

Henry Ford Health System Publication List – January 2020

This bibliography aims to recognize the scholarly activity and provide ease of access to journal articles, meeting abstracts, book chapters, books and other works published by Henry Ford Health System personnel. Searches were conducted in PubMed, Embase, and Google Scholar during the month, and then imported into EndNote for formatting. There are 128 unique citations listed this month; articles are listed first, followed by conference abstracts and books. Because of various limitations, this does not represent an exhaustive list of all published works by Henry Ford Health System authors.

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Articles

Allergy and Immunology

Sitarik A, Havstad S, Kim H, Zoratti EM, Ownby D, Johnson CC, and Wegienka G. Racial Disparities in Allergic Outcomes Persist to Age 10 Years in Black and White Children. *Ann Allergy Asthma Immunol* 2020; Epub ahead of print. PMID: 31945477. [Full Text](#)

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BACKGROUND: Previous analyses in the WHEALS birth cohort demonstrated black children are more likely to experience allergic outcomes than white children by age 2 years. The results could not be explained by a host of variables. **OBJECTIVE:** Assess whether racial disparities persisted to age 10 years and determine whether any differences could be explained by a panel of variables related to early life exposures in WHEALS. **METHODS:** At age 10 years, WHEALS children (n=481) completed skin prick testing, spirometry and methacholine challenge and a physician exam for eczema and asthma. Allergen-specific IgEs (sIgE) and total IgE were measured. Inverse probability weighting with logistic and linear regression models was used to assess associations between race (black or white) and the outcomes. **RESULTS:** Black children fared worse than white children with respect to each outcome. Black children were more likely to have eczema, asthma, sensitization (≥ 1 sIgE ≥ 0.35 IU/L) and at least one positive skin prick test; however, some variability was present in the magnitudes of association within subgroups defined by delivery mode, sex of the child, prenatal indoor dog exposure, and firstborn status. In some subgroups, Black children were also more likely to have higher total IgE and worse pulmonary function test measures (PC 20 ≤ 25 mg/ml, % predicted FVC, FEV1/FVC, FEF 25-75). Confounding did not explain these differences. **CONCLUSION:** Racial differences persisted in this cohort through age 10 years. Future studies should include potentially important, but rarely studied factors such as segregation and structural racism as these factors could explain the observed racial differences.

Anesthesiology

Acho C, Chhina A, and Galusca D. Anesthetic Considerations for Patients on Renal Replacement Therapy. *Anesthesiology Clinics* 2020; Epub ahead of print. PMID: Not assigned. [Full Text](#)

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The number of patients presenting for surgery with renal dysfunction requiring renal replacement therapy (RRT) is expected to increase as the population ages and improvements in therapy continue to be made. Every aspect of the perioperative period is affected by renal dysfunction, its associated comorbidities, and altered physiology secondary to RRT. Most alarming is the increased risk for perioperative cardiac morbidity and mortality seen in this population. Perioperative optimization and management aims to minimize these risks; however, few definite guidelines on how to do so exist.

Anesthesiology

Ahuja S, Mascha EJ, Yang D, Maheshwari K, Cohen B, Khanna AK, Ruetzler K, Turan A, and Sessler DI. Associations of Intraoperative Radial Arterial Systolic, Diastolic, Mean, and Pulse Pressures with Myocardial and Acute Kidney Injury after Noncardiac Surgery: A Retrospective Cohort Analysis. *Anesthesiology* 2020; 132(2):291-306. PMID: 31939844. [Full Text](#)

From the Departments of OUTCOMES RESEARCH, (S.A., E.J.M., D.Y., K.M., B.C., A.K.K., K.R., A.T., D.I.S.) Quantitative Health Sciences (E.J.M., D.Y.) General Anesthesiology (K.M., K.R., A.T.), Cleveland Clinic, Cleveland, Ohio the Department of Anesthesiology, Pain Management and Perioperative Medicine, Henry Ford Health System, Detroit, Michigan (S.A.) the Division of Anesthesia, Critical Care, and Pain Management, Tel-Aviv Medical Center, Tel Aviv University, Tel-Aviv, Israel (B.C.) the Department of Anesthesiology, Section on Critical Care Medicine, Wake Forest School of Medicine, Wake Forest Center for Biomedical Informatics, and the Critical Injury, Illness and Recovery Research Center, Winston-Salem, North Carolina (A.K.K.).

BACKGROUND: Arterial pressure is a complex signal that can be characterized by systolic, mean, and diastolic components, along with pulse pressure (difference between systolic and diastolic pressures). The authors separately evaluated the strength of associations among intraoperative pressure components with myocardial and kidney injury after noncardiac surgery. **METHODS:** The authors included 23,140 noncardiac surgery patients at Cleveland Clinic who had blood pressure recorded at 1-min intervals from radial arterial catheters. The authors used univariable smoothing and multivariable logistic regression to estimate probabilities of each outcome as function of patients' lowest pressure for a cumulative 5 min for each component, comparing discriminative ability using C-statistics. The authors further assessed the association between outcomes and both area and minutes under derived thresholds corresponding to the beginning of increased risk for the average patient. **RESULTS:** Out of 23,140 patients analyzed, myocardial injury occurred in 6.1% and acute kidney injury in 8.2%. Based on the lowest patient blood pressure experienced for greater than or equal to 5 min, estimated thresholds below which the odds of myocardial or kidney injury progressively increased (slope $P < 0.001$) were 90 mmHg for systolic, 65 mmHg for mean, 50 mmHg for diastolic, and 35 mmHg for pulse pressure. Weak discriminative ability was noted between the pressure components, with univariable C-statistics ranging from 0.55 to 0.59. Area under the curve in the highest (deepest) quartile of exposure below the respective thresholds had significantly higher odds of myocardial injury after noncardiac surgery and acute kidney injury compared to no exposure for systolic, mean, and pulse pressure (all $P < 0.001$), but not diastolic, after adjusting for confounding. **CONCLUSIONS:** Systolic, mean, and pulse pressure hypotension were comparable in their strength of association with myocardial and renal injury. In contrast, the relationship with diastolic pressure was poor. Baseline factors were much more strongly associated with myocardial and renal injury than intraoperative blood pressure, but pressure differs in being modifiable.

Behavioral Health Services/Psychiatry

Chaudhary AMD, **Memon RI**, Dar SK, Bhullar DK, Dar KR, and Naveed S. Suicide during Transition of Care: a Review of Targeted Interventions. *Psychiatr Q* 2020; Epub ahead of print. PMID: 31960191. [Full Text](#)

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The risk of suicide is significant during the transition of care; the highest in the first few weeks after discharge from a healthcare facility. This systematic review summarizes the evidence for interventions providing care during this high-risk period. In January 2019, PubMed and Scopus were systematically searched using the search terms: Suicide AND (Hospital OR Emergency department) AND Discharge. Articles relevant to interventions targeting suicidal behaviors during the transition of care were selected after the title and abstract screening followed by full-text

screening. This review article included 40 articles; with a total patient population of 24,568. The interventions included telephone contacts, letters, green cards, postcards, structured visits, and community outreach programs. An improvement in the engagement of patients in outpatient services was observed but the evidence for suicidal behaviors was conflicting. The reviewed interventions were efficacious in linking patients to outpatient services, reducing feelings of social isolation and helping patients in navigating the available community resources. For patients with repetitive suicidal behaviors, psychosocial interventions such as dialectical behavioral therapy can be helpful. Patients should be followed by targeted interventions based on risk categorization of the patients by using evidence-based tools.

Behavioral Health Services/Psychiatry

Hecht LM, Pester B, Braciszewski JM, Graham AE, Mayer K, Martens K, Hamann A, Carlin AM, and Miller-Matero LR. Socioeconomic and Racial Disparities in Bariatric Surgery. *Obes Surg* 2020; Epub ahead of print. PMID: 31927686. [Full Text](#)

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The purpose of this study was to examine the associations among race and socioeconomic factors (receiving social security disability, insurance type, and income) with undergoing bariatric surgery and weight loss outcomes in a racially diverse, urban cohort of bariatric surgery candidates (N = 314). Patients with private insurance and who identified as Caucasian were more likely to undergo bariatric surgery. Income significantly predicted percentage of excess weight loss 1 year after surgery, although this was no longer significant when accounting for race. Race and socioeconomic factors should be considered during psychosocial evaluations to support patients at risk of surgical attrition and poorer weight loss outcomes. Future research should explore policy solutions to improve access, while qualitative work may help with understanding racial disparities in bariatric surgery.

Cardiology/Cardiovascular Research

Brawner CA, Ehrman JK, and Keteyian SJ. Are International Standards for Exercise Capacity Ready for Prime Time? *Mayo Clinic Proceedings* 2020; 95(2):218-220. PMID: Not assigned. [Full Text](#)

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Cardiology/Cardiovascular Research

Eng MH, Kherallah RY, Guerrero M, Greenbaum AB, Frisoli T, Villablanca P, Wang DD, Lee J, Wyman J, and O'Neill WW. Complete percutaneous apical access and closure: Short and intermediate term outcomes. *Catheter Cardiovasc Interv* 2020; Epub ahead of print. PMID: 31957915. [Full Text](#)

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OBJECTIVES: To examine the safety of utilizing transapical access during structural interventions. **BACKGROUND:** Complex interventions of the mitral or aortic region sometimes require coaxial forces to orient and deliver devices. Apical access can provide coaxial countertraction for either transseptal or retrograde aortic access. This manuscript describes the single center experience of small bore transapical access. **METHODS:** Retrospective review of cases from 2013 to 2018 at Henry Ford Hospital was performed. Patient demographics and procedure characteristics were abstracted to describe the safety of transapical access using small bore sheaths. **RESULTS:** A total 21 cases were performed at Henry Ford, most of them for transcatheter mitral valve replacement (81%). The mean sheath size used was 4.7 +/- 0.9 Fr and protamine was used at the end of 57% of cases. All patients received nitinol-based plugs, 80.1% were from the Amplatzer Duct Occluder II type. Four major complications related apical puncture occurred, two pericardial effusions, two hemothorax. Over a median follow time of 430 days (IQR 50-652) a total of five deaths occurred, two related to the procedure and three late deaths with a median time of 362 days (range 205-628 days). No deaths were associated with transapical access. Echocardiographic follow up did not detect any late structural complications from occluder devices. **CONCLUSIONS:** Transapical access and closure with nitinol-based devices is feasible and facilitates complex interventions where coaxial forces are need for device delivery and alignment. The most common complication is bleeding and this should be kept in perspective when treating high-risk patients.

Cardiology/Cardiovascular Research

Gupta T, Weinreich M, Kolte D, Khera S, **Villablanca PA**, Bortnick AE, Wiley JM, Menegus MA, Kirtane AJ, Bhatt DL, Garcia MJ, Latib A, and Weisz G. Comparison of Incidence and Outcomes of Cardiogenic Shock Complicating Posterior (Inferior) Versus Anterior ST-Elevation Myocardial Infarction. *Am J Cardiol* 2020; Epub ahead of print. PMID: 31955831. [Full Text](#)

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Cardiogenic shock (CS) is a catastrophic consequence of ST-elevation myocardial infarction (STEMI). CS has been reported to be associated less often with inferior wall (IWMI) than anterior wall STEMI (AWMI). We queried the National Inpatient Sample databases from January 2010 to September 2015 to identify all patients aged ≥ 18 years admitted with AWMI or IWMI. Patients with a concomitant diagnosis of CS were then identified. Complex samples multivariable logistic regression models were used to compare the incidence, management, and in-hospital mortality of CS complicating IWMI versus AWMI. The incidence of CS was lower in IWMI (9.5%) versus AWMI (14.1%), adjusted OR (aOR) 0.84 (95% confidence interval [CI] 0.81 to 0.87). Revascularization rates with either percutaneous coronary intervention or coronary artery bypass grafting were similar in CS complicating IWMI versus AWMI (80.9% vs 80.3%; aOR 1.05; 95% CI 0.97 to 1.14). The reported use of percutaneous mechanical circulatory support devices was lower in patients with CS-IWMI versus CS-AWMI (44.7% vs 61.0%; aOR 0.55; 95% CI 0.52 to 0.59). In-hospital mortality was modestly lower in patients with CS complicating IWMI versus AWMI (30.3% vs 31.9%; aOR, 0.80; 95% CI 0.75 to 0.86). Use of percutaneous mechanical circulatory support was not associated with lower in-hospital mortality in either CS-AWMI (30.0% vs 34.7; aOR 1.04; 95% CI 0.94 to 1.14) or CS-IWMI (31.0% vs 29.8%; aOR 1.20; 95% CI 1.08 to 1.33). In conclusion, the incidence of CS in the contemporary era is lower in patients with IWMI compared with those with AWMI. CS complicating STEMI is associated with higher in-hospital mortality in AWMI versus IWMI, and outcomes were not different with or without percutaneous circulatory support.

Cardiology/Cardiovascular Research

Hernandez GA, **Lemor A**, Clark D, Blumer V, Burstein D, Byrne R, Fowler R, Frischhertz B, Sandhaus E, Schlendorf K, Zalawadiya S, Lindenfeld J, and Menachem JN. Heart transplantation and in-hospital outcomes in adult congenital heart disease patients with Fontan: A decade nationwide analysis from 2004 to 2014. *J Card Surg* 2020; Epub ahead of print. PMID: 31971277. [Full Text](#)

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INTRODUCTION: Treatment of adult congenital heart disease patients who require advanced therapies remains challenging due to high perioperative and wait-list mortality and limited donors. Patients palliated with Fontan are at the highest risk of early mortality due to multiorgan involvement and few centers able to safely transplant them. We sought to evaluate the early outcomes of heart transplants in these adult Fontan patients. **METHODS:** Using the Nationwide Inpatient Sample database, we identified all adults aged at least 18 years old who underwent heart transplantation across U.S. hospitals from 2004 to 2014. We then identified those with specific ICD-9 codes to include tricuspid atresia, hypoplastic left heart syndrome and common ventricle. Multivariate regression models were created to adjust for potential confounders. **RESULTS:** A total of 93 Fontan patients underwent heart transplant during the study time (0.5% of all heart transplants). Compared to non-Fontan heart transplantations, Fontan patients were younger, with a higher incidence of liver disease and coagulopathy. Fontan patients receiving heart transplant had higher mortality during transplant hospitalization compared to non-Fontan patients (26.3% vs 5.3% OR, 18.10, CI, 5.06-65.0 $P < .001$). Extracorporeal membrane oxygenator (ECMO) usage and bleeding were also higher in the Fontan cohort with an OR of 5.30 ($P = .016$) and 5.32 ($P = .015$) for ECMO and bleeding, respectively. The remaining outcomes were similar for both cohorts. **CONCLUSION:** Adults with Fontan palliation undergoing heart

transplantation have exceptionally high inpatient mortality, which is nearly five times that of non-Fontan heart transplant recipients, perhaps related to a delayed referral, surgical complexity, and coexistent, underrecognized liver failure.

Cardiology/Cardiovascular Research

Michaels A, Aurora L, Peterson E, Liu B, Pinto YM, Sabbah HN, Williams K, and Lanfear DE. Risk Prediction in Transition: MAGGIC Score Performance at Discharge and Incremental Utility of Natriuretic Peptides. *J Card Fail* 2020; 26(1):52-60. PMID: 31751788. [Full Text](#)

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BACKGROUND: Risk stratification for hospitalized patients with heart failure (HF) remains a critical need. The Meta-Analysis Global Group in Chronic Heart Failure (MAGGIC) score is a robust model derived from patients with ambulatory HF. Its validity at the time of discharge and the incremental value of natriuretic peptides (NPs) in this setting is unclear. **METHODS:** This was a single-center study examining a total of 4138 patients with HF from 2 groups; hospital discharge patients from administrative data (n=2503, 60.5%) and a prospective registry of patients with ambulatory HF (n=1635, 39.5%). The ambulatory registry patients underwent N-terminal pro-B-type NP (BNP) measurement at enrollment, and in the hospitalize discharge cohort clinical BNP levels were abstracted. The primary endpoint was all-cause mortality within 1 year. MAGGIC score performance was compared between cohorts utilizing Cox regression and calibration plots. The incremental value of NPs was assessed using calculated area under the curve and net reclassification improvement (NRI). **RESULTS:** The hospitalized and ambulatory cohorts differed with respect to primary outcome (777 and 100 deaths, respectively), sex (52.1% vs 41.7% female) and race (35% vs 49.5% African American). The MAGGIC score showed poor discrimination of mortality risk in the hospital discharge (C statistic: 0.668, hazard ratio [HR]: 1.1 per point, 95% confidence interval [CI]: 0.652, 0.684) but fair discrimination in the ambulatory cohorts (C statistic: 0.784, HR: 1.16 per point, 95% CI: 0.74, 0.83), respectively, a difference that was statistically significant (P=.001 for C statistic, 0.002 for HR). Calibration assessment indicated that the slope and intercept (of MAGGIC-predicted to observed mortality) did not statistically differ from ideal in either cohort and did not differ between the cohorts (all P > .1). NP levels did not significantly improve prediction in the hospitalized cohort (P=.127) but did in the ambulatory cohort (C statistic: 0.784 [95% CI: 0.74, 0.83] vs 0.82 [95% CI: 0.78, 0.85]; P=.018) with a favorable NRI of 0.354 (95% CI: 0.202-0.469; P=.002). **CONCLUSION:** The MAGGIC score showed poor discrimination when used in patients with HF at hospital discharge, which was inferior to its performance in patients with ambulatory HF. Discrimination within the hospital discharge group was not improved by including hospital NP levels.

Cardiology/Cardiovascular Research

Neupane S, Basir M, Tan C, Sultan A, Tabaku M, Alqarqaz M, Khandelwal A, Gupta A, Don C, and Alaswad K. Feasibility and safety of orbital atherectomy for the treatment of in-stent restenosis secondary to stent under-expansion. *Catheter Cardiovasc Interv* 2020; Epub ahead of print. PMID: 31985132. [Full Text](#)

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BACKGROUND: Debulking and ablative techniques are sometimes used for the treatment of in-stent restenosis (ISR) secondary to resistant stent under-expansion (SU). The safety and effectiveness of orbital atherectomy (OA) in this cohort of patients has not been reported. **METHODS:** We retrospectively evaluated consecutive patients treated with OA for ISR secondary to balloon undilatable SU at two academic tertiary care centers between October 2016 and June 2019. Angiographic or intravascular imaging identified SU. Technical success was defined as residual 0% stenosis with TIMI III flow. **RESULTS:** A total of 41 patients were included in the study. Patients had an average age of 65 +/- 12 years; 73% male, 61% diabetic, 41% with prior coronary artery bypass grafting, 61% with a prior incident of ISR, 51% presented with stable angina, 17% unstable angina, and 32% non-ST elevation myocardial infarction (MI). Implantation of the under-expanded stents occurred between 2 months and 22 years prior to the index procedure. A total of 27% of patients had multiple layers of stents in the target lesion and 32% of patients had in-stent chronic total occlusion. Technical success was achieved in 40 (98%) patients. There were 2 (5%) major adverse cardiovascular events; both of them were periprocedural MI from the no-reflow phenomenon. There were 2 (5%) Ellis

type II coronary perforations that required no intervention. **CONCLUSIONS:** OA can be effectively performed as an adjunctive tool in the treatment of ISR with balloon undilatable SU. The use of OA for SU is not approved by the U.S. Food and Drug Administration and is "off label" and caution must be used to limit any device/stent interaction.

Cardiology/Cardiovascular Research

Ritchey MD, Maresh S, McNeely J, Shaffer T, Jackson SL, **Keteyian SJ**, **Brawner CA**, Whooley MA, Chang T, Stolp H, Schieb L, and Wright J. Tracking Cardiac Rehabilitation Participation and Completion Among Medicare Beneficiaries to Inform the Efforts of a National Initiative. *Circ Cardiovasc Qual Outcomes* 2020; 13(1):e005902. PMID: 31931615. [Full Text](#)

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Office of the Surgeon General, US Department of Health and Human Services, Washington, DC (J.W.).

BACKGROUND: Despite cardiac rehabilitation (CR) being shown to improve health outcomes among patients with heart disease, its use has been suboptimal. In response, the Million Hearts Cardiac Rehabilitation Collaborative developed a road map to improve CR use, including increasing participation rates to $\geq 70\%$ by 2022. This observational study provides current estimates to measure progress and identifies the populations and regions most at risk for CR service underutilization. **METHODS AND RESULTS:** We identified Medicare fee-for-service beneficiaries who were CR eligible in 2016, and assessed CR participation (≥ 1 CR session attended), timely initiation (participation within 21 days of event), and completion (≥ 36 sessions attended) through 2017. Measures were assessed overall, by beneficiary characteristics and geography, and by primary CR-qualifying event type (acute myocardial infarction hospitalization; coronary artery bypass surgery; heart valve repair/replacement; percutaneous coronary intervention; or heart/heart-lung transplant). Among 366 103 CR-eligible beneficiaries, 89 327 (24.4%) participated in CR, of whom 24.3% initiated within 21 days and 26.9% completed CR. Eligibility was highest in the East South Central Census Division (14.8 per 1000). Participation decreased with increasing age, was lower among women (18.9%) compared with men (28.6%; adjusted prevalence ratio: 0.91 [95% CI, 0.90-0.93]) was lower among Hispanics (13.2%) and non-Hispanic blacks (13.6%) compared with non-Hispanic whites (25.8%; adjusted prevalence ratio: 0.63 [0.61-0.66] and 0.70 [0.67-0.72], respectively), and varied by hospital referral region and Census Division (range: 18.6% [East South Central] to 39.1% [West North Central]) and by qualifying event type (range: 7.1% [acute myocardial infarction without procedure] to 55.3% [coronary artery bypass surgery only]). Timely initiation varied by geography and qualifying event type; completion varied by geography. **CONCLUSIONS:** Only 1 in 4 CR-eligible Medicare beneficiaries participated in CR and marked disparities were observed. Reinforcement of current effective strategies and development of new strategies will be critical to address the noted disparities and achieve the 70% participation goal.

Cardiology/Cardiovascular Research

Sabbah HN. Targeting the Mitochondria in Heart Failure: A Translational Perspective. *JACC: Basic to Translational Science* 2020; 5(1):88-106. PMID: Not assigned. [Full Text](#)

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The burden of heart failure (HF) in terms of health care expenditures, hospitalizations, and mortality is substantial and growing. The failing heart has been described as "energy-deprived" and mitochondrial dysfunction is a driving force associated with this energy supply-demand imbalance. Existing HF therapies provide symptomatic and longevity benefit by reducing cardiac workload through heart rate reduction and reduction of preload and afterload but do not address the underlying causes of abnormal myocardial energetic nor directly target mitochondrial abnormalities. Numerous studies in animal models of HF as well as myocardial tissue from explanted failed human hearts have shown that the failing heart manifests abnormalities of mitochondrial structure, dynamics, and function that lead to a marked increase in the formation of damaging reactive oxygen species and a marked reduction in on demand adenosine triphosphate synthesis. Correcting mitochondrial dysfunction therefore offers considerable potential as a new therapeutic approach to improve overall cardiac function, quality of life, and survival for patients with HF.

Cardiology/Cardiovascular Research

Sutton NR, Seth M, **Lingam N**, and Gurm HS. Radial Access Use for Percutaneous Coronary Intervention in Dialysis Patients. *Circ Cardiovasc Interv* 2020; 13(1):e008418. PMID: 31914789. [Full Text](#)

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Cardiology/Cardiovascular Research

Whelton SP, McAuley PA, Dardari Z, Orimoloye OA, **Brawner CA**, **Ehrman JK**, **Keteyian SJ**, Al-Mallah M, and Blaha MJ. Association of BMI, Fitness, and Mortality in Patients With Diabetes: Evaluating the Obesity Paradox in the Henry Ford Exercise Testing Project (FIT Project) Cohort. *Diabetes Care* 2020; Epub ahead of print. PMID: 31949085. [Full Text](#)

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OBJECTIVE: To determine the effect of fitness on the association between BMI and mortality among patients with diabetes. **RESEARCH DESIGN AND METHODS:** We identified 8,528 patients with diabetes (self-report, medication use, or electronic medical record diagnosis) from the Henry Ford Exercise Testing Project (FIT Project). Patients with a BMI <18.5 kg/m² or cancer were excluded. Fitness was measured as the METs achieved during a physician-referred treadmill stress test and categorized as low (<6), moderate (6-9.9), and high (≥10). Adjusted hazard ratios for mortality were calculated using standard BMI (kilograms per meter squared) cutoffs of normal (18.5-24.9), overweight (25-29.9), and obese (≥30). Adjusted splines centered at 22.5 kg/m² were used to examine BMI as a continuous variable. **RESULTS:** Patients had a mean age of 58 ± 11 years (49% women) with 1,319 deaths over a mean follow-up of 10.0 ± 4.1 years. Overall, obese patients had a 30% lower mortality hazard (P < 0.001) compared with normal-weight patients. In adjusted spline modeling, higher BMI as a continuous variable was predominantly associated with a lower mortality risk in the lowest fitness group and among patients with moderate fitness and BMI ≥30 kg/m². Compared with the lowest fitness group, patients with higher fitness had an approximately 50% (6-9.9 METs) and 70% (≥10 METs) lower mortality hazard regardless of BMI (P < 0.001). **CONCLUSIONS:** Among patients with diabetes, the obesity paradox was less pronounced for patients with the highest fitness level, and these patients also had the lowest risk of mortality.

