, Dabjan M, Buelow K, Torma J, Marples B and Galoforo S (2020). "Dacomitinib and gedatolisib in combination with fractionated radiation in head and neck cancer." *Clinical and Translational Radiation Oncology* 26: 15-23.

[Full Text](#)

Department of Radiation Oncology

Background and Purpose: There has been little success targeting individual genes in combination with radiation in head and neck cancer. In this study we investigated whether targeting two key pathways simultaneously might be more effective. Materials and Methods: We studied the effect of combining dacomitinib (pan-HER, irreversible inhibitor) and gedatolisib (dual PI3K/MTOR inhibitor) with radiation in well characterized, low passage xenograft models of HNSCC in vitro and in vivo. Results: Dacomitinib showed differential growth inhibition in vitro that correlated to EGFR expression whilst gedatolisib was effective in both cell lines. Neither agent radiosensitized the cell lines in vitro. In vivo studies demonstrated that dacomitinib was an effective agent alone and in combination with radiation whilst the addition of gedatolisib did not enhance the effect of these two modalities despite inhibiting phosphorylation of key genes in the PI3K/MTOR pathway. Conclusions: Our results showed that combining two drugs with radiation provided no added benefit compared to the single most active drug. Dacomitinib deserves more investigation as a radiation sensitizing agent in HNSCC.

Winker KP, Beaulieu R, Beville L, Mishulin A and **Black EH** (2020). "Effects of aspirin on postoperative bruising and bleeding complications in upper eyelid surgery." *Ophthalmic Plastic and Reconstructive Surgery* 36(6): 575-578.

[Full Text](#)

Department of Ophthalmology

Purpose: We evaluated the effects of aspirin versus placebo in patients undergoing upper eyelid blepharoplasty and/or levator advancement or plication blepharoptosis repair in this randomized, prospective study. Methods: Patients who presented between October 2017 and April 2019 requiring blepharoptosis repair and/or upper eyelid blepharoplasty who were taking 81 mg aspirin were randomized to receive 1 week of aspirin tablets or 1 week of placebo tablets prior to surgery. Postoperative complications, such as bleeding, hematoma, or hemorrhage, were noted as well as perioperative thromboembolic complications. Photos were obtained at the patient's first postoperative visit and later judged on bruising severity. The 2 groups were subsequently compared. Results: A total of 48 patients and 89 eyelids were evaluated in this study. Fifty-two eyelids were included in the aspirin group and 37 eyelids were included in the placebo group. There was no statistically significant difference in bruising rating between groups. There was no statistically significant difference in the number of patients who experienced mild postoperative bleeding. No patients experienced vision loss. No patients experienced a thromboembolic event. There were no patients who experienced hemorrhage, hematoma, or retrobulbar hemorrhage. Conclusions: Continuation of aspirin does not appear to effect outcomes with respect to postoperative bruising in patients undergoing upper eyelid blepharoplasty or blepharoptosis repair. The study was not powered to determine statistical significance with regard to bleeding complications and would require a significantly higher sample size. We suggest changing the current guidelines to recommend routine continuation of low dose 81 mg aspirin before upper eyelid surgery.

Xie M and Ma H (2020). "Nasopharyngeal mantle cell lymphoma with IGH/CCND1 rearrangement and MALT1 amplification: A case study with literature review." *Human Pathology: Case Reports* 22(11): 200424.

[Full Text](#)

Department of Pathology

Mantle cell lymphoma (MCL) is an aggressive B cell lymphoma and characterized by the t(11;14)(q13;q32)/CCND1+. MALT1 amplification is the most common genetic event in MALT lymphomas. Identification of CCND1 and MALT1 gene over expression plays a key role in the diagnosis of MCL and some MALT lymphomas. Several unusual variants of MCL have been described with variable morphological, immunophenotypic and genetic characteristics. Here, we report an unusual nasopharyngeal B cell lymphoma with both CCND1 rearrangement and MALT1 amplification. The patient was a 60 year old gentleman admitted for further evaluation of "unspecified lymphoma". PET oncology study revealed intense FDG avidity in the nasopharyngeal region, highly suspicious for malignancy. A biopsy of nasopharyngeal lesion was performed. Histological examination showed focal expansion of mantle zone surrounding residual germinal centers. Flow cytometry demonstrated one population of monoclonal B cells, negative for CD23 with variable CD5 expression. Lymphocytes in mantle zone were positive for CD20, BCL1 and weakly CD5 by immunohistochemistry. Interestingly, FISH studies were positive for standard and variant IGH/CCND1 rearrangement (85%) and MALT1 gene amplification (60%). Staging evaluations showed minimal bone marrow lymphoma involvement and increased FDG avidity in bilateral tonsillar regions and regional nodes of the neck, indicative of systemic disease. The overall findings were consistent with primary nasopharyngeal mantle cell lymphoma, which harbored both CCND1 and MALT1, with systemic involvement. The patient responded well with chemotherapy. To our knowledge, this is the first such case reported in the literature. Recent studies have shown that MALT1 gene may involve in the MYC pathway regulation in MCL, which represents a promising target for future therapies in MCL patients.

