THE GW SCHOOL OF MEDICINE AND HEALTH SCIENCES

MEDICAL STUDENT RESEARCH DAY
HIGHLIGHTING THE BREADTH OF RESEARCH AND SCHOLARLY ACTIVITY

MAY 7, 2021

School of Medicine & Health Sciences
THE GEORGE WASHINGTON UNIVERSITY
This year there will be a special medical student research day to be held on May 7th, 2021 that is distinct from the university-wide research day. This is an opportunity for all medical students to showcase their work through poster sessions and selected oral presentations. Awards will be presented for outstanding poster presentations.

Medical student research day is designed to highlight the breadth of research and scholarly activity that medical students have accomplished during their education at The GW School of Medicine and Health Sciences. All medical students are invited to present research regardless of the area of focus. Abstract submissions represent a broad range of research interests and disciplines, including basic and translational science, clinical research, health policy and public health research, and education-related research.
LIST OF PRESENTATIONS

CLINICAL & TRANSLATIONAL RESEARCH

The GW School of Medicine and Health Sciences 2021 Research Day
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Background: While drug-induced sleep endoscopy and magnetic resonance imaging are valuable studies for the assessment of obstructive sleep apnea etiology and severity, the varying protocols and medication regimens used in these procedures may alter results and inappropriately influence clinical decision making around OSA management. The sedative and anesthetic medications used in these studies have been shown to exert different effects on upper airway morphology, degree of obstruction, and vital signs. Furthermore, few studies have found consensus on these various effects. The aim of this study was to systematically review existing studies reporting morphological changes of the upper airway during DISE, sedated MRI, and sedated upper airway electromyography. Methods: This systematic review searched PubMed, Scopus, EMBASE, and Cochrane CENTRAL Register of Controlled Trials. An initial search was performed on June 4, 2020 and was specific to DISE. This search was later expanded to include sedated MRI and upper airway EMG studies on December 6, 2020. Inclusion criteria included reporting of location of airway collapse under specified sedative and/or anesthetic regimens; availability in English; publication in the past 10 years; and being a human study. Articles were excluded if they failed to meet inclusion criteria, failed to disaggregate different medication regimens in upper airway morphology results, had less than 3 patients, or did not provide original data. Two investigators independently reviewed all search results through the Covidence systematic review title/abstract and full-text screening program. Results: A total of 421 article titles/abstracts were screened, and of these 57 articles were eligible for full text review. Out of these, 23 studies met criteria for the qualitative synthesis. Primary medications of included studies were propofol, dexmedetomidine, midazolam, propofol-remifentanil, sevoflurane, lidocaine (4% topical), and pentobarbital. Medications with multiple included studies showed a wide variety of outcomes between studies. Study designs also varied widely, particularly in pre-medication regimens, sedation depths and scales, drug administration protocols, and sample demographics. Most, but not all, studies demonstrated that sedation with propofol (especially high dose/deep sedation) resulted in lower minimum and/or mean O2 saturation compared with low dose/light propofol sedation or sedation with other medications. Conclusion: Additional research is needed to determine the direct effects of sedative and anesthetic agents on upper airway morphology; however, variables such as pre-medication regimens, sedation depth and scale utilization, drug administration protocols, and study populations are likely to influence the results of these studies, and as such should be considered for standardization in future studies.
Introduction: Midazolam is commonly used preoperatively for anxiety. Adverse effects data in pediatric patients with obstructive sleep apnea (OSA) undergoing tonsillectomy and adenoidectomy (T&A) is limited. We hypothesized that preoperative midazolam increases time to emergence from anesthesia and postoperative discharge. Secondary objectives assessed if patients receiving midazolam experienced increased side effects or complications from treatment. Methods: This study was a retrospective chart review of patients undergoing T&A from July 2014 to December 2015. Midazolam receiving patients (Midazolam Group: MG) were compared to patients who did not (Non-Midazolam Group: NMG). Multivariable analyses were performed and adjusted for predefined potential cofounder variables. Results: Emergence and discharge times were 5.2 minutes (95% CI [-7.1, 17.4]; p=0.41) and 10.1 minutes (95% CI [-6.7, 26.8]; p=0.24) longer in MG. These results were not statistically significant. Comparing by OSA status, there was no statistical difference in emergence and discharge times between mild, moderate and severe OSA groups or between MG and NMG within each OSA group. Emergence and discharge times in moderate OSA was 6.1 minutes (95% CI [-17.6, 29.8]; p=0.61) and 18.8 minutes (95% CI [-16.4, 53.9]; p=0.29) longer than mild OSA, and in the severe OSA group, 2.6 minutes (95% CI [-19.9, 25.1]; p=0.82) shorter and 2.8 minutes (95% CI [-30.3, 35.9]; p=0.87) longer. The incidence of postoperative complications was comparable between MG and NMG groups. Conclusions: Premedication with midazolam was not associated with prolonged emergence or discharge time or higher incidence of complications after anesthesia for T&A in patients with OSA.
Ambulatory surgery has become common practice in the US pediatric population with over 70% of pediatric surgeries occurring on an ambulatory basis, making the ability to anticipate adverse events in the post-anesthetic care unit (PACU) critical. Several predictors have been previously indicated as risk factors for perioperative respiratory adverse events, including age, ASA status, obesity, pre-existing pulmonary disorder, and surgery type. The primary aim of the study is to identify predictors of significant PACU events for pediatric patients presenting to ambulatory surgery centers (ASC).

We conducted a retrospective chart review of 387 charts from 2019-2020 of pediatric patients from the Children’s National Montgomery ASC in Maryland to assess predictors present in patients with significant PACU events. We assessed variables of age, sex, race, obesity, ASA status, sleep apnea, pulmonary history, and cardiac history. PACU adverse events were defined as an airway event, post-op nausea/vomiting, post-op bleeding, post-op pain, admission to hospital, return to OR, and transfer to another facility while in the PACU. We compiled data and conducted analysis with RedCap. Of 387 patients, 103 patients had adverse events. The majority were post-op pain, with 97 patients reporting a pain score>1 and 38 of those patients requiring pharmacologic intervention. Airway events occurred in 6 patients. 3 of those patients with airway events were 12-months old and younger, and 2 of those patients had a respiratory co-morbidity. Post-op nausea/vomiting occurred only in 1 patient. Post-op bleeding occurred in 3 patients. 3 returned to the OR for post-op bleeding. There were no admissions to the hospital/transfers to another facility. The initial results of this study demonstrate that serious adverse events in appropriately selected children at ASC’s are rare and were associated with age.
Background: In children undergoing cardiopulmonary bypass (CPB), there is an increased risk of postoperative renal dysfunction due to the systemic inflammatory response to the cardiopulmonary bypass machine. In this single-center, retrospective cohort study we compared the incidence and severity of acute kidney injury (AKI) following open heart surgery in children less than 18 years of age after administration of exogenous inhaled nitric oxide (iNO) into the cardiopulmonary bypass circuit.

Methods: We retrospectively reviewed the medical records of all children less than 18 years of age who underwent surgery with cardiopulmonary bypass between January 4, 2017 and June 28, 2019. Patients were divided into 2 groups based on whether they received exogenous nitric oxide into the CPB circuit; all patients from March 7, 2018 through June 28, 2019 received exogenous nitric oxide 20 parts per million directly into the circuit during CPB. The primary endpoint was change in serum creatinine levels as defined as the difference between the preoperative creatinine (CrPre) and peak postoperative creatinine (CrmaxPost). The secondary endpoint was the incidence and severity of post-operative AKI as defined by Acute Kidney Injury Network (AKIN) criteria. Results: A total of 617 patients were included in the analysis: 321 (52%) in the control group (without inhaled NO) and 296 (48%) in the intervention group (with iNO). Control and intervention groups didn’t vary significantly in terms of demographic characteristics. After adjusting for the potential confounding variable of CPB times (above and below 120 minutes) there was no statistically significant difference in increase in serum creatinine between the control and the intervention groups (0.01 [95% CI: 0.02, 0.04], p= 0.535). There was also no statistically significant difference found between cohorts in patients under 6 weeks old (-0.05 (-0.13, 0.02) p=0.18). The incidences of AKI in the control and intervention groups by AKIN score were 12.6% (36 out of 285) and 12.5% (36 out of 288), respectively.

Conclusions: In this single center retrospective cohort study, we found no change in the incidence and severity of postoperative acute kidney injury after the administration of exogenous nitric oxide into the cardiopulmonary bypass circuit in children.
The liver is a major metastasis-susceptible site for malignant melanoma, particularly that of uveal origin. The liver's role in metastasis is not passive but rather, its pro-inflammatory response to circulating melanoma cells and their soluble factors can trigger a “liver pro-metastatic reaction (LPR)”, increasing patient vulnerability to metastatic liver disease. The inflammatory reaction of hepatic cells to both melanoma and host factors provides a special microenvironment which facilitates survival and growth of liver-colonizing melanoma cells. In addition, melanoma cells must be “LPR-responsive” and their detection may have implications for early diagnosis, prevention and treatment of liver-metastasizing melanomas. In particular, endogenous interleukin (IL)-1beta and IL-18 have prometastatic effects via vascular endothelial growth factor (VEGF)-induced melanoma cell adhesion to VCAM-1-expressing hepatic sinusoidal endothelium, which in turn points to VLA-4 as a prometastatic response factor for melanoma cells. The combined expression of IL-18R and VLA-4 has previously defined a “liver metastasis-competent” melanoma cell phenotype and a heterogeneous expression of IL-18-regulated signature genes was verified in lymph node metastases from patients with melanoma. However, it isn't clinically clear if generation of LPR-responsive melanoma cells is a required event preceding and enabling liver metastasis. Therefore, a better understanding of the hepatic metastasis-prone melanoma phenotype is needed to identify patients with and without “LPR-responsive” melanomas. We studied the gene expression pattern of melanoma cells with and without the VLA-4/IL-18R phenotype receiving recombinant VCAM-1 to mimic the LPR and to induce the VLA-4-dependent intracellular signaling pathway required for the metastatic implantation and growth of melanoma cells in the liver. Next, we determined the efficacy of VCAM-1-regulated signature genes to sort metastatic melanoma lesions with and without IL-18-regulated signature genes and to identify immune checkpoint (ICP) and cancer stem cell (CSC) genes contributing to differentiate melanoma subtypes with and without LPR-responsive phenotype. Finally, an in silico analysis was performed using clinicopathological data from 80 patients with uveal melanoma obtained from The Cancer Genome Atlas (TCGA) consortium to determine overall survival of uveal melanoma (UM) with and without the ICP and CSC genes associated to IL-18 and VCAM-1-regulated signature genes. Our results sorted patients developing UM with and without IL-18 and VCAM-1 effects, generating ICP and CSC gene expression patterns which affected survival. Because UM patient survival is mainly determined by liver metastases, gene signature identification of melanoma with or without the LPR-responsive phenotype may help for a better understanding of UM and aid in prediction of hepatic recurrence.
Despite recent advances, the efficacy of androgen/androgen receptor (AR)-targeted therapy is still limited for many patients with metastatic prostate cancer. This is in part because prostate cancers adaptively switch to the androgen/AR-independent pathway for survival and growth, thereby conferring therapy resistance. Tumor hypoxia is considered as a major cause of treatment resistance. However, the exact mechanism is largely unclear. Here we report that chronic-androgen deprivation therapy (ADT) in hypoxia induces adaptive androgen/AR-independence and therefore resistance to androgen/AR-targeted therapy, e.g. enzalutamide. Mechanistically, this is mediated by glucose-6-phosphate isomerase (GPI), which is transcriptionally repressed by AR in hypoxia, but restored and increased by AR inhibition. In turn, GPI maintains glucose metabolism and energy homeostasis in hypoxia by redirecting the glucose flux from androgen/AR-dependent pentose phosphate pathway (PPP) to hypoxia-induced glycolysis pathway, thereby reducing the growth inhibitory effect of enzalutamide. Inhibiting GPI overcomes the therapy resistance in hypoxia in vitro and increases enzalutamide efficacy in vivo.
Role of p53 in Regulation of Transposable Elements in Ovarian Cancer