Center for Health Policy and Health Services Research

Boggs JM, Lindrooth RC, Battaglia C, Beck A, Ritzwoller DP, **Ahmedani BK**, Rossom RC, Lynch FL, Lu CY, Waitzfelder BE, Owen-Smith AA, Simon GE, and Anderson HD. Association between suicide death and concordance with benzodiazepine treatment guidelines for anxiety and sleep disorders. *Gen Hosp Psychiatry* 2020; 62:21-27. PMID: 31765794. [Full Text](#)

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OBJECTIVE: Guidelines for management of anxiety and sleep disorders emphasize antidepressant medications and/or psychotherapy as first/second-line and benzodiazepines as third-line treatments. We evaluated the association between suicide death and concordance with benzodiazepine guidelines. **METHODS:** Retrospective case-control study of patients with anxiety and/or sleep disorders from health systems across 8 U.S. states within the Mental Health Research Network. Suicide death cases were matched to controls on year and health system. Appropriate benzodiazepine prescribing defined as: no monotherapy, no long duration, and/or age < 65 years. The association between guideline concordance and suicide death was evaluated, adjusting for diagnostic and treatment covariates. **RESULTS:** Sample included 6960 patients with anxiety disorders (2363 filled benzodiazepine) and 6215 with sleep disorders (1237 filled benzodiazepine). Benzodiazepine guideline concordance was associated with reduced odds for suicide in patients with anxiety disorders (OR = 0.611, 95% CI = 0.392-0.953, p = 0.03) and was driven by shorter duration of benzodiazepine use with concomitant psychotherapy or antidepressant medication. The association of benzodiazepine guideline concordance with suicide death did not meet statistical significance in the sleep disorder group (OR = 0.413, 95% CI = 0.154-1.11, p = 0.08). **CONCLUSIONS:** We found reduced odds for suicide in those with anxiety disorders who filled benzodiazepines in short-moderate duration with concomitant psychotherapy or antidepressant treatment.

Center for Health Policy and Health Services Research

Daida YG, Boscarino JA, Moorman AC, **Lu M, Rupp LB, Gordon SC**, Teshale EH, Schmidt MA, and Spradling PR. Mental and physical health status among chronic hepatitis B patients. *Qual Life Res* 2020; Epub ahead of print. PMID: 31938963. [Full Text](#)

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PURPOSE: Little is known about health-related quality of life (HRQoL) in patients with chronic hepatitis B virus (CHB) infection in the United States. Our goal is to understand factors associated with HRQoL in this population.

METHODS: We conducted a survey to assess HRQoL and behavioral risks among patients with CHB infection from four large U.S. health care systems. Primary outcomes were generated from the SF-8 scale to assess HRQoL, as measured by the mental component scores (MCS) and physical component scores (PCS). The survey also measured socio-demographic information, hepatitis-related behavioral risk factors, treatment exposure/history, stress, and social support. We supplemented survey data with electronic health records data on patient income, insurance, disease severity, and comorbidities. Multivariate analysis was used to estimate and compare adjusted least square means of MCS and PCS, and examine which risk factors were associated with lower MCS and PCS. **RESULTS:** Nine hundred sixty-nine patients (44.6%) responded to the survey. Current life stressors and unemployment were associated with both lower MCS and PCS results in multivariate analyses. Lower MCS was also associated with White race and low social support, while lower PCS was also associated with Medicaid insurance. **CONCLUSIONS:** Stressful life events and unemployment were related to mental and physical health status of CHB patients. Those who have social support have better mental health; White and Medicaid patients are more likely to have poorer mental and physical health, respectively. Management of CHB patients should include stress management, social support, and financial or employment assistance.

Center for Health Policy and Health Services Research

Gordon SC, Wu KH, Lindor K, Bowlus CL, Rodriguez CV, Anderson H, Boscarino JA, **Trudeau S, Rupp LB**, Haller IV, Romanelli RJ, VanWormer JJ, Schmidt MA, Daida YG, Sahota A, Vincent J, **Zhang T, Li J, and Lu M**. Ursodeoxycholic Acid Treatment Preferentially Improves Overall Survival Among African Americans With Primary Biliary Cholangitis. *Am J Gastroenterol* 2020; Epub ahead of print. PMID: 31985529. [Full Text](#)

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BACKGROUND: We used data from the Fibrotic Liver Disease Consortium to evaluate the impact of ursodeoxycholic acid (UDCA) treatment across race/ethnicity, gender, and clinical status among patients with primary biliary cholangitis. **METHODS:** Data were collected from "index date" (baseline) through December 31, 2016. Inverse Probability of Treatment Weighting was used to adjust for UDCA treatment selection bias. Cox regression, focusing on UDCA-by-risk factor interactions, was used to assess the association between treatment and mortality and liver transplant/death. **RESULTS:** Among 4,238 patients with primary biliary cholangitis (13% men; 8% African American, 7% Asian American/American Indian/Pacific Island [ASINPI]; 21% Hispanic), 78% had ever received UDCA. The final multivariable model for mortality retained age, household income, comorbidity score, total bilirubin, albumin, alkaline phosphatase, and interactions of UDCA with race, gender, and aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . Among untreated patients, African Americans and ASINPIs had higher mortality than whites (adjusted hazard ratio [aHR] = 1.34, 95% confidence interval [CI] 1.08-1.67 and aHR = 1.40, 95% CI 1.11-1.76, respectively). Among treated patients, this relationship was reversed (aHR = 0.67, 95% CI 0.51-0.86 and aHR = 0.88, 95% CI 0.67-1.16). Patterns were similar for liver transplant/death. UDCA reduced the risk of liver transplant/death in all patient groups and mortality across all groups except white women with aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . As compared to patients with low-normal bilirubin at baseline (≤ 0.4 mg/dL), those with high-normal ($1.0 > 0.7$) and mid-normal bilirubin ($0.7 > 0.4$) had significantly higher liver transplant/death and all-cause mortality. **DISCUSSION:** African American and ASINPI patients who did not receive UDCA had significantly higher mortality than white patients. Among African Americans, treatment was associated with significantly lower mortality. Regardless of UDCA treatment, higher baseline bilirubin, even within the normal range, was associated with increased mortality and liver transplant/death compared with low-normal levels.

Center for Health Policy and Health Services Research

Hecht LM, Pester B, Braciszewski JM, Graham AE, Mayer K, Martens K, Hamann A, Carlin AM, and Miller-Matero LR. Socioeconomic and Racial Disparities in Bariatric Surgery. *Obes Surg* 2020; Epub ahead of print. PMID: 31927686. [Full Text](#)

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The purpose of this study was to examine the associations among race and socioeconomic factors (receiving social security disability, insurance type, and income) with undergoing bariatric surgery and weight loss outcomes in a racially diverse, urban cohort of bariatric surgery candidates (N = 314). Patients with private insurance and who identified as Caucasian were more likely to undergo bariatric surgery. Income significantly predicted percentage of excess weight loss 1 year after surgery, although this was no longer significant when accounting for race. Race and socioeconomic factors should be considered during psychosocial evaluations to support patients at risk of surgical attrition and poorer weight loss outcomes. Future research should explore policy solutions to improve access, while qualitative work may help with understanding racial disparities in bariatric surgery.

Dermatology

Fatima S, **Braunberger T**, **Mohammad T**, **Kohli I**, and **Hamzavi I**. The role of sunscreen in melasma and postinflammatory hyperpigmentation. *Indian Journal of Dermatology* 2020; 65(1):5-10. PMID: Not assigned. [Full Text](#)

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Photosensitive conditions such as melasma and postinflammatory hyperpigmentation (PIH) are exacerbated by exposure to ultraviolet (UV) rays and visible light making sunscreen use an essential component of treatment. This is especially true in skin of color patients who are less likely to use photoprotection, even if diagnosed with these photoexacerbated conditions. We aimed to evaluate the body of literature to provide evidence for the use of sunscreen in the treatment of melasma and PIH. We reviewed English articles from PubMed, Journals@Ovid Full Text, and Embase using the search terms 'sunscreen' and either 'melasma' 'PIH,' or 'post-inflammatory hyperpigmentation.' Nine relevant publications provide evidence that a broad spectrum of protection, including UVA, UVB, and visible light within sunscreens can play an adjuvant role in therapy for melasma and PIH by stabilizing and improving these pigmentary disorders in skin of color patients. This review illustrates the advantages and limitations of sunscreen use, as well as practice gaps in photoprotection in the skin of color patients with melasma and PIH.

Dermatology

Kohli I, **Braunberger TL**, **Nahhas AF**, Mirza FN, Mokhtari M, **Lyons AB**, Kollias N, Ruvolo E, **Lim HW**, and **Hamzavi IH**. Long-wavelength Ultraviolet A1 and Visible Light Photoprotection: A Multimodality Assessment of Dose and Response. *Photochem Photobiol* 2020; 96(1):208-214. PMID: 31464341. [Request Article](#)

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Human skin is exposed to visible light (VL; 400-700 nm) and long-wavelength ultraviolet A1 (UVA1) radiation (370-400 nm) after the application of organic broad-spectrum sunscreens. The biologic effects of these wavelengths have been demonstrated; however, a dose-response has not been investigated. Ten subjects with Fitzpatrick skin phototype IV-VI were enrolled. Subjects were irradiated with 2 light sources (80-480 J cm⁻²): one comprising VL with less than 0.5% UVA1 (VL+UVA1) and the other pure VL. Skin responses were evaluated for 2 weeks using clinical and spectroscopic assessments. 4-mm punch biopsies were obtained from nonirradiated skin and sites irradiated with 480 J cm⁻² of VL+UVA1 and pure VL 24 h after irradiation. Clinical and spectroscopic assessments demonstrated a robust response at VL+UVA1 sites compared with pure VL. Histology findings demonstrated a statistically significant increase in the marker of inflammation (P < 0.05) and proliferation (P < 0.05) at the irradiated sites compared with nonirradiated control. Threshold doses of VL+UVA1 resulting in biologic responses were calculated. Results indicate that approximately 2 h of sun exposure, which equates to VL+UVA1 dose (~400 J cm⁻²), is capable of inducing inflammation, immediate erythema and delayed tanning. These findings reinforce the need of photoprotection beyond the UV range.

Dermatology

Krutmann J, Passeron T, Gilaberte Y, Granger C, Leone G, Narda M, Schalka S, Trullas C, Masson P, and **Lim HW**. Photoprotection of the future: challenges and opportunities. *J Eur Acad Dermatol Venereol* 2020; Epub ahead of print. PMID: 31898355. [Full Text](#)

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The use of sunscreens is an important and essential component of photoprotection. Since their introduction during the first half of the last century, sunscreens have benefited enormously from major technological advances such as

the development of novel UV filters; as a result, their efficacy in preventing UV-induced erythema is unequivocal. More recently, however, new challenges have appeared, which have prompted a robust discussion about the safety of sunscreens. These include topics directly related to photoprotection of human skin such as improved/alternative methods for standardization of assessment of the efficacy of sunscreens, but also many others such as photoprotection beyond UV, concerns about human toxicity and ecological safety, the potential of oral photoprotective measures, consequences of innovative galenic formulations. On a first glance, some of these might raise questions and doubts among dermatologists, physicians and the general public about the use sunscreens as a means of photoprotection. This situation has prompted us to critically review such challenges, but also opportunities, based on existing scientific evidence. We conclude by providing our vision about how such challenges can be met best in the future in an attempt to create the ideal sunscreen, which should provide adequate and balanced protection and be easy and safe to use.

Dermatology

Lyons AB, Ghia D, Abdallah M, Abdel-Malek Z, Esmat S, Ezzedine K, Grimes P, Harris JE, Lui H, Manga P, **Mi QS**, Pandya A, Parsad D, Passeron T, Picardo M, Seneschal J, Silpa-Archa N, Taieb A, Xiang F, **Lim HW**, and **Hamzavi IH**. Proceeding Report of the Second Vitiligo International Symposium (VIS)- November 9-10, 2018, Detroit, Michigan, USA. *Pigment Cell Melanoma Res* 2020; Epub ahead of print. PMID: 31984599. [Full Text](#)

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The Global Vitiligo Foundation (GVF) hosted the 2(nd) Biennial Vitiligo International Symposium (VIS), which was held at the Detroit Marriott at Renaissance Center in Detroit, Michigan, USA from November 9-10, 2018. The conference was opened by Iltefat H. Hamzavi (Detroit, Michigan, USA), President of the GVF and Co-Chair of the VIS and David M. Ozog (Detroit, Michigan, USA), C.S. Livingood Chair and Chairman of the Department of Dermatology of Henry Ford Hospital, Detroit, Michigan, USA. Henry W. Lim (Detroit, Michigan, USA), former President of the American Academy of Dermatology, Chair Emeritus of the Department of Dermatology of Henry Ford Hospital, and Co-Chair of the VIS, then presented highlights of the meeting. The meeting was organized around four plenary lectures, several diverse panel discussions, and workshops emphasizing vitiligo surgery and imaging.

Dermatology

Menter A, Cordoro KM, Davis DMR, Kroshinsky D, Paller AS, Armstrong AW, Connor C, Elewski BE, Gelfand JM, Gordon KB, Gottlieb AB, Kaplan DH, Kavanaugh A, Kiselica M, Kivelevitch D, Korman NJ, Lebwohl M, Leonardi CL, Lichten J, **Lim HW**, Mehta NN, Parra SL, Pathy AL, Farley Prater EA, Rupani RN, Siegel M, Stoff B, Strober BE, Wong EB, Wu JJ, Hariharan V, and Elmets CA. Joint American Academy of Dermatology-National Psoriasis Foundation guidelines of care for the management and treatment of psoriasis in pediatric patients. *J Am Acad Dermatol* 2020; 82(1):161-201. PMID: 31703821. [Full Text](#)

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Psoriasis is a chronic, multisystem, inflammatory disease that affects approximately 1% of children, with onset most common during adolescence. This guideline addresses important clinical questions that arise in psoriasis management and provides evidence-based recommendations. Attention will be given to pediatric patients with psoriasis, recognizing the unique physiology, pharmacokinetics, and patient-parent-provider interactions of patients younger than 18 years old. The topics reviewed here mirror those discussed in the adult guideline sections, excluding those topics that are irrelevant to, or lack sufficient information for, pediatric patients.

Dermatology

Narla S, Kohli I, Hamzavi IH, and Lim HW. Visible light in photodermatology. *Photochem Photobiol Sci* 2020; 19(1):99-104. PMID: 31922171. [Request Article](#)

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Until recently, visible light (VL) had been regarded to be without significant photobiologic effect on the skin. Updated research suggests that this is not the case and the measurable effect of visible light on the skin is being documented in all skin types. Recent studies have demonstrated that in dark-skinned individuals, visible light can induce more intense and longer lasting pigmentation of the skin compared to UVA1. This effect was potentiated when VL was combined with a small percentage of ultraviolet A1 radiation (UVA1). Further, the combination of VL + UVA1 was also able to induce erythema in light-skinned individuals, a novel finding since the erythemogenic spectrum of sunlight had primarily been attributed to ultraviolet B (UVB) and short wavelength UVA (320-340 nm). Based on these findings, VL and UVA1 may also potentially play a role in conditions aggravated by sun exposure such as phototoxicity in light-skinned patients and post-inflammatory hyperpigmentation and melasma, especially in dark-skinned individuals. Currently available organic (chemical) UV filters are not sufficient to protect the skin from the effect of VL. VL is emerging as a key player in photodermatology and additional research is needed on the cutaneous effects of VL, as well as the development of filters and other means of photoprotection against the harmful effects of the VL spectrum. The aim of this manuscript is to review the literature on the cutaneous effects of VL as well as to highlight areas of dermatology where VL may play an important role.

Dermatology

Oska S, Zarbo A, and Jahnke MN. Sleep-related rhythmic movement disorder: A case report of head banging alopecia. *Pediatr Dermatol* 2020; Epub ahead of print. PMID: 31930572. [Full Text](#)

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We present a case of alopecia associated with sleep-related rhythmic movement disorder (RMD) in an otherwise healthy 2-year-old boy. The alopecic patch he presented with on his scalp coincided with the location of repeated head banging in a video taken by the patient's mother. Alopecia secondary to RMD is an under recognized entity and should be included in the differential diagnosis of pediatric alopecia.

Dermatology

Vickers C, **Oberlin D**, and **Shwayder TA**. A girl with loose anagen hair syndrome and concurrent uncombable hair syndrome. *JAAD Case Reports* 2020; 6(2):92-95. PMID: Not assigned. [Full Text](#)

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Diagnostic Radiology

Elsayed M, Kadom N, Ghobadi C, Strauss B, Al Dandan O, Aggarwal A, Anzai Y, **Griffith B**, Lazarow F, Straus CM, and Safdar NM. Virtual and augmented reality: potential applications in radiology. *Acta Radiol* 2020; Epub ahead of print. PMID: 31928346. [Full Text](#)

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Diagnostic Radiology

Mehdizavareh MH, Hemati S, and **Soltanian-Zadeh H**. Enhancing performance of subject-specific models via subject-independent information for SSVEP-based BCIs. *PLoS One* 2020; 15(1):e0226048. PMID: 31935220. [Full Text](#)

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Recently, brain-computer interface (BCI) systems developed based on steady-state visual evoked potential (SSVEP) have attracted much attention due to their high information transfer rate (ITR) and increasing number of targets. However, SSVEP-based methods can be improved in terms of their accuracy and target detection time. We propose a new method based on canonical correlation analysis (CCA) to integrate subject-specific models and subject-independent information and enhance BCI performance. We propose to use training data of other subjects to optimize hyperparameters for CCA-based model of a specific subject. An ensemble version of the proposed method is also developed for a fair comparison with ensemble task-related component analysis (TRCA). The proposed method is compared with TRCA and extended CCA methods. A publicly available, 35-subject SSVEP benchmark dataset is used for comparison studies and performance is quantified by classification accuracy and ITR. The ITR of the proposed method is higher than those of TRCA and extended CCA. The proposed method outperforms extended CCA in all conditions and TRCA for time windows greater than 0.3 s. The proposed method also outperforms TRCA when there are limited training blocks and electrodes. This study illustrates that adding subject-independent information to subject-specific models can improve performance of SSVEP-based BCIs.

Emergency Medicine

Caldwell MT, Hambrick N, **Vallee P**, Thomas CSD, Sutton A, Daniels G, **Goyal N**, **Manteuffel J**, **Joseph CLM**, and Guetterman TC. "They're Doing Their Job": Women's Acceptance of Emergency Department Contraception Counseling. *Ann Emerg Med* 2020; Epub ahead of print. PMID: 31959536. [Full Text](#)

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Institute for Population Health, Detroit, MI.

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STUDY OBJECTIVE: We explore reproductive-aged women's acceptance of contraception counseling in the emergency department (ED). **METHODS:** This study is phase 1 of an exploratory sequential mixed methods study. We purposively interviewed 31 participants with the following criteria: black, white, or Latina race/ethnicity; nonpregnant; aged 15 to 44 years; receiving nonemergency care; not using highly effective contraception; and did not intend to become pregnant. We conducted semistructured interviews with a piloted interview guide until reaching thematic saturation. We coded transcripts with an iteratively developed codebook, maintaining intercoder agreement greater than 80%. Qualitative acceptance of ED contraception counseling was grouped into 3 categories: acceptable, unacceptable, and equivocal. We conducted a thematic text analysis to assess themes expressing support and concern for ED contraception counseling. Qualitative findings were stratified by age, race, and frequency of ED use. Using components of grounded theory, we developed a conceptual model. **RESULTS:** Most participants (81%) accepted ED contraception counseling. Themes expressing support and concern for ED contraception counseling included opportunity to address women's unmet contraception needs, contraception is within the scope of ED practice, the ED is a convenient setting with competent providers, contraception is a sensitive topic, and the ED may be an inappropriate setting for some women. Latina participants had lower acceptance of ED contraception counseling. Dominant subthemes varied slightly by race, age, and frequency of ED use. **CONCLUSION:** Diverse women had high acceptance of contraception counseling in the ED. Perspectives expressing both support and concern in regard to ED contraception counseling were explored in detail.

Emergency Medicine

Clery MJ, Dworkis DA, Sonuyi T, **Khalidun JS**, and Abir M. Location of Violent Crime Relative to Trauma Resources in Detroit: Implications for Community Interventions. *West J Emerg Med* 2020; Epub ahead of print.:1-4. PMID: 31999248. [Full Text](#)

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INTRODUCTION: Detroit, Michigan, is among the leading United States cities for per-capita homicide and violent crime. Hospital- and community-based intervention programs could decrease the rate of violent-crime related injury but require a detailed understanding of the locations of violence in the community to be most effective. **METHODS:** We performed a retrospective geospatial analysis of all violent crimes reported within the city of Detroit from 2009-2015 comparing locations of crimes to locations of major hospitals. We calculated distances between violent crimes and trauma centers, and applied summary spatial statistics. **RESULTS:** Approximately 1.1 million crimes occurred in Detroit during the study period, including approximately 200,000 violent crimes. The distance between the majority of violent crimes and hospitals was less than five kilometers (3.1 miles). Among violent crimes, the closest hospital was an outlying Level II trauma center 60% of the time. **CONCLUSION:** Violent crimes in Detroit occur throughout the city, often closest to a Level II trauma center. Understanding geospatial components of violence relative to trauma center resources is important for effective implementation of hospital- and community-based interventions and targeted allocation of resources.

Emergency Medicine

Garmel GM, Pettis HM, Lane DR, Darvish A, Winters M, **Vallee P**, Mattu A, Haydel MJ, Cheaito MA, Bond MC, and Kazzi A. Clerkships in Emergency Medicine. *J Emerg Med* 2020; Epub ahead of print. PMID: 31911019. [Full Text](#)

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Planning for clerkships in emergency medicine (EM) can be stressful, prolonged, and challenging. Therefore, medical students should start planning for them early. In this article, we offer guidance regarding several issues pertinent to the EM clerkship, such as the best time to schedule one (or more) during medical school, the most appropriate institution or program to schedule it, the process of selecting and applying for the clerkship, and the number of EM clerkships to consider. We will explain why an EM clerkship should be scheduled between June and October and the reason that 2 EM clerkships at different sites are sufficient for the majority of students. Additionally, we emphasize that clerkships in emergency departments associated with EM residency programs or with reputations for outstanding student teaching tend to be most beneficial. Above all, students interested in EM should attempt to leave a great impression after completing their clerkships by providing stellar patient care, demonstrating enthusiasm at all times, and maintaining professionalism. In turn, they will gain knowledge and clinical experiences that should prove valuable in their future.

Emergency Medicine

Kocher KE, Arora R, Bassin BS, Benjamin LS, Bolton M, Dennis BJ, Ham JJ, **Krupp SS**, Levasseur KA, Macy ML, O'Neil BJ, Pribble JM, Sherwin RL, Sroufe NS, Uren BJ, and Nypaver MM. Baseline Performance of Real-World Clinical Practice Within a Statewide Emergency Medicine Quality Network: The Michigan Emergency Department Improvement Collaborative (MEDIC). *Ann Emerg Med* 2020; 75(2):192-205. PMID: 31256906. [Full Text](#)

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STUDY OBJECTIVE: Large-scale quality and performance measurement across unaffiliated hospitals is an important strategy to drive practice change. The Michigan Emergency Department Improvement Collaborative (MEDIC), established in 2015, has baseline performance data to identify practice variation across 15 diverse emergency departments (EDs) on key emergency care quality indicators. **METHODS:** MEDIC is a unique physician-led partnership supported by a major third-party payer. Member sites contribute electronic health record data and trained abstractors add supplementary data for eligible cases. Quality measures include computed tomography (CT) appropriateness for minor head injury, using the Canadian CT Head Rule for adults and Pediatric Emergency Care Applied Network rules for children; chest radiograph use for children with asthma, bronchiolitis, and croup; and diagnostic yield of CTs for suspected pulmonary embolism. Baseline performance was established with statistical process control charts. **RESULTS:** From June 1, 2016, to October 31, 2017, the MEDIC registry contained 1,124,227 ED visits, 23.2% for children (<18 years). Overall baseline performance included the following: 40.9% of adult patients with minor head injury (N=11,857) had appropriate CTs (site range 24.3% to 58.6%), 10.3% of pediatric minor head injury cases (N=11,183) exhibited CT overuse (range 5.8% to 16.8%), 38.1% of pediatric patients with a respiratory condition (N=18,190) received a chest radiograph (range 9.0% to 62.1%), and 8.7% of pulmonary embolism CT results (N=16,205) were positive (range 7.5% to 14.3%). **CONCLUSION:** Performance varied greatly, with demonstrated opportunity for improvement. MEDIC provides a robust platform for emergency physician engagement across ED practice settings to improve care and is a model for other states.