Ye H, Rutka E and **Robertson J** (2020). "Identifying priority action for improving patient satisfaction in outpatient cancer care." *International Journal of Radiation Oncology Biology Physics* 108(3): E226-E226.

[Full Text](#)

Department of Radiation Oncology

Yilmaz A, Ugur Z, Ustun I, Akyol S, **Bahado-Singh RO**, **Maddens M**, Aasly JO and **Graham SF** (2020). "Metabolic profiling of CSF from people suffering from sporadic and LRRK2 Parkinson's Disease: A pilot study." *Cells* 9(11): 1.

[Full Text](#)

Department of Obstetrics & Gynecology

Department of Internal Medicine

CSF from unique groups of Parkinson's disease (PD) patients was biochemically profiled to identify previously unreported metabolic pathways linked to PD pathogenesis, and novel biochemical biomarkers of the disease were characterized. Utilizing both (1)H NMR and DI-LC-MS/MS we quantitatively profiled CSF from patients with sporadic PD (n = 20) and those who are genetically predisposed (LRRK2) to the disease (n = 20), and compared those results with age and gender-matched controls (n = 20). Further, we systematically evaluated the utility of several machine learning techniques for the diagnosis of PD. (1)H NMR and mass spectrometry-based metabolomics, in combination with bioinformatic analyses, provided useful information highlighting previously unreported biochemical pathways and CSF-based biomarkers

associated with both sporadic PD (sPD) and LRRK2 PD. Results of this metabolomics study further support our group's previous findings identifying bile acid metabolism as one of the major aberrant biochemical pathways in PD patients. This study demonstrates that a combination of two complimentary techniques can provide a much more holistic view of the CSF metabolome, and by association, the brain metabolome. Future studies for the prediction of those at risk of developing PD should investigate the clinical utility of these CSF-based biomarkers in more accessible biomatrices. Further, it is essential that we determine whether the biochemical pathways highlighted here are recapitulated in the brains of PD patients with the aim of identifying potential therapeutic targets.

Yilmaz A, Ustun I, Ugur Z, Akyol S, Hu WT, Fiandaca MS, Mapstone M, Federoff H, Maddens M and Graham SF (2020). "A community-based study identifying metabolic biomarkers of mild cognitive impairment and Alzheimer's Disease using artificial intelligence and machine learning." Journal of Alzheimer's Disease 78(4): 1381-1392.

[Request Form](#)

Department of Internal Medicine

Department of Obstetrics and Gynecology

Background: Currently, there is no objective, clinically available tool for the accurate diagnosis of Alzheimer's disease (AD). There is a pressing need for a novel, minimally invasive, cost friendly, and easily accessible tool to diagnose AD, assess disease severity, and prognosticate course. Metabolomics is a promising tool for discovery of new, biologically, and clinically relevant biomarkers for AD detection and classification. Objective: Utilizing artificial intelligence and machine learning, we aim to assess whether a panel of metabolites as detected in plasma can be used as an objective and clinically feasible tool for the diagnosis of mild cognitive impairment (MCI) and AD. Methods: Using a community-based sample cohort acquired from different sites across the US, we adopted an approach combining Proton Nuclear Magnetic Resonance Spectroscopy (1H NMR), Liquid Chromatography coupled with Mass Spectrometry (LC-MS) and various machine learning statistical approaches to identify a biomarker panel capable of identifying those patients with AD and MCI from healthy controls. Results: Of the 212 measured metabolites, 5 were identified as optimal to discriminate between controls, and individuals with MCI or AD. Our models performed with AUC values in the range of 0.72-0.76, with the sensitivity and specificity values ranging from 0.75-0.85 and 0.69-0.81, respectively. Univariate and pathway analysis identified lipid metabolism as the most perturbed biochemical pathway in MCI and AD. Conclusion: A comprehensive method of acquiring metabolomics data, coupled with machine learning techniques, has identified a strong panel of diagnostic biomarkers capable of identifying individuals with MCI and AD. Further, our data confirm what other groups have reported, that lipid metabolism is significantly perturbed in those individuals suffering with dementia. This work may provide additional insight into AD pathogenesis and encourage more in-depth analysis of the AD lipidome.