Approximately half of all cancers have mutations in TP53, 90% of which are "hotspot" mutations located in the DNA binding domain. While the role of P53 in cell cycle regulation and apoptosis is known, P53 regulation of repetitive elements in cancer remains poorly defined. The premise of this project is that P53 and epigenetic mechanisms regulate REs in cancer and thus mutant TP53 will affect response to epigenetic therapy. In Dr. Chiappinelli's preliminary data, DNMTi/HDACi treated TP53 hotspot mutant cell lines exhibit significantly increased chromatin accessibility and transcription at REs compared to TP53 wild-type cell lines. We hypothesize that mutant TP53 aberrantly activates REs, increasing the DNMTi/RE-induced immune response. Our aim is to examine how wild-type and mutant p53 cooperate with epigenetic mechanisms to transcriptionally regulate REs response and interferon response. We previously established Hey ovarian cancer cell lines that have been CRISPR edited so that one Hey cell line has the wild-type p53 (control) and the other has an R175H CRISPR induced p53 mutation. In order to characterize these established cell lines, we ran qPCRs after treating with two p53 drugs: Etoposide and Nutlin. We then compared the gene expressions of some downstream p53 genes, ERVs, and Interferon-Stimulated Genes (ISGs) to measure immune responses. Comparing the graphs from the control cell line with wild-type p53 and that of the mutant p53, we saw that nutlin-3a did not alter the fold change in the expression of ERVs and LINE-1 elements in the mutant p53 cell line, however, there was some significant change in the expression of some ERVs in the wild-type p53 cell line. This is consistent with the fact that nutlin-3A only acts on wild-type p53. Furthermore, we treated the two cell lines with the DNMTi 5-azacytidine (AZA) and measured the ERV expression levels and immune responses. Both mutant and wild-type p53 cell lines showed an increase in the fold change expression of ERVs and ISGs with AZA. We conclude that both wild-type and mutant P53 can increase expression of ERVs. Furthermore, we sequenced p53 genes in patient samples from collaborators in Erlangen. From the DNA samples, we prepared libraries using the NEB chip-Seq kit and used Next Generation Deep Sequencing to determine the p53 mutational status. Going forward, we will analyze these sequences results to determine the p53 status and correlate this with the already known levels of ERVs, ISGs, and infiltrating immune cells in these patients.
Introduction: Paraneoplastic leukemoid reaction (PLR) is defined as a white blood cell (WBC) count greater than 50,000/mm³ with a neutrophilic predominance resulting from malignancy. The estimated prevalence of PLR in solid tumors is between 1 and 10%. About half of the patients with PLR have a lung malignancy, and 17% of them have non-small cell lung cancer (NSCLC). The underlying etiology of PLR is thought to be due to increased cytokine production by the tumor cells leading to recruitment of neutrophils and neutrophilic precursors. A previous study by Koyama et al using mouse models identified that a mutation to the gene STK-11 S216F (hereafter STK-11) caused recruitment of neutrophils in mice with K-ras driven NSCLC and found that the mutation down-regulated PD-1 ligand expression on tumor cells, potentially rendering immunotherapeutic agents targeting PD-1 ineffective against NSCLC. Case: We present a case of a 68-year-old man with a past medical history of COPD who presented with hyper-progression of NSCLC and PLR in the setting of a two-month hiatus from maintenance therapy. The patient was originally diagnosed with stage IV NSCLC by needle biopsy. Subsequently he received four cycles of Carboplatin, Pemetrexad and Pembrolizumab (an anti-PD-1 agent), and later underwent 11 cycles of maintenance therapy with Pemetrexad and Pembrolizumab. His WBC count was in normal range throughout therapy. His maintenance therapy was halted when he became ill with COVID-19 and then developed hemoptysis leading to hemorrhagic shock, for which he underwent embolization of the bronchial artery. He presented two months after his last treatment to oncology clinic for re-initiation of therapy and was found to have altered mental status, worsening cachexia, a new supraclavicular mass with radiologic features of metastatic tumor, and a WBC count of 97,000/mm³ with 99% mature neutrophils. The patient was admitted, and further workup ruled out other possible causes of leukemoid reaction including infection, primary hematologic malignancy and medications, leaving PLR as the most likely explanation for his neutrophilia. Genetic analysis of his tumor biopsy revealed a mutation in STK-11. Discussion: To our knowledge this is the first case in the medical literature that describes PLR in a NSCLC patient with an STK-11 mutation. We propose that the STK-11 mutation may have predisposed this patient to develop extreme PLR. Given previous research in mouse models, it is also possible that the STK-11 mutation may confer resistance to PD-1 inhibitors including Pembrolizumab.
Dinutuximab, a monoclonal antibody (mAb) against GD2, has increased survival for high-risk neuroblastoma (HR-NB), but anti-GD2 mAb-induced pain remains a dose-limiting toxicity and is an unmet medical need. Dinutuximab induces severe, transient allodynia that often necessitates multiple analgesics. Unlike cytotoxic chemotherapy, however, dinutuximab does not appear to cause long-term neurological complications. While this pain is thought to occur due to the presence of the GD2 ganglioside on peripheral nerves, its exact pathogenesis is poorly understood and has limited the development of targeted analgesic strategies. We conducted a narrative review of purported mechanisms of anti-GD2 antibody-induced pain using the PubMed and Google Scholar databases. We then evaluated the feasibility of current hypotheses and proposed new hypotheses for the pathogenesis of anti-GD2 mAb-induced pain, establishing unmet needs in the literature for the development of future studies. Our analysis found that anti-GD2 mAb-induced pain shares aspects of both inflammatory and neuropathic pain. Anti-GD2 mAb-induced pain has been thought to be caused by complement-dependent cytotoxicity (CDC). However, in clinical trials of Hu14.18K322A, a mAb which lacks the complement-binding domain of dinutuximab, patients still required opioid analgesia, which suggests pain independent of CDC. In vivo animal models of dinutuximab-induced allodynia have found that inhibition of the C5a receptor produces less allodynia relative to inhibition of C6. Moreover, clinical trials of naxitamab, an anti-GD2 mAb with a greater antibody-dependent cellular cytotoxicity (ADCC) to CDC ratio than dinutuximab, have demonstrated greater tolerability. These findings suggest that complement components indirectly contribute to pain, via yet-elucidated mechanisms independent of the complement cascade. Recent evidence suggests that complement-mediated pain is thought to occur through the upregulation and sensitization of the membrane ion channel TRPV1. Activation of the C5a receptor on macrophages causes the release of NGF, which increases neuronal transcription of pro-nociceptive peptides such as substance P and CGRP. The CGRP receptor has also been found to induce mechanical hypersensitivity independent of TRPV1 in a model of C5a-induced pain. The development of GD2-targeted CAR-T cell therapy, which has not produced severe pain in clinical trials, raises the possibility that anti-GD2 mAb-induced pain is specific to the humoral immune response. Future research should evaluate the feasibility of the proposed mechanisms discussed in this review, as well as the potential efficacy of targeted analgesic strategies.
Developing Prostate Cancer Organoids to Model Molecular Mechanisms of Health Disparities

Prostate cancer is the most frequently diagnosed cancer in men and the second greatest cause of cancer related mortality. It disproportionately impacts African American patients, who have incidence and mortality rates that are higher than their Caucasian counterparts. Despite evidence that there are marked differences in prostate cancer amongst Caucasian and African American patients, the field is lacking in models that accurately represent these differences. Recent advances in cell culture techniques have allowed researchers to produce three dimensional prostate organoids that have shown potential to be more viable in cell culture than a traditional cell monolayer. Here the growth of prostate cancer organoids from fourteen different patient samples were analyzed. Organoid size, number, and length of time in culture was evaluated with respect to tumor characteristics and culture methods. There was significant variability in the length of time organoids grew in culture, however the organoids that demonstrated the most promise came from African American patients with higher grade prostate cancers that showed tumor marker expression. These findings help to generate an ideal profile of characteristics that can be used in the future to predict which patients could be good candidates for the successful generation of immortal organoid lines.
The liver is a major metastasis-susceptible site for malignant melanoma, particularly that of uveal origin. The liver’s role in metastasis is not passive but rather, its pro-inflammatory response to circulating melanoma cells and their soluble factors can trigger a “liver pro-metastatic reaction (LPR)”, increasing patient vulnerability to metastatic liver disease. The inflammatory reaction of hepatic cells to both melanoma and host factors provides a special microenvironment which facilitates survival and growth of liver-colonizing melanoma cells. In addition, melanoma cells must be “LPR-responsive” and their detection may have implications for early diagnosis, prevention and treatment of liver-metastasizing melanomas. In particular, endogenous interleukin (IL)-1 beta and IL-18 have prometastatic effects via vascular endothelial growth factor (VEGF)-induced melanoma cell adhesion to VCAM-1-expressing hepatic sinusoidal endothelium, which in turn points to VLA-4 as a prometastatic response factor for melanoma cells. The combined expression of IL-18R and VLA-4 has previously defined a “liver metastasis-competent” melanoma cell phenotype and a heterogeneous expression of IL-18-regulated signature genes was verified in lymph node metastases from patients with melanoma. However, it isn’t clinically clear if generation of LPR-responsive melanoma cells is a required event preceding and enabling liver metastasis. Therefore, a better understanding of the hepatic metastasis-prone melanoma phenotype is needed to identify patients with and without “LPR-responsive” melanomas. We studied the gene expression pattern of melanoma cells with and without the VLA-4/IL-18R phenotype receiving recombinant VCAM-1 to mimic the LPR and to induce the VLA-4-dependent intracellular signaling pathway required for the metastatic implantation and growth of melanoma cells in the liver. Next, we determined the efficacy of VCAM-1-regulated signature genes to sort metastatic melanoma lesions with and without IL-18-regulated signature genes and to identify immune checkpoint (ICP) and cancer stem cell (CSC) genes contributing to differentiate melanoma subtypes with and without LPR-responsive phenotype. Finally, an in silico analysis was performed using clinicopathological data from 80 patients with uveal melanoma obtained from The Cancer Genome Atlas (TCGA) consortium to determine overall survival of uveal melanoma (UM) with and without the ICP and CSC genes associated to IL-18 and VCAM-1-regulated signature genes. Our results sorted patients developing UM with and without IL-18 and VCAM-1 effects, generating ICP and CSC gene expression patterns which affected survival. Because UM patient survival is mainly determined by liver metastases, gene signature identification of melanoma with or without the LPR-responsive phenotype may help for a better understanding of UM and aid in prediction of hepatic recurrence.
Prussian Blue Nanoparticles Targeting the Glioma-Associated TWEAK/Fn14 Axis Induces a Pro-Immunogenic Tumor Microenvironment in Glioblastoma Multiforme

Cellular immunotherapies have attained large success in treating various malignancies; however, these successes have not been replicated in glioblastoma multiforme (GBM): the deadliest and most prevalent form of brain cancer. A major obstacle immunotherapies face with respect to GBM is the fact that this tumor is immunologically “cold” and therefore largely unresponsive to current therapeutic modalities. In an effort to modulate the TME from “cold” to immunologically “hot”, we have developed a novel nano-immunotherapeutic platform combining Prussian blue nanoparticle (PBNP)-mediated photothermal therapy (PTT) with a tropic element that targets the upregulated TWEAK/Fn14 cytokine/receptor axis within the tumor microenvironment. Here we report the first use of this therapeutic modality against GBM. PBNPs prepared by co-precipitation were covalently cross-linked to aFn14 via an optimized EDC chemistry reaction. Stability assays show optimal aFn-14 attachment efficiency and retention of intrinsic photothermal energy conversion properties out to 20 days post-synthesis. In vitro data shows that aFn14-PBNP-mediated PTT causes thermo-ablative cell death in the majority of a GBM cell population (84%), with the degree of cell death correlated to the thermal dose imparted on the cell population. There was also release and/or overexpression of key biomolecular activators of innate immune cells including ATP, HMGB1, and calreticulin, all consistent with successful induction of an immunogenic cell death (p<0.005). In addition, the surviving tumor population also expressed lower amounts of immunological evasion markers such as CTLA-4 and PD-L1 (p<0.005), higher amounts of tumor specific disialogangliosides, and increased amounts of MHC Class-I and CD80/86 costimulatory markers (p<0.0005). Taken together, this data suggests that aFn14-PBNP-mediated PTT is not only an effective cytotoxic modality, it also holds promise for favorably modulating the TME for a subsequent secondary immunotherapeutic regimen.
Head and neck squamous cell carcinoma (HNSCC) is the sixth most common cancer and predicted to grow to one million cases annually worldwide. HNSCC is typically detected at a late stage and has a significant mortality rate, with a modest 66% 5-year survival rate. New therapeutic strategies are rapidly being explored for metastatic HNSCC, such as immune checkpoint inhibition and targeted therapy, but drug resistance and toxicity remain obstacles for effective treatment. Understanding the underlying molecular mechanisms in HNSCC is key to identifying novel biomarkers critical for predicting treatment response and discovering new targeted therapy approaches.