Emergency Medicine

McLean SA, Ressler K, Koenen KC, Neylan T, Germine L, Jovanovic T, Clifford GD, Zeng D, An X, Linnstaedt S, Beaudoin F, House S, Bollen KA, Musey P, Hendry P, Jones CW, **Lewandowski C**, Swor R, Datner E, Mohiuddin K, Stevens JS, Storrow A, Kurz MC, McGrath ME, Fermann GJ, Hudak LA, Gentile N, Chang AM, Peak DA, Pascual JL, Seamon MJ, Sergot P, Peacock WF, Diercks D, Sanchez LD, Rathlev N, Domeier R, Haran JP, Pearson C, Murty VP, Insel TR, Dagum P, Onnela JP, Bruce SE, Gaynes BN, Joormann J, Miller MW, Pietrzak RH, Buysse DJ, Pizzagalli DA, Rauch SL, Harte SE, Young LJ, Barch DM, Lebois LAM, van Rooij SJH, Luna B, Smoller JW, Dougherty RF, Pace TWW, Binder E, Sheridan JF, Elliott JM, Basu A, Fromer M, Parlikar T, Zaslavsky AM, and Kessler R. The AURORA Study: a longitudinal, multimodal library of brain biology and function after traumatic stress exposure. *Mol Psychiatry* 2020; 25(2):283-296. PMID: 31745239. [Request Article](#)

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Adverse posttraumatic neuropsychiatric sequelae (APNS) are common among civilian trauma survivors and military veterans. These APNS, as traditionally classified, include posttraumatic stress, postconcussion syndrome, depression, and regional or widespread pain. Traditional classifications have come to hamper scientific progress because they artificially fragment APNS into siloed, syndromic diagnoses unmoored to discrete components of brain functioning and studied in isolation. These limitations in classification and ontology slow the discovery of pathophysiologic mechanisms, biobehavioral markers, risk prediction tools, and preventive/treatment interventions. Progress in overcoming these limitations has been challenging because such progress would require studies that both evaluate a broad spectrum of posttraumatic sequelae (to overcome fragmentation) and also perform in-depth biobehavioral evaluation (to index sequelae to domains of brain function). This article summarizes the methods of the Advancing Understanding of Recovery after trauma (AURORA) Study. AURORA conducts a large-scale (n = 5000 target sample) in-depth assessment of APNS development using a state-of-the-art battery of self-report, neurocognitive, physiologic, digital phenotyping, psychophysical, neuroimaging, and genomic assessments, beginning in the early aftermath of trauma and continuing for 1 year. The goals of AURORA are to achieve improved phenotypes, prediction tools, and understanding of molecular mechanisms to inform the future development and testing of preventive and treatment interventions.

Endocrinology and Metabolism

Huq S, **Todkar S**, and **Lahiri SW**. Patient Perspectives On Obesity Management: Need For Greater Discussion Of BMI And Weight-Loss Options Beyond Diet And Exercise Especially In Patients With Diabetes. *Endocr Pract* 2020; Epub ahead of print. PMID: 31968196. [Request Article](#)

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Objective: To identify perceptions of obesity management in patients with and without diabetes. Methods: A 48-question survey was administered in 2018 to our Endocrinology Clinic's adult patients with a body mass index (BMI) >30 kg/m². Chi-squared or Fisher's exact tests were used to compare variables between groups. Results: Of 146 respondents, 105 had diabetes and 41 did not. Most respondents were female (61.4%), African American (66.4%), with an income <\$50,000 (58.6%). Those with diabetes had significantly greater comorbidities of hypertension, high cholesterol, and arthritis. Over 90% in both groups agreed that obesity is related to hypertension, diabetes, heart disease, and early death. Only 48% were aware of their BMI and only 30.5% with diabetes and 41.5% without diabetes perceived themselves to be obese. Over 60% in each group reported discussion of diet and exercise with their providers whereas few in both groups reported referral to a formal weight-loss program (18.9%) or to a specialty that manages obesity (4.2%), or discussion of anti-obesity medications (11.2%) or bariatric surgery (8.4%). Reported concerns with anti-obesity medications and bariatric surgery included lack of knowledge and side effects or complications. Conclusion: These findings revealed excellent patient awareness of obesity as a health problem but misperception of obese status and unawareness of BMI. Presence of diabetes and other comorbidities did not result in greater discussion of weight-loss methods beyond diet and exercise. Increased patient education and discussion of specific weight-loss services, anti-obesity medications, and bariatric surgery are needed.

Endocrinology and Metabolism

Sultan R, Levy S, Sulanc E, Honasoge M, and **Rao SD**. Utility Of Afirma Gene Expression Classifier For Evaluation Of Indeterminate Thyroid Nodules And Correlation With Ultrasound Risk Assessment: Single Institutional Experience. *Endocr Pract* 2020; Epub ahead of print. PMID: 31968199. [Request Article](#)

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Objective: We assessed our experience with Afirma gene expression classifier (GEC) combined with sonographic risk assessment, using both the ATA and TI-RADS in evaluating indeterminate thyroid nodules. Methods: We identified 98 patients with 101 nodules who had a second fine needle aspiration biopsy (FNA) between 01/01/2014 and 09/30/2017 and sent to Veracyte for cytopathology and subsequent Afirma GEC testing. A second FNA biopsy was performed if the initial cytopathology was either Bethesda III or IV (n= 94) or non-diagnostic (n= 7). We correlated cytopathology, histopathology, and Afirma GEC results with sonographic risk assessment using both the ATA system and TI-RADS. Results: The mean age of the cohort was 57.4 +/- 12.3 years; 84% women and 60% white. Repeat FNA was benign in 51 of 101 nodules, and of the remaining 50 nodules, 18 (36%) were GEC-benign and 32 (64%) GEC-suspicious. Eighteen of the 32 GEC-suspicious nodules underwent surgery with the following results: 7 benign

(39%), 1 follicular thyroid carcinoma (6%), 6 follicular variant of papillary thyroid cancer (33%), and 4 non-invasive follicular tumor with papillary-like nuclear features (22%). The malignancy rate among the surgical cohort was 39% (without NIFTP) and 61% (with NIFTP) and about 50% and 20% of this group scored in the high suspicion category by ATA and TR5 by TI-RADS respectively. Conclusion: Afirma GEC was useful in avoiding surgery in one-third of indeterminate nodules and performed similarly to ATA and TI-RADS. However, use of echogenicity in scoring may underestimate the risk of malignancy in patients with indeterminate nodules.

Family Medicine

Park B, **Islam S**, **Vemulapalli RC**, and **Shreve ME**. Primary biliary cholangitis presenting as acute ischemic stroke: A rare association. *Clinical Case Reports* 2020; Epub ahead of print. PMID: Not assigned. [Request Article](#)

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Primary biliary cholangitis is associated with hyperlipidemia, but studies show that the condition does not increase cardiovascular risks. The case presents acute ischemic stroke with no underlying risk factors and subsequent new diagnosis of primary biliary cholangitis, which can suggest possible association between primary biliary cholangitis and acute stroke.

Gastroenterology

Gordon SC, **Wu KH**, Lindor K, Bowlus CL, Rodriguez CV, Anderson H, Boscarino JA, **Trudeau S**, **Rupp LB**, Haller IV, Romanelli RJ, VanWormer JJ, Schmidt MA, Daida YG, Sahota A, Vincent J, **Zhang T**, **Li J**, and **Lu M**. Ursodeoxycholic Acid Treatment Preferentially Improves Overall Survival Among African Americans With Primary Biliary Cholangitis. *Am J Gastroenterol* 2020; Epub ahead of print. PMID: 31985529. [Full Text](#)

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BACKGROUND: We used data from the Fibrotic Liver Disease Consortium to evaluate the impact of ursodeoxycholic acid (UDCA) treatment across race/ethnicity, gender, and clinical status among patients with primary biliary cholangitis. **METHODS:** Data were collected from "index date" (baseline) through December 31, 2016. Inverse Probability of Treatment Weighting was used to adjust for UDCA treatment selection bias. Cox regression, focusing on UDCA-by-risk factor interactions, was used to assess the association between treatment and mortality and liver transplant/death. **RESULTS:** Among 4,238 patients with primary biliary cholangitis (13% men; 8% African American, 7% Asian American/American Indian/Pacific Island [ASINPI]; 21% Hispanic), 78% had ever received UDCA. The final multivariable model for mortality retained age, household income, comorbidity score, total bilirubin, albumin, alkaline phosphatase, and interactions of UDCA with race, gender, and aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . Among untreated patients, African Americans and ASINPIs had higher mortality than whites (adjusted hazard ratio [aHR] = 1.34, 95% confidence interval [CI] 1.08-1.67 and aHR = 1.40, 95% CI 1.11-1.76, respectively). Among treated patients, this relationship was reversed (aHR = 0.67, 95% CI 0.51-0.86 and aHR = 0.88, 95% CI 0.67-1.16). Patterns were similar for liver transplant/death. UDCA reduced the risk of liver transplant/death in all patient groups and mortality across all groups except white women with aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . As compared to patients with low-normal bilirubin at baseline (≤ 0.4 mg/dL), those with high-normal ($1.0 > 0.7$) and mid-normal bilirubin ($0.7 > 0.4$) had significantly higher liver transplant/death and all-cause mortality. **DISCUSSION:** African American and ASINPI patients who did not receive UDCA had significantly higher mortality than white patients. Among African Americans, treatment was associated with significantly lower mortality.

Regardless of UDCA treatment, higher baseline bilirubin, even within the normal range, was associated with increased mortality and liver transplant/death compared with low-normal levels.

Global Health Initiative

Pieper B, Sobeck J, **Kaljee L**, and Templin TN. A Descriptive Study Using an Intercept Survey: Knowledge, Attitudes, Beliefs, and Behaviors About Systemic Antibiotic Use in Adults Who Reported a Wound Within the Previous Year. *J Wound Ostomy Continence Nurs* 2020; 47(1):20-25. PMID: 31929440. [Full Text](#)

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PURPOSE: This project examined knowledge, attitudes, beliefs, and behaviors about systemic antibiotic use for persons who reported a wound within the previous year. **DESIGN:** Secondary data analyses of 505 adults from a cross-sectional, prospective, intercept survey where every fifth adult was randomly approached to participate. **SUBJECTS AND SETTING:** Twenty-six participants (5.15% of the parent sample) stated having a wound within the previous year. **METHODS:** Participants were "interviewed" using the Facilitators and Barriers to Consumer Use of Antibiotics questionnaire that included demographics, health, information sources, antibiotic knowledge, attitudes, beliefs, and behavior questions. Hierarchical agglomerative cluster analysis was used to find clusters of items on the attitude, beliefs, and behavior questions. **RESULTS:** Sample demographics included 15 women and 11 African Americans, and 17 had some college education. Knowledge about antibiotics had a mean correct score of 10 out of 15 (67%) questions. Higher antibiotic knowledge was significantly related to higher education ($r_s = 0.69$, $P < .001$). There were 2 attitude and beliefs clusters: most participants (>85%) recognized the need for medical supervision of antibiotic use (cluster 1), and beliefs about the need for antibiotics to prevent illness or treat wounds varied in 27% to 62% of participants (cluster 2). There were 4 behavior clusters: almost all participants 96% (cluster 1) filled and took the antibiotic if prescribed; greater than 71% (cluster 2) disagreed with unapproved methods of obtaining antibiotics; greater than 87% (cluster 3) used prescribed antibiotics correctly; and 36% of participants heard about antibiotic resistance through television or radio or Internet (40%) (cluster 4). **CONCLUSIONS:** Knowledge about antibiotics was low, while attitudes were positive. These findings support the need for research and evidence-based information on the role of antibiotics in wound care.

Hematology-Oncology

Du Z, Weinhold N, Song GC, Rand KA, Van Den Berg DJ, Hwang AE, Sheng X, Hom V, Ailawadhi S, Nooka AK, Singhal S, Pawlish K, Peters ES, Bock C, Mohrbacher A, Stram A, Berndt SI, Blot WJ, Casey G, Stevens VL, Kittles R, Goodman PJ, Diver WR, Hennis A, Nemesure B, Klein EA, **Rybicki BA**, Stanford JL, Witte JS, Signorello L, John EM, Bernstein L, Stroup AM, Stephens OW, Zangari M, Van Rhee F, Olshan A, Zheng W, Hu JJ, Ziegler R, Nyante SJ, Ingles SA, Press MF, Carpten JD, Chanock SJ, Mehta J, Colditz GA, Wolf J, Martin TG, Tomasson M, Fiala MA, Terebelo H, **Janakiraman N**, Kolonel L, Anderson KC, Le Marchand L, Auclair D, Chiu BC, Ziv E, Stram D, Vij R, Bernal-Mizrachi L, Morgan GJ, Zonder JA, Huff CA, Lonial S, Orlowski RZ, Conti DV, Haiman CA, and Cozen W. A meta-analysis of genome-wide association studies of multiple myeloma among men and women of African ancestry. *Blood Adv* 2020; 4(1):181-190. PMID: 31935283. [Full Text](#)

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Persons of African ancestry (AA) have a twofold higher risk for multiple myeloma (MM) compared with persons of European ancestry (EA). Genome-wide association studies (GWASs) support a genetic contribution to MM etiology in individuals of EA. Little is known about genetic risk factors for MM in individuals of AA. We performed a meta-analysis of 2 GWASs of MM in 1813 cases and 8871 controls and conducted an admixture mapping scan to identify risk alleles. We fine-mapped the 23 known susceptibility loci to find markers that could better capture MM risk in individuals of AA and constructed a polygenic risk score (PRS) to assess the aggregated effect of known MM risk alleles. In GWAS meta-analysis, we identified 2 suggestive novel loci located at 9p24.3 and 9p13.1 at $P < 1 \times 10^{-6}$; however, no genome-wide significant association was noted. In admixture mapping, we observed a genome-wide significant inverse association between local AA at 2p24.1-23.1 and MM risk in AA individuals. Of the 23 known EA risk variants, 20 showed directional consistency, and 9 replicated at $P < .05$ in AA individuals. In 8 regions, we identified markers that better capture MM risk in persons with AA. AA individuals with a PRS in the top 10% had a 1.82-fold (95% confidence interval, 1.56-2.11) increased MM risk compared with those with average risk (25%-75%). The strongest functional association was between the risk allele for variant rs56219066 at 5q15 and lower ELL2 expression ($P = 5.1 \times 10^{-12}$). Our study shows that common genetic variation contributes to MM risk in individuals with AA.

Hematology-Oncology

Kumar R, Bhandari S, **Singh SRK**, Malapati S, and Cisak KI. Incidence and outcomes of heparin-induced thrombocytopenia in solid malignancy: an analysis of the National Inpatient Sample Database. *Br J Haematol* 2020; Epub ahead of print. PMID: 31990984. [Full Text](#)

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Heparin-induced thrombocytopenia (HIT) is an immune-mediated adverse reaction to heparin products characterized by thrombocytopenia with or without thrombosis. This study aimed to determine the incidence, morbidity, mortality

and economic burden of HIT in solid-malignancy-related hospitalizations. We analyzed the National Inpatient Sample Database (NIS), the largest public database of hospital admissions in the United States, from January 2012 to September 2015. The primary outcome of the study was the incidence of HIT. Secondary outcomes included incidence of venous thrombosis (acute deep venous thrombosis and pulmonary embolism), arterial thrombosis (thrombotic stroke, myocardial infarctions and other arterial thromboembolism), mortality associated with HIT, length of stay, total hospital charges and disposition. During the study period, 7 437 049 hospitalizations had an associated diagnosis of solid malignancy. Approximately 0.08% (n = 6225) hospitalizations had a secondary diagnosis of HIT in this population. The standardized incidence of total thrombotic events was higher in the solid malignancy with HIT compared to the solid malignancy without HIT group (24.7% vs. 6.8%, $P < 0.001$). The standardized mortality rate was 4.8% in solid malignancy with HIT compared to 3.4% in the without HIT group (OR, 1.53; 95% CI, 1.25-1.89; $P < 0.001$). HIT in solid malignancy is a rare condition but associated with increased morbidity and mortality.

Hypertension and Vascular Research

Roy B, and Palaniyandi SS. Aldehyde dehydrogenase 2 inhibition potentiates 4-hydroxy-2-nonenal induced decrease in angiogenesis of coronary endothelial cells. *Cell Biochem Funct* 2020; Epub ahead of print. PMID: 31943249. [Full Text](#)

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Coronary endothelial cell (EC) dysfunction including defective angiogenesis is reported in cardiac diseases. 4-Hydroxynonenal (4HNE) is a lipid peroxidation product, which is increased in cardiac diseases and implicated in cellular toxicity. Aldehyde dehydrogenase (ALDH) 2 is a mitochondrial enzyme that metabolizes 4HNE and reduces 4HNE-mediated cytotoxicity. Thus, we hypothesize that ALDH2 inhibition potentiates 4HNE-mediated decrease in coronary EC angiogenesis in vitro. To test our hypothesis, first, we treated the cultured mouse coronary EC (MCEC) lines with 4HNE (25, 50, and 75 μ M) for 2 and 4 hours. Next, we pharmacologically inhibited ALDH2 by disulfiram (DSF) (2.5 μ M) before challenging the cells with 4HNE. In this study, we found that 4HNE attenuated tube formation which indicates decreased angiogenesis. Next, we found that 4HNE has significantly downregulated the expressions of vascular endothelial growth factor receptor (VEGFR) 2 ($P < .05$ for mRNA and $P = .005$ for protein), Sirtuin 1 (SIRT 1) ($P < 0.0005$ for mRNA), and Ets-related gene (ERG) ($P < 0.0001$ for mRNA and $P < 0.005$ for protein) in MCECs compared with control. ALDH 2 inhibition by DSF potentiated 4HNE-induced decrease in angiogenesis ($P < 0.05$ vs 4HNE at 2 h and $P < 0.0005$ vs 4HNE at 4 h) by decreasing the expressions of VEGFR2 ($P < 0.005$ for both mRNA and protein), SIRT 1 ($P < 0.05$), and ERG ($P < 0.005$) relative to 4HNE alone. Thus, we conclude that ALDH2 acts as a proangiogenic signaling molecule by alleviating the antiangiogenic effects of 4HNE in MCECs.

Infectious Diseases

Cassone M, Zhu Z, Mantey J, Gibson KE, **Perri MB, Zervos MJ**, Snitkin ES, Foxman B, and Mody L. Interplay Between Patient Colonization and Environmental Contamination With Vancomycin-Resistant Enterococci and Their Association With Patient Health Outcomes in Postacute Care. *Open Forum Infect Dis* 2020; 7(1):ofz519. PMID: 31988973. [Request Article](#)

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Background: The clinical utility of patient and environmental surveillance screening for vancomycin-resistant enterococci (VRE) in the postacute care setting has not been definitively clarified. We assessed the longitudinal relationship between patient colonization and room contamination, and we established their association with unfavorable health outcomes. **Methods:** Four hundred sixty-three postacute care patients were followed longitudinally from enrollment to discharge for up to 6 months. Multiple body and environmental sites were sampled at regular intervals to establish correlation between environmental contamination and patient colonization and with longer than expected stay, unplanned hospitalization, and infections adjusting for sex, age, race, Charlson's comorbidity index, and physical self-maintenance score. **Results:** New VRE acquisition was more likely in patients residing in contaminated rooms (multivariable odds ratio [OR] = 3.75; 95% confidence interval [CI], 1.98-7.11) and vice versa (OR = 3.99; 95% CI, 2.16-7.51). New acquisition and new contamination were associated with increased length of stay (OR = 4.36, 95% CI = 1.86-10.2 and OR = 4.61, 95% CI = 1.92-11.0, respectively) and hospitalization (OR = 2.42, 95% CI = 1.39-4.22 and OR = 2.80, 95% CI = 1.52-5.12). New-onset infections were more common with higher VRE burdens (15% in the absence of VRE, 20% when after VRE isolation only on the patient or only in the room, and

29% after VRE isolation in both the patient and the room). Conclusions: Room contamination with VRE is a risk factor for patient colonization, and both are associated with future adverse health outcomes in our postacute care patients. Further research is warranted to establish whether VRE screening may contribute to better understanding of risk assessment and adverse outcome prevention in postacute care.

Infectious Diseases

Dey S, **Gudipati S**, Giuliano C, **Zervos MJ**, Monk JM, Szubin R, Jorgensen SCJ, Sakoulas G, and Berti AD. Reduced production of bacterial membrane vesicles predicts mortality in ST45/USA600 methicillin-resistant *Staphylococcus aureus* bacteremia. *Antibiotics* 2020; 9(1). PMID: Not assigned. [Full Text](#)

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Immune biomarkers can stratify mortality risk in staphylococcal bacteremia. Microbial biomarkers may provide more consistent signals during early infection. We demonstrate that in ST45/USA600 bacteremia, bacterial membrane vesicle production in vitro predicts clinical mortality (773 vs. 116 RFU, survivors vs. decedents, $p < 0.0001$). Using a threshold of 301 relative fluorescence units (RFU), the sensitivity and specificity of the membrane vesicles to predict mortality are 78% and 90%, respectively. This platform is facile, scalable and can be integrated into clinical microbiology lab workflows.

Infectious Diseases

McCreary EK, Kullar R, Geriak M, Zasowski EJ, Rizvi K, Schulz LT, Ouellette K, Vasina L, Haddad F, Rybak MJ, **Zervos MJ**, Sakoulas G, and Rose WE. Multicenter Cohort of Patients With Methicillin-Resistant *Staphylococcus aureus* Bacteremia Receiving Daptomycin Plus Ceftaroline Compared With Other MRSA Treatments. *Open Forum Infect Dis* 2020; 7(1):ofz538. PMID: 31938716. [Request Article](#)

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Background: Daptomycin and ceftaroline (DAP-CPT) have been used for persistent methicillin-resistant *Staphylococcus aureus* bacteremia (MRSAB), but have rarely been compared with other therapies. This study provides an exploratory analysis of patients placed on DAP-CPT vs standard of care (SOC) for MRSAB. Methods: This is a retrospective, matched cohort study MRSAB patients at 4 hospitals in the United States. Patients receiving DAP-CPT for ≥ 72 hours at any point in therapy were matched 2:1 when possible, 1:1 otherwise, to SOC, first by infection source, then age and renal function. SOC was empiric treatment with vancomycin or daptomycin and any subsequent combination antibiotic(s), except for DAP-CPT. Results: Fifty-eight patients received DAP-CPT with 113 matched SOC. Ninety-six percent of SOC received vancomycin, and 56% (63/113) escalated therapy at least once in the treatment course. Twenty-four patients received DAP-CPT within 72 hours of index culture; 2 (8.3%) died within 30 days vs 14.2% (16/113) with SOC ($P > .05$). Subgroup analysis identified numerically lower mortality in DAP-CPT patients with a Charlson comorbidity index ≥ 3 , endovascular source, and receipt of DAP-CPT within 72 hours of index culture. The median MRSAB duration was 9.3 vs 4.8 days for DAP-CPT and SOC, respectively. DAP-CPT was initiated on day 6 on average; after receipt of DAP-CPT, MRSAB duration was 3.3 days. Conclusions: DAP-CPT treatment is often delayed in MRSAB. Combination therapy may be more beneficial if initiated earlier, particularly in patients at higher risk for mortality. Blinded, randomized, prospective studies are needed to eliminate selection bias inherent in retrospective analyses when examining DAP-CPT vs SOC.

Infectious Diseases

Mercuro NJ, Gill CM, Kenney RM, Alangaden GJ, and Davis SL. Treatment and outcomes of *Enterococcus faecium* bloodstream infections in solid organ transplant recipients. *Transpl Infect Dis* 2020; Epub ahead of print. PMID: 31997476. [Full Text](#)

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The Centers for Disease Control and Prevention estimates that resistant enterococci are responsible for 20,000 infections and over 1,000 deaths in the United States each year, representing 8% of nosocomial bloodstream infections.(1,2) Solid organ transplant (SOT) recipients, particularly liver, are among the populations at greatest risk of disease caused by resistant enterococci.(3,4) Colonization with vancomycin resistant-Enterococcus (VRE) is present in about 15% of patients with of abdominal transplant recipients, or on waiting lists.

Internal Medicine

Ali O, Shenoy M, Alani A, **Alani M**, and Williams K. Are SPECT MPI measures of dyssynchrony dyssynchronous? *J Nucl Cardiol* 2020; Epub ahead of print. PMID: 31933153. [Request Article](#)

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BACKGROUND: Assessment of left ventricular mechanical dyssynchrony (LVMD) from gated SPECT myocardial perfusion imaging (MPI) aims to aid selection of patients for cardiac resynchronization therapy (CRT), using either the standard deviation of left ventricular phase (PSD) ≥ 43 degrees or phase histogram bandwidth (HBW) of > 38 degrees and > 30.6 degrees in males and females, respectively. We observed dyssynchrony parameters might be affected by test type and alignment. **METHODS:** We reviewed 242 patients who underwent gated SPECT MPI with use of the Emory Cardiac Toolbox comparing PSD and HBW at rest and stress for Pearson correlation, and substitutability with Bland-Altman analysis. **RESULTS:** There is statistically significant difference in the mean PSD and HBW during rest vs stress (33.4 ± 17.4 degrees vs 20.7 ± 13.5 degrees and 97.7 ± 59.6 degrees vs 59.4 ± 45.4 degrees, respectively, $P < 0.001$). Proper valve plane alignment rendered smaller values (i.e., less dyssynchrony) in both phase SD and HBW (16.8 ± 13.5) vs (22.2 ± 14.7) ($P = 0.011$), and (47.0 ± 38.2) vs (60.7 ± 48.0) ($P = 0.023$), respectively. **CONCLUSION:** Proper alignment and test type, particularly low-dose rest vs high-dose stress, should be considered when assessing LVMD using SPECT MPI.