Yorke AA, Solis D, Jr. and **Guerrero T** (2020). "A feasibility study to estimate optimal rigid-body registration using combinatorial rigid registration optimization (CORRO)." Journal of Applied Clinical Medical Physics 21(11): 14-22.

[Full Text](#)

Department of Radiation Oncology

Purpose: Clinical image pairs provide the most realistic test data for image registration evaluation. However, the optimal registration is unknown. Using combinatorial rigid registration optimization (CORRO) we demonstrate a method to estimate the optimal alignment for rigid-registration of clinical image pairs. Methods: Expert selected landmark pairs were selected for each CT/CBCT image pair for six cases representing head and neck, thoracic, and pelvic anatomic regions. Combination subsets of a k number of landmark pairs (k-combination set) were generated without repeat to form a large set of k-combination sets (k-set) for k = 4,8,12. The rigid transformation between the image pairs was calculated for each k-combination set. The mean and standard deviation of these transformations were used to derive final registration for each k-set. Results: The standard deviation of registration output decreased as the k-size increased for all cases. The joint entropy evaluated for each k-set of each case was smaller than those from two commercially available registration programs indicating a stronger correlation between the image pair after CORRO was used. A joint histogram plot of all three algorithms showed high correlation between them. As further proof of the efficacy of CORRO the joint entropy of each member of 30 000 k-combination sets in k = 4 were calculated for one of the thoracic cases. The minimum joint entropy was found to exist at the estimated mean of registration indicating CORRO converges to the optimal rigid-registration results. Conclusions: We have developed a methodology called CORRO that allows us to estimate optimal alignment for rigid-registration of clinical image pairs using a large set landmark point. The results for the rigid-body registration have been shown to be comparable to results from commercially available algorithms for all six cases. CORRO can serve as an excellent tool that can be used to test and validate rigid registration algorithms.

Youn A (2020). "Commentary on: Predicting public interest in nonsurgical cosmetic procedures using Google Trends." Aesthetic Surgery Journal 40(11): 1263-1264.

[Full Text](#)

Department of Surgery

Zazove P, Plegue MA, McKee MM, DeJonckheere M, Kileny PR, Schleicher LS, Green LA, Sen A, Rapai ME and **Mulhem E** (2020). "Effective hearing loss screening in primary care: The early auditory referral-primary care study." *Annals of Family Medicine* 18(6): 520-527.

[Full Text](#)

Department of Family Medicine and Community Health

Purpose: Hearing loss, the second most common disability in the United States, is under-diagnosed and under-treated. Identifying it in early stages could prevent its known substantial adverse outcomes. Methods: A multiple baseline design was implemented to assess a screening paradigm for identifying and referring patients aged ≥ 55 years with hearing loss at 10 family medicine clinics in 2 health systems. Patients completed a consent form and the Hearing Handicap Inventory for the Elderly (HHI). An electronic alert prompted clinicians to screen for hearing loss during visits. Results: The 14,877 eligible patients during the study period had 36,701 encounters. Referral rates in the family medicine clinics increased from a baseline rate of 3.2% to 14.4% in 1 health system and from a baseline rate of 0.7% to 4.7% in the other. A general medicine comparison group showed referral rate increase from the 3.0% baseline rate to 3.3%. Of the 5,883 study patients who completed the HHI 25.2% (n=1,484) had HHI scores suggestive of hearing loss; those patients had higher referral rates, 28% vs 9.2% (P <.001). Of 1,660 patients referred for hearing testing, 717 had audiology data available for analysis: 669 (93.3%) were rated appropriately referred and 421 (58.7%) were considered hearing aid candidates. Overall, 71.5% of patients contacted felt their referral was appropriate. Conclusion: An electronic alert used to remind clinicians to ask patients aged ≥ 55 years about hearing loss significantly increased audiology referrals for at-risk patients. Audiologic and audiogram data support the effectiveness of the prompt. Clinicians should consider adopting this method to identify patients with hearing loss to reduce its known and adverse sequelae.

Zhang PL, Herrera GA and Liu B (2020). "Monoclonal glomerulopathy with features of cryoglobulinemic glomerulopathy in murine multiple myeloma model." *Ultrastructural Pathology*: 1-8.