p38 kinases are key adaptive cellular response regulators and modulate important neoplastic processes, such as proliferation, differentiation, and survival, in response to extracellular stimuli, including stress and inflammatory signals. p38alpha and p38delta, the two main p38 isoforms in HNSCC, are overexpressed and/or activated in HNSCC, but their functions in HNSCC need to be fully delineated. We examined the effects of pharmacologic and RNAi-mediated inhibition of p38alpha and p38delta in human SCC9, and mouse MOC1 and MOC2 oral cancer cell lines. Co-inhibition of p38alpha and p38delta with Compound 62, a highly potent pan-p38 inhibitor, or a p38delta siRNA-mediated knockdown decreased human and mouse oral cancer cell viability. In addition, a simultaneous knockdown of p38alpha and p38delta in SCC9 decreased colony diameter and colony count in colony formation assays to a higher degree compared with the knockdown of the p38alpha and p38delta individually. Co-inhibition of p38alpha and p38delta led to G2/M cell cycle arrest in SCC9 and MOC1/MOC2 cell lines. We further assessed the gene expression, prognostic value, and clinical correlations of the p38 isoforms in The Cancer Genome Atlas HNSCC sample datasets, utilizing bioinformatics tools such as GEPIA, LinkedOmics, TIMER, and GSCALite. p38alpha and p38delta expression levels were similar among normal tissue and HNSCC tumor tissue samples. No significant correlation was observed for overall or disease-free survival of HNSCC patients and the levels of p38alpha and p38delta expression. However, lower p38delta expression and higher p38alpha expression correlated with higher immune cell infiltration, including CD4+ T cells, dendritic cells, and neutrophils, and increased T-cell exhaustion, suggesting that targeting p38delta in the HNSCC tumor microenvironment may stimulate antitumor immunity. This study highlights the potential paths for translational research targeting p38 isoforms in HNSCC.
Prescriptions for Medications from the Beers Criteria Among Older Adults Hospitalized for Heart Failure

Background: Potentially inappropriate medications (PIMs) are common in older adults. However, their prevalence among older adults hospitalized for heart failure (HF) - an especially vulnerable population that universally contends with polypharmacy - is unknown. To identify a potentially modifiable factor contributing to worse outcomes, we sought to investigate the determinants of PIM use among this population. Methods: We examined participants aged ≥65 years with expert- adjudicated hospitalization for HF between 2003-2017, derived from the geographically diverse REasons for Geographic and Racial Differences in Stroke (REGARDS) cohort. We abstracted data about PIM use (based on the 2019 American Geriatrics Society’s Beers Criteria) from medical records at hospital admission and discharge. We conducted a multivariable logistic regression analysis to identify the determinants of potentially harmful prescribing patterns, defined as the initiation or continuation of PIMs between admission and discharge. Results: Among 648 participants, the median age was 77 (IQR 70-84), 45.7% were female, and 33.6% were Black. The prevalence of PIMs was 61.1% at admission and 64.0% at discharge. Between admission and discharge, 19.1% of patients experienced an increase in the number of PIMs, 15.1% experienced a decrease, and 37.0% remained on the same number. The medications with the greatest increase from admission to discharge were proton pump inhibitors (32.6% to 38.6%) and amiodarone (6.2% to 12.2%). Polypharmacy, defined as the use of at least 10 medications, was the strongest determinant of potentially harmful prescribing patterns (OR: 2.27, 95% CI: 1.31-3.95, p-value = 0.003). Geriatric conditions, including cognitive and functional impairment, were not associated. Conclusion: PIM use is common among older adults hospitalized for HF and may be an important target to improve outcomes in this vulnerable population. Key Words: PIMs, adverse reactions
Background: Red blood cell (RBC) transfusions are a life-saving intervention, with nearly 14 million RBC units transfused in the United States each year. However, the safety and efficacy of this procedure can be influenced by variations in the collection, processing, and administration of RBCs. Specifically, procedures or manipulations that increase potassium (K+) levels in stored blood products can predispose patients to hyperkalemia and transfusion-associated hyperkalemic cardiac arrest (TAHCA).

Study design: We aimed to review the literature on the incidence of transfusion-associated hyperkalemia, highlight the association with TAHCA, and identify potential mitigation strategies to reduce the risk of TAHCA in pediatric patients. Results: We identified 21 case reports and case series documenting TAHCA in pediatric patients. Hyperkalemia and cardiac arrhythmias were reported in pediatric patients when blood products were transfused quickly, blood products were delivered directly to the heart without time for electrolyte equilibration, or when blood products accumulated extracellular K+ due to storage time or irradiation. We note that hyperkalemia and/or TACHCA may be underreported due to incomplete hemovigilance reporting. Collectively, these reports suggest that the risk of hyperkalemia may be mitigated by using fresh blood products, reducing storage time after blood product irradiation, and implementing manipulations that wash or remove excess extracellular K+.

Discussion: Advances in blood banking have improved the availability and quality of RBCs, yet, vulnerable patient populations are sensitive to transfusion-associated hyperkalemia. Mitigation strategies may help to reduce the risk of TAHCA, which is associated with an increased mortality rate following rapid blood transfusions.
Objective: The Norwood operation is the standard of care for the first stage of palliation of hypoplastic left heart syndrome (HLHS) in neonates. The hybrid strategy consisting of bilateral pulmonary artery banding (BPAB) with/without ductal stenting is an alternative for patients with ductal-dependent systemic circulation. We sought to understand outcomes of high-risk neonates with HLHS undergoing an initial hybrid palliation followed by risk-adjusted decision making for the second operation. Methods: Single-center, retrospective review of neonates with HLHS or variants who underwent hybrid stage I operation between December 2017 and February 2021. High risk criteria were defined. Primary outcome measure was mortality. Secondary outcome measures included post-operative reinterventions and utilization of ECMO. Results: 29 neonates met inclusion criteria; 10 received BPAB and prostaglandin while 19 received BPAP with ductal stenting. Median (range) age and body weight at hybrid stage I were 3 days (0-43) and 2.9kg (1.1-4.2), respectively. Median number of high risk criteria per patient was 5 (1-6). Preoperatively, 23 patients were on inotropic support (79%), 20 were intubated (69%), and 17 presented in a shock-stage (59%). There was =1 extracardiac anomaly in 20 patients (69%) and 16 had high-risk cardiac anatomy (55%). Operative survival after hybrid stage 1 was 93% (25/27); two patients received palliative care. Postoperative reinterventions were performed in 41% of patients (12/29) and 3% utilized ECMO (1/29). Median (IQR) length of CICU and hospital stay was 37 days (1-404) and 55 days (1-404), respectively. Seven patients received a comprehensive stage II operation with 86% survival (6/7); one patient has received a successful Fontan operation. Eleven patients were bridged to a delayed Norwood operation with 82% survival (9/11); survival after bidirectional Glenn operation was 83% (5/6). Two patients in the cohort received orthotopic heart transplantation and four patients received a biventricular repair with 100% survival. Overall survival in the cohort was 69% (20/29) at a median (range) follow-up time of 9 months (0-37). One patient is awaiting a stage II operation and ten are awaiting Fontan completion. Conclusions: High-risk neonates with ductal-dependent systemic circulation can be palliated using the hybrid strategy with excellent survival. Although we observed a high rate of postoperative reinterventions and long length of stay following hybrid stage I, risk-adjusted decision making for the second operation has shown good outcomes. This approach is a promising alternative for neonates with HLHS and multiple preoperative risk factors who may have otherwise died using the traditional approach.
Background: Myocarditis and dilated cardiomyopathy (M/DCM) are rare but important causes of morbidity and mortality in pediatric patients. Specifically, myocarditis is the most common cause of heart failure in children, and mortality ranges from 6-24%. DCM has significant overlap with myocarditis, with many patients presenting with myocarditis progressing to DCM. Diagnosis of these diseases is challenging because of the heterogeneity of presenting symptoms, but failure to diagnose can be fatal.

Objective: To compare clinical findings in patients with M/DCM to age- and chief-complaint-matched controls.

Methods: Retrospective case-control study of patients =21 years-old presenting to the emergency department of a quaternary care children's hospital between 2010 and 2019. Cases were identified using ICD 9/10 codes and were confirmed by medical record review. Patients with previously diagnosed heart disease or presenting with fulminant disease were excluded. Controls were identified in a 3:1 ratio to cases by random selection of patients matched on age and chief complaint category (respiratory, cardiac, GI, or fever). Medical history, physical exam, and diagnostic testing variables were identified from the medical record and compared using odds ratios with 95% confidence intervals.

Results: Between 2010-2019, we identified 47 eligible cases of M/DCM and 147 matched controls. Median age was 15.3 years (IQR: 6.2-17.0 years) with a bimodal distribution of 64% >12 years and 21% <2 years. Chest pain was the most common chief complaint in older children whereas respiratory symptoms were common in younger children. Table 1 depicts the findings associated with M/DCM in bivariable analyses. Cases were more likely to report vomiting or decreased appetite, and less likely to report cough or congestion. On physical exam, cases were much more likely to be tachycardic or tachypneic. Cases were also more likely to have an abnormal ECG. Labs were infrequently obtained in controls and thus were unable to be analyzed.