Internal Medicine

Altibi AM, Prousi G, Agarwal M, Shah M, Tripathi B, Ram P, and Patel B. Readmission-free period and in-hospital mortality at the time of first readmission in acute heart failure patients-NRD-based analysis of 40,000 heart failure readmissions. *Heart Fail Rev* 2020; Epub ahead of print. PMID: 31897907. [Full Text](#)

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The 30-day readmission rates, predictors, and outcomes for acute heart failure (AHF) patients are well published, but data beyond 30 days and the association between readmission-free period (RFP) and in-hospital readmission-related mortality remain unknown. We queried the National Readmission Database to analyze comparative outcomes of AHF. Patients were divided into three groups based on their RFP: group 1 (1-30 days), group 2 (31-90 days), and group 3 (91-275 days). AHF cases and clinical variables were identified using ICD-9 codes. The primary outcome was in-hospital mortality at the time of readmission. A total of 39,237 unplanned readmissions occurred within 275 days; 15,181 within group 1, 11,925 within group 2, and 12,131 within group 3. In-hospital mortality in groups 1, 2, and 3 were 7.4%, 5.1%, and 4.1% ($p < 0.001$). Group 1 had higher percentages of patients with cardiogenic shock (1.3% vs. 0.9% vs. 0.9%; $p < 0.001$), acute kidney injury (30.2% vs. 25.9% vs. 24.0%; $p < 0.001$), dialysis use (8.6% vs. 7.5% vs. 6.9%; $p < 0.001$), and non-ST elevation myocardial infarction (4.4% vs. 3.8% vs. 3.6%; $p < 0.001$), but there was no statistical difference among the three groups for ST-elevation myocardial infarction, percutaneous coronary intervention (PCI), or ventricular assist device use at the time of index admission. However, group 3 had higher PCI (1.7%) compared with groups 1 and 2 ($p < 0.001$). In multivariable logistic regression, groups 2 and 3 had

odd ratio of 0.70 and 0.55, respectively, for in-hospital mortality compared with group 1. Longer RFP is associated with decreased risk of in-hospital mortality at the time of first readmission.

Internal Medicine

Elkaryoni A, **Altibi AM**, Khan MS, Okasha O, Ellakany K, Hassan A, Singh A, Qarajeh R, Mehta S, and Nanda NC. Global longitudinal strain assessment of the left ventricle by speckle tracking echocardiography detects acute cellular rejection in orthotopic heart transplant recipients: A systematic review and meta-analysis. *Echocardiography* 2020; Epub ahead of print. PMID: 31967669. [Full Text](#)

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BACKGROUND: In orthotopic heart transplant recipients, surveillance with endomyocardial biopsy is crucial to detect acute cellular rejection (ACR) early. ACR is a common and serious complication of transplantation with substantial morbidity and mortality. Speckle tracking echocardiography with global longitudinal strain (GLS) assessment of the left ventricle has emerged as a possible noninvasive screening modality. We have conducted a systematic literature review and meta-analysis to evaluate the role of GLS in diagnosing ACR. **METHODS:** The following databases were queried: PubMed, Cochrane Central Register of Controlled Trials (CENTRAL), Scopus, and Embase. We compiled all articles evaluating changes in GLS in comparison to endomyocardial biopsy in ACR dated prior to September 2019. Weighted mean differences (WMD) and 95% confidence intervals (CIs) were pooled by using a random effects model. In order to determine the risk of bias, we used the revised version of the Quality Assessment of Diagnostic Accuracy Studies (QUADAS-2) tool. **RESULTS:** Twelve studies met inclusion criteria of which ten were chosen. These studies encompassed 511 patients and 1267 endomyocardial biopsies. There was a significant difference in GLS between patients who did and did not have ACR proven by biopsy (WMD = 2.18; 95% CI: 1.57-2.78, $P < .001$; $I(2) = 76\%$). The overall sensitivity for GLS in detecting ACR was 78% (CI: 63%-90%, $P = .123$; $I(2) = 52.2\%$) while the overall specificity was 68% (CI: 50%-83%, $P < .001$; $I(2) = 88.3\%$). **CONCLUSION:** Global longitudinal strain assessment of the left ventricle by speckle tracking echocardiography is useful in detecting ACR and could potentially reduce the burden of frequent endomyocardial biopsies in heart transplant recipients.

Nephrology

Davenport MS, Perazella MA, **Yee J**, Dillman JR, Fine D, McDonald RJ, Rodby RA, Wang CL, and Weinreb JC. Use of Intravenous Iodinated Contrast Media in Patients with Kidney Disease: Consensus Statements from the American College of Radiology and the National Kidney Foundation. *Radiology* 2020; Epub ahead of print.:192094. PMID: 31961246. [Full Text](#)

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Intravenous iodinated contrast media are commonly used with CT to evaluate disease and to determine treatment response. The risk of acute kidney injury (AKI) developing in patients with reduced kidney function following exposure to intravenous iodinated contrast media has been overstated. This is due primarily to historic lack of control groups sufficient to separate contrast-induced AKI (CI-AKI; ie, AKI caused by contrast media administration) from contrast-associated AKI (CA-AKI; ie, AKI coincident to contrast media administration). Although the true risk of CI-AKI remains uncertain for patients with severe kidney disease, prophylaxis with intravenous normal saline is indicated for patients who have AKI or an estimated glomerular filtration rate less than 30 mL/min/1.73 m² who are not undergoing maintenance dialysis. In individual high-risk circumstances, prophylaxis may be considered in patients with an estimated glomerular filtration rate of 30-44 mL/min/1.73 m² at the discretion of the ordering clinician. This article is a simultaneous joint publication in Radiology and Kidney Medicine. The articles are identical except for stylistic changes in keeping with each journal's style. Either version may be used in citing this article.

Nephrology

Nonahal K. Message From the Chair. *J Ren Nutr* 2020; 30(1):88. PMID: 31882126. [Full Text](#)

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Neurology

Chesnut R, Aguilera S, Buki A, Bulger E, Citerio G, Cooper DJ, Arrastia RD, Diringer M, Figaji A, Gao G, Geocadin R, Ghajar J, Harris O, Hoffer A, Hutchinson P, Joseph M, Kitagawa R, Manley G, **Mayer S**, Menon DK, Meyfroidt G, Michael DB, Oddo M, Okonkwo D, Patel M, Robertson C, Rosenfeld JV, Rubiano AM, Sahuquillo J, Servadei F, Shutter L, Stein D, Stocchetti N, Taccone FS, Timmons S, Tsai E, Ullman JS, Vespa P, Videtta W, Wright DW, Zammit C, and Hawryluk GWJ. A management algorithm for adult patients with both brain oxygen and intracranial pressure monitoring: the Seattle International Severe Traumatic Brain Injury Consensus Conference (SIBICC). *Intensive Care Med* 2020; Epub ahead of print. PMID: 31965267. [Full Text](#)

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BACKGROUND: Current guidelines for the treatment of adult severe traumatic brain injury (sTBI) consist of high-quality evidence reports, but they are no longer accompanied by management protocols, as these require expert opinion to bridge the gap between published evidence and patient care. We aimed to establish a modern sTBI protocol for adult patients with both intracranial pressure (ICP) and brain oxygen monitors in place. **METHODS:** Our consensus working group consisted of 42 experienced and actively practicing sTBI opinion leaders from six continents. Having previously established a protocol for the treatment of patients with ICP monitoring alone, we addressed patients who have a brain oxygen monitor in addition to an ICP monitor. The management protocols were developed through a Delphi-method-based consensus approach and were finalized at an in-person meeting. **RESULTS:** We established three distinct treatment protocols, each with three tiers whereby higher tiers involve therapies with higher risk. One protocol addresses the management of ICP elevation when brain oxygenation is normal. A second addresses management of brain hypoxia with normal ICP. The third protocol addresses the situation when both intracranial hypertension and brain hypoxia are present. The panel considered issues pertaining to blood transfusion and ventilator management when designing the different algorithms. **CONCLUSIONS:** These protocols are intended to assist clinicians in the management of patients with both ICP and brain oxygen monitors but they do not reflect either a standard-of-care or a substitute for thoughtful individualized management. These protocols should be used in conjunction with recommendations for basic care, management of critical neuroworsening and weaning treatment recently published in conjunction with the Seattle International Brain Injury Consensus Conference.

Neurology

Gan X, Chopp M, Xin H, Wang F, Golembieski W, Lu M, He L, and Liu Z. Targeted tPA overexpression in denervated spinal motor neurons promotes stroke recovery in mice. *J Cereb Blood Flow Metab* 2020; Epub ahead of print. PMID: 31987011. [Full Text](#)

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Neurology

Li R, Yuan Q, Su Y, **Chopp M**, Yan T, and **Chen J.** Immune response mediates the cardiac damage after subarachnoid hemorrhage. *Exp Neurol* 2020; 323:113093. PMID: 31676318. [Full Text](#)

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Cardiac dysfunction is a common adverse effect of subarachnoid hemorrhage (SAH). Autopsy of SAH patients shows immunocyte infiltration into the heart. In this study, a SAH model of endovascular perforation was performed in adult male mice in order to test whether SAH causes cardiac dysfunction in non-primary cardiac disease young adult male mice and whether immune response mediates SAH induced cardiac and neurological deficit. Splenectomy was performed on a subpopulation of mice one week prior to induction of the SAH. Neurological functional tests, transthoracic Doppler echocardiography, immunofluorescent staining, and flow cytometry were performed to investigate neurological and cardiac function and immune/inflammatory effects of SAH in mice with or without splenectomy. We found that SAH significantly induces ventricular fibrillation and cardiac dysfunction identified by significantly reduced left ventricular ejection fraction, left ventricular fractional shortening, decreased heart rate, as well as increased macrophage and neutrophil infiltration into heart and inflammatory factor expression in the heart compared to sham control mice. SAH also induces neurological deficit, increases astrocyte and microglial activity, and inflammatory cell infiltration into brain as well as up-regulates inflammatory factor expression in the brain tissue. Splenectomy not only significantly improves neurological function, but also reduces cardiac dysfunction compared to SAH alone mice. Splenectomy in SAH mice significantly reduces inflammatory cell infiltration, and decreases NADPH oxidase-2 and macrophage chemokine protein-1 expression in heart and brain when compared to non-splenectomy SAH mice. Our data suggest that, SAH induces acute cardiac dysfunction in non-primary cardiac disease mice. Secondary immune response may play an important role in mediating brain-heart damage after SAH.

Neurology

Li W, Li L, Li W, Chopp M, Venkat P, Zacharek A, Chen Z, Landschoot-Ward J, and Chen J. Spleen associated immune-response mediates brain-heart interaction after intracerebral hemorrhage. *Exp Neurol* 2020; Epub ahead of print. PMID: 31987832. [Full Text](#)

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BACKGROUND AND PURPOSE: Intracerebral hemorrhage (ICH) patients frequently encounter cardiovascular complications which may contribute to increased mortality and poor long term outcome. ICH induces systemic oxidative stress and activates peripheral immune responses which are involved in the pathological cascade leading to cardiac dysfunction and heart failure after ICH. We have previously reported that ICH induces progressive cardiac dysfunction in mice without primary cardiac diseases. In this study, we have investigated the role of immune response in mediating cardiac dysfunction post ICH in mice. **METHODS:** Adult male C57BL/6J mice were randomly assigned to the following groups (n=8/group): 1) sham control; 2) ICH; 3) splenectomy with ICH (ICH+Spx); 4) splenectomy alone (Spx). Echocardiography was performed at 7 and 28days after ICH. A battery of neurological and cognitive tests were performed. Flow cytometry, western blot and immunostaining were used to test mechanisms of ICH induced cardiac dysfunction. **RESULTS:** Compared to sham control mice, Spx alone does not induce acute (7day) or chronic (28day) cardiac dysfunction. ICH induces significant neurological and cognitive deficits, as well as acute and chronic cardiac dysfunction compared to sham control mice. Mice subjected to ICH+Spx exhibit significantly improved neurological and cognitive function compared to ICH mice. Mice with ICH+Spx also exhibit significantly improved acute and chronic cardiac function compared to ICH mice indicated by increased left ventricular ejection fraction (LVEF) and left ventricular fractional shortening (LVFS), decreased cardiac fibrosis, decreased cardiomyocyte hypertrophy, decreased cardiac infiltration of immune cells and decreased expression of inflammatory factor and oxidative stress in the heart. **CONCLUSIONS:** Our study demonstrates that splenectomy attenuates ICH-induced neurological and cognitive impairment as well as ICH-induced cardiac dysfunction in mice. Inflammatory cell infiltration into heart and immune responses mediated by the spleen may contribute to ICH-induce acute and chronic cardiac dysfunction and pathological cardiac remodeling.

Neurology

Mayer SA, and Viarasilpa T. Response by Mayer and Viarasilpa to Letter Regarding Article, "CTA-for-All: Impact of Emergency Computed Tomographic Angiography for All Patients With Stroke Presenting Within 24 Hours of Onset". *Stroke* 2020; 51(2):e43. PMID: 31914886. [Full Text](#)

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Neurology

Shen Y, Hu J, Eteer K, Chen Y, Buch S, Alhourani H, Shah K, **Jiang Q**, Ge Y, and Haacke EM. Detecting sub-voxel microvasculature with USPIO-enhanced susceptibility-weighted MRI at 7 T. *Magn Reson Imaging* 2020; 67:90-100. PMID: 31911199. [Full Text](#)

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BACKGROUND: Susceptibility weighted imaging (SWI) combines phase with magnitude information to better image sub-voxel veins. Recently, it has been extended to image very small sub-voxel arteries and veins by injecting intravenously the ultra-small superparamagnetic iron oxide, Ferumoxytol. **OBJECTIVE:** To determine practical experimental imaging parameters for sub-voxel cerebral vessels at 7 T. **METHODS:** Six Wistar-Kyoto rats aged 7-13 weeks were imaged. For a given spatial resolution, SWI was acquired pre- and post- Ferumoxytol with doses of 2, 4, 6 and 8 mg/kg and echo times (TEs) of 5, 10 and 15 ms at each dose. The spatial resolutions of 62.5 x 125 x 250 μm^3 (acquisition time of 7.5 min) and 62.5 x 62.5 x 125 μm^3 (30 min) were used. Both SWI and quantitative susceptibility mapping (QSM) data were analyzed. Contrast-to-noise ratio (CNR) was measured and used to determine the optimal practical imaging parameters for detection of small cortical penetrating arteries. **RESULTS:** For a given spatial resolution with an aspect ratio (frequency: phase: slice) of 2:4:8 relative to the vessel size, we found the TE-dose index (TE x dose) must be at least 40 ms.mg/kg for both SWI and QSM to reveal the most vessels. The higher the TE-dose index, the better the image quality for both SWI and QSM up to 60 ms.mg/kg. **CONCLUSIONS:** There is an optimal TE-dose index for improved visualization of sub-voxel vessels. Choosing the smallest TE and the largest allowed dose made it possible to run the sequence efficiently. In practice, the aspect ratio of 2:4:8 and the TE-dose index ranging from 40 to 60 ms.mg/kg provided the optimal and most practical solution.

Neurology

Suri R, and **Ali A**. Coining the Pablo Picasso Syndrome. *Headache* 2020; Epub ahead of print. PMID: 31957015. [Full Text](#)

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BACKGROUND: The Alice in Wonderland Syndrome has been well described in the literature. Along with sensory disturbances, patients notably experience metamorphopsias, or distortions in size (micropsia/macropsia) and distance (teleopsia), particularly of body parts. Some migraineurs, however, report dislocation and disorientation of body parts, which are common features found in paintings of Pablo Picasso. **METHODS:** A 60-year-old female with a 20-year history of chronic migraine presented for evaluation of frequent headaches and visual disturbances. In between her attacks of migraine, she would occasionally notice alterations which she describes as a "Picasso" painting. When looking at people, she would note their ear on top of their head, or their right arm would be short and attached to the face. This would occur 1-2 times per week and would last 5 to 10 minutes. Inanimate objects, however, would not appear distorted. **RESULTS:** The available literature, including published works and biographies,

suggests Picasso did not suffer from migraine. Nonetheless, careful descriptions taken from migraineurs with visual disturbances may uncover features that resemble his paintings, be it dislocation of limbs with hints of cubism, as reported above, or illusory splitting as has been previously reported. **CONCLUSION:** Dislocation or disorientation of body parts as a migraine-related visual phenomenon is rare and only sparsely reported in the medical literature. Coining of a "Pablo Picasso Syndrome" may better describe this occurrence.

Neurology

Viarasilpa T, Panyavachiraporn N, Osman G, Akioyamen NO, Wasade VS, Barkley G, and Mayer SA. Intubation for Psychogenic Non-Epileptic Attacks: Frequency, Risk Factors, and Impact on Outcome. *Seizure* 2020; 76:17-21. PMID: Not assigned. [Full Text](#)

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Purpose: Patients with psychogenic non-epileptic attacks (PNEA) sometimes receive aggressive treatment leading to endotracheal intubation. We sought to identify the frequency, risk factors, and impact on outcome of intubation for PNEA. **Methods:** We retrospectively reviewed all PNEA patients admitted via the emergency department (ED) who had an episode of PNEA documented by continuous video electroencephalography (vEEG) at Henry Ford Hospital between January 2012 and October 2017. Patients with comorbid epilepsy were excluded. Clinical features, treatments, and vEEG reports were compared between intubated and non-intubated patients. **Results:** Of 80 patients who were admitted via the ED and had PNEA documented by vEEG, 12 (15%) were intubated. Compared with non-intubated PNEA patients, intubated patients had longer duration of convulsive symptoms (25 [IQR 7-53] vs 2 [IQR 1-9] minutes, $P = 0.01$), were less likely to have a normal Glasgow Coma Scale score of 15 (33% vs 94%, $P < 0.001$), received higher doses of benzodiazepines (30 [IQR 16-45] vs 10 [IQR 5-20] mg of diazepam equivalents, $P = 0.004$), and were treated with more antiepileptic drugs (AEDs, 2 [IQR 1-3] vs 1 [IQR 1-2], $P = 0.01$). Hospital length of stay was longer (3 [IQR 3-5] vs 2 [IQR 2-3], $P = 0.001$), and the rate of complications (25% vs 4%, $P = 0.04$) and re-hospitalization from a recurrent episode of PNEA within 30 days was higher among intubated PNEA patients (17% vs 0%, $P = 0.02$). **Conclusion:** Fifteen percent of patients hospitalized for vEEG-documented PNEA were intubated. Intubated patients had longer length of stay, more in-hospital complications, and a high rate of re-hospitalization from recurrent PNEA symptoms. Prolonged duration of convulsive symptoms, depressed level of consciousness, and aggressive treatment with benzodiazepines were associated with intubation for PNEA.

Neurology

Wang L, Chopp M, Szalad A, Lu X, Zhang Y, Wang X, Cepparulo P, Lu M, Li C, and Zhang ZG. Exosomes Derived From Schwann Cells Ameliorate Peripheral Neuropathy in Type II Diabetic Mice. *Diabetes* 2020; Epub ahead of print. PMID: 31915154. [Full Text](#)

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Schwann cell-derived exosomes communicate with dorsal root ganglia (DRG) neurons. The present study investigated the therapeutic effect of exosomes derived from healthy Schwann cells (SC-Exos) on diabetic peripheral neuropathy (DPN). We found that intravenous administration of SC-Exos to type II diabetic db/db mice with peripheral neuropathy remarkably ameliorated DPN by improving sciatic nerve conduction velocity and increasing thermal and mechanical sensitivity. These functional improvements were associated with the augmentation of epidermal nerve fibers, and remyelination of sciatic nerves. Quantitative RT-PCR and Western blot analysis of sciatic nerve tissues showed that the SC-Exo treatment reversed diabetes-reduced microRNA (miR)-21, -27a and -146a and diabetes-increased Semaphorin 6A (SEMA6A), Ras homolog gene family, member A (RhoA), phosphatase and tensin homolog (PTEN), and nuclear factor-kappaB (NF-kappaB). In vitro data showed that SC-Exos promoted neurite outgrowth of diabetic DRG neurons and migration of Schwann cells challenged by high glucose. Collectively, these novel data provide evidence that SC-Exos have a therapeutic effect on DPN in mice and suggest that SC-Exos modulation of miRs contribute to this therapy.

Neurology

Yu X, Jiaerken Y, Wang S, Hong H, Jackson A, Yuan L, Lou M, Jiang Q, Zhang M, and Huang P. Changes in the Corticospinal Tract Beyond the Ischemic Lesion Following Acute Hemispheric Stroke: A Diffusion Kurtosis Imaging Study. *J Magn Reson Imaging* 2020; Epub ahead of print. PMID: 31981400. [Full Text](#)

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BACKGROUND: The degeneration of the corticospinal tract (CST) in chronic stroke has been widely described using diffusion tensor imaging and correlates with the extent of motor deficits. However, only a few studies have reported the early degeneration in the distal CST during the acute stage of stroke and pathological changes in the distal CST have not been described. **PURPOSE:** To study the microstructural changes along the CST beyond the ischemic lesion in acute stroke using diffusion kurtosis imaging (DKI). **STUDY TYPE:** Prospective. **POPULATION:** In all, 48 patients (26 males, 22 females; mean age 58.27 +/- 12.89 years) with acute ischemic stroke. **SEQUENCE:** A DKI sequence with three b-values (0, 1000, and 2000 s/mm²) at 3.0T MRI. **ASSESSMENT:** The kurtosis and tensor parameters were derived from DKI and were compared along the length of the CST beyond the ischemic lesion between the affected and unaffected hemispheres using both voxelwise and slice-wise analysis. The degree of neurological deficits was evaluated using the National Institute of Health Stroke Score (NIHSS) and the Barthel index and the clinical outcome at 3 months was evaluated using a modified Rankin scale. **STATISTICAL TESTS:** Paired t-tests, a linear mixed model, and multivariate linear regression. **RESULTS:** Voxelwise analysis demonstrated increased mean kurtosis, increased axial kurtosis, and decreased axial diffusivity in the affected CST, which were seen only at the level of the cerebral peduncle (all corrected $P < 0.05$). Slice-wise analysis also demonstrated increased axial kurtosis in the cerebral peduncle of the affected CST (corrected $P < 0.05$). The axial kurtosis from slice-wise analysis independently correlated with the motor component of NIHSS ($\beta = 0.297$, $P = 0.040$). **DATA CONCLUSION:** Our findings suggest that early anterograde degeneration occurs along the axon direction in the distal CST in acute stroke, and can be detected using DKI. Moreover, acute axonal degeneration along the CST correlated with motor deficits. **LEVEL OF EVIDENCE:** 2 **TECHNICAL EFFICACY STAGE:** 1.

Neurology

Zhao Q, Yan T, **Chopp M, Venkat P, and Chen J.** Brain-kidney interaction: Renal dysfunction following ischemic stroke. *J Cereb Blood Flow Metab* 2020; 40(2):246-262. PMID: 31766979. [Full Text](#)

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Neurology

Zhou Y, Cai J, Zhang W, Gong X, Yan S, Zhang K, Luo Z, Sun J, **Jiang Q**, and Lou M. Impairment of the Glymphatic Pathway and Putative Meningeal Lymphatic Vessels in the Aging Human. *Ann Neurol* 2020; Epub ahead of print. PMID: 31916277. [Full Text](#)

Department of Neurology, Second Affiliated Hospital of Zhejiang University, School of Medicine, Hangzhou, China.
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OBJECTIVE: Aging is a major risk factor for numerous neurological disorders, and the mechanisms underlying brain aging remain elusive. Recent animal studies demonstrated a tight relationship between impairment of the glymphatic pathway, meningeal lymphatic vessels, and aging. However, the relationship in the human brain remains uncertain. **METHODS:** In this observational cohort study, patients underwent magnetic resonance imaging before and at multiple time points after intrathecal administration of a contrast agent. Head T1-weighted imaging was performed to assess the function of the glymphatic pathway and head high-resolution T2-fluid attenuated inversion recovery imaging to visualize putative meningeal lymphatic vessels (pMLVs). We measured the signal unit ratio (SUR) of 6 locations in the glymphatic pathway and pMLVs, defined the percentage change in SUR from baseline to 39 hours as the clearance of the glymphatic pathway and pMLVs, and then analyzed their relationships with aging. **RESULTS:** In all patients ($N = 35$), the SUR of the glymphatic pathway and pMLVs changed significantly after intrathecal injection of the contrast agent. The clearance of both the glymphatic pathway and pMLVs was related to aging (all $p < 0.05$). The clearance of pMLVs was significantly related to the clearance of the glymphatic pathway (all $p < 0.05$), and the clearance of the glymphatic pathway was significantly faster in patients with early filling of pMLVs than those with late filling (all $p < 0.05$). **INTERPRETATION:** We revealed that both the glymphatic pathway and pMLVs might be impaired in the aging human brain through the novel, clinically available method to simultaneously visualize their clearance. Our findings also support that in humans, pMLVs are the downstream of the glymphatic pathway. *ANN NEUROL* 2020.

Neurosurgery

Colaprico A, Olsen C, Bailey MH, Odom GJ, Terkelsen T, Silva TC, Olsen AV, Cantini L, Zinovyev A, Barillot E, **Noushmehr H**, Bertoli G, Castiglioni I, Cava C, Bontempi G, Chen XS, and Papaleo E. Interpreting pathways to discover cancer driver genes with Moonlight. *Nat Commun* 2020; 11(1):69. PMID: 31900418. [Full Text](#)

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Cancer driver gene alterations influence cancer development, occurring in oncogenes, tumor suppressors, and dual role genes. Discovering dual role cancer genes is difficult because of their elusive context-dependent behavior. We define oncogenic mediators as genes controlling biological processes. With them, we classify cancer driver genes, unveiling their roles in cancer mechanisms. To this end, we present Moonlight, a tool that incorporates multiple -omics data to identify critical cancer driver genes. With Moonlight, we analyze 8000+ tumor samples from 18 cancer types, discovering 3310 oncogenic mediators, 151 having dual roles. By incorporating additional data (amplification, mutation, DNA methylation, chromatin accessibility), we reveal 1000+ cancer driver genes, corroborating known molecular mechanisms. Additionally, we confirm critical cancer driver genes by analysing cell-line datasets. We discover inactivation of tumor suppressors in intron regions and that tissue type and subtype indicate dual role status. These findings help explain tumor heterogeneity and could guide therapeutic decisions.