[Full Text](#)

Department of Pathology

In vivo and animal models of monoclonal light chain-associated renal diseases are limited. The Vk*MYC transgenic model with multiple myeloma in 50-70 weeks old mice with renal involvement has been reported before, but detailed renal pathologic changes have not been well documented. This study fully investigated pathologic changes in the kidneys of Vk*MYC transgenic model using light microscopy, immunofluorescence stains for kappa and lambda light chains, and electron microscopy. Compared to the kidneys of wild-type mice, the kidneys of transgenic mice showed either mesangial segmental expansion, some with associated hypercellularity, and/or thrombotic obstruction of glomerular capillaries. The glomeruli revealed stronger lambda staining than kappa light chain staining. Six out of 12 kidneys from transgenic mice showed abundant electron-dense deposits when examined ultrastructurally. The deposits were located in glomerular capillary lumina in three cases. Large luminal and subendothelial deposits were characterized by randomly disposed microtubular structures measuring up to 16 nm in diameter, with overall features most consistent with cryoglobulins. In summary, about 50% of kidneys from the Vk*MYC mice with myeloma had features most consistent with monoclonal cryoglobulinemic glomerulopathy.

Zhang PL, Pancioli T, Li W and **Kanaan HD** (2020). "Electron microscopic findings can support multiple etiologies of nephrotoxicity in renal tubules." *Ultrastructural Pathology*. ePub Ahead of Print.

[Request Form](#)

Department of Pathology

Electron microscopy (EM) has been mainly used for identifying ultrastructural abnormalities such as fusion of foot processes and immune complex deposits in glomeruli. However, electron microscopic findings in renal tubules can provide either diagnostic evidence (unique finding) or supportive evidence (additional finding) for final diagnosis. Here we present multiple situations that EM can be used for drawing conclusions of various drug-associated nephrotoxicity. Multiple cases with drug-induced nephrotoxicity are reviewed, including clinical history, EM findings, and serum creatinine (sCr) levels, prior to renal biopsy and during follow-up. Two cases with nephrotoxicity by aminoglycoside antibiotics showed acute tubular injury with EM findings of myeloid bodies, characterized by laminated dense materials in lysosomes in both proximal and distal tubular epithelium (diagnostic evidence). Five cases of vancomycin associated nephrotoxicity presented with acute tubular injury and vancomycin casts in distal tubules, characterized by central laminated casts in the lumina of distal tubules (supportive evidence). Vedolizumab, a humanized monoclonal antibody used in treating Crohn's disease, can cause T-cell dominant acute interstitial nephritis, with EM revealing lymphocytic infiltration into tubules as tubulitis (supportive evidence). Four of Seven cases (5/8) cases had renal functional recovery upon follow-up check for sCr. EM findings of characteristic changes in

renal tubules can be particularly useful as either diagnostic or supportive evidence, in correlation with clinical history and etiologies of nephrotoxicity. Therefore, EM should not only focus on glomerular changes, but renal tubular changes as well.

Zwaans BMM, Nicolai HE, **Chancellor MB** and Lamb LE (2020). "Prostate cancer survivors with symptoms of radiation cystitis have elevated fibrotic and vascular proteins in urine." [PLoS ONE](#) 15(10 October).

[Full Text](#)

Department of Urology

Radiation for pelvic cancers can result in severe bladder damage and radiation cystitis (RC), which is characterized by chronic inflammation, fibrosis, and vascular damage. RC development is poorly understood because bladder biopsies are difficult to obtain. The goal of this study is to gain understanding of molecular changes that drive radiation-induced cystitis in cancer survivors using urine samples from prostate cancer survivors with history of radiation therapy. 94 urine samples were collected from prostate cancer survivors with (n = 85) and without (n = 9) history of radiation therapy. 15 patients with radiation history were officially diagnosed with radiation cystitis. Levels of 47 different proteins were measured using Multiplex Luminex. Comparisons were made between non-irradiated and irradiated samples, and within irradiated samples based on radiation cystitis diagnosis, symptom scores or hematuria. Statistical analysis was performed using Welch's t-test. In prostate cancer survivors with history of radiation therapy, elevated levels of PAI 1, TIMP1, TIMP2, HGF and VEGF-A were detected in patients that received a radiation cystitis diagnosis. These proteins were also increased in patients suffering from hematuria or high symptom scores. No inflammatory proteins were detected in the urine, except in patients with gross hematuria and end stage radiation cystitis. Active fibrosis and vascular distress is detectable in the urine through elevated levels of associated proteins. Inflammation is only detected in urine of patients with end-stage radiation cystitis disease. These results suggest that fibrosis and vascular damage drive the development of radiation cystitis and could lead to the development of more targeted treatments. © 2020 Zwaans et al. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.