Discussion: The results of this case-control study are largely consistent with previous descriptive studies that were performed without controls. Key findings on history, physical exam, and diagnostic testing are strongly associated with the diagnosis of myocarditis/DCM. Multivariable analyses are ongoing and will provide the strength of independent association with each variable. Future multi-centered studies are needed to confirm these findings with the final goal to create a clinical prediction rule.
Cardiovascular disease remains the major cause of death in developed countries, with atherosclerosis leading to approximately 650,000 myocardial infarctions (MI) each year in the United States. While the current diagnostic gold standard for coronary artery disease (CAD) is coronary angiography via cardiac catheterization, less invasive blood tests identifying a regulatory T cell (Treg) imbalance have shown impressive sensitivity and specificity for CAD. Whole blood RNA analyses via single-molecule next-generation sequencing (NGS) of RNA (RNAseq) have identified transcripts associated with CAD (TRACs) that illustrate an mRNA signature of a Treg-like defect in CAD patients. Results have been variable, however, based on the specific single molecule sequencer product employed. The prospect of an accurate and reliable blood test to predict the development of atherosclerosis excites many and would fundamentally alter the diagnostic landscape for CAD. The objective of the project was to determine the degree of reproducibility among the primary techniques previously used to identify and quantify the Treg imbalance underlying atherosclerosis. Specifically, the single molecule sequencer from SeqLL and that from Illumina have been utilized previously and reflect some heterogeneity in their results. This knowledge would enable investigators to discern superior techniques and ultimately empower clinicians and to make use of the most reliable methods. Whole blood RNA was analyzed by single-molecule next-generation sequencing (NGS) of RNA (RNA-Seq) to identify TRACs in a discovery group and a validation group presenting for coronary catheterization. Whole blood RNA was depleted of ribosomal RNA (rRNA) and then sequenced on a SeqLL Single Molecule Sequencer. The resulting short reads were aligned to the human transcriptome and the number of reads per kilobase of exon per million (RPKM) was determined and compared between groups by a combined fold-change/p-value filter. This model was replicated in an additional study, and an identical design was undertaken using a sequencer from Illumina, and transcript reads were analyzed by sequencer product. Sequencing identified a profile of Treg imbalance in patients with even mild coronary stenosis (>20%) as confirmed on coronary angiography. The SeqLL platform identified a subset of 39 transcripts highly-associated with CAD that were replicated in a follow-up study (p<0.001), while the Illumina follow-up study displayed minimal meaningful overlap with its initial findings. The SeqLL sequencing platform of amplification-free, single molecule sequencing seems to be more reproducible than the amplification-dependent Illumina NextSeq. Future investigations will be directed toward establishing a clinically relevant amplification-free method of quantifying RNA in patient blood.
We present a case of a 60-year-old female with a history of anti-synthetase syndrome (anti-Jo-1+) who presented to the ER with chest pain. She was found to be in atrial fibrillation with rapid ventricular response. A subsequent EKG revealed ST elevations in leads V2-6 and I, II, aVL, and aVF. She was then admitted for emergency cardiac catheterization due to concern for STEMI but was found to have patent coronary arteries. The diffuse ST elevations suggested pericarditis. Furthermore, the myocardial involvement could have been a catalyst to biventricular dysfunction (EF 20%) due to potential interference of cardiac conduction pathways. Prior to the acute cardiac presentation, the patient demonstrated classic features of polymyositis, including ground glass opacities on X-ray and progressive bilateral proximal muscle weakness and dysphagia. The patient gradually improved following induction therapy with Solu-Medrol, IVIG, Rituximab, Eliquis, and Amiodarone. She received 1g IV methylprednisolone tapered to 40 mg IV for 20 days. She was then transitioned to 40 mg PO prednisone which was tapered by 5 mg prednisone daily, until dosage was sustained at 10 mg daily. Antisynthetase syndrome (ASS) is classically associated with autoantibodies against histidyl aminoacyl-transfer ribonucleic acid (tRNA) synthetase, and consists of the following clinical features: fever, inflammatory lung disease (ILD), Raynaud’s phenomenon, and hyperkeratosis over the distal digits of the dorsal hands (“mechanic’s hands”). ASS may also be associated with polymyositis, such as symmetric, bilateral proximal muscle weakness, as seen in our patient. The chronic inflammatory state, which implicates both humoral and cell-mediated immunity processes, can have relatively novel clinical presentations, such as perimyocarditis. ASS can induce an inflammatory myopathy and idiopathic cardiomyopathy. Under the microscope, one may discover a mononuclear infiltrate in the perivascular and endomysial layers of muscle. The inflammatory processes, in both skeletal and cardiac muscle, can be attributed to many factors. An infection, for instance, may act as a nidus for B cell activation, yielding antibody formation against an epitope, in a process known as molecular mimicry. B cells present this antigen to T cells, which further propagates the inflammation. Furthermore, the Jo-1 antibody upregulates the MHC class I molecule, which has been associated with lung and muscle inflammation. In our patient, the initial inflammatory process most likely progressed to implicate cardiac tissue. Along with other autoimmune cardiac processes occurring in this patient, coronary artery inflammation and coronary vasospasm could have led to this patient’s conductive dysfunction and biventricular failure.
Introduction: This case exemplifies an inaccurate diagnosis of primary pulmonary artery hypertension (PAH) in a pediatric patient with missed patent ductus arteriosus (PDA) with right-to-left shunting at birth, which then progressed to Eisenmenger syndrome due to inappropriate vasodilatory therapy. The objective is to clarify the signs and symptoms easily missed in right-to-left shunting PDA in the pediatric population and to describe the expected findings on echocardiogram, in order to aid clinicians in avoiding inaccurate diagnosis of primary PAH. Case Presentation A 13-year-old girl from Patna, India with past medical history of Down’s syndrome and idiopathic PAH (on five years of vasodilator therapy) presented with history of bluish discoloration and excessive fatigue with exertion. Multiple echocardiograms performed at local centers suggested a dilated right atrium and right ventricle (RV), PAH, and RV dysfunction, for which she was referred to a higher center of care. On examination, she had systemic oxygen saturation of 95% in the upper limbs and 90% in the lower limbs, narrow S2 with loud split P2, and parasternal heave. Admission echocardiogram revealed PDA measuring 7mm with right-to-left shunting, severe supra-systemic PAH, and mild RV dysfunction. The patient received a cardiac catheterization with vasoactive testing, which showed supra-systemic pulmonary artery pressures, but no response to vasodilator testing with nitric oxide. In view of the supra-systemic pulmonary artery pressures and gross desaturation from the ascending to descending aorta (suggestive of a right-to-left shunt), balloon occlusion of the PDA was not done, but rather deferred for a later stage after optimization of pulmonary vasodilator therapy. Conclusion This case study demonstrates that a right-to-left shunting PDA is likely to be missed on echocardiography without appropriate examination and follow-up testing, reaffirming the importance of detailed examination at birth of patients with suspected primary PAH and appropriate follow up.
Introduction: Since the start of the pandemic, approximately 3.2% of patients with COVID-19 required intubation and mechanical ventilation at some point during their treatment course. Intubators are at particular risk of infection due to the aerosol-generating nature of the procedure. Simulation training (ST) offers an opportunity for trainees to enhance knowledge and skills in airway management and has been used as a training tool to prepare health providers for airway management of COVID-19 patients. The purpose of this study is to explore the demographics of providers participating in COVID-19 specific ST and the efficacy of ST in improving provider experience during the intubation of COVID-19 patients. Methods: In this multicenter cross-sectional national study, electronic surveys were sent to intubators from 32 hospitals between 9/2020 and 12/2020. The survey assessed providers’ comfort of intubating and fear of contracting COVID-19 during COVID-19 intubations using 1-10 scale. Various demographic and exposure factors were also collected. Simulation training group (ST) and no simulation training group (non-ST) were compared using the Mann-Whitney U test, Fisher’s exact test, and Chi-square test of homogeneity. Statistical significance was declared at p<0.05. Results: A total of 186 surveys from 32 hospitals were analyzed after excluding surveys that reported no experiences with COVID-19 intubations. From 32 hospitals, 28 hospitals (87.5%) had providers participating in ST. Within those hospitals, the attendance of ST ranged from 44.4% to 100.0%. From 186 providers, 62 providers (33.3%) reported participating in a ST. Of those, 45 (72.6%) of them reported that the ST helped reduce their fear of intubating COVID-19 patients. More women participated in the ST compared to men (n=36, 58.1% vs. n=26, 41.9%; p=0.049). There was no difference in the number of COVID-19 intubations and COVID-19 exposure factors between the two groups. Providers in the ST group reported a higher level of comfort level with intubating COVID-19 patients than providers in the non-ST group (median=9, IQR=3-10 vs. 8, 1-10; p=0.021). Conclusions: Our study demonstrated that COVID-19 specific intubation simulation training improved providers’ comfort level during COVID-19 intubations. Moreover, the majority of providers reported a reduction in fear of intubating COVID-19 patients after participating in simulation training. Simulation training on intubation may be implemented as part of airway management training for health care providers during the COVID-19 pandemic as well as in novel pandemic situations to help providers’ comfort and fear.
Ethnic Disparities in Outcomes Among COVID-19 Patients in Our Nation’s Capital

Introduction/Hypothesis: African American and Hispanic patients have been disproportionately affected by infection with SARS-CoV-2 and subsequent coronavirus disease (COVID-19). Initial data suggests that these populations are more likely to suffer severe illness requiring hospitalization compared to Whites. We sought to further investigate the effects of race and ethnicity on critical care outcomes in hospitalized COVID-19 patients within the ethnically diverse area of the District of Columbia.

Methods: We performed a single-center, review of a prospective registry of 233 patients hospitalized with COVID-19 at an urban, academic hospital in Washington, D.C. Demographic and clinical data was gathered from chart review. We compared mean admission SOFA and APACHE scores, along with rates of ICU admission, intubation and mortality between White, Black, Hispanic, and Other ethnicities.

Results: Of the admitted patients 3.8% (n=9) were White, 70% (n=166) were Black, and 17% (n=41) Hispanic, with 7.7% (n=18) unknown or Other race. The mean admission SOFA score for White, Black and Hispanic patients were 3.14, 2.65 and 1.88, respectively. The mean APACHE scores for Whites, Blacks, and Hispanics were 15.25, 17.85, and 14.75, respectively. 56% (n=5) of Whites, 29% (n=48) of Blacks, and 41% (n=17) of Hispanics were admitted to the ICU. Intubations occurred in 44% (n=4) of Whites, 17% (n=28) of Blacks, and 37% (n=15) of Hispanics. Mortality rates were 22% (n=2), 30% (n=49) , and 29% (n=12) in Whites, Blacks, and Hispanics, respectively.

Conclusions: According to estimates by the US census bureau, the population of the District of Columbia is 46% White, 46% Black, and 11.3% Hispanic. Our data demonstrates a disproportionate hospitalization rate in minorities affected by COVID-19. Despite lower ICU admission and intubation rates, Blacks had a high mortality rate. There was a disproportionately high utilization of the ICU care, intubation and mortality amongst Hispanics. Further investigation is necessary to examine causes of these significant health disparities and to prevent further health inequalities amongst minorities.
Objective: To examine the clinical characteristics and complications of COVID-19 patients experiencing neurologic symptoms. Methods: In this single-center, retrospective, observational case series, we examined clinical data for COVID-19 patients hospitalized at the George Washington University Hospital (GWUH) as the Spring 2020 stay-at-home orders began to take effect in the District of Columbia. Study data were obtained from an internal hospital data registry of patients with laboratory confirmed COVID-19. We initially identified 303 records for patients with a recorded discharge date from GWUH between March 27, 2020, and May 27, 2020. We excluded incomplete records (n=22) or records from a subsequent readmission (n=1). Patients were recorded as having neurologic manifestations if they reported experiencing neurologic symptoms, prior to or upon hospital admission. Additionally, patients who received inpatient head CT with findings suggesting an acute cerebrovascular accident (CVA) were included in the “neurologic manifestations” group. Data analysis was performed using Prism statistical software version 9 (GraphPad Software) and Excel for Mac version 16 (Microsoft). Results: Clinical data for 280 patients (mean [SD] age, 62.3 [17.9] years; 150 men and 130 women) ultimately met our criteria for inclusion. Most patients (85.4%, n=239) experienced symptoms that have been associated with COVID-19 infection, with 31.8% (n=89) experiencing neurologic manifestations. The most common neurologic symptoms reported were impaired consciousness (16.1%, n=45), headache (8.6%, n=24), and loss of smell or taste (4.3%, n=12). Of the patients who underwent head CT imaging, 4 had evidence suggesting an acute CVA. Charlson Comorbidity Index scores for those with neurologic manifestations (median [IQR] score, 5 [2–7]) were statistically significantly higher than for those without neurologic manifestations (median [IQR] score, 3 [1–6]), U=6697, p=0.0039. Overall mortality in our study population was 25.4% (n=71). Kaplan-Meier survival analysis showed that median survival during hospitalization was worse in patients experiencing neurologic manifestations (13 days; 95% CI, 0.3646 to 0.9577) compared to those without neurologic manifestations (22 days; 95% CI, 1.044 to 2.743). The survival distributions were compared using the log-rank test and statistically significantly different (Chi-Square=5.069, p=0.0244). Conclusion: In this study, we examine the clinical characteristics of hospitalized patients with COVID-19 during an 8 week period from the early months of the 2020 pandemic in Washington, D.C. Neurologic manifestations were common, especially in those with comorbidities, and associated with poorer in-hospital survival.
Introduction: Given the risk of transmission, severe degrees of hypoxia, and PPE requirements, providers have encountered additional challenges while intubating COVID-19 patients. Several studies have demonstrated that senior physicians are more likely to achieve successful endotracheal intubations on the first attempt and show better confidence leading resuscitations. The purpose of this study was to explore the association between provider age and years in training and comfort levels during primary and subsequent intubations of COVID-19 patients. Methods: In this IRB-approved national multi-center, prospective, cross-sectional study, we used a snowball sampling approach to administer a 24-question survey to providers across different specialties, training levels, and geographic locations in the United States. Data was analyzed using Pearson’s chi-squared, Mann-Whitney U, and Wilcoxon rank tests. Results: We analyzed 186 responses from providers at 32 hospitals after excluding incomplete surveys and surveys that reported no experiences with COVID-19 intubations. Providers were more comfortable with intubation in general than with intubation of COVID-19 suspected patients (median 10, IQR = 5-10, vs. 8, IQR = 1-10, p < 0.0005). Providers with more than 16 years of experience reported greater comfort with intubation in general and intubation of COVID-19 patients than providers with 0 to 5 years of experience (median 10, IQR = 6-10, vs. 9, IQR = 5-10, p < 0.0005 and median 9, IQR = 3-10, vs. 8, IQR = 1-10, p = 0.006). Between primary and subsequent intubation attempts of COVID-19 suspected patients, fear of contracting COVID-19 declined from a median rating of 7, IQR = 1-10, to 4, IQR = 1-10 (p < 0.0005). Across all age groups, there was no difference in fear level during the first intubation attempt of a COVID-19 suspected patient. During subsequent intubation attempts, however, providers aged 25 to 35 years old averaged a higher fear rating than providers older than 56 years old (median 5, IQR = 1-10, vs. 3, IQR = 1-9, p = 0.048). Conclusions: While all age groups experienced similar fear levels during initial intubations of COVID-19 patients, providers older than 56 years old encountered less fear than providers aged 25 to 35 years old during subsequent intubations. Despite the heightened risk of infection due to age, it is possible that older providers encountered less fear during subsequent intubations due to more practice managing airways in the past and greater confidence with leading resuscitations.
Anesthetic Outcomes in Pediatric Patients with COVID-19: A Matched Cohort Study