Neurosurgery

Lee EQ, Weller M, Sul J, Bagley SJ, Sahebjam S, van den Bent M, Ahluwalia M, Campian JL, Galanis E, Gilbert MR, Holdhoff M, Lesser GJ, Lieberman FS, Mehta MP, Penas-Prado M, Schreck KC, Strowd RE, Vogelbaum MA, **Walbert T**, Chang SM, Nabors LB, Grossman S, Reardon DA, and Wen PY. Optimizing eligibility criteria and clinical trial conduct to enhance clinical trial participation for primary brain tumor patients. *Neuro Oncol* 2020; Epub ahead of print. PMID: 31974566. [Full Text](#)

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Building on an initiative to enhance clinical trial participation involving the Society for Neuro-Oncology (SNO), the Response Assessment in Neuro-Oncology (RANO) Working Group, patient advocacy groups, clinical trial cooperative groups, and other partners, we evaluate the impact of eligibility criteria and trial conduct on neuro-oncology clinical trial participation. Clinical trials often carry forward eligibility criteria from prior studies that may be overly restrictive, unnecessary, and needlessly limit patient accrual. Inclusion and exclusion criteria should be evaluated based on the goals and design of the study and whether they impact patient safety and/or treatment efficacy. In addition, we evaluate clinical trial conduct as barriers to accrual and discuss strategies to minimize such barriers for neuro-oncology trials.

Neurosurgery

Schafer E, **Bazydlo M**, **Schultz L**, Park P, **Chang V**, Easton RW, **Schwalb J**, Khalil J, Perez-Cruet M, **Abdulhak M**, and Aleem I. Rates and Risk Factors Associated with 90-day Readmission Following Cervical Spine Fusion Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative (MSSIC) Registry. *Spine J* 2020; Epub ahead of print. PMID: 31958576. [Full Text](#)

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BACKGROUND CONTEXT: Hospital readmission rates are an increasingly important focus. Identifying patients at-risk for readmission can help decrease those rates and thus decrease the overall cost of care. **PURPOSE:** We sought to report the rates and the risk factors associated with 90-day hospital readmission after degenerative cervical spine surgery via either an anterior or posterior approach. **STUDY DESIGN:** Retrospective review of prospectively collected database **PATIENT SAMPLE:** Michigan Spine Surgery Improvement Collaborative (MSSIC) registry **OUTCOME MEASURES:** Hospital readmission at 90 days **METHODS:** The MSSIC registry prospectively enrolls patients undergoing surgery for degenerative cervical spine disease. The registry was queried over a four-year period to determine patient characteristics and risk factors associated with unplanned readmission at 90 days following degenerative cervical spine fusion surgery through either an anterior or posterior approach. Univariate and multivariate regression modeling was used to compare patient characteristics and odds of readmission. **RESULTS:** Of 3762 patients who underwent an anterior approach, 202 (5.4%) were readmitted within 90 days. Of 693 patients who underwent a posterior approach, 85 (12.3%) were readmitted within 90 days. Risk factors associated with increased likelihood of readmission after the anterior approach were male sex (OR 1.56, CI 1.10-2.20), American Society of Anesthesiologists (ASA) class >2 (OR 1.70, CI 1.26-2.30), and increased length of stay (OR 1.10, CI 1.03-1.19). Factors associated with decreased likelihood of readmission after the anterior approach were being independently ambulatory pre-operatively (OR 0.59, CI 0.46-0.76) and holding private insurance (OR 0.67, CI 0.50-0.90). A history of previous spine surgery was associated with increased risk of readmission after the posterior approach (OR 1.76, CI 1.37-2.25). Pain was the most common single reason cited for readmission after either approach (9% anterior, 13% posterior). After an anterior approach, common surgical reasons for readmission include new radicular findings (8%), dysphagia (6%), and surgical site hematoma (5%) while common medical reasons include pneumonia (7%), infection outside the surgical site (6%), and an electrolyte issue. After a posterior approach, common surgical reasons for readmission after 90 days include surgical site infection (8%) and new radicular findings (6%) while common medical reasons include infection outside the surgical site (9%), urinary tract infection (8%), and an abdominal issue (8%). **CONCLUSIONS:** Analysis of a large multi-centered, spine-specific database for elective cervical spine fusion surgery demonstrated an unplanned 90-day readmission rate of 5.4% for the anterior approach and 12.3% for the posterior approach. Factors associated with readmission for the anterior approach include male

sex, ASA class > 2, increased length of stay, holding private insurance, and being ambulatory pre-operatively. A history of previous spine surgery was associated with increased odds of readmission after the posterior approach.

Obstetrics, Gynecology, and Women's Health Services

Doe S, Petersen S, and Swain M. Utilization of genetic testing in breast cancer treatment after implementation of comprehensive multi-disciplinary care. *Breast J* 2020; Epub ahead of print. PMID: 31916345. [Full Text](#)

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To evaluate the utilization of genetic testing after implementing a comprehensive multi-disciplinary care (cMDC) program for breast cancer and to assess for racial disparities. This retrospective study included patients newly diagnosed with invasive breast cancer 1 year before and 1 year after implementing a cMDC program to assess the rate of genetic referrals. Appropriate genetic referrals were defined by age, family history, triple-negative status, and personal history based on National Comprehensive Cancer Network guidelines. Secondary outcomes included rates of recommended testing, actual testing, compliance, and equity in genetic referrals across demographics (race, insurance type, and hospital site). Statistical analyses used the Fisher exact test or chi-square test. The 431 patients identified included 116 non-cMDC and 315 cMDC patients. Following implementation of cMDC, a significant increase occurred not only in appropriate genetic referrals (35.3%-55.5%) but also in inappropriate referrals (1.7%-15.5%) ($P = .001$). Overall attendance increased among both cohorts, Caucasians were more compliant with attending their genetic appointment compared to their African American counterparts (non-cMDC $P = .025$, cMDC $P = .004$). In the cMDC group, African Americans demonstrated a 6% increase in attendance compared to a 2% decrease among Caucasians. More appropriate genetic referrals were made to those with private insurance following implementation of cMDC. Utilizing a cMDC approach to breast cancer care may help increase appropriate utilization of genetics.

Obstetrics, Gynecology, and Women's Health Services

Tsafir Z, Janosek-Albright K, Aoun J, Diaz-Insua M, Abd-El-Barr AE, Schiff L, Talukdar S, Menon M, Munkarah A, Theoharis E, and Eisenstein D. The impact of a wireless audio system on communication in robotic-assisted laparoscopic surgery: A prospective controlled trial. *PLoS One* 2020; 15(1):e0220214. PMID: 31923185. [Full Text](#)

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BACKGROUND: Robotic surgery presents a challenge to effective teamwork and communication in the operating theatre (OR). Our objective was to evaluate the effect of using a wireless audio headset device on communication, efficiency and patient outcome in robotic surgery. **METHODS AND FINDINGS:** A prospective controlled trial of team members participating in gynecologic and urologic robotic procedures between January and March 2015. In the first phase, all surgeries were performed without headsets (control), followed by the intervention phase where all team members used the wireless headsets. Noise levels were measured during both phases. After each case, all team members evaluated the quality of communication, performance, teamwork and mental load using a validated 14-point questionnaire graded on a 1-10 scale. Higher overall scores indicated better communication and efficiency. Clinical and surgical data of all patients in the study were retrieved, analyzed and correlated with the survey results. The study included 137 procedures, yielding 843 questionnaires with an overall response rate of 89% (843/943). Self-reported communication quality was better in cases where headsets were used (113.0 +/- 1.6 vs. 101.4 +/- 1.6; $p < .001$). Use of headsets reduced the percentage of time with a noise level above 70 dB at the console (8.2% +/- 0.6 vs. 5.3% +/- 0.6, $p < .001$), but had no significant effect on length of surgery nor postoperative complications. **CONCLUSIONS:** The use of wireless headset devices improved quality of communication between team members and reduced the peak noise level in the robotic OR.

Ophthalmology and Eye Care Services

Rathbun DL, Shivdasani MN, Guo T, Fried S, Lovell NH, and Hessburg P. The Eye and the Chip 2019-Conference Report. *J Neural Eng* 2020; 17(1):010401. PMID: 31965978. [Request Article](#)

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Orthopaedics/Bone and Joint

Fidai MS, Okoroha KR, Meldau J, Meta F, Lizzio VA, Borowsky P, Redler LH, Moutzouros V, and Makhni EC. Fatigue Increases Dynamic Knee Valgus in Youth Athletes: Results From a Field-Based Drop-Jump Test. *Arthroscopy* 2020; 36(1):214-222.e212. PMID: 31864579. [Full Text](#)

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PURPOSE: To determine whether fatigue increases dynamic knee valgus in adolescent athletes, as measured after a standardized exercise protocol and video-based drop-jump test. A secondary aim was to determine whether individual risk factors place certain athletes at increased risk for dynamic knee valgus. **METHODS:** Athletes aged 14 to 18 years were recruited for this video analysis study. Athletes were recorded performing a standard drop-jump to assess dynamic valgus. Participants then completed a standardized exercise protocol. Fatigue was quantified using a maximum vertical jump, which was compared with pre-exercise values. The drop-jump was repeated postexercise. All drop-jump recordings were randomized and scored for dynamic valgus by 11 blinded reviewers. Univariate analysis was performed to identify characteristics that predisposed athletes to increased dynamic valgus. **RESULTS:** Eighty-five (47 female, 38 male) athletes with an average age of 15.4 years were included in this study. Forty-nine percent of athletes demonstrated an increase in dynamic valgus determined by drop-jump assessment after exercise. A significantly greater percentage of athletes were graded "medium or high risk" in jumps recorded after the exercise protocol (68%) as compared with before the exercise protocol (44%; $P < .01$). Female athletes ($P < .01$) and those older than 15 years of age ($P < .01$) were the most affected by fatigue. **CONCLUSIONS:** In conclusion, our study found that exercise increases dynamic knee valgus in youth athletes. Female athletes and those older than 15 years of age were most significantly affected by exercise. Greater fatigue levels were found to correlate with an increase in dynamic knee valgus, which may place athletes at greater anterior cruciate ligament injury risk. The field-based exercise drop-jump test is a low-cost and reproducible screening tool to identify at-risk athletes who could possibly benefit from anterior cruciate ligament injury-prevention strategies. **LEVEL OF EVIDENCE:** III, Comparative trial.

Orthopaedics/Bone and Joint

Gardinier JD, Daly-Seiler CS, and Zhang C. Osteocytes' expression of the PTH/PTHrP receptor has differing effects on endocortical and periosteal bone formation during adenine-induced CKD. *Bone* 2020; Epub ahead of print.:115186. PMID: 31987988. [Full Text](#)

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Osteocytes play a key role in the pathophysiology of chronic kidney disease (CKD). However, the extent to which osteocytes contribute to abnormalities in bone turnover due to excessive levels of parathyroid hormone (PTH) remains poorly understood. The purpose of this study was to determine the extent to which bone formation and tissue strength during the progression of CKD is modified through osteocytes' response to PTH. Conditional knockout mice targeting osteocytes' expression of the PTH/PTH-related protein type 1 receptor (PPR) were subjected to adenine-induced CKD. After 6-weeks of treatment, adenine-induced CKD was found to reduce bone formation at the periosteal and endocortical surfaces of the tibia. The loss in bone mass corresponded with a significant decrease in structural-level mechanical properties. In knockout mice, the loss of PPR expression in osteocytes further exacerbated the loss in bone formation at the endocortical surface, but inhibited bone loss at the periosteal surface. In general, the effects of adenine-induced CKD were not as extensive in female mice. Collectively, these findings demonstrate that osteocytes' response to PTH under adenine-induced CKD has a unique impact on bone turnover that is specific to the periosteal and endocortical surfaces.

Orthopaedics/Bone and Joint

Gulledge CM, Lizzio VA, Smith DG, Guo E, and Makhni EC. What Are the Floor and Ceiling Effects of Patient-Reported Outcomes Measurement Information System Computer Adaptive Test Domains in Orthopaedic Patients? A Systematic Review. *Arthroscopy* 2020; Epub ahead of print. PMID: 31919023. [Full Text](#)

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PURPOSE: To perform a systematic review to answer the following: (1) What are the floor and ceiling (F/C) effects of the Patient-Reported Outcomes Measurement Information System (PROMIS) computer adaptive test (CAT) domains of physical function (PF), upper extremity physical function (UE), pain interference (PI), and depression (D) in adult

orthopaedic patients? (2) Do the PROMIS-PF and PROMIS-PI domains have differing F/C effects depending on use in upper extremity, lower extremity, spine, neck, and back, or trauma patients?. METHODS: (Preferred Reporting Items for Systematic Review and Meta-Analyses guidelines were followed, the review was registered on PROSPERO, and the methodological index for non-randomized studies was used for this systematic review. Studies reporting the F/C effects of at least 1 of 4 PROMIS CAT domains in orthopaedic patient cohorts accessed through PubMed and Embase on October 30, 2018, were included. F/C effects for each study were reported within forest plots. RESULTS: Forty-three studies were included. Generally, varying cohorts demonstrated no F/C effects for PROMIS-PF (0%-9.0%), variable ceiling effects for PROMIS-UE (lower in v2.0; 0%-28.2%), variable floor effects for PROMIS-PI (0%-19.0%), and significant floor effects for PROMIS-D (0.4%-23.4%). CONCLUSIONS: The orthopaedic literature demonstrated generally favorable floor and ceiling effects for PROMIS CAT domains, with the exception of variable ceiling effects for PROMIS-UE (the newer version exhibits only minor effects), variable floor effects for PROMIS-PI, and significant floor effects for PROMIS-D. In addition, the F/C effects of PROMIS-PF did not vary based on patient population. Although the floor effects of PROMIS-PI did vary based on patient population, the variability does not appear to be based solely on anatomic location. The PROMIS-PF and PROMIS-UE v2.0 demonstrate consistently low floor and ceiling effects. However, the PROMIS-PI and PROMIS-D may need modification before widespread adoption for clinical and research purposes. LEVEL OF EVIDENCE: III; systematic review of Level I-III studies.

Orthopaedics/Bone and Joint

Johnson CD, Outerleys J, Jamison ST, Tenforde AS, **Ruder M**, and Davis IS. Comparison of Tibial Shock during Treadmill and Real-World Running. *Med Sci Sports Exerc* 2020; Epub ahead of print. PMID: 31985578. [Full Text](#)

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The degree to which standard laboratory gait assessments accurately reflect impact loading in an outdoor running environment is currently unknown. PURPOSE: To compare tibial shock between treadmill and road marathon conditions. METHODS: 192 runners (Men/Women: 105/87, Age: 44.9+/-10.8 yrs) completed a treadmill gait assessment while wearing a tibial-mounted inertial measurement unit, several days before completing a marathon race. Participants ran at 90% of their projected race speed and 30-seconds of tibial shock data were collected. Participants then wore the sensors during the race and tibial shock was averaged over the 12, 23 and 40 km. One-way analysis of covariance and correlation coefficients were used to compare vertical/resultant tibial shock between treadmill and marathon conditions. Analyses were adjusted for differences in running speed between conditions. RESULTS: A significant main effect of condition was found for mean vertical and resultant tibial shock ($p < 0.001$). Early in the marathon (12km point), runners demonstrated higher mean tibial shock adjusted for speed compared with the treadmill data (vertical = +24.3% and resultant = +30.3%). Mean differences decreased across the course of the marathon. Vertical tibial shock at the 40th km of the race was similar to treadmill data, and resultant shock remained higher. Vertical and resultant tibial shock were significantly correlated between treadmill and the 12 km of the race ($r_s = 0.64-0.65$, $p < 0.001$), with only 40-42% of the variance in outdoor tibial shock explained by treadmill measures. Correlations for tibial shock showed minimal changes across stages of the marathon. CONCLUSIONS: These results demonstrate that measures of impact loading in an outdoor running environment are not fully captured on a treadmill.

Orthopaedics/Bone and Joint

Khalil LS, Mehran N, Toor A, Matar RN, and Kharrazi FD. National Basketball Association combine performance after a partial meniscectomy. *Musculoskelet Surg* 2020; Epub ahead of print. PMID: 31989533. [Full Text](#)

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BACKGROUND: An arthroscopic meniscectomy is one of the most common orthopedic procedures in athletes. Return to play rates and deficits in muscle function have been reviewed after meniscectomy, but no study has reviewed functional performance after an isolated partial meniscectomy. HYPOTHESIS/PURPOSE: To compare the performance of elite-level basketball players after a partial meniscectomy to a control group of players with no previous reported knee injury. We believe that there is no difference between the two groups in functional performance. STUDY DESIGN: Case Series. METHODS: Functional performance results from the National Basketball Association (NBA) combine were reviewed between 2000 and 2015. Twelve out of 1092 players were found to have undergone a partial meniscectomy prior to competing in the NBA combine. The partial meniscectomy group was compared to an age-, size-, and position-matched control group with respect to functional performance

testing such as the shuttle run test, lane agility test, (3/4) court sprint, vertical jump (no step), and vertical jump (max). RESULTS: The meniscectomy and the control groups that there was no significant difference between the two groups in agility, quickness, sprinting, and jumping ability. However, there was a - 0.596 spearman correlation between months after surgery and agility ($p = 0.041$), while there was a + 0.690 and + 0.650 spearman correlation between both months after surgery and standing vertical and max vertical ($p = 0.013$ and $p = 0.022$). CONCLUSIONS: Athletes competing in the NBA combine who have undergone a partial meniscectomy perform as well as uninjured athletes in all NBA combine performance testing. Furthermore, as athletes are further out from surgery, they have an improvement in both standing and max vertical jump.

Orthopaedics/Bone and Joint

Meldau JE, Srivastava K, Okoroha KR, Ahmad CS, Moutzouros V, and Makhni EC. Cost analysis of Tommy John surgery for Major League Baseball teams. *J Shoulder Elbow Surg* 2020; 29(1):121-125. PMID: 31668501. [Full Text](#)

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BACKGROUND: The economic loss following ulnar collateral ligament reconstruction (UCLR) in Major League Baseball (MLB) pitchers has not been evaluated. The purpose of this study is to quantify the financial impact of UCLR on MLB teams. We hypothesize that MLB teams incur significant losses annually as a result of salaries paid to injured players following reconstruction. METHODS: Public records were accessed to identify MLB pitchers from January 1, 2004, to December 31, 2014, who had undergone UCLR. Contract terms and time away from competition were used to approximate economic loss. Successful return was considered when a pitcher returned to play in at least 1 Minor League Baseball (MiLB) or MLB game. RESULTS: One hundred ninety-four MLB pitchers underwent UCLR from 2004 to 2014, missing on average 180.2 days of the MLB regular season. Cost of recovery (COR) amounted to \$395 million, averaging \$1.9 million per player. Starting pitchers accounted for the largest total COR at \$239.6 million, whereas closers had the largest economic loss per player (\$3.9 million/player). Only 77% of pitchers returned to MLB play. CONCLUSION: UCLR has a substantial economic impact on MLB teams. Starting pitchers represented a majority of team cost, but closers represented higher costs per pitcher.

Otolaryngology

Deeb R. Surgical Considerations in Patients of Middle Eastern Descent. *Otolaryngol Clin North Am* 2020; Epub ahead of print. PMID: 31982175. [Full Text](#)

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Rhinoplasty in patients of Middle Eastern descent presents a unique challenge. There are a large number of variations of skin tone, skin thickness, and structural deformities, which require a high degree of thoughtfulness and planning. A thorough history and physical examination is the cornerstone to achieving a good result. An open and honest discussion is necessary to fully understand the patient's goals. The surgeon should clearly define which goals are achievable and which are not. Conservative techniques will help achieve a natural, balanced outcome and will allow for preservation of nasal function.

Otolaryngology

Mann EA, Nandkumar S, Addy N, Demko BG, Freedman NS, Gillespie MB, Headapohl W, Kirsch DB, Phillips BA, Rosen IM, Schneider LD, Stepnowsky CJ, Yaremchuk KL, and Eydelman MB. Study Design Considerations for Sleep Disordered Breathing Devices. *J Clin Sleep Med* 2020; Epub ahead of print. PMID: 31992406. [Full Text](#)

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None: In recent years, sleep disordered breathing (SDB) has been recognized as a prevalent but under-diagnosed condition in adults and has prompted the need for new and better diagnostic and therapeutic options. To facilitate the development and availability of innovative, safe and effective SDB medical device technologies for patients in the United States, the Food and Drug Administration (FDA) collaborated with six SDB-related professional societies and a consumer advocacy organization to convene a public workshop focused on clinical investigations of SDB devices. Sleep medicine experts discussed appropriate definitions of terms used in the diagnosis and treatment of SDB, the use of home sleep testing versus polysomnography, clinical trial design issues in studying SDB devices, and current and future trends in digital health technologies for diagnosis and monitoring SDB. The panel's breadth of clinical expertise and experience across medical specialties provided useful and important insights regarding clinical trial designs for SDB devices.

Pathology

Antar AI, **Otrock ZK**, Jabbour E, Mohty M, and Bazarbachi A. FLT3 inhibitors in acute myeloid leukemia: ten frequently asked questions. *Leukemia* 2020; Epub ahead of print. PMID: 31919472. [Full Text](#)

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The FMS-like tyrosine kinase 3 (FLT3) gene is mutated in approximately one third of patients with acute myeloid leukemia (AML), either by internal tandem duplications (FLT3-ITD), or by a point mutation mainly involving the tyrosine kinase domain (FLT3-TKD). Patients with FLT3-ITD have a high risk of relapse and low cure rates. Several FLT3 tyrosine kinase inhibitors have been developed in the last few years with variable kinase inhibitory properties, pharmacokinetics, and toxicity profiles. FLT3 inhibitors are divided into first generation multi-kinase inhibitors (such as sorafenib, lestaurtinib, midostaurin) and next generation inhibitors (such as quizartinib, crenolanib, gilteritinib) based on their potency and specificity of FLT3 inhibition. These diverse FLT3 inhibitors have been evaluated in myriad clinical trials as monotherapy or in combination with conventional chemotherapy or hypomethylating agents and in various settings, including front-line, relapsed or refractory disease, and maintenance therapy after consolidation chemotherapy or allogeneic stem cell transplantation. In this practical question-and-answer-based review, the main issues faced by the leukemia specialists on the use of FLT3 inhibitors in AML are addressed.

Pathology

Carroll KC, Reid JL, Thornberg A, Whitfield NN, Trainor D, Lewis S, Wakefield T, Davis TE, Church KG, **Samuel L**, Mills R, Jim P, Young S, and Nolte FS. Clinical Performance of the Novel GenMark Dx ePlex(R) Blood Culture ID Gram-Positive Panel. *J Clin Microbiol* 2020; Epub ahead of print. PMID: 31996444. [Request Article](#)

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BACKGROUND: Rapid identification from positive blood cultures is standard of care (SOC) in many clinical microbiology laboratories. The GenMark Dx ePlex(R) Blood Culture ID Gram Positive (BCID-GP) Panel is a multiplex nucleic acid amplification assay based on competitive DNA hybridization and electrochemical detection using eSensor(R) technology. This multicenter study compared the Investigational Use Only (IUO) BCID-GP Panel to comparator methods for identification of 20 gram-positive bacteria, four antimicrobial resistance genes, and both Pan Candida and Pan Gram-Negative targets that are unique to the BCID-GP Panel. **MATERIALS AND METHODS:** Ten microbiology laboratories throughout the USA collected residual, de-identified positive blood culture samples for analysis. Five laboratories tested both clinical and contrived samples with the BCID-GP Panel. Comparator identification methods included each laboratory's SOC, which included MALDI-TOF MS and automated identification systems, and targeted PCR/qPCR with bidirectional sequencing. **RESULTS:** A total of 2,342 evaluable samples (1,777 clinical, 565 contrived) were tested with the BCID-GP Panel. The overall sample accuracy for on-panel organisms was 89% before discordant resolution. For pathogenic gram-positive targets (Bacillus cereus group,

Enterococcus, E. faecalis, E. faecium, Staphylococcus, S. aureus, S. epidermidis, S. lugdunensis, Listeria, L. monocytogenes, Streptococcus, S. agalactiae, S. anginosus group, S. pneumoniae, S. pyogenes), positive percent agreement (PPA) and negative percent agreement (NPA) ranged from 93.1%-100% and 98.8%-100%, respectively. For contamination rule-out targets (Bacillus subtilis group, Corynebacterium, Cutibacterium acnes, Lactobacillus, Micrococcus), PPA and NPA ranged from 84.5%-100% and 99.9%-100%, respectively. Positive percent agreement and NPA for the Pan Candida and Pan Gram-Negative targets were 92.4%, 95.7% and 99.9%, 99.6%, respectively. The PPA for each resistance marker was mecA 97.2 %, mecC 100%, vanA 96.8%, and vanB 100%. Negative percent agreement ranged from 96.6%-100%. **CONCLUSION:** The ePlex BCID-GP Panel compares favorably to SOC and targeted molecular methods for the identification of twenty gram-positive pathogens and four antimicrobial resistance genes in positive blood culture bottles. This panel detects a broad range of pathogens and mixed infections with yeast and gram-negative organisms from the same positive blood culture bottle.