Introduction: Data regarding the clinical implications of COVID-19 are crucial to inform decision making in healthcare. Pediatric patients with viral infections are known to be vulnerable to perioperative complications, often respiratory in nature. However, limited information is available regarding the perioperative and anesthetic risks associated with concurrent SARS-COV-2 infection, particularly in children. Several studies have demonstrated that postoperative pulmonary complications occur frequently in adult patients with perioperative SARS-CoV-2, however comparable data is not available for pediatric patients. This study compared anesthetic outcomes in pediatric patients, with and without confirmed SARS-CoV-2 infection, undergoing general anesthesia. We hypothesized that children with confirmed SARS-CoV-2 infection are at an increased risk of developing post-anesthesia complications compared to those without. Secondly, we hypothesized that an association exists between the presence of SARS-CoV-2-related symptoms and post-anesthesia complications, among children with SARS-CoV-2. Methods: This single-center, retrospective, case-control study included 35 pediatric patients with confirmed SARS-CoV-2 infection who underwent anesthesia for a surgical procedure or diagnostic study and 70 non-SARS-CoV-2 control patients, matched 1:2 by age and type of procedure. SARS-CoV-2 infection was defined as a positive SARS-CoV-2 polymerase chain reaction (PCR) test within 7 days prior to the anesthetic. All anesthetics occurred between January 3, 2020 and September 24, 2020. The primary outcomes of the study included post-anesthesia complications within 30 days. Secondary outcomes were 30-day mortality, hospital length of stay (LOS), and intraoperative complications. Conditional logistic regression models were used to evaluate the relationship between cases and controls and prognostic factors. Results: The median age of the patients was 3.7 years (IQR 1-6) with 49% female. 26% of SARS-CoV-2 cases had post-anesthesia complications compared to 1% of controls (OR=18.00, 95% CI 2.49, 788.96, p=0.0007). SARS-CoV-2 patients were more likely to exhibit preoperative upper respiratory tract infection symptoms than controls. There were no deaths within 30 days of procedure. There was also no evidence for a difference in hospital LOS between the two groups and no intraoperative complications in either group. Comparing SARS-CoV-2 patients that were symptomatic (n=13) to those that were asymptomatic (n=22), there was no significant difference in the incidence of post-anesthesia complications (p=0.8869) or in LOS (p=0.8733). Conclusion: SARS-CoV-2 positive pediatric patients undergoing surgical procedures or exams under anesthesia may be at higher risk for immediate post-anesthesia complications than their SARS-CoV-2 negative counterparts. SARS-CoV-2 status is important to discern in evaluating risk for post-anesthesia complications in this patient population.
Identifying clinical findings that can be used to predict mortality in COVID-19 positive patients remains challenging. Many patients with COVID-19 present with dyspnea and physical examination findings concerning for pulmonary pathology, thus chest imaging is obtained upon presentation as a potential prognostic tool. Identifying findings in chest imaging that are correlated with mortality is critical in triaging high-risk patients and may aid in reducing mortality in COVID-19 positive patients. This retrospective chart review consisted of 365 hospitalized patients that tested positive for COVID-19 at an urban tertiary care center in the United States between March 1, 2020 and May 31, 2020. Data was collected on the presence and distribution of abnormalities including: opacities, consolidation, lymphadenopathy, pleural effusion, pulmonary edema, cardiomegaly, cavitation, empyema, and/or pneumothorax from official imaging reports dictated by radiologists of the institution. Correlations between initially chest x-ray findings and mortality in these patients were assessed, with the exclusion of patients with unknown mortality data. Statistical analysis was completed to determine whether a statistically significant relationship existed between initial chest X-ray findings and patient mortality. The majority of patients received chest imaging within the first week of hospitalization, with most (91.78%) receiving at least one chest X-ray. Abnormalities were present on 273/335 (81.49%) of patient’s chest X-rays. The most frequently reported abnormality was opacities (62.39%), typically in a bilateral distribution (53.43%). No chest X-ray showed lymphadenopathy, cavitation, empyema, or pneumothorax, thus these variables were removed from analysis. The variables “consolidation” and “upper distribution” were also removed as they were present on less than 10 chest X-rays. We excluded from data analysis those patients for whom mortality or chest imaging information was not available. These exclusions resulted in 323 patients remaining for final mortality analysis. There is a statistically significant association between the chest imaging findings of diffuse opacities; diffuse or bilateral distribution of opacities; pleural effusion; and/or underlying lying conditions, namely pulmonary in nature, and mortality with a p-value of 0.002. However, there was no significant association between the findings of opacities in the peripheral, central, and peribronchovascular distribution; focal opacification; pulmonary edema; or cardiomegaly and mortality. Further analysis of this data is needed to determine the role that initial chest imaging can play in predicting mortality in COVID-19 positive patients. Further analysis of this data can also be used to identify patients who are at increased risk of COVID-related mortality.
Objective: General endotracheal anesthesia (GET) in asymptomatic COVID-19 patients could precipitate a systemic inflammatory response syndrome (SIRS) and ultimately respiratory failure. This study evaluates outcomes in patients undergoing urgent surgery with GET unrelated to their asymptomatic COVID-19 infection. Methods This is a retrospective, single institution study from March through December 2020. We included asymptomatic polymerase chain reaction (PCR) positive COVID-19 patients who underwent urgent surgery; asymptomatic status was based on chart review. Primary outcomes included unplanned reintubation, mechanical ventilation greater than 48 hours, bacterial pneumonia, and mortality. Secondary outcomes included major cardiac adverse events (MACE), Deep Vein Thrombosis, Pulmonary Embolism, and Intensive Care and hospital length of stay. Results There were 27 patients who met inclusion criteria, of which 12 were trauma activations. There were no unplanned reintubations, 3 patients (11%) required mechanical ventilation greater than 48 hours, 1 of which (4%) was diagnosed with bacterial pneumonia, 2 of whom (7%) died. One patient required laparotomy with gastric ulcer ligation for a gastrointestinal (GI) bleed and remained intubated for open abdomen management. One patient required multiple laparotomies and bowel resections for GI bleed and died from multi-system organ failure. One patient required a decompressive craniotomy after massive trauma and care was withdrawn due to neurologic function. Secondary outcomes are shown in Table 1. Conclusion Our study demonstrated that patients’ morbidity and mortality was more consistent with their underlying clinical presentation than their asymptomatic COVID-19 status. This study suggests it may be safe to proceed with urgent surgery if clinically necessary. Table 1. Postoperative outcomes in asymptomatic COVID-19 patients undergoing emergent and urgent surgery. Hospital and ICU length of stay are reported as: days (+/- standard deviation).
Introduction: The COVID-19 pandemic has resulted in an increased use of Powered Air Purifying Respirators (PAPRs), by health care providers to mitigate the risk of viral transmission, especially for aerosol-generating procedures. In this study, we evaluate communication devices that could be used concurrently with PAPRs to promote improved communication. Methods: We tested two devices, a Bluetooth earpiece and a neckpiece that operated over mobile networks, against a control scenario in a simulated operating room environment with participants donning PAPRs. Participants read a short paragraph to each other, transcribed short phrases, and evaluated the scenarios according to speech intelligibility, ease of use, and comfort. Results: There were 30 participants of varying PAPR experience. The Bluetooth headset had the most accurate transcriptions, followed by control, and lastly the neckpiece (94.7% vs 88.4% vs 76%, p<0.001). Conclusion: Communication devices have the potential to bridge but also worsen communications barriers between providers donning PAPRs.
As of abstract submission, the SARS-CoV-2 coronavirus (COVID-19) has killed over 2.5 million people worldwide. Early risk factors for mortality were identified as advanced age and various comorbidities. As more patients began requiring hospitalization and advanced airway management, many hospitals faced equipment shortages. Resource-limited areas overwhelmed by a heavy infection burden considered ventilator rationing and withholding life-saving interventions from individuals over a certain age due to inevitably increased mortality. To build a better framework for resource allocation, we examined whether healthy elderly individuals have increased mortality over their younger counterparts with comorbid conditions. The Charlson Comorbidity Index (CCI) is a popular risk adjustment tool for 10-year survival in patients but was never applied to COVID-19 patients. We hoped to determine whether age or the CCI is superior in predicting mortality in COVID-19 patients. Between March - July 2020, a prospective registry containing all COVID-19 admissions to George Washington University Hospital was created. A receiver operator characteristic (ROC) curve was created for both age and CCI as a predictor of mortality. Data was then divided into age brackets with a breakdown of CCI quartiles for each bracket. In total, 369 patients were studied. Mean age was 61.5 years and CCI was 3.91. The ROC curve for CCI yielded an Area under the Curve (AOC) of 0.6476 (0.57-0.72), while that for age yielded an AOC of 0.6737 (0.60-0.75). ROC contrast estimation of these two predictors did not indicate that one was significantly better than the other. However, analysis of age groups by CCI revealed certain healthy older age groups with better survival than their younger counterparts with comorbidities counterparts. 91–100-year-olds with a lower quartile CCI (0-5,6) had a 0-33.3% mortality rate, markedly better than 81–90 year-olds with a CCI of 7 (57.1%) or = 9 (75%) and even 61–70-year-olds with a CCI of 5–6 (53.8%) and 7-10 (50.0%). Comparing both age and CCI did not show a difference in mortality prediction for the population represented in this registry. However, our study suggests that one must reconsider withholding treatment from the healthy elderly population, as these patients may have better survival than their younger, but more comorbid, counterparts. Further studies are needed to evaluate these trends and to possibly look at a larger COVID-19 patient sample, rather than just those admitted to GW hospital.
Introduction: Since healthcare providers performing intubations (intubators) of confirmed COVID-19 patients are at particular risk of infection, many intubators utilize powered air-purifying respirator (PAPR) in addition to currently recommended PPE. Our study aims to compare various demographic, exposure factors, and feeling of adequacy on PPE usage between PAPR and only N95 use during intubation of suspected or confirmed COVID-19 patients. Methods: In this multicenter cross-sectional national study, electronic surveys were disseminated to intubators between 9/2020 and 12/2020. Various demographic and exposure factors, and feelings of the adequacy of PPE were collected. Respondents using PAPR with or without N95 (PAPR group) were compared to those using only N95 (N95 group) using the Mann-Whitney test, Fisher’s test, and Chi-square test. Statistical significance for these tests was declared at p< .0125). More providers who use PAPR felt that PPE was adequate during the majority of the intubation for COVID-19 patients compared to those who use N95 only (n=67, 98.5% vs. n=97, 85.1%, p=0.003). Conclusions: More providers who use PAPR with or without N95 as a part of their PPE felt that PPE was adequate during COVID-19 intubations compared to providers who only use N95. This suggests that PAPR may provide an additional benefit to healthcare providers who feel that PPE is inadequate during the intubation for confirmed or suspected COVID-19 patients.
Introduction/Hypothesis: Acute respiratory disease syndrome (ARDS) is due to compromised lung oxygen exchange in the setting of severe alveolar inflammation. This can be assessed and diagnosed using the ratio of alveolar oxygen saturation (PaO2) to the fraction of inspired oxygen (FiO2), P-F ratio. In hospitalized COVID-19 patients, the role of trending inflammatory markers to categorize levels of ARDS severity in the clinical setting has yet to be established. In this study, we describe the correlational relationship of five biomarkers to the PaO2/FiO2 ratio (P-F ratio), a key diagnostic criterion, and a measure of severity in ARDS. Methods: This is a prospective cohort analysis of SARS-CoV-2 patients admitted to the ICU at a single urban academic center from March to June 2020. Levels of Endotoxin activity assay (EAA), CRP, ferritin, LDH, and d-dimer were obtained from intubated patients throughout their ICU stay. PaO2 and FiO2 values matching the same days as the biomarkers and demographic information were abstracted from the medical record. The inflammatory markers were matched to the P-F ratios of the same day, and Spearman Correlation Coefficients were performed to detect the relationship between them. Results: A total of 45 intubated COVID patients were included, with baseline characteristics of: median age 55 years and 33% female, 62% Black, 27% Hispanic, 9% Asian, and 2% White. Spearman Correlation Coefficient (rho) showed statistically significant relationships between P/F ratios and EAA, IL-6, CRP, and ESR, with respective values of: rho(89)=-0.2366, p=0.02; rho(13)=-0.7143, p=0.006; rho(77)=-0.3670, p=0.001; ?(17)=-0.5569, p=0.02. rho was also calculated between P/F ratios and Ferritin, D-dimer, WBC, and LDH with respective values of: p(77)=0.0819, p=0.47; p(78)=-0.2105, p=0.06; p(88)=-0.1046, p=0.33; rho(73)=0.0420, p=0.72, showing no statistically significant relationship between these variables. Conclusions: EAA, IL-6, CRP, and ESR levels had a statistically significant negative correlation with the P-F ratio. Elevations in these biomarkers correlated with worsening P-F ratios, suggesting that they could serve as useful biomarkers to predict ARDS severity. Additional studies are needed to further understand the trend of these biomarkers and validate their clinical use in prognostication in ARDS.
Learning Objectives: Since the outbreak of the COVID-19 pandemic, it has been challenging on how to advise patients on when to seek care for their symptoms. Patients may present to the hospital late in their disease process and only when symptom severity cannot be avoided any longer due to lack of access to healthcare or fear of hospitalization. It is unclear if these delays in care affect clinical treatments or hospital outcomes. We aimed to determine if the reported length of preadmission symptoms in COVID-19 patients was associated with significant differences in critical care outcomes. Methods: We utilized registry data on hospitalized COVID-positive patients from an urban, academic, medical center. All patients with a finalized dataset were included. Patients were stratified by length of symptoms (1-5 days, 6-10 days or more than 10 days) prior to admission. We compared the rate of ICU admission, SOFA and APACHE scores on admission, intubation status, and mortality. Chi-square tests and logistic regression models were used. Results: A total of 247 patients were included with a mean age of 62 years and 47.87% female. Of these patients, 78 (33.5%) were admitted to the ICU. There was no significant difference in ICU admission rate between groups (1-5 days: 26.9%; 6-10 days: 35.3%; >10 days: 37.9%; p=0.30). There was no significant difference in SOFA or APACHE score categories by group (p=0.64 and p=0.90, respectively). Additionally, there were no significant differences in rate of intubation (p=0.12) or in-hospital mortality (p=0.33) by group. After controlling for age, BMI, and gender, logistic regression analysis demonstrated no significant difference between groups for rate of ICU admission, rate of intubation, or in-hospital mortality. Conclusion: We have demonstrated that the reported length of pre-admission symptoms in COVID-positive patients was not a significant predictor of outcomes. We had hypothesized patients with longer duration of pre-admission symptoms would exhibit worse outcomes. However, we posit the expeditious development and implementation of remote monitoring programs and outpatient management by our institution could have allowed for timely intervention in patients whose clinical status was deteriorating.
Though it remains difficult to predict the prognosis of COVID-19 positive patients, analyzing chest imaging may provide important information that can be used to improve prognostic accuracy. To this aim, we conducted a retrospective chart review of 365 hospitalized patients who tested positive for COVID-19 at an urban tertiary care center in the United States between March 2020 and May 2020. For each patient, one chest X-ray and one CT scan per week of hospitalization were chosen for data extraction and analysis. For chest X-rays, data was collected on the presence of opacities, consolidation, lymphadenopathy, pleural effusion, pulmonary edema, cardiomegaly, cavititation, empyema, or pneumothorax. For CT scans, data was collected on the presence of ground glass opacities, consolidation, crazy paving, reverse halo, interlobular septal thickening, pleural effusion, lymphadenopathy, bronchiectasis, bronchial wall thickening, mucus plugging, nodules, empyema, abscess, cavity, pulmonary embolism, cardiomegaly, coronary artery disease calcifications, and pericardial effusion. Any pre-existing lung disease was noted. Finally, frequencies were calculated for each finding, stratified by week. During week 1 of hospitalization, 91.78% of patients received at least one chest X-ray, with 81.49% of these chest X-rays showing abnormalities. The most frequently reported abnormality were opacities (62.39%), typically in a bilateral distribution (53.43%). Chest X-Rays taken during week 1 showed no lymphadenopathy, cavititation, empyema, or pneumothorax. During week 1 of hospitalization, just 6.14% of patients received a chest CT. The most common chest CT scan findings were ground glass opacities (66.67%), typically in a bilateral distribution (57.14%). For the patients who required chest imaging during Week 2 of hospitalization, 94.19% had an abnormal chest X-ray, with the majority of images showing opacities (52.9%) in a bilateral distribution (45.35%). Lymphadenopathy, cavititation, empyema, pneumothorax, and abscess were not present. All chest CT scans from Week 2 of hospitalization were abnormal, but the majority lacked ground glass opacities (98.46%) or consolidations (98.46%). Chest imaging during weeks 3-5 of hospitalization remained largely abnormal but fewer than 50% of chest X-rays and CT scans showed opacities. Our data show that for COVID-19 positive patients, the most common chest imaging findings were opacities in a bilateral distribution, while cavititation, empyema, abscess, lymphadenopathy were not noted. By week 3 of hospitalization the majority of patients no longer had opacities on imaging. Further retrospective analysis of this data is indicated in order to understand the role of imaging in prognosis of COVID-19 patients.
Throughout the COVID-19 pandemic, Intensive Care Units (ICU) in medical centers in the United States have experienced an overwhelming influx of patients. These units have been pushed to the brink, facing shortages of personnel and life-saving equipment with continuous uncertainty about the clinical course of their patients. Predicting the prognosis of a COVID-19 positive patient upon hospital admission remains a challenge. However, identification of early signs of severe illness, that may require an ICU stay, through analysis of chest imaging could provide a method to predict patient outcomes and reduce mortality. The study consists of a retrospective chart review of 365 hospitalized patients who tested positive for COVID-19 at an urban tertiary care center in the United States between March 1, 2020 and May 31, 2020. The correlation between initial chest x-ray or CT findings and ICU admission during the hospital stay of COVID-19 positive patients was assessed. Data was collected on the presence and distribution of various pulmonary abnormalities on chest imaging and whether patients required ICU admission at any point during their hospitalization. For patients who received multiple modalities of chest imaging during the first week of hospitalization, the earliest imaging was used. Chest X-ray and CT scan reports were analyzed to determine statistical significance between abnormalities seen on the initial chest X-ray and ICU admission. Statistical analysis was performed using chi-squared and Fisher Exact tests. Within the first week of hospitalization, 335/365 (91.78%) patients received some type of chest imaging, with the majority having received at least one chest X-ray. A small number of patients, 12/365 or 3.29%, received both a chest X-ray and CT scan, though only one image was included in analysis. Patients from whom ICU admission status was unknown were excluded from analysis, resulting in 359 patients considered for analysis. It was found that there is a statistically significant relationship between ICU admissions and an initial chest X-rays revealing opacities (P < 0.04) in a diffuse distribution (P < 0.004) as well as bilateral distribution (P < 0.04). There was also found to be a statistically significant relationship between patients with underlying medical conditions and ICU admission (P < 0.000009). Further analysis of this data is needed to determine what role the results of chest imaging can play in predicting the likelihood of ICU admission for hospitalized COVID-19 positive patients.
COVID-19 Intubation Safety: A Multidisciplinary, Rapid-Cycle Model of Improvement

The COVID-19 pandemic has forced the health care industry to develop dynamic protocols to maximize provider safety as aerosolizing procedures, specifically intubation, increase the risk of contracting SARS-CoV-2. The authors sought to create a quality improvement framework to ensure safe practices for intubating providers, and describe a multidisciplinary model developed at an academic tertiary care facility centered on rapid-cycle improvements and real-time gap analysis to track adherence to COVID-19 intubation safety protocols. The model included an Intubation Safety Checklist, a standardized documentation template for intubations, obtaining real-time feedback, and weekly multidisciplinary team meetings to review data and implement improvements. This study captured 68 intubations in suspected COVID-19 patients and demonstrated high personal protective equipment compliance at the institution, but also identified areas for process improvement. Overall, the authors posit that an interdisciplinary workgroup and the integration of standardized processes can be used to enhance intubation safety among providers during the COVID-19 pandemic.
Background: In the current COVID-19 pandemic, patients with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) can present with a wide constellation of symptoms. These patients then progress along a highly variable clinical course that can range from asymptomatic to life-threatening. Many patients initially present to Emergency Departments where providers are tasked with evaluating patients’ current disease severity and assessing their potential prognoses. As such, it is important for providers to be able to predict potential outcomes based on patients’ presenting characteristics. Objective: To evaluate the association of the initial clinical characteristics and symptomatology of Emergency Department (ED) patients with SARS-CoV-2 with hospital admission and the need for ICU care. Methods: This study is a retrospective case-series of patients who presenting to a single ED at George Washington Hospital with symptomatic COVID-19 from March 7 – August 9, 2020. Patients were eligible if they tested positive for SARS-CoV-2 in the ED and were symptomatic for the infection. We collected patient-level information using a structured chart review and performed a stratified analysis of ED disposition by three categories: intensive care unit (ICU), general ward and discharge to home. Using multivariable logistic regression, identified risk factors were then modeled for need for hospital admission and development of severe COVID-19. Severe COVID-19 was defined as death or need for ICU care at any time during hospital admission. Results: In total, 994 patients were included in the study. Of these, 993 patients were included in the analysis with 370 (37.3%) patients requiring hospital admission and 70 (7.0%) developing severe COVID-19. Patients with wheezing, dyspnea, respiratory distress/failure, altered mental status (AMS), malaise, diarrhea, or syncope were more likely to be admitted to the hospital while patients with rhinorrhea, sore throat, dry cough, myalgias, headache, or olfactory/taste disturbances were more likely to convalesce at home. Patients with respiratory failure, AMS, or lack of fever were more likely to require ICU-level care. Heart rate = 100 bpm, respiratory rate = 20 breaths/minute, SaO2 = 95% on triage vitals were also associated with admission. Conclusions: In this cohort of symptomatic COVID-19 patients presenting to the ED, the symptoms of wheezing, dyspnea, respiratory failure, AMS, malaise, diarrhea, or syncope were associated with hospital admission while respiratory failure, AMS, or lack of fever were associated with development of severe COVID-19. The virus has a heterogenous clinical presentation but the initial presence of certain symptoms were more likely to predict illness severity.
Introduction: With more than 300,000 physicians infected with COVID-19, preserving the wellness of providers is essential. Endotracheal intubation is a hazardous procedure risking contraction of SAR-CoV-2 due to airway proximity and aerosolization. Since an estimated 8% of COVID-19 patients eventually require endotracheal intubations, there have been studies addressing the safety concerns regarding COVID-19 intubations. In our study, we investigate factors affecting providers’ fear of contracting COVID-19 during intubations. Methods: In this multi-center cross-sectional study, we disseminated an IRB-approved 24-question survey, pilot-tested for reliability and validity, to providers from different specialties, training levels, and geographic locations across the USA using a snowball sample approach to assess factors affecting providers’ fear when intubating COVID-19 patients. A scale of 1-10, with 10 being the most fearful, was used to assess providers’ fear of contracting COVID-19 by asking the following questions: “On a scale from 1-10, how would you rate your fear of contracting COVID-19 during your FIRST intubation of a confirmed or suspected COVID-19 patient?” A similar question was asked for subsequent intubations. Data was analyzed using Pearson’s chi-squared, Mann-Whitney U, and Wilcoxon rank tests. Results: We analyzed 186 responses from providers at 32 hospitals after excluding incomplete surveys and surveys that reported no experiences with COVID-19 intubations. While there were no significant differences in fear levels during the first COVID-19 intubation, providers with a history of quarantine for potential COVID-19 exposure reported more fear during subsequent COVID-19 intubations than those without a history of quarantine (p=0.021, median 5 vs 4). Factors that did not significantly affect the fear of contracting COVID-19 during first or subsequent intubations included having a designated intubation team, having children, being a primary caretaker for someone over the age of 80, and having friends or close relatives contract COVID-19. Conclusions: Fear is a known psychological response to quarantine. As the provider’s fear levels during initial COVID-19 intubations were not significant, increased fear of contracting COVID-19 during subsequent intubations can be attributed to the negative psychological outcomes, financial loss, isolation, and stigma associated with quarantine. This may also suggest that providers associated their personal infection with a prior intubation, leading to increased fear during future intubations. The cumulative risk of exposure from multiple COVID-19 intubations could explain why providers experienced more fear during repeat intubations. Educational interventions and psychological support have been shown to improve the mental health of physicians combating the COVID-19 pandemic.
This study aims to characterize the diseases seen in a multispecialty pediatric dermatology-gynecology vulvar clinic at CNH. Vulvar dermatology is a field in which both dermatologists and gynecologists may lack sufficient experience and comfort. Relatively few vulvar dermatology clinics exist in the US and likely help to ameliorate that knowledge gap. Characterizing the diagnoses (and misdiagnoses) treated at the CNH vulvar dermatology clinic will help to provide insight into these knowledge gaps and benefit of multidisciplinary clinics. It is also likely that there are disparities in referrals to the vulvar dermatology clinic based on socioeconomic status and race. Comparing demographic data of patients seen in vulvar dermatology clinic compared to general dermatology clinic may provide insight into disparities to access to care. In addition, there may be ethnic and racial risk factors for vulvar dermatologic diseases that have not been described. The multiethnic, multiracial patient population seen in this clinic will provide early insight into these unanswered questions.
Consumer Attitudes and Behaviors on Medical Cannabis in Dermatology