Pathology

Kryvenko ON, **Williamson SR**, Schwartz LE, and Epstein JI. Gleason score 5+3=8 (grade group 4) prostate cancer - a rare occurrence with contemporary grading. *Hum Pathol* 2020; Epub ahead of print. PMID: 31923450. [Full Text](#)

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Grade Group (GG) 4 prostate cancer includes Gleason scores (GS) 3+5=8, 4+4=8, and 5+3=8. Some studies without pathology re-review of historical cohorts proposed that the presence of pattern 5 worsens prognosis compared to GS 4+4=8 cancer. We assessed how often historically graded GS 5+3=8 cancers retain this grade with contemporary grading recommendations. Sixteen prostate biopsies and 24 radical prostatectomies (RP) reported from 2005 to 2019 as GS 5+3=8 were re-reviewed and graded according to contemporary recommendations. In discrepant cases, an attempt was made to explain the different grading. One (6%) biopsy and 3 (12%) RPs remained GS 5+3=8 (GG4) after re-review. Two (12%) biopsies remained GG4 but were re-graded as GS 3+5=8 and 1 (4%) RP was reclassified as GS 4+4=8 (GG4). Eight (50%) biopsies and 15 (64%) RPs were upgraded to Gleason scores 9-10 (GG5). Five (32%) biopsies and 1 (4%) RPs were downgraded to Gleason score 7 (GG2 and 3). One (4%) RP showed GS 3+3=6 (GG1) cancer. Data from 2013-current from the three institutions were available to assess the incidence of GS 5+3=8 following re-review of the cases. Out of 14359 biopsies with cancer and 6727 radical prostatectomy specimens, only 1 case (0.007%) and no cases (0%) were graded as GS 5+3=8, respectively. Reasons for grading discrepancies included: 1) assigning an overall common grade to separate needle cores or tumor nodules; 2) inclusion of <5% lower grade pattern into grading; and 3) misinterpretation of variant histology and patterns. Challenging patterns were poorly-formed glands, signet ring cell-like features, atrophic carcinoma, ductal carcinoma, and mucinous fibroplasia. GS 5+3=8 (GG4) cancer is very rare with contemporary grading. The reliability of conclusions from retrospective databases regarding the clinical significance of this grade combination without slide re-review is questionable.

Pharmacy

Jorgensen SCJ, Murray KP, Lagnf AM, Melvin S, Bhatia S, Shamim MD, Smith JR, Brade KD, Simon SP, Nagel J, Williams KS, Ortwine JK, Veve MP, Truong J, Huang DB, **Davis SL**, and Rybak MJ. A Multicenter Evaluation of Vancomycin-Associated Acute Kidney Injury in Hospitalized Patients with Acute Bacterial Skin and Skin Structure Infections. *Infect Dis Ther* 2020; Epub ahead of print. PMID: 31983021. [Request Article](#)

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BACKGROUND: We sought to determine the real-world incidence of and risk factors for vancomycin-associated acute kidney injury (V-AKI) in hospitalized adults with acute bacterial skin and skin structure infections (ABSSSI).

METHODS: Retrospective, observational, cohort study at ten U.S. medical centers between 2015 and 2019.

Hospitalized patients treated with vancomycin (≥ 72 h) for ABSSSI and $\geq$ one baseline AKI risk factor were eligible. Patients with end-stage kidney disease, on renal replacement therapy or AKI at baseline, were excluded. The primary outcome was V-AKI by the vancomycin guidelines criteria. **RESULTS:** In total, 415 patients were included. V-AKI occurred in 39 (9.4%) patients. Independent risk factors for V-AKI were: chronic alcohol abuse (aOR 4.710, 95% CI 1.929-11.499), no medical insurance (aOR 3.451, 95% CI 1.310-9.090), ICU residence (aOR 4.398, 95% CI 1.676-11.541), Gram-negative coverage (aOR 2.926, 95% CI 1.158-7.392) and vancomycin duration (aOR 1.143, 95% CI 1.037-1.260). Based on infection severity and comorbidities, 34.7% of patients were candidates for oral antibiotics at baseline and 39.3% had non-purulent cellulitis which could have been more appropriately treated with a beta-lactam. Patients with V-AKI had significantly longer hospital lengths of stay (9 vs. 6 days, $p = 0.001$), higher 30-day readmission rates (30.8 vs. 9.0%, $p < 0.001$) and increased all-cause 30-day mortality (5.1 vs. 0.3%, $p = 0.024$). **CONCLUSIONS:** V-AKI occurred in approximately one in ten ABSSSI patients and may be largely prevented by preferential use of oral antibiotics whenever possible, using beta-lactams for non-purulent cellulitis and limiting durations of vancomycin therapy.

Pharmacy

Jorgensen SCJ, Trinh TD, Zasowski EJ, Lagnf AM, Simon SP, Bhatia S, Melvin SM, Steed ME, Finch NA, Morrisette T, Estrada SJ, Rosenberg JR, **Davis SL**, and Rybak MJ. Real-world experience with ceftolozane-tazobactam for multidrug-resistant gram-negative bacterial infections. *Antimicrob Agents Chemother* 2020; Epub ahead of print.

PMID: 31932379. [Full Text](#)

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Objective: To describe the prescribing practices, clinical characteristics, and outcomes of patients treated with ceftolozane-tazobactam (C/T) for multidrug-resistant (MDR) gram-negative infections. **Methods:** Multicenter, retrospective, cohort study at eight U.S. medical centers (2015-2019). Inclusion criteria were age ≥ 18 years and receipt of C/T (≥ 72 hours) for suspected or confirmed MDR gram-negative infection. The primary efficacy outcome, evaluated amongst patients with MDR *Pseudomonas aeruginosa* infections, was composite clinical failure: 30-day all-cause mortality, 30-day recurrence and/or failure to resolve or improve infection signs or symptoms on C/T. **Results:** In total, 259 patients were included. *P. aeruginosa* was isolated in 236 (91.1%). The MDR and extremely drug-resistant phenotypes were detected in 95.8% and 37.7% of *P. aeruginosa* isolates, respectively. The most common infection source was the respiratory tract (RTI, 62.9%). High dose C/T was used in 71.2% of patients with a RTI overall, but in only 39.6% of patients with a RTI who required C/T renal dose adjustment. In the primary efficacy population ($n=226$), clinical failure and 30-day mortality occurred in 85 (37.6) and 39 (17.3%) patients, respectively. New C/T MDR *P. aeruginosa* resistance was detected in three of 31 patients (9.7%) with follow-up cultures. Hospital-

acquired infection and APACHE II score were independently associated with clinical failure (aOR 2.472, 95% CI 1.322-4.625 and aOR 1.068, 95% CI 1.031-1.106, respectively). Twenty-five (9.7%) patients experienced $\geq$ one adverse effect (nine acute kidney injury, 13 *Clostridioides difficile* infection, one hepatotoxicity, two encephalopathy and two gastrointestinal intolerance) Conclusions: C/T addresses an unmet medical need in patients with MDR gram-negative infections.

Pharmacy

Mercuro NJ, Gill CM, Kenney RM, Alangaden GJ, and Davis SL. Treatment and outcomes of *Enterococcus faecium* bloodstream infections in solid organ transplant recipients. *Transpl Infect Dis* 2020; Epub ahead of print.:e13251. PMID: 31997476. [Full Text](#)

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The Centers for Disease Control and Prevention estimates that resistant enterococci are responsible for 20,000 infections and over 1,000 deaths in the United States each year, representing 8% of nosocomial bloodstream infections.(1,2) Solid organ transplant (SOT) recipients, particularly liver, are among the populations at greatest risk of disease caused by resistant enterococci.(3,4) Colonization with vancomycin resistant-*Enterococcus* (VRE) is present in about 15% of patients with of abdominal transplant recipients, or on waiting lists.

Plastic Surgery

Klassen AF, Dominici L, Fuzesi S, Cano SJ, Atisha D, Locklear T, Gregorowitsch ML, Tsangaris E, Morrow M, King T, and Pusic AL. Development and Validation of the BREAST-Q Breast-Conserving Therapy Module. *Ann Surg Oncol* 2020; Epub ahead of print. PMID: 31965369. [Full Text](#)

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BACKGROUND: In breast cancer surgery, patient-reported outcome measures are needed to measure outcomes best reported by patients (e.g., psychosocial well-being). This study aimed to develop and validate a new BREAST-Q module to address the unique concerns of patients undergoing breast-conserving therapy (BCT). **METHODS:** Phase 1 involved qualitative and cognitive interviews with women who had BCT and clinical expert input to establish content for the BCT module. A field-test (phase 2) was performed, and Rasch measurement theory (RMT) analysis was used for item reduction and examination of reliability and validity. Validation of the item-reduced scales in a clinical sample (phase 3) was conducted for further assessment of their psychometric properties. **RESULTS:** Qualitative interviews with 24 women resulted in the addition of 15 new items across multiple existing BREAST-Q scales and the development of two new scales (Adverse Effects of Radiation and Satisfaction With Information-Radiation Therapy). Feedback from 15 patients and 5 clinical experts were used to refine the instructions, response options, and item wording. An RMT analysis of data from 3497 women resulted in item reduction. The final set of scales showed evidence of ordered response option thresholds, good item fit, and good reliability, except for the Adverse Effects of the Radiation Scale. Validity and reliability were further supported by the phase 3 data from 3125 women. **CONCLUSIONS:** The BREAST-Q BCT module can be used in research and clinical care to evaluate quality metrics and to compare surgical outcomes across all breast cancer surgery patients.

Plastic Surgery

Siddiqui A, Ueno C, Agarwal J, Chang EI, Chrysopoulou M, Davidson C, Khuthaila D, Manahan MA, Matros E, Newman LA, Newman M, Sowden M, Tessler O, Whitacre E, and Lee BT. Evidence-Based Performance Measures for Autologous Breast Reconstruction: An American Society of Plastic Surgeons Quality Performance Measure Set. *Plast Reconstr Surg* 2020; 145(2):284e-294e. PMID: 31985618. [Full Text](#)

Detroit, Mich.; Morgantown, W.Va.; Salt Lake City, Utah; Houston and San Antonio, Texas; Arlington Heights, Ill.; New York, N.Y.; Baltimore, Md.; Torrance, Calif.; Burlington, Vt.; New Orleans, La.; Tucson, Ariz.; and Boston, Mass.

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The American Society of Plastic Surgeons commissioned the Autologous Breast Reconstruction Performance Measure Development Work Group to identify and draft quality measures for the care of patients undergoing autologous breast reconstruction and other breast reconstruction surgery. Four outcome measures and one process measure were identified. Outcomes include patient satisfaction with information for all breast reconstruction, a subscale of the BREAST-Q, and the length of stay, operative time, and rate of blood transfusion for autologous blood transfusion. The process measure looks at coordination of care around managing the breast reconstruction patient's care, with the physician coordinating the ongoing care, be it an oncologist, radiologist, other specialist, or primary care physician. All measures in this report were approved by the American Society of Plastic Surgeons Quality and Performance Measures Work Group and the American Society of Plastic Surgeons Executive Committee. The Work Group recommends the use of these measures for quality initiatives, continuing medical education, maintenance of certification, American Society of Plastic Surgeons' Qualified Clinical Data Registry reporting, and national quality-reporting programs.

Public Health Sciences

Byun JS, Singhal S, Park S, Yi DI, Yan T, Caban A, Jones A, Mukhopadhyay P, Gil SM, Hewitt SM, Newman L, **Davis MB**, Jenkins BD, Sepulveda JL, De Siervi A, Napoles AM, Vohra NA, and Gardner K. Racial Differences in the Association between Luminal Master Regulator Gene Expression Levels and Breast Cancer Survival. *Clin Cancer Res* 2020; Epub ahead of print. PMID: 31911546. [Full Text](#)

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PURPOSE: Compared to their European American (EA) counterparts, African American (AA) women are more likely to die from breast cancer in the United States. This disparity is greatest in hormone receptor-positive subtypes. Here we uncover biological factors underlying this disparity by comparing functional expression and prognostic significance of master transcriptional regulators of luminal differentiation. **EXPERIMENTAL DESIGN:** Data and biospecimens from 262 (AA) and 293 (EA) patients diagnosed with breast cancer from 2001-2010 at a major medical center, were analyzed by immunohistochemistry (IHC) for functional biomarkers of luminal differentiation including estrogen receptor (ESR1), and its pioneer factors FOXA1 and GATA3 Integrated comparison of protein levels with network-level gene expression analysis uncovered predictive correlations with race and survival. **RESULTS:** Univariate or multivariate hazard ratios (HRs) for overall survival, estimated from digital IHC scoring of nuclear antigen, show distinct differences in the magnitude and significance of these biomarkers to predict survival based on race: ESR1 (EA HR= 0.47, 95% CI: 0.31-0.72; AA HR= 0.77, CI: 0.48-1.18); FOXA1 (EA HR= 0.38, CI: 0.23-0.63; AA HR = 0.53, CI: 0.31-0.88); and GATA3 (EA HR= 0.36, CI: 0.23-0.56; AA HR= 0.57, CI: 0.56-1.4). Additionally, we identify genes in the downstream regulons of these biomarkers highly correlated with race and survival. **CONCLUSIONS:** Even within clinically homogeneous tumor groups, regulatory networks that drive mammary luminal differentiation reveal race-specific differences in their association with clinical outcome. Understanding these biomarkers and their downstream regulons will elucidate the intrinsic mechanisms that drive racial disparities in breast cancer survival.

Public Health Sciences

Caldwell MT, Hambrick N, **Vallee P**, Thomas CSD, Sutton A, Daniels G, **Goyal N**, **Manteuffel J**, **Joseph CLM**, and Guetterman TC. "They're Doing Their Job": Women's Acceptance of Emergency Department Contraception Counseling. *Ann Emerg Med* 2020; Epub ahead of print. PMID: 31959536. [Full Text](#)

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STUDY OBJECTIVE: We explore reproductive-aged women's acceptance of contraception counseling in the emergency department (ED). **METHODS:** This study is phase 1 of an exploratory sequential mixed methods study. We purposively interviewed 31 participants with the following criteria: black, white, or Latina race/ethnicity; nonpregnant; aged 15 to 44 years; receiving nonemergency care; not using highly effective contraception; and did not intend to become pregnant. We conducted semistructured interviews with a piloted interview guide until reaching thematic saturation. We coded transcripts with an iteratively developed codebook, maintaining intercoder agreement greater than 80%. Qualitative acceptance of ED contraception counseling was grouped into 3 categories: acceptable, unacceptable, and equivocal. We conducted a thematic text analysis to assess themes expressing support and concern for ED contraception counseling. Qualitative findings were stratified by age, race, and frequency of ED use. Using components of grounded theory, we developed a conceptual model. **RESULTS:** Most participants (81%) accepted ED contraception counseling. Themes expressing support and concern for ED contraception counseling included opportunity to address women's unmet contraception needs, contraception is within the scope of ED practice, the ED is a convenient setting with competent providers, contraception is a sensitive topic, and the ED may be an inappropriate setting for some women. Latina participants had lower acceptance of ED contraception counseling. Dominant subthemes varied slightly by race, age, and frequency of ED use. **CONCLUSION:** Diverse women had high acceptance of contraception counseling in the ED. Perspectives expressing both support and concern in regard to ED contraception counseling were explored in detail.

Public Health Sciences

Du Z, Weinhold N, Song GC, Rand KA, Van Den Berg DJ, Hwang AE, Sheng X, Hom V, Ailawadhi S, Nooka AK, Singhal S, Pawlish K, Peters ES, Bock C, Mohrbacher A, Stram A, Berndt SI, Blot WJ, Casey G, Stevens VL, Kittles R, Goodman PJ, Diver WR, Hennis A, Nemesure B, Klein EA, **Rybicki BA**, Stanford JL, Witte JS, Signorello L, John EM, Bernstein L, Stroup AM, Stephens OW, Zangari M, Van Rhee F, Olshan A, Zheng W, Hu JJ, Ziegler R, Nyante SJ, Ingles SA, Press MF, Carpten JD, Chanock SJ, Mehta J, Colditz GA, Wolf J, Martin TG, Tomasson M, Fiala MA, Terebelo H, **Janakiraman N**, Kolonel L, Anderson KC, Le Marchand L, Auclair D, Chiu BC, Ziv E, Stram D, Vij R, Bernal-Mizrachi L, Morgan GJ, Zonder JA, Huff CA, Lonial S, Orlowski RZ, Conti DV, Haiman CA, and Cozen W. A meta-analysis of genome-wide association studies of multiple myeloma among men and women of African ancestry. *Blood Adv* 2020; 4(1):181-190. PMID: 31935283. [Full Text](#)

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Persons of African ancestry (AA) have a twofold higher risk for multiple myeloma (MM) compared with persons of European ancestry (EA). Genome-wide association studies (GWASs) support a genetic contribution to MM etiology in individuals of EA. Little is known about genetic risk factors for MM in individuals of AA. We performed a meta-analysis of 2 GWASs of MM in 1813 cases and 8871 controls and conducted an admixture mapping scan to identify risk alleles. We fine-mapped the 23 known susceptibility loci to find markers that could better capture MM risk in individuals of AA and constructed a polygenic risk score (PRS) to assess the aggregated effect of known MM risk alleles. In GWAS meta-analysis, we identified 2 suggestive novel loci located at 9p24.3 and 9p13.1 at $P < 1 \times 10^{-6}$; however, no genome-wide significant association was noted. In admixture mapping, we observed a genome-wide significant inverse association between local AA at 2p24.1-23.1 and MM risk in AA individuals. Of the 23 known EA risk variants, 20 showed directional consistency, and 9 replicated at $P < .05$ in AA individuals. In 8 regions, we identified markers that better capture MM risk in persons with AA. AA individuals with a PRS in the top 10% had a 1.82-fold (95% confidence interval, 1.56-2.11) increased MM risk compared with those with average risk (25%-75%). The strongest functional association was between the risk allele for variant rs56219066 at 5q15 and lower ELL2 expression ($P = 5.1 \times 10^{-12}$). Our study shows that common genetic variation contributes to MM risk in individuals with AA.

Public Health Sciences

Gan X, Chopp M, Xin H, Wang F, Golembieski W, Lu M, He L, and Liu Z. Targeted tPA overexpression in denervated spinal motor neurons promotes stroke recovery in mice. *J Cereb Blood Flow Metab* 2020; Epub ahead of print. PMID: 31987011. [Full Text](#)

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Public Health Sciences

Gordon SC, Wu KH, Lindor K, Bowlus CL, Rodriguez CV, Anderson H, Boscarino JA, Trudeau S, Rupp LB, Haller IV, Romanelli RJ, VanWormer JJ, Schmidt MA, Daida YG, Sahota A, Vincent J, Zhang T, Li J, and Lu M. Ursodeoxycholic Acid Treatment Preferentially Improves Overall Survival Among African Americans With Primary Biliary Cholangitis. *Am J Gastroenterol* 2020; Epub ahead of print. PMID: 31985529. [Full Text](#)

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BACKGROUND: We used data from the Fibrotic Liver Disease Consortium to evaluate the impact of ursodeoxycholic acid (UDCA) treatment across race/ethnicity, gender, and clinical status among patients with primary biliary cholangitis. **METHODS:** Data were collected from "index date" (baseline) through December 31, 2016. Inverse Probability of Treatment Weighting was used to adjust for UDCA treatment selection bias. Cox regression, focusing on UDCA-by-risk factor interactions, was used to assess the association between treatment and mortality and liver transplant/death. **RESULTS:** Among 4,238 patients with primary biliary cholangitis (13% men; 8% African American, 7% Asian American/American Indian/Pacific Island [ASINPI]; 21% Hispanic), 78% had ever received UDCA. The final multivariable model for mortality retained age, household income, comorbidity score, total bilirubin, albumin, alkaline phosphatase, and interactions of UDCA with race, gender, and aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . Among untreated patients, African Americans and ASINPIs had higher mortality than whites (adjusted hazard ratio [aHR] = 1.34, 95% confidence interval [CI] 1.08-1.67 and aHR = 1.40, 95% CI 1.11-1.76, respectively). Among treated patients, this relationship was reversed (aHR = 0.67, 95% CI 0.51-0.86 and aHR = 0.88, 95% CI 0.67-1.16). Patterns were similar for liver transplant/death. UDCA reduced the risk of liver transplant/death in all patient groups and mortality across all groups except white women with aspartate aminotransferase/alanine aminotransferase ≥ 1.1 . As compared to patients with low-normal bilirubin at baseline (≤ 0.4 mg/dL), those with high-normal ($1.0 > 0.7$) and mid-normal bilirubin ($0.7 > 0.4$) had significantly higher liver transplant/death and all-cause mortality. **DISCUSSION:** African American and ASINPI patients who did not receive UDCA had significantly higher mortality than white patients. Among African Americans, treatment was associated with significantly lower mortality. Regardless of UDCA treatment, higher baseline bilirubin, even within the normal range, was associated with increased mortality and liver transplant/death compared with low-normal levels.

Public Health Sciences

Michaels A, Aurora L, Peterson E, Liu B, Pinto YM, Sabbah HN, Williams K, and Lanfear DE. Risk Prediction in Transition: MAGGIC Score Performance at Discharge and Incremental Utility of Natriuretic Peptides. *J Card Fail* 2020; 26(1):52-60. PMID: 31751788. [Full Text](#)

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BACKGROUND: Risk stratification for hospitalized patients with heart failure (HF) remains a critical need. The Meta-Analysis Global Group in Chronic Heart Failure (MAGGIC) score is a robust model derived from patients with ambulatory HF. Its validity at the time of discharge and the incremental value of natriuretic peptides (NPs) in this setting is unclear. **METHODS:** This was a single-center study examining a total of 4138 patients with HF from 2 groups; hospital discharge patients from administrative data (n=2503, 60.5%) and a prospective registry of patients with ambulatory HF (n=1635, 39.5%). The ambulatory registry patients underwent N-terminal pro-B-type NP (BNP) measurement at enrollment, and in the hospitalize discharge cohort clinical BNP levels were abstracted. The primary endpoint was all-cause mortality within 1 year. MAGGIC score performance was compared between cohorts utilizing Cox regression and calibration plots. The incremental value of NPs was assessed using calculated area under the curve and net reclassification improvement (NRI). **RESULTS:** The hospitalized and ambulatory cohorts differed with respect to primary outcome (777 and 100 deaths, respectively), sex (52.1% vs 41.7% female) and race (35% vs 49.5% African American). The MAGGIC score showed poor discrimination of mortality risk in the hospital discharge (C statistic: 0.668, hazard ratio [HR]: 1.1 per point, 95% confidence interval [CI]: 0.652, 0.684) but fair discrimination in the ambulatory cohorts (C statistic: 0.784, HR: 1.16 per point, 95% CI: 0.74, 0.83), respectively, a difference that was statistically significant (P=.001 for C statistic, 0.002 for HR). Calibration assessment indicated that the slope and intercept (of MAGGIC-predicted to observed mortality) did not statistically differ from ideal in either cohort and did not differ between the cohorts (all P > .1). NP levels did not significantly improve prediction in the hospitalized cohort (P=.127) but did in the ambulatory cohort (C statistic: 0.784 [95% CI: 0.74, 0.83] vs 0.82 [95% CI: 0.78, 0.85]; P=.018) with a favorable NRI of 0.354 (95% CI: 0.202-0.469; P=.002). **CONCLUSION:** The MAGGIC score showed poor discrimination when used in patients with HF at hospital discharge, which was inferior to its performance in patients with ambulatory HF. Discrimination within the hospital discharge group was not improved by including hospital NP levels.

Public Health Sciences

Schafer E, **Bazydlo M**, **Schultz L**, Park P, **Chang V**, Easton RW, **Schwalb J**, Khalil J, Perez-Cruet M, **Abdulhak M**, and Aleem I. Rates and Risk Factors Associated with 90-day Readmission Following Cervical Spine Fusion Surgery: Analysis of the Michigan Spine Surgery Improvement Collaborative (MSSIC) Registry. *Spine J* 2020; Epub ahead of print. PMID: 31958576. [Full Text](#)

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BACKGROUND CONTEXT: Hospital readmission rates are an increasingly important focus. Identifying patients at-risk for readmission can help decrease those rates and thus decrease the overall cost of care. **PURPOSE:** We sought to report the rates and the risk factors associated with 90-day hospital readmission after degenerative cervical spine surgery via either an anterior or posterior approach. **STUDY DESIGN:** Retrospective review of prospectively collected database **PATIENT SAMPLE:** Michigan Spine Surgery Improvement Collaborative (MSSIC) registry **OUTCOME MEASURES:** Hospital readmission at 90 days **METHODS:** The MSSIC registry prospectively enrolls patients undergoing surgery for degenerative cervical spine disease. The registry was queried over a four-year period to determine patient characteristics and risk factors associated with unplanned readmission at 90 days following degenerative cervical spine fusion surgery through either an anterior or posterior approach. Univariate and multivariate regression modeling was used to compare patient characteristics and odds of readmission. **RESULTS:** Of 3762 patients who underwent an anterior approach, 202 (5.4%) were readmitted within 90 days. Of 693 patients who underwent a posterior approach, 85 (12.3%) were readmitted within 90 days. Risk factors associated with increased likelihood of readmission after the anterior approach were male sex (OR 1.56, CI 1.10-2.20), American Society of Anesthesiologists (ASA) class >2 (OR 1.70, CI 1.26-2.30), and increased length of stay (OR 1.10, CI 1.03-1.19). Factors associated with decreased likelihood of readmission after the anterior approach were being independently ambulatory pre-operatively (OR 0.59, CI 0.46-0.76) and holding private insurance (OR 0.67, CI 0.50-0.90). A history of previous spine surgery was associated with increased risk of readmission after the posterior approach (OR 1.76, CI 1.37-2.25). Pain was the most common single reason cited for readmission after either approach (9% anterior, 13% posterior). After an anterior approach, common surgical reasons for readmission include new radicular findings (8%), dysphagia (6%), and surgical site hematoma (5%) while common medical reasons include pneumonia (7%), infection outside the surgical site (6%), and an electrolyte issue. After a posterior approach, common surgical reasons for readmission after 90 days include surgical site infection (8%) and new radicular findings (6%) while common medical reasons include infection outside the surgical site (9%), urinary tract infection (8%), and an abdominal issue (8%). **CONCLUSIONS:** Analysis of a large multi-centered, spine-specific database for elective cervical spine fusion surgery demonstrated an unplanned 90-day readmission rate of 5.4% for the anterior approach and 12.3% for the posterior approach. Factors associated with readmission for the anterior approach include male

sex, ASA class > 2, increased length of stay, holding private insurance, and being ambulatory pre-operatively. A history of previous spine surgery was associated with increased odds of readmission after the posterior approach.