INTRODUCTION: Access to medical cannabis products (MCPs) has rapidly increased due to changing regulatory landscapes. However, literature on consumer behaviors and attitudes with regards to dermatologic use of is limited, and therefore we sought to address this gap. METHODS: A survey was emailed via SurveyMonkey’s platform to users of their rewards panel asking about usage patterns and beliefs regarding MCP use to treat dermatologic conditions. RESULTS: 504 adults completed our survey (92.1% response rate) with a relatively consistent distribution of age and gender. 17.6% of respondents used an over-the-counter (OTC) cannabis product without dermatologist recommendation to treat a skin condition [most common indications: acne (28.4%), psoriasis (26.1%) and atopic dermatitis (22.7%); most common ROA: topical (64.7%)]. Of those who had seen a dermatologist (66.3%), 15.3% used an OTC product [most common indications: psoriasis (32%), rosacea (30%), and acne (30%); most common ROA: topical (62.5%)] and 7.8% used an MCP which required a Department of Health-approved card [most common indications: acne (68%), psoriasis (28%), and rosacea (28%); most common ROA: ingestion (50%)] per their dermatologist’s recommendations. 11.8% of respondents were not comfortable seeing a dermatologist who recommended MCPs and 6.4% of respondents disapproved the use of cannabinoids for dermatologic indications. CONCLUSION: Based on use patterns, both with and without medical guidance, it is clear that consumers are interested in and are using MCPs for dermatologic indications, most commonly for inflammatory skin disorders. Targeted education for dermatologists is recommended to allow counseling of patients on safe and effective use of medical cannabis.
Emerging Therapies for Rare Cutaneous Cancers: A Systematic Review

Background: Rare cutaneous cancers require early management given their aggressive nature; however, few therapeutic options exist for managing these rare cancers.

Objective: To identify emerging therapies for extramammary Paget’s disease, Merkel cell carcinoma, sebaceous gland carcinoma, microcystic adnexal carcinoma, Kaposi sarcoma and cutaneous angiosarcoma. Methods: A systematic review was conducted using PubMed database from October 2010 to October 2020. Published clinical trials and case reports/series were included if they involved primarily a targeted agent rather than classic cytotoxic chemotherapy or photosensitizing medication. Active clinical trials were evaluated using ClinicalTrials.gov, the Japanese University Hospitals Clinical Information Network, and the ISRCTN registry. Quality of evidence for each study was rated using the Oxford Centre for Evidence-Based Medicine Level of Evidence Rating Scale. Results: There are several emerging therapies for rare cutaneous cancers with many clinical trials actively recruiting. PD-1 receptor inhibitors were the most investigated treatment, targeting several cancers. Merkel cell carcinoma and Kaposi sarcoma had the most clinical trials while microcystic adnexal carcinoma and sebaceous gland carcinoma had the least. Limitations: Lack of key findings from clinical trials still in progress. Conclusions: Emerging therapies exist for rare cutaneous cancers; results of ongoing studies will provide more robust evidence in the future.
Multichannel Graphene-Oxide based Immunosensor for Detection of Blood Hemoglobin and C-reactive Protein with Applications in Point-of-Care Diagnostics

Rapid low-cost biosensor platforms are in critical demand, particularly as the world works to overcome the COVID-19 pandemic and interconnected digital healthcare becomes a permanent staple of modern medicine. Low-cost multiplexed biosensor platforms that enable fast and frequent monitoring of blood analytes are a key technology in this evolution. These platforms have wide applications in both public health crises like COVID-19 and in chronic disease management for patients requiring regular biomarker surveillance. This research demonstrates a novel multiplexed point of care (x-POC) biosensor utilizing electrochemical impedance spectroscopy (EIS) to quickly identify multiple biomarkers in a single sample requiring only one drop of sample per measurement channel. We integrate a graphene oxide (GO) biorecognition surface with mass produced printed circuit board (PCB) to demonstrate a low-cost, easily customizable 7-channel microfluidic electrochemical immunosensor. This novel x-POC device succeeds in quantifying human hemoglobin and C-reactive protein (CRP) from complex solution in only 10 minutes, with high sensitivity, high specificity, and a detection limit below physiologic relevance. By simplifying manufacturing methods, surface chemistry, and sample acquisition, our biosensor shows immense potential as a single sample, high throughput device that could be easily deployed in a wide range of health environments.
Background: Throughout the COVID-19 pandemic, it has been crucial to limit virus transmission on all possible fronts. As of February 2021, there have been at least 3507 reported deaths amongst healthcare workers (Kaiser). Healthcare workers (HCW) are at increased risk for transmission, and their protection lies in the form of properly used personal protective equipment (PPE). To ensure proper use of PPE, the safety officer role was instated. The safety officer position (SO) is assigned to a HCW to solely monitor PPE donning and doffing, without treating patients simultaneously. Proper donning/doffing can mitigate transmission, reducing any potential spread from HCW to patients, especially the immunocompromised. We hypothesize that the role of SO may be done virtually. With the advancements in HIPAA compliant telemedicine, a virtual safety officer (VSO) who monitors PPE donning and doffing remotely can free up HCWs who can then treat patients. This study aims to compare the donning/doffing violation detection rate between in-person officers and remote officers. Methods 5 SOs will be conducting both in-person trials and virtual trials. Each SO will conduct 14 trials total: 7 in-person, and 7 virtual. Within trials, there will be 0-3 planned violations. These violations were selected from the donning/doffing checklist that safety officers currently use in the field, as well as from a literature review of the most common violations. Actors will record seven separate videos of themselves donning/doffing PPE (7 videos total). Within each recording, there will be 0-3 planned violations. Each trial will consist of the subjects viewing a video, and then reporting which, if any, violations were found. These recordings will serve as the trials for both in-person, and virtual. The first round of trials will be in-person, so the subjects would view these donning/doffing scenarios as they are being filmed. Two weeks later, the subjects will be viewing the same videos, but this time remotely. Results Pending Discussion A VSO can prove useful in a variety of settings. In this current pandemic, it can free up personnel in the field. Much of the reopening guidelines are based on healthcare learning during the pandemic (Gawande). If our project demonstrates effectiveness, there are opportunities to further leverage technology to reduce the human resource challenge widespread safety officers needs could require. As more time goes on in this pandemic, it is imperative that HCWs uphold the same level of scrutiny in mitigating transmission, regardless of downward trends in cases.
Dexmedetomidine in Alcohol Withdrawal Syndrome: Are We Intubating Less?

Introduction: When used for sedation of non-intubated patients during the treatment of alcohol withdrawal, dexmedetomidine may reduce symptom severity while preventing respiratory depression. The addition of dexmedetomidine to a Clinical Institute Withdrawal Assessment (CIWA) based benzodiazepine treatment strategy, the standard treatment modality for alcohol withdrawal, may reduce benzodiazepine usage and ultimately the need for intubation. We sought to determine whether the addition of dexmedetomidine to a CIWA-based benzodiazepine protocol reduced the risk of intubation for patients admitted to our intensive care units with severe alcohol withdrawal.

Methods: A single center, retrospective cohort study at our urban, academic medical center compared patients receiving dexmedetomidine in addition to the standard CIWA-based benzodiazepine protocol to standard therapy alone. Patients with CIWA score greater than 7 between January 2019 and March 2020 were included. We collected demographic and clinical data including CIWA score, benzodiazepine usage, dexmedetomidine usage, and intubation. The primary outcome measure was intubation. Odds ratio (OR) was determined for intubation events based on exposure to dexmedetomidine and benzodiazepine usage.

Results: A total of 68 charts were analyzed. The mean patient age was 51, 54 patients were men. 44 patients received standard CIWA-based benzodiazepine therapy without dexmedetomidine, of these 24 (54.5%) were intubated during hospitalization. Twenty-four patients received dexmedetomidine in addition to standard therapy; 7 of these patients (29.1%) were intubated, with OR = 0.34 [95% CI: 0.12-0.99; p=0.048]. The mean CIWA score was 14.9 for the standard therapy group and 17.4 for the group receiving dexmedetomidine (p=0.21). The mean dose of IV lorazepam given in the 12 hours prior to intubation were 0.9mg for the standard therapy group and 1.8mg for the dexmedetomidine group (p=0.65). Conclusions: In this series of patients with severe alcohol withdrawal syndrome, the addition of dexmedetomidine to CIWA-based benzodiazepine therapy correlates with a significantly lower frequency of intubation. No significant benzodiazepine-limiting effect was demonstrated. Future prospective analysis is necessary to explore the relationship of these observations.
Physicians perform the FAST exam (Focused Assessment with Sonography in Trauma) during a comprehensive trauma evaluation in order to determine the patient's need for intervention (surgery, computed tomography scan, interventional radiology procedure, etc.) and disposition planning. A FAST exam can be accomplished rapidly at the bedside and includes an assessment of the heart, lungs, and abdomen. FAST exams have been demonstrated to show excellent specificity but varying sensitivity in the identification of free fluid and organ injury. The objective of our study was to examine all false positive and false negative FAST exams performed in the emergency department over the course of seven years when compared to CT imaging as the gold standard. We performed a retrospective review of false negative and false positive FAST exams completed at an academic level 1 trauma center. We identified 27 false positive and 75 false negative FAST scans, each patient's chart was reviewed in order to collect data on demographics, vitals, trauma details, disposition, and the educational year of the resident conducting the FAST exam. In our study, sensitivity was 70.6% and the specificity was 99.1% for the FAST exam. Among the false positive cohort, fat pads mistaken for pericardial effusions and right upper quadrant (RUQ) or left upper quadrant (LUQ) double line sign were the most common misinterpretations. The most common misinterpretation amongst residents for false negative scans was free fluid in the pelvis, followed by free fluid in the right upper quadrant (RUQ) and left upper quadrant (LUQ). Most of the FAST exams were performed by a PGY-2 resident. Based on our findings we will change our educational focus for training residents, we will implement changes to the curriculum to reduce these types of errors.
Evaluation of Thromboelastography in Patients with Gastrointestinal Bleeding