Public Health Sciences

Sitarik A, Havstad S, Kim H, Zoratti EM, Ownby D, Johnson CC, and Wegienka G. Racial Disparities in Allergic Outcomes Persist to Age 10 Years in Black and White Children. *Ann Allergy Asthma Immunol* 2020; Epub ahead of print. PMID: 31945477. [Full Text](#)

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BACKGROUND: Previous analyses in the WHEALS birth cohort demonstrated black children are more likely to experience allergic outcomes than white children by age 2 years. The results could not be explained by a host of variables. **OBJECTIVE:** Assess whether racial disparities persisted to age 10 years and determine whether any differences could be explained by a panel of variables related to early life exposures in WHEALS. **METHODS:** At age 10 years, WHEALS children (n=481) completed skin prick testing, spirometry and methacholine challenge and a physician exam for eczema and asthma. Allergen-specific IgEs (sIgE) and total IgE were measured. Inverse probability weighting with logistic and linear regression models was used to assess associations between race (black or white) and the outcomes. **RESULTS:** Black children fared worse than white children with respect to each outcome. Black children were more likely to have eczema, asthma, sensitization (≥ 1 sIgE ≥ 0.35 IU/L) and at least one positive skin prick test; however, some variability was present in the magnitudes of association within subgroups defined by delivery mode, sex of the child, prenatal indoor dog exposure, and firstborn status. In some subgroups, Black children were also more likely to have higher total IgE and worse pulmonary function test measures (PC 20 ≤ 25 mg/ml, % predicted FVC, FEV1/FVC, FEF 25-75). Confounding did not explain these differences. **CONCLUSION:** Racial differences persisted in this cohort through age 10 years. Future studies should include potentially important, but rarely studied factors such as segregation and structural racism as these factors could explain the observed racial differences.

Public Health Sciences

Wang L, Chopp M, Szalad A, Lu X, Zhang Y, Wang X, Cepparulo P, Lu M, Li C, and Zhang ZG. Exosomes Derived From Schwann Cells Ameliorate Peripheral Neuropathy in Type II Diabetic Mice. *Diabetes* 2020; Epub ahead of print. PMID: 31915154. [Full Text](#)

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Schwann cell-derived exosomes communicate with dorsal root ganglia (DRG) neurons. The present study investigated the therapeutic effect of exosomes derived from healthy Schwann cells (SC-Exos) on diabetic peripheral neuropathy (DPN). We found that intravenous administration of SC-Exos to type II diabetic db/db mice with peripheral neuropathy remarkably ameliorated DPN by improving sciatic nerve conduction velocity and increasing thermal and mechanical sensitivity. These functional improvements were associated with the augmentation of epidermal nerve fibers, and remyelination of sciatic nerves. Quantitative RT-PCR and Western blot analysis of sciatic nerve tissues showed that the SC-Exo treatment reversed diabetes-reduced microRNA (miR)-21, -27a and -146a and diabetes-increased Semaphorin 6A (SEMA6A), Ras homolog gene family, member A (RhoA), phosphatase and tensin homolog (PTEN), and nuclear factor-kappaB (NF-kappaB). In vitro data showed that SC-Exos promoted neurite outgrowth of diabetic DRG neurons and migration of Schwann cells challenged by high glucose. Collectively, these novel data provide evidence that SC-Exos have a therapeutic effect on DPN in mice and suggest that SC-Exos modulation of miRs contribute to this therapy.

Radiation Oncology

Ennis RD, **Movsas B**, Park C, Sandler HM, Smith BD, Wilson L, and Deweese TL. Examinations in Radiation Oncology: Listening, Learning, and Looking Forward Together. *Int J Radiat Oncol Biol Phys* 2020; 106(1):29-31. PMID: 31647971. [Full Text](#)

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MD Anderson Cancer Center, Houston, Texas.

Yale University, New Haven, Connecticut.

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Radiation Oncology

Hagan M, Kapoor R, Michalski J, Sandler H, **Movsas B**, Chetty I, Lally B, Rengan R, Robinson C, Rimner A, Simone C, Timmerman R, Zelefsky M, DeMarco J, Hamstra D, Lawton C, Potters L, Valicenti R, Mutic S, Bosch W, Abraham C, Caruthers D, Brame R, Palta JR, Sleeman W, and Nalluri J. VA-Radiation Oncology Quality Surveillance Program. *Int J Radiat Oncol Biol Phys* 2020; Epub ahead of print. PMID: 31983560. [Full Text](#)

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VHA Prostate Cancer Blue Ribbon Panel.

PURPOSE: We sought to develop a quality surveillance program for approximately 15,000 US veterans treated at the 40 radiation oncology facilities at the Veterans Affairs (VA) hospitals each year. **METHODS AND MATERIALS:** State-of-the-art technologies were used with the goal to improve clinical outcomes while providing the best possible care to veterans. To measure quality of care and service rendered to veterans, the Veterans Health Administration established the VA Radiation Oncology Quality Surveillance program. The program carries forward the American College of Radiology Quality Research in Radiation Oncology project methodology of assessing the wide variation in practice pattern and quality of care in radiation therapy by developing clinical quality measures (QM) used as quality indices. These QM data provide feedback to physicians by identifying areas for improvement in the process of care and identifying the adoption of evidence-based recommendations for radiation therapy. **RESULTS:** Disease-site expert panels organized by the American Society for Radiation Oncology (ASTRO) defined quality measures and established scoring criteria for prostate cancer (intermediate and high risk), non-small cell lung cancer (IIIA/B stage), and small cell lung cancer (limited stage) case presentations. Data elements for 1567 patients from the 40 VA radiation oncology practices were abstracted from the electronic medical records and treatment management and planning systems. Overall, the 1567 assessed cases passed 82.4% of all QM. Pass rates for QM for the 773 lung and 794 prostate cases were 78.0% and 87.2%, respectively. Marked variations, however, were noted in the pass rates for QM when tumor site, clinical pathway, or performing centers were separately examined. **CONCLUSIONS:** The peer-review protected VA-Radiation Oncology Surveillance program based on clinical quality measures allows providers to compare their clinical practice to peers and to make meaningful adjustments in their personal patterns of care unobtrusively.

Radiation Oncology

Lukovic J, Henke L, Gani C, Kim TK, Stanescu T, Hosni A, Lindsay P, Erickson B, Khor R, Eccles C, Boon C, Donker M, Jagavkar R, Nowee ME, Hall WA, **Parikh P**, and Dawson LA. MRI-Based Upper Abdominal Organs-at-Risk Atlas for Radiation Oncology. *Int J Radiat Oncol Biol Phys* 2020; Epub ahead of print. PMID: 31953061. [Full Text](#)

Department of Radiation Oncology, University of Toronto, Radiation Medicine Program, Princess Margaret Cancer Centre, University Health Network, Toronto, Ontario, Canada.

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PURPOSE: The purpose of our study was to provide a guide for identification and contouring of upper abdominal organs-at-risk (OARs) in the setting of online magnetic resonance imaging (MRI)-guided radiation treatment planning and delivery. **METHODS AND MATERIALS:** After a needs assessment survey, it was determined that an upper abdominal MRI-based atlas of normal OARs would be of benefit to radiation oncologists and radiation therapists. An anonymized diagnostic 1.5T MRI from a patient with typical upper abdominal anatomy was used for atlas development. Two MRI sequences were selected for contouring, a T1-weighted gadoxetic acid contrast-enhanced MRI acquired in the hepatobiliary phase and axial fast imaging with balanced steady-state precession. Two additional clinical MRI sequences from commercial online MRI-guided radiation therapy systems were selected for contouring and were included in the final atlas. Contours from each data set were completed and reviewed by radiation oncologists, along with a radiologist who specializes in upper abdominal imaging, to generate a consensus upper abdominal MRI-based OAR atlas. **RESULTS:** A normal OAR atlas was developed, including recommendations for contouring. The atlas and contouring guidance are described, and high-resolution MRI images and contours are displayed. OARs, such as the bile duct and biliary tree, which may be better seen on MRI than on computed tomography, are highlighted. The full DICOM/DICOM-RT MRI images from both the diagnostic and clinical online MRI-guided radiation therapy systems data sets have been made freely available, for educational purposes, at econtour.org. **CONCLUSIONS:** This MRI contouring atlas for upper abdominal OARs should provide a useful reference for contouring and education. Its routine use may help to improve uniformity in contouring in radiation oncology planning and OAR dose calculation. Full DICOM/DICOM-RT images are available online and provide a valuable educational resource for upper abdominal MRI-based radiation therapy planning and delivery.

Radiation Oncology

Parikh PJ, and Chapman W, Jr. Same results, 20% of the cost: Short-course total neoadjuvant therapy. *Int J Radiat Oncol Biol Phys* 2020; Epub ahead of print. PMID: 31924409. [Full Text](#)

Department of Radiation Oncology, Henry Ford Cancer Institute, Detroit, Michigan.
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Research Administration

Mehdizavareh MH, Hemati S, and **Soltanian-Zadeh H**. Enhancing performance of subject-specific models via subject-independent information for SSVEP-based BCIs. *PLoS One* 2020; 15(1):e0226048. PMID: 31935220. [Full Text](#)

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Recently, brain-computer interface (BCI) systems developed based on steady-state visual evoked potential (SSVEP) have attracted much attention due to their high information transfer rate (ITR) and increasing number of targets. However, SSVEP-based methods can be improved in terms of their accuracy and target detection time. We propose a new method based on canonical correlation analysis (CCA) to integrate subject-specific models and subject-independent information and enhance BCI performance. We propose to use training data of other subjects to optimize hyperparameters for CCA-based model of a specific subject. An ensemble version of the proposed method is also developed for a fair comparison with ensemble task-related component analysis (TRCA). The proposed method is compared with TRCA and extended CCA methods. A publicly available, 35-subject SSVEP benchmark dataset is used for comparison studies and performance is quantified by classification accuracy and ITR. The ITR of the proposed method is higher than those of TRCA and extended CCA. The proposed method outperforms extended CCA in all conditions and TRCA for time windows greater than 0.3 s. The proposed method also outperforms TRCA

when there are limited training blocks and electrodes. This study illustrates that adding subject-independent information to subject-specific models can improve performance of SSVEP-based BCIs.

Sleep Medicine

Cheng P, Kalmbach D, Fellman-Couture C, Arnedt JT, Cuamatzi-Castelan A, and Drake CL. Risk of excessive sleepiness in sleep restriction therapy and cognitive behavioral therapy for insomnia: a randomized controlled trial. *J Clin Sleep Med* 2020; Epub ahead of print. PMID: 31992407. [Full Text](#)

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STUDY OBJECTIVES: Sleep restriction therapy (SRT) has been shown to be comparably effective relative to cognitive behavioral therapy for insomnia (CBT-I), but with lower requirements for patient contact. As such, SRT appears to be a viable alternate treatment for those who cannot complete a full course of CBT-I. However, it is unclear whether SRT—a treatment solely focusing on restricting time in bed—increases risk for sleepiness comparably to CBT-I. The current study tested objective sleepiness as an outcome in a randomized controlled trial comparing SRT, CBT-I, and attention control in a sample of postmenopausal women in whom insomnia was diagnosed according to criteria of the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition. **METHODS:** Single-site, randomized controlled trial. A total of 150 postmenopausal women (56.44 ± 5.64 years) with perimenopausal or postmenopausal onset of Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition insomnia disorder were randomized to 3 treatment conditions: sleep education control (6 sessions); SRT (2 sessions with interim phone contact); and CBT-I (6 sessions). Blinded assessments were performed at pretreatment and posttreatment. Risk of excessive sleepiness was evaluated using a symmetry analysis of sleepiness measured through the Multiple Sleep Latency Test (MSLT). **RESULTS:** The odds ratios (ORs) of being excessively sleepy versus nonsleepy were not different than 1.0 for both SRT (OR = 0.94, 95% confidence interval [0.13-6.96]) and CBT-I (OR = 0.62, 95% confidence interval [0.09-4.46]), indicating that the odds of becoming excessively sleepy following treatment was not different from the odds of being nonsleepy. This suggests that excessive sleepiness is not of unique concern following SRT relative to CBT-I or sleep education. **CONCLUSIONS:** SRT appears to have a comparable risk profile for excessive sleepiness as CBT-I, and thus may be considered a safe alternative to CBT-I. Future research should characterize objective measures of excessive sleepiness immediately following sleep restriction. **CLINICAL TRIAL REGISTRATION:** Registry: ClinicalTrials.gov; Name: Behavioral Treatment of Menopausal Insomnia; Sleep and Daytime Outcomes; Identifier: NCT01933295.

Sleep Medicine

Roehrs T, Withrow D, Koshorek G, Verkler J, Bazan L, and Roth T. Sleep and Pain in Subjects with Fibromyalgia and Comorbid Insomnia: Double-blind, Crossover, Study of Suvorexant 20 mg versus Placebo. *J Clin Sleep Med* 2020; Epub ahead of print. PMID: 31992394. [Full Text](#)

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OBJECTIVES: The chronic pain disorder, fibromyalgia, is associated with sleep disturbance, typically sleep maintenance. No studies have evaluated the effect of sleep medication on pain sensitivity in this population. Suvorexant, an orexin antagonist, approved for treatment of insomnia was evaluated for effects on both the sleep and pain of fibromyalgia. **METHODS:** Women, 21- 65 yrs old, with fibromyalgia and co-morbid insomnia (n=10) were treated, double-blind, for 9 nights each with suvorexant, 20 mg, and placebo in counterbalanced order. All were in good psychiatric and stable physical health and met American College of Rheumatology 2010 criteria for fibromyalgia and DSM-V criteria for insomnia. A screening 8-hr PSG was used to rule out other sleep disorders. On nights 8 and 9 of each treatment 8-hr PSGs were collected and on days 1 and 8 pain sensitivity was assessed at 1100 and 1500 hr by measuring finger withdrawal latency (FWL) to a radiant heat stimulus at 5 randomly presented intensity levels. **RESULTS:** Suvorexant vs placebo increased total sleep time (7.2 vs 6.7 hrs, $p < .05$) and reduced wake after sleep onset (37 vs 67 min, $p < .04$) with no night effects or interaction. Latency to persistent sleep and sleep stage measures were not altered. FWL on both am and pm tests varied as a function of intensity ($p < .001$). Average FWL (over 5 intensities and both days) was increased relative to placebo on both the am test (13.9 vs 13.1 sec) and pm tests (15.8 vs 14.1 sec, $p < .03$) following suvorexant the previous night. **CONCLUSIONS:** Suvorexant 20 mg in patients with fibromyalgia, improved sleep time and reduced next-day pain sensitivity on assessments of FWL to a radiant heat stimulus.

Surgery

Diwan TS, Lee TC, **Nagai S**, Benedetti E, Posselt A, Bumgardner G, Noria S, Whitson BA, Ratner L, Mason D, Friedman J, Woodside KJ, and Heimbach J. Obesity, Transplantation, and Bariatric Surgery: An Evolving Solution for a Growing Epidemic. *Am J Transplant* 2020; Epub ahead of print. PMID: 31965711. [Full Text](#)

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The increasing obesity epidemic has major implications in the realm of transplantation. Patients with obesity face barriers in access to transplantation as well as unique challenges in perioperative and postoperative outcomes. Due to comorbidities associated with obesity along with the underlying end-stage organ disease leading to transplantation candidacy, these patients may not even be referred for transplant evaluation, much less be waitlisted or actually undergo transplantation. However, the utilization of bariatric surgery in this population can help optimize the transplant candidacy of patients with obesity and end-stage organ disease as well as improve perioperative and postoperative outcomes. In this paper, we will review the impact of obesity on kidney, liver, and cardiothoracic transplant candidates and recipients, as well as explore potential interventions to address obesity in these populations.

Surgery

Dougherty MC, Kulenkamp JE, **Boyajian H**, Koh JL, Lee MJ, and Shi LL. National trends in the diagnosis and repair of SLAP lesions in the United States. *J Orthop Surg (Hong Kong)* 2020; 28(1). PMID: 31876225. [Request Article](#)

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BACKGROUND: Since superior labrum anterior-to-posterior (SLAP) tear was introduced as an International Classification of Diseases-Ninth Revision, Clinical Modification diagnosis in 1994, awareness, diagnosis, and surgical treatment of this disorder has increased. Here, we aim to clarify trends in the frequency of SLAP tear diagnosis and arthroscopic SLAP repair surgery in the United States. **METHODS:** Using private insurance claims from 2003 to 2013 in MarketScan (approximately 55 million Americans), we identified patients with SLAP tear diagnosis or arthroscopic SLAP repair surgery. Population-based rates of SLAP diagnosis and related shoulder procedures were calculated. **RESULTS:** A total of 329,643 patients in the MarketScan database received a SLAP tear diagnosis. In all, 62.8% underwent some form of shoulder surgery after diagnosis. SLAP diagnosis increased from 28.0 per 100,000 in 2003 to 142.4 per 100,000 in 2013 ($p < 0.0001$); the rate of shoulder surgery in these patients increased from 20.1 per 100,000 in 2003 to 74.1 per 100,000 in 2013 ($p < 0.0001$). However, the percentage of patients with SLAP tears who got shoulder surgery decreased ($p < 0.0001$). In 2003, almost no patient got biceps tenodesis for SLAP tears; by 2013, 18.1% of surgeries for SLAP tear were biceps tenodesis. Isolated arthroscopic SLAP repairs peaked in 2009 at 28.4 per 100,000 and stabilized thereafter. **CONCLUSION:** We confirmed prior reports that SLAP diagnosis increased from 2003 to 2013, although the percentage of these patients who underwent surgery decreased over this period. Arthroscopic SLAP repair doubled but then plateaued after 2009. Biceps tenodesis now accounts for a substantial portion of surgeries for SLAP tear. This may reflect an improved understanding of superior labrum anatomy and biomechanics.

Surgery

Goettman MA, Riccardi ML, Vang L, Dughayli MS, and Faraj CH. Robotic assistance in ventral hernia repair may decrease the incidence of hernia recurrence. *J Minim Access Surg* 2020; Epub ahead of print. PMID: 31929224. [Full Text](#)

Department of General Surgery, Henry Ford Wyandotte Hospital, MI, USA.

Background: Since the advent of laparoscopic surgery, many studies have shown the advantages of laparoscopic surgery over open surgery for ventral hernia repair (VHR). As robotic surgery is gaining popularity, we sought to compare the outcomes of this newer robotic-assisted technique to the outcomes of established open and

laparoscopic techniques to assess for any additional benefit. Methods: A meta-analysis research design was employed. Multiple databases were queried for publications over the past 10 years and 23 articles were selected based on pre-determined selection criteria. Data were extracted and the arm-based network meta-analysis method was utilised to examine the effect difference for the three arms of our study: Open, laparoscopic and robotic-assisted VHR. Results: As expected, laparoscopy had an advantage over open VHR in terms of infection rates. This advantage was also observed in the robotic group over the open group; however, there was no statistical difference between the laparoscopic and robotic groups when infection rates were compared head-to-head. The robotic group had a significant advantage over both the open and more importantly, the laparoscopic groups in recurrence rates. Conclusions: The results of this study suggest that robotic surgery maintains some of the advantages of laparoscopic surgery and may also provide the additional advantage of recurrence rate reduction. This may be explained by the ability to perform a more complex hernia repair with robotic assistance secondary to the ease of closure of the fascial defect. More research is needed to validate this finding.

Surgery

Hecht LM, Pester B, Braciszewski JM, Graham AE, Mayer K, Martens K, Hamann A, Carlin AM, and Miller-Matero LR. Socioeconomic and Racial Disparities in Bariatric Surgery. *Obes Surg* 2020; Epub ahead of print. PMID: 31927686. [Full Text](#)

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The purpose of this study was to examine the associations among race and socioeconomic factors (receiving social security disability, insurance type, and income) with undergoing bariatric surgery and weight loss outcomes in a racially diverse, urban cohort of bariatric surgery candidates (N = 314). Patients with private insurance and who identified as Caucasian were more likely to undergo bariatric surgery. Income significantly predicted percentage of excess weight loss 1 year after surgery, although this was no longer significant when accounting for race. Race and socioeconomic factors should be considered during psychosocial evaluations to support patients at risk of surgical attrition and poorer weight loss outcomes. Future research should explore policy solutions to improve access, while qualitative work may help with understanding racial disparities in bariatric surgery.

Surgery

Nasser H, Ivanics T, Leonard-Murali S, and Stefanou A. Risk Factors for Surgical Site Infection After Laparoscopic Colectomy: An NSQIP Database Analysis. *J Surg Res* 2020; 249:25-33. PMID: 31918327. [Full Text](#)

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BACKGROUND: Surgical site infection (SSI) is a common complication after colon surgery. This study aimed to evaluate risk factors for SSI and its types in laparoscopic colectomy patients using the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) database. **MATERIALS AND METHODS:** The NSQIP database was queried for patients undergoing laparoscopic colectomy from 2011 through 2017. Univariate analysis and multivariable logistic regression were used to evaluate risk factors associated with any SSI, superficial SSI, deep-incisional SSI, and organ-space SSI. **RESULTS:** Of 72,519 patients, 4906 cases of SSI were identified: 2276 superficial SSI, 357 deep-incisional SSI, and 2483 organ-space SSI. Risk factors associated with superficial SSI were admission before procedure (adjusted odds ratio [AOR] = 1.31; 95% confidence interval [CI] 1.17-1.47; $P < 0.01$), smoking (AOR = 1.29; 95% CI 1.16-1.44; $P < 0.01$), and higher body mass index (AOR = 1.24 for every 5 kg/m² increase; 95% CI 1.20-1.27; $P < 0.01$). Deep-incisional SSI was associated with steroid use (AOR = 1.81; 95% CI 1.31-2.49; $P < 0.01$), admission before procedure (AOR = 1.66; 95% CI 1.30-2.13; $P < 0.01$), and smoking (AOR = 1.50; 95% CI 1.17-1.94; $P < 0.01$). Risk factors associated with organ-space SSI were wound class (AOR = 2.45 for class 4 versus ≤ 2 ; 95% CI 2.16-2.78; $P < 0.01$), chemotherapy within 90 d (AOR = 1.57; 95% CI 1.33-1.84; $P < 0.01$), and steroid use (AOR = 1.46; 95% CI 1.29-1.65; $P < 0.01$). Receipt of an oral antibiotic prep preoperatively was the strongest factor associated with SSI. **CONCLUSIONS:** SSI types in patients undergoing laparoscopic colectomy have different risk factors. Modifiable risk factors may provide an opportunity to reduce SSI risk and its associated morbidity.

Surgery

Nasser H, Ivanics T, Ranjal RS, Leonard-Murali S, and Genaw J. Perioperative Outcomes of Robotic Versus Laparoscopic Sleeve Gastrectomy in the Superobese. *J Surg Res* 2020; 249:34-41. PMID: 31918328. [Full Text](#)

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BACKGROUND: The robotic platform is often used for bariatric surgery in superobese patients (body mass index ≥ 50 kg/m²) with the assumption that it offers a technical advantage. This study aimed to compare perioperative outcomes of robotic-assisted sleeve gastrectomy (RSG) and laparoscopic sleeve gastrectomy (LSG) in superobese patients. **METHODS:** The Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program database was queried for superobese patients undergoing nonrevisable RSG and LSG from 2015 through 2017. Univariate analysis and multivariable logistic regression were used to compare outcomes in RSG and LSG. **RESULTS:** A total of 61,493 patients (4685 RSG and 56,808 LSG) were identified. Patients were similar in terms of age (RSG 42.3 $\pm$ 11.8 versus LSG 42.4 $\pm$ 11.7 y; $P = 0.60$) and body mass index (RSG 56.8 $\pm$ 6.9 versus LSG 56.9 $\pm$ 7.1 kg/m²; $P = 0.17$). The RSG group had a longer operative time (102.4 $\pm$ 46.0 versus 74.7 $\pm$ 37.5 min; $P < 0.01$) and length of stay (1.79 $\pm$ 1.78 versus 1.66 $\pm$ 1.51 d; $P < 0.01$). Overall morbidity (RSG 3.5% versus LSG 3.7%; $P = 0.54$) and mortality (RSG 0.1% versus LSG 0.1%; $P = 0.73$) were similar between the two groups. After adjustment, RSG represented an independent risk factor for organ-space surgical site infection (adjusted odds ratio 2.70; 95% confidence interval 1.54-4.73; $P < 0.01$). **CONCLUSIONS:** Use of RSG in superobese patients infers higher risk for organ-space surgical site infection and is associated with prolonged operative time and length of stay. This questions the role of robotics in superobese patients undergoing sleeve gastrectomy.

Urology

Agochukwu NQ, Wittmann D, Boileau NR, Dunn RL, Montie J, Kim T, Miller DC, Peabody J, and Carozzi NE. Reply to K.P. Weinfurt et al. *J Clin Oncol* 2020; Epub ahead of print. PMID: 31895615. [Full Text](#)

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Urology

Sood A, Abdollah F, Jeong W, and Menon M. The Precision Prostatectomy: "Waiting for Godot". *Eur Urol Focus* 2020; Epub ahead of print. PMID: 31983662. [Full Text](#)

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Precision prostatectomy may allow patients to choose a risk-stratified surgical approach for treatment of localized prostate cancer.

Urology

Tsafir Z, Janosek-Albright K, Aoun J, Diaz-Insua M, Abd-El-Barr AE, Schiff L, Talukdar S, Menon M, Munkarah A, Theoharis E, and Eisenstein D. The impact of a wireless audio system on communication in robotic-assisted laparoscopic surgery: A prospective controlled trial. *PLoS One* 2020; 15(1):e0220214. PMID: 31923185. [Full Text](#)

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Vattikuti Urology Institute, Henry Ford Hospital, Detroit, Michigan.

BACKGROUND: Robotic surgery presents a challenge to effective teamwork and communication in the operating theatre (OR). Our objective was to evaluate the effect of using a wireless audio headset device on communication, efficiency and patient outcome in robotic surgery. **METHODS AND FINDINGS:** A prospective controlled trial of team members participating in gynecologic and urologic robotic procedures between January and March 2015. In the first

phase, all surgeries were performed without headsets (control), followed by the intervention phase where all team members used the wireless headsets. Noise levels were measured during both phases. After each case, all team members evaluated the quality of communication, performance, teamwork and mental load using a validated 14-point questionnaire graded on a 1-10 scale. Higher overall scores indicated better communication and efficiency. Clinical and surgical data of all patients in the study were retrieved, analyzed and correlated with the survey results. The study included 137 procedures, yielding 843 questionnaires with an overall response rate of 89% (843/943). Self-reported communication quality was better in cases where headsets were used (113.0 $\pm$ 1.6 vs. 101.4 $\pm$ 1.6; $p < .001$). Use of headsets reduced the percentage of time with a noise level above 70 dB at the console (8.2% $\pm$ 0.6 vs. 5.3% $\pm$ 0.6, $p < .001$), but had no significant effect on length of surgery nor postoperative complications. **CONCLUSIONS:** The use of wireless headset devices improved quality of communication between team members and reduced the peak noise level in the robotic OR.

Urology

Zeinali M, Lee M, Nadhan A, Mathur A, Hedman C, Lin E, Harouaka R, Wicha MS, Zhao L, **Palanisamy N**, Hafner M, Reddy R, Kalemkerian GP, Schneider BJ, Hassan KA, Ramnath N, and Nagrath S. High-Throughput Label-Free Isolation of Heterogeneous Circulating Tumor Cells and CTC Clusters from Non-Small-Cell Lung Cancer Patients. *Cancers (Basel)* 2020; 12(1). PMID: 31947893. [Request Article](#)

Chemical Engineering, University of Michigan, 2800 Plymouth Road, NCRC, Building 20-3rd Floor, Ann Arbor, MI 48109, USA.

Biointerfaces Institute, University of Michigan, 2800 Plymouth Road, NCRC B10-A184, Ann Arbor, MI 48109, USA. Institute for Medical Technology of Heidelberg University & University of Applied Sciences Mannheim, Paul-Wittsack-Strasse 10, 68163 Mannheim, Germany.

Molecular, Cellular, and Developmental Biology, University of Michigan, 1105 North University Avenue, 2220 Biological Science Building, Ann Arbor, MI 48109, USA.

Department of Internal Medicine, University of Michigan, 1500 E Medical Center Dr, Ann Arbor, MI 48109, USA.

Biostatistics Department, University of Michigan, Ann Arbor, MI 48109, USA.

Department of Urology, Henry Ford Health System, 1 Ford Place, Room 2D26, Detroit, MI 48202, USA.

Department of Surgery, University of Michigan, 1500 E Medical Center Dr, Ann Arbor, MI 48109, USA.

Veterans Administration Ann Arbor Healthcare System, 2215 Fuller Road, Ann Arbor, MI 48105, USA.

(1) Background: Circulating tumor cell (CTC) clusters are emerging as clinically significant harbingers of metastases in solid organ cancers. Prior to engaging these CTC clusters in animal models of metastases, it is imperative for technology to identify them with high sensitivity. These clusters often present heterogeneous surface markers and current methods for isolation of clusters may fall short. (2) Methods: We applied an inertial microfluidic Labyrinth device for high-throughput, biomarker-independent, size-based isolation of CTCs/CTC clusters from patients with metastatic non-small-cell lung cancer (NSCLC). (3) Results: Using Labyrinth, CTCs (PanCK+/DAPI+/CD45-) were isolated from patients ($n = 25$). Heterogeneous CTC populations, including CTCs expressing epithelial (EpCAM), mesenchymal (Vimentin) or both markers were detected. CTCs were isolated from 100% of patients (417 $\pm$ 1023 CTCs/mL). EpCAM- CTCs were significantly greater than EpCAM+ CTCs. Cell clusters of ≥ 2 CTCs were observed in 96% of patients-of which, 75% were EpCAM-. CTCs revealed identical genetic aberrations as the primary tumor for RET, ROS1, and ALK genes using fluorescence in situ hybridization (FISH) analysis. (4) Conclusions: The Labyrinth device recovered heterogeneous CTCs in 100% and CTC clusters in 96% of patients with metastatic NSCLC. The majority of recovered CTCs/clusters were EpCAM-, suggesting that these would have been missed using traditional antibody-based capture methods.

Conference Abstracts

Emergency Medicine

Farhan S, Marusca G, Bazydlo M, Neme K, Mikulandric N, Stephen J, Kortam N, Mayur R, Pelland D, Zagar N, Trapp MA, Henne E, Rohrer S, Szymanski S, Emole J, Peres E, and Janakiraman N. Prospective Randomized Study of Prophylactic Ciprofloxacin Versus Levofloxacin in Hematopoietic Stem Cell Transplant Patients: An Interim Report. *Biology of Blood and Marrow Transplantation* 2020; 26(3):S320.

S. Farhan, Hematology/Oncology and Stem Cell Transplantation and Cellular Therapy, Henry Ford Hospital, Detroit, MI, United States

Infection is a serious complication of hematopoietic stem cell transplantation (SCT). However, the optimum oral agent for antibacterial prophylaxis in SCT recipients remains uncertain. Different antibiotics might affect incidence of blood stream infections, resistance, *Clostridium difficile*, gut microbiome, GVHD and relapse. To explore this we started this first clinical trial of levofloxacin (Levo) versus ciprofloxacin (Cipro) at our center. Methods: This is a single center prospective randomized study. Patients who meet the SCT program criteria to undergo autologous or allogeneic hematopoietic stem cell transplantation are eligible. Results: We present interim results. 111 consecutive patients were randomized since June 2018. At the time of the present report 102 of these patients have follow up for 60 days or more. There were 62 males and 40 females. Median age at time of SCT was 61. Fifty received Cipro and 52 received Levo. Fifty-six patients had autologous (27 Cipro and 29 Levo) while 46 patients had allogeneic SCT (23 Cipro and 23 Levo). For allogeneic SCT, 12 patients in each group had ATG. Time to engraftment and length of stay were similar in both groups. In the Cipro group 6 patients (12%) had bacteremia while in the Levo group 7 (13%) had bacteremia. Of patients with bacteremia, in the Cipro group none had Gram negative bacteremia while in the Levo group 4 had gram negative bacteremia (OR 9.37, $p = 0.137$). In the Cipro group 6 patients had gram positive bacteremia while in the Levo group 3 patients had gram positive bacteremia (OR 2.22, $p = 0.277$). In the Cipro group, 6 (12%) had *Clostridium difficile* while in the Levo group only 1 (1.9%) had *Clostridium difficile* (OR 6.95, $p = 0.078$). Acute GVHD of all grades accrued in 17 patients (34%) in Cipro group and in 16 patients (30.7%) in the Levo group. Grade III-IV aGVHD occurred in 6 patients (12%) in Cipro group and in 3 patients (5.8%) in the Levo group (OR 2.23, $p = 0.277$). The hazard ratio for progression free survival was 0.67 (95% CI: 0.27, 1.67), $p=0.395$ for Levo vs. Cipro. The hazard ratio for overall survival, adjusted for auto/allo and age at transplant was 0.29 (95% CI: 0.09, 0.95), $p = 0.041$, for Levo vs. Cipro. However, 3 of deaths in the Cipro group were not related to type of antibacterial prophylaxis (listeriosis from contaminated food, fungal pneumonia in a wooden-house builder and stroke from intraventricular thrombus). So, unadjusted hazard ratio for overall survival (Levo vs. Cipro): 0.41 (95% CI: 0.13, 1.34), $p = 0.142$. Hazard ratio for overall survival (Levo vs. Cipro), adjusting for allo/auto and age at transplant: 0.39 (95% CI: 0.11, 1.33), $p = 0.132$. Conclusion: At this point, in this interim analysis, there seems to be a trend for Cipro to protect patients from gram negative bacteremia compared to levo. As a trade-off, there is higher trend for *Clostridium difficile* in the Cipro group compared to Levo group, but none is statistically significant so far.

Hematology-Oncology

Farhan S, Marusca G, Bazydlo M, Neme K, Mikulandric N, Stephen J, Kortam N, Mayur R, Pelland D, Zagar N, Trapp MA, Henne E, Rohrer S, Szymanski S, Emole J, Peres E, and Janakiraman N. Prospective Randomized Study of Prophylactic Ciprofloxacin Versus Levofloxacin in Hematopoietic Stem Cell Transplant Patients: An Interim Report. *Biology of Blood and Marrow Transplantation* 2020; 26(3):S320.

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Acute GVHD of all grades accrued in 17 patients (34%) in Cipro group and in 16 patients (30.7%) in the Levo group. Grade III-IV aGVHD occurred in 6 patients (12%) in Cipro group and in 3 patients (5.8%) in the Levo group (OR 2.23, $p = 0.277$). The hazard ratio for progression free survival was 0.67 (95% CI: 0.27, 1.67), $p=0.395$ for Levo vs. Cipro. The hazard ratio for overall survival, adjusted for auto/allo and age at transplant was 0.29 (95% CI: 0.09, 0.95), $p = 0.041$, for Levo vs. Cipro. However, 3 of deaths in the Cipro group were not related to type of antibacterial prophylaxis (listeriosis from contaminated food, fungal pneumonia in a wooden-house builder and stroke from intraventricular thrombus). So, unadjusted hazard ratio for overall survival (Levo vs. Cipro): 0.41 (95% CI: 0.13, 1.34), $p = 0.142$. Hazard ratio for overall survival (Levo vs. Cipro), adjusting for allo/auto and age at transplant: 0.39 (95% CI: 0.11, 1.33), $p = 0.132$. Conclusion: At this point, in this interim analysis, there seems to be a trend for Cipro to protect patients from gram negative bacteremia compared to levo. As a trade-off, there is higher trend for *Clostridium difficile* in the Cipro group compared to Levo group, but none is statistically significant so far.

Infectious Diseases

Farhan S, Marusca G, Bazydlo M, Neme K, Mikulandric N, Stephen J, Kortam N, Mayur R, Pelland D, Zagar N, Trapp MA, Henne E, Rohrer S, Szymanski S, Emole J, Peres E, and Janakiraman N. Prospective Randomized Study of Prophylactic Ciprofloxacin Versus Levofloxacin in Hematopoietic Stem Cell Transplant Patients: An Interim Report. *Biology of Blood and Marrow Transplantation* 2020; 26(3):S320.

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Pharmacy

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Public Health Sciences

Farhan S, Marusca G, Bazydlo M, Neme K, Mikulandric N, Stephen J, Kortam N, Mayur R, Pelland D, Zagar N, Trapp MA, Henne E, Rohrer S, Szymanski S, Emole J, Peres E, and Janakiraman N. Prospective Randomized Study of Prophylactic Ciprofloxacin Versus Levofloxacin in Hematopoietic Stem Cell Transplant Patients: An Interim Report. *Biology of Blood and Marrow Transplantation* 2020; 26(3):S320.

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Books and Book Chapters

Endocrinology and Metabolism

Shill JE. "Diabetic Ketoacidosis". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 444-446.e441. [Full Text](#)

Endocrinology and Metabolism

Shill JE. "Hyperglycemic Hyperosmolar Syndrome". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 716-717.e711. [Full Text](#)

Family Medicine

Casadei K, and Kiel J. "Triangular Fibrocartilage Complex (TFCC) Injuries". StatPearls. Treasure Island (FL), StatPearls Publishing. StatPearls Publishing LLC. 2020. PMID: 30725740. [Full Text](#)

The triangular fibrocartilage complex (TFCC) is a load-bearing structure between the lunate, triquetrum, and ulnar head. The function of the TFCC is to act as a stabilizer for the ulnar aspect of the wrist. The TFCC is at risk for either acute or chronic degenerative injury. Forced ulnar deviation and positive ulnar variation carry associations with injuries to the TFCC. Patients with TFCC injury will present with ulnar-sided wrist pain that may present with clicking or point tenderness between the pisiform and the ulnar head. MRI imaging is useful as a preliminary diagnostic tool; arthroscopy is the diagnostic gold standard. Treatment options include conservative therapies such as rest, NSAIDs, and corticosteroid injections as well as operative management.

Family Medicine

Casadei K, and Kiel J. "Proximal Humeral Epiphysiolysis (Little League Shoulder)". StatPearls. Treasure Island (FL), StatPearls Publishing. StatPearls Publishing LLC. 2020. PMID: 30485006. [Full Text](#)

Proximal humeral epiphysiolysis (Little League shoulder) is a shear or stress injury of the epiphyseal cartilage of the proximal humerus. Little League shoulder has also been referred to as osteochondrosis of the proximal humeral epiphysis and rotation stress fracture of the proximal humeral epiphyseal plate. Little League shoulder occurs exclusively in athletes whose physis remains open, prior to closure of the growth plate, and it classically affects youth baseball pitchers. Since growth plate closure occurs between 18 and 21 years old, injuries can theoretically occur until that age. However, the typical age at presentation is between 11 and 16 years old. Although it is typically described in youth baseball players and throwing athletes, there have also been cases reported in competitive gymnasts[1] and tennis players[2].

Family Medicine

Casadei K, and Kiel J. "Anthropometric Measurement". StatPearls. Treasure Island (FL), StatPearls Publishing. StatPearls Publishing LLC. 2020. PMID: 30726000. [Full Text](#)

Anthropometric measurements are a series of quantitative measurements of the muscle, bone, and adipose tissue used to assess the composition of the body. The core elements of anthropometry are height, weight, body mass index (BMI), body circumferences (waist, hip, and limbs), and skinfold thickness. These measurements are important because they represent diagnostic criteria for obesity, which significantly increases the risk for conditions such as cardiovascular disease, hypertension, diabetes mellitus, and many more. There is further utility as a measure of nutritional status in children and pregnant women. Additionally, anthropometric measurements can be used as a baseline for physical fitness and to measure the progress of fitness.

Gastroenterology

Ahmed A, and **Zuchelli T.** "Anatomy, Abdomen and Pelvis, Sphincter of Oddi (Hepatopancreatic Sphincter)". StatPearls. Treasure Island (FL), StatPearls Publishing. StatPearls Publishing LLC. 2020. PMID: 31855359. [Full Text](#)

First described by Ruggero Oddi in 1887, the sphincter of Oddi (SO) is a smooth muscle valve located in the second portion of the duodenum. It serves to regulate the flow of hepatic and pancreatic substances into the small intestines. Although its function seems simple, it represents a great example of how smooth muscle can be under the regulation by hormones and other signals. The SO serves many purposes in medicine and is often traversed in procedures such as endoscopic retrograde cholangiopancreatography (ERCP). This sphincter may also become dysfunctional at times requiring either medical or surgical intervention.

Nephrology

Andrievskaya M, and **Novak J**. "Hepatorenal Syndrome". Ferri's Clinical Advisor 2020. United States, Elsevier. 2020: 667. [Full Text](#)

Nephrology

Faber MD, and **Yee J**. "Hyponatremia". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 758-761.e751. [Full Text](#)

Nephrology

Faber MD, and **Yee J**. "Syndrome of Inappropriate Antidiuresis". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 1332-1334.e1331. [Full Text](#)

Nephrology

Karthikeyan V, and **Prashar R**. "Graft-Versus-Host Disease". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 598-600.e591. [Full Text](#)

Nephrology

Kopyt N, and **Yee J**. "Hyperkalemia". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 7168-7722.e7161. [Full Text](#)

Nephrology

Kumbar L. "Hypernatremia". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 726-728.e721. [Full Text](#)

Nephrology

Reddy ST. "Chronic Kidney Disease". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 338-341.e334. [Full Text](#)

Nephrology

Reddy ST. "Hypomagnesemia". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 755-757.e751. [Full Text](#)

Nephrology

Shaban H. "Rhabdomyolysis". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 1209-1211.e1201. [Full Text](#)

Nephrology

Soman S, and **Chitturi C**. "Cardiorenal Syndrome". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 302.e303-302.e307. [Full Text](#)

Nephrology

Uduman J. "Acute Kidney Injury". Ferri's Clinical Advisor 2020. United States, Elsevier. 2020: 39-44. [Full Text](#)

Nephrology

Uduman J. "Acute Tubular Necrosis". Ferri's Clinical Advisor 2020. United States, Elsevier. 2020: 72.e74-72.e75. [Full Text](#)

Nephrology

Umanath K. "Ferri's Clinical Advisor 2020". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 595.e593-595.e594. [Full Text](#)

Nephrology

Yee J. "Bartter Syndrome". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 211.e216-211.e217. [Full Text](#)

Nursing

Puckett Y, **Gabbar A**, and Bokhari AA. "Prednisone". StatPearls. Treasure Island (FL), StatPearls Publishing StatPearls Publishing LLC. 2020. PMID: 30521230. [Full Text](#)

Prednisone is a synthetic, anti-inflammatory glucocorticoid that derives from cortisone. It is biologically inert and converted to prednisolone in the liver. Prednisone is an FDA-approved, delayed-release corticosteroid indicated as

an anti-inflammatory or immunosuppressive agent to treat a broad range of diseases including immunosuppressive/endocrine, rheumatic, collagen, dermatologic, allergic states, ophthalmic, respiratory, hematologic, neoplastic, edematous, gastrointestinal (GI, acute exacerbations of multiple sclerosis, and as an anti-inflammatory and an antineoplastic agent. Prednisone is a corticosteroid (cortisone-like medicine or steroid). It works on the immune system to help relieve swelling, redness, itching, and allergic reactions. This medication is available only by prescription.[1]

Orthopaedics/Bone and Joint

Sattar MH, and **Guthrie ST**. "Anatomy, Back, Sacral Vertebrae". StatPearls. Treasure Island (FL), StatPearls Publishing
StatPearls Publishing LLC. 2020. PMID: 31869117. [Full Text](#)

The vertebral column, or spine, is composed of 33 vertebrae. These vertebrae play an essential role in protecting the spinal cord and the spinal nerves. They serve as a support for the head, neck, thorax, abdomen, and pelvis, while also allowing for flexibility and mobility through the presence of intervertebral discs and facet joints without compromising their supportive function. The spine consists of multiple segments. These are the: Cervical Spine - 7 vertebrae. Thoracic Spine - 12 vertebrae. Lumbar Spine - 5 vertebrae. Sacral Spine - 5 fused vertebrae. Coccyx - 3-5 fused vertebrae. A typical vertebra consists of a vertebral body and vertebral arch. These structures enclose the vertebral foramen, in which lies the spinal cord. Seven processes arise from each vertebra. These include two superior articular processes, two inferior articular processes, two transverse processes, and a spinous process. These processes serve as joint facets with adjacent vertebrae, attachment origins for muscles, and form intervertebral foramina from which spinal nerves arise.

Surgery

Czajka ML, and **Pfeifer C**. "Breast Cancer Surgery". StatPearls. Treasure Island (FL), StatPearls Publishing
StatPearls Publishing LLC. 2020. PMID: 31971717. [Full Text](#)

Breast cancer is the most common cancer of women in the United States. As of 2018, 1 in 8 women in the U.S. will have had a diagnosis of invasive breast cancer in their lifetime. The management of breast cancer is in constant evolution. Fortunately, survival rates continue to improve, likely due to improved individualized treatment as well as earlier detection. Surgery has been a mainstay of breast cancer treatment for several decades. It is often the sole treatment in the management of early-stage breast cancer. Understanding the current recommendations for surgical treatment is vital in the accurate diagnosis, staging, and treatment of patients with breast cancer. Multiple landmark studies published in the last several decades have led to the transition from more radical options, such as radical mastectomy, towards breast-conserving surgery (BCS). The National Surgical Adjuvant Breast and Bowel Project (NSABP) B-04 was instrumental in this transition. The study examined radical mastectomy to total mastectomy with or without radiation therapy. In patients who underwent a total mastectomy, axillary dissection was only necessary for the setting of positive lymph nodes. The NSABP B-04 trial confirmed there was no difference in disease-free survival, relapse-free survival, distant-disease-free survival, or overall survival between those who received total mastectomy or radical mastectomy. This development led to an overall shift away from radical surgical intervention.[1] To further direct treatment away from radical approaches, the NSABP B-06 trial was a randomized prospective study that included women with tumors less than 4-cm and compared mastectomy, lumpectomy, or lumpectomy with radiation. All women in the study also underwent axillary lymph node dissection as part of their surgical treatment. The study found no difference in disease-free, distant-disease-free, or overall survival between groups. Additionally, there was a significant decrease in local recurrence rates when lumpectomy was supplemented with radiation therapy, rather than lumpectomy alone.[2] This study was monumental in the evolution away from mastectomy towards breast-conserving surgery in women with early-stage invasive breast cancer. Despite these advances indicating similar overall survival between mastectomy and BCS when combined with radiation therapy, in recent years, mastectomy rates have continuously been increasing in number. There are a variety of theories regarding this, but most attribute the rate of increase to younger patient age, genetic testing, patient education, and the increasing availability of reconstruction options. Also, the use of magnetic resonance imaging (MRI) of the breast has shown recent interest, particularly in patients with dense breasts, positive family history, or difficulty in characterizing a breast tumor following diagnosis.[3] It is important to note, however, that studies have demonstrated that the use of MRI has a positive correlation in mastectomy rates, despite no increase in survival.[4]

Surgery

Hope WW, and **Pfeifer C**. "Laparoscopic Inguinal Hernia Repair". StatPearls. Treasure Island (FL), StatPearls Publishing
StatPearls Publishing LLC. 2020. PMID: 28613576. [Full Text](#)

Inguinal hernia repairs are one of the most common general surgical operations performed in the world. Diagnosis of inguinal hernias is typically performed using a thorough history, and physical and is typically signified by a bulge in the

groin. There are many treatment options for patients with inguinal hernias including watchful waiting, open primary repair, open tension-free repairs with the use of mesh prosthetics, and laparoscopic repairs which are typically performed with mesh prosthetics.

Surgery

Mathew G, and Pfeifer C. "Gallbladder, Cholecystitis, Clostridial (Gangrenous, Emphysematous)". StatPearls. Treasure Island (FL), StatPearls Publishing. StatPearls Publishing LLC. 2020. PMID: 28846291. [Full Text](#)

Emphysematous cholecystitis is a fulminant variety of acute cholecystitis that differs in its pathology and epidemiology from cholecystitis induced by gallstones. The characteristic feature of this sinister variant of cholecystitis is the presence of gas in the lumen and wall of the gallbladder. The presence of gas may be detected elsewhere in the biliary tract or adjacent structures in addition to gas in the gallbladder wall. Emphysematous cholecystitis occurs in about 1% of all cases of acute cholecystitis but carries significantly higher morbidity and mortality. Individuals most susceptible to emphysematous cholecystitis are people with diabetes mellitus and those with a weak immune system.[1][2][3][4]

Surgery

Regelsberger-Alvarez CM, and Pfeifer C. "Richter Hernia". StatPearls. Treasure Island (FL), StatPearls Publishing StatPearls Publishing LLC. 2020. PMID: 30725912. [Full Text](#)

Richter hernia is a less known entity of the hernia family. Although not well known and overall rare, Richter hernias can lead to grave clinical sequelae. The definition of Richter hernia is a herniation of the anti-mesenteric portion of the bowel through a fascial defect. This exact phenomenon explains the often subclinical symptoms and late presentation. With the advent of minimally invasive surgery, there was an increase in the incidence of Richter hernias, which has only continued as minimally invasive surgeries become more popular. Operative treatment of Richter hernias depends on the viability of the involved bowel and may often require bowel resection in addition to repair of the fascial defect.

Surgery

Rountree KM, and Lopez PP. "Partial Thromboplastin Time". StatPearls. Treasure Island (FL), StatPearls Publishing StatPearls Publishing LLC. 2020. PMID: 29939549. [Full Text](#)

Partial thromboplastin time (PTT) is the time it takes for a patient's blood to form a clot as measured in seconds. It is used to measure the activity of the intrinsic pathway of the clotting cascade. PTT tests the function of all clotting factors except VII (tissue factor) and XIII (fibrin stabilizing factor). PTT is commonly used in clinical practice to monitor patient response to unfractionated heparin infusion to target therapeutic anticoagulation, and as part of a "coagulation panel" to help elucidate causes of bleeding or clotting disorders.

Urology

Baumgarten L, and Leavitt DA. "Hydronephrosis". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 704-705.e703. [Full Text](#)

Urology

Borchert A, and Leavitt DA. "Acute Urinary Retention". Ferri's Clinical Advisor 2020. United States, Elsevier. 2020: 73-74.e71. [Full Text](#)

Urology

Sood A, and Leavitt DA. "Urolithiasis (Nephrolithiasis)". Ferri's Clinical Advisor 2020. Ferri FF. United States, Elsevier. 2020: 1425-1430.e1422. [Full Text](#)