Introduction: Thromboelastography (TEG) is a low-cost, point-of-care diagnostic test used to quantitatively assess platelet function, clot formation, and fibrinolysis. TEG is increasingly employed to guide transfusion therapy in trauma and surgical cases to decrease mortality and blood product transfusion. These populations are distinctly different from the medical population which carries different comorbidities, risk factors and baseline antiplatelet/anticoagulant use. The most common subset of medical patients with acute bleeding are those with gastrointestinal bleeding (GIB). The utility of TEG in patients with GIB is not well described. We sought to assess whether TEG has a benefit in patients with clinically significant GIB by examining blood product utilization. Methods: Single-center, retrospective review of 558 patients admitted to George Washington University Hospital with a diagnosis of GIB between 01/01/2017 and 12/31/2019. Patient demographics, comorbidities, APACHE II and SOFA scores, vitals, and lab values were collected from the medical records, as well as outcomes such as vasopressor use, blood product use, and mortality. After exclusion, a total of 51 patients that received TEGs and 176 patients that received the standard of care (no TEG) were analyzed by multivariate analysis to account for baseline differences between both arms. Results: Analysis of the baseline variance between both study arms demonstrated between-group differences for higher APACHE scores (16.4 vs. 13.7, p<0.05), higher rate of malignancy (37.9% vs. 18.5%, p<0.05), higher baseline lactate (4.1 vs. 2.9, p<0.05), higher shock index (1.2 vs. 1.0, p<0.05) in the TEG arm. After adjusting for these differences the outcomes data demonstrated that utilization of TEG resulted in 1.9 units more pRBC transfused at day 0 and 1.5 units more FFP at day 0 - both results which demonstrated significance with p<0.05. In spite of the increased rate of transfusion within the TEG arm, there was no difference in outcomes-based data including ICU LOS, ventilator days, vasopressor use, in-hospital mortality, rate of renal replacement therapy and incidence of transfusion-related adverse events (e.g. TRALI, TACO, ALI). Conclusions: The use of TEG for patients presenting with GIB resulted in increased pRBC and FFP transfusions without any change in clinical outcomes as compared to the standard of care. Our findings underscore the need for an RCT to further elucidate the role of TEG in medical patients before routine adoption of its use in these patients.
Objectives: Pediatric emergency department (ED) visits can be a stressful time for patients and their caregivers. This high stress environment can lead to questions and needed clarifications post-discharge. We implemented a post-discharge callback system to resolve these concerns for a focused subset of patients who historically have provided the most negative comment feedback on ED patient experience surveys. We hypothesized that comment types would shift to more positive than negative and the themes of the comments received would change. Methods: We developed a discharge callback process that focused on patients who were triaged as ESI level 4 during their emergency department visit. Over a 6-week period, patients were called the day after discharge and asked if they had questions regarding their recent ED visit in addition to questions regarding current health, post-discharge instructions, prescriptions, or follow-up instructions if applicable. A maximum of 3 discharge calls were made if needed in order to contact the patient or family. Any questions regarding health care needs were followed up by a licensed healthcare provider within 24 hours with a maximum of 3 attempts. At the end of the project timeframe we analyzed comments received from our patient experience surveys to identify if there was a shift in comment types and their themes. In addition, we analyzed ED return rates within 72 hours of discharge. Results: During the 6-week period, 2710 calls were made to contact 1618 patients caregivers. Follow up was requested by 149 families with a healthcare provider. There was no significant change in the number of comment types received. Thematic analysis of the patient experience survey comments received during this time period, revealed a reduction in questions regarding the recent ED visit and post discharge needs. There was no significant change in 72 hour ED return rates. Conclusion: The institution of an ED discharge callback system can effectively reduce patients and families questions regarding post-discharge care by providing an opportunity to clarify care after they have left the emergency department.
Pediatric Hemorrhage Trauma Algorithm

Problem Statement/Introduction: The management of high-risk pediatric trauma patients relies on identifying the needs of the critical patient and working toward fulfilling those needs. The objective of this study was to develop a model for goal-prediction in the resuscitation of pediatric trauma patients who present with hemorrhagic shock based on information observable during the evaluation. Methods This study began with a review of the relevant literature and was followed by the observation and annotation of 10 resuscitation event logs and their corresponding video recordings in which patients arrived in the trauma bay in severe hemorrhagic shock. An initial algorithm was drafted based off of these observations and was subsequently refined through five interviews with a trauma team member. The algorithm was updated and tested on an additional 9 resuscitation events to evaluate for quality of prediction and goal setting in the context of a child being treated for hemorrhagic shock. Results The final algorithm had six decision points for patients who entered the trauma bay with the potential for hemorrhagic shock. The decision points prioritize observable information that trigger follow up actions. An example is the determination of whether the patient is in shock, including tachycardia, hypotension, absent central pulses, and poor peripheral perfusion. When shock is confirmed, the team pursues several activities, including the establishment of intravenous access, administration of packed red blood cells, the initiation of the massive blood transfusion protocol, and drawing laboratory tests. This algorithm was able to predict the actions that occurred in 10 resuscitations in which hemorrhagic shock occurred. Conclusion We have developed an algorithm for structuring the actions taken by teams to manage hemorrhagic shock early after injury. This algorithm provides the structure required to develop real-time decision support in this setting.
Over the last couple of years, emergency department disaster preparedness and response programs funding have been cut nationwide. With the ubiquity of unplanned mass casualty events the deprioritization of disaster training in medical education has left many hospital systems and providers under-prepared to respond. As seen with the COVID-19 Pandemic, the lack of readiness to handle mass casualty events can be devastating. Existing emergency disaster plans for hospitals typically lack thorough operational steps and key considerations that providers must remember under extreme duress. To date, there has not been a comprehensive, free, online resource of this type. We hypothesized that the creation and implementation of a novel, online, just-in-time disaster response toolkit and resource repository called DisasterConsult.org can improve emergency medicine provider readiness and immediate response to no-notice mass casualty incidents. The creation of emergency protocols can help streamline care at the local, regional, state or even national level. The use of the database aims to help hospitals and providers better prepare for the unexpected, optimize patient flow and avoid bottlenecks in order to improve quality care and outcomes. For each disaster topic chosen peer-reviewed literature searches, book chapters, and evaluation of grey literature was critically appraised to create evidence-based comprehensive emergency plans. Current research and data was analyzed to fill in the gaps in knowledge for on-going mass-casualty incidents such as civil unrest injuries and COVID-19. In order to make DisasterConsult.org more accessible to providers, our team has also created a corresponding mobile app for Apple Phones. Since the creation of the website in May, there have been 1,605 domestic and foreign users with a total of over 12,000 page views. The research is ongoing as more topics, including mass shootings, bombings, radioactive and chemical warfare disaster emergency plans are underway. The research can be accessed at DisasterConsult.org.
Introduction: Falls are the leading cause of traumatic injury in older adults. While the risk and severity of falls increase with age, appropriate counseling and physical interventions have been proven to mitigate fall risk. Primary care providers can therefore play a major role in reducing the incidence of falls among their elderly patients. However, primary care providers may be limited by a number of factors including time, resources, and knowledge of risk reduction strategies. This study aims to determine the extent of elderly fall risk screening and counseling that occurs in the primary care setting, and to define limitations to its usage.

Methods: A questionnaire was adapted from a previous survey study to explore the beliefs, knowledge, attitudes, and clinical practice regarding falls in primary care providers. Information about participant training background and patient population was also acquired. The questionnaire was distributed by email to 36 primary care providers at a level 1 tertiary urban medical center. Results: The survey achieved a response rate of 58%. Adults over 65 make up most of the respondents’ patient population (57%; 25%-86%). All of the respondents agreed that patients over 65 years should be assessed for fall risks. All respondents also agreed that evidence-based fall prevention programs can reduce the risk of falls in older adults who are at high risk; however, 43% of participants did not agree that they had the expertise to perform fall risk assessments. Furthermore, while 52% of respondents were aware of the Medicare reimbursement for fall risk screening, only 24% of respondents have billed for fall risk screening and only 5% of respondents agreed that they were adequately reimbursed for performing fall risk assessments. Lastly, only 57% of respondents agreed with the statement that they had time to perform fall risk assessments in their office. Conclusion: The results of this survey exhibit that primary care providers are aware that evidence-based fall prevention programs can reduce fall risk and that all older adults should be assessed for fall risk. However, several barriers to performing these risk assessments in primary care clinics were uncovered. These barriers included provider’s perception of their lack of expertise to perform fall risk assessments, lack of time, and lack of reimbursement. Notably, a large proportion of survey respondents were not aware that they could be reimbursed for performing fall risk assessments.
Background: Children with short bowel syndrome (SBS) are at high risk for bloodstream infections (BSIs) due in part to dependence on a central line for nutrition. Objective: Identify and characterize risk factors associated with BSIs in children with SBS. Methods: Retrospective cohort study among children with SBS cared for at Children’s National Hospital between January 2010 and July 2020. Structured chart review was performed to collect demographics, etiology of SBS, history of liver disease, immunosuppression, presence of ileocecal valve and colon, diagnosis of small intestinal bacterial overgrowth, residual small bowel length, and blood culture dates and isolates. A BSI was defined using criteria from the Centers for Disease Control and Prevention. Incidence rate for BSI was calculated as the number of BSIs per 1000 days in the cohort, and reported with 95% confidence intervals for each variable of interest. Multivariate Poisson regression was used to determine the adjusted incidence rate ratio (IRR) for each variable. Results: A total of 162 unique patients met the inclusion criteria, with a mean time in the cohort of 5.8 years. Of these, 58% were male, 45% were black, and 18% were Hispanic. The mean age at time entering into the cohort was 19.6 months (SD 57.6), and the mean small bowel length remaining at time of entering the cohort was 60.2 cm (SD 49.7). 73 patients experienced ≥1 BSI for a total of 197 BSI events. The most common underlying etiology for SBS was necrotizing enterocolitis (NEC, 38.3%), followed by intestinal atresia (30.9%), midgut volvulus (19.8%), and gastroschisis (Table 1). In univariate analysis, male sex, shorter bowel length, history of liver disease, immunosuppressed status, and SBS etiologies of intestinal atresia, gastroschisis, and “other” were associated with increased BSI incidence. Conversely, NEC and Hirschsprung disease as etiologies of SBS were associated with decreased incidence of BSI. In multivariate analysis younger age (IRR 0.85, 95% CI 0.73-0.99), shorter small bowel length (IRR 0.99, 95% CI 0.98-0.99), and “other” etiologies of SBS (IRR 2.11, 95% CI 1.37-3.25) were independently associated with increased incidence of BSI, while NEC as the etiology of SBS was associated with a lower risk for BSI (IRR 0.61, 95% CI 0.39-0.95). Conclusion: Shorter small bowel length, younger age at first BSI presentation, and uncommon etiologies of SBS are associated with an increased risk for BSI in this patient population.
Background: In response to the COVID-19 pandemic, ambulatory care at Children’s National’s Goldberg Center shifted rapidly to provide most visits via telemedicine. Prior literature cites higher rates of inappropriate prescribing for acute respiratory tract infections (ARTIs) in telemedicine. This may in part be due to inability to perform throat swabs to diagnose Streptococcal pharyngitis. Objective: To evaluate testing and antibiotic prescribing trends for pharyngitis before and after a shift to telemedicine.

Design/Methods: Retrospective cohort study including children 3 months to 18 years old presenting to the Goldberg Center between January 2018 and September 2020 with pharyngitis (ICD J02.x and J03.x) were included. Demographics, type of visit (in-person vs phone encounter vs. telemedicine), diagnoses, Streptococcal test results, and any antibiotics prescribed at the visit were collected from the medical records. We excluded visits with concurrent diagnoses for which an antibiotic is indicated. Encounters occurring within 3 days with the same diagnosis were considered as a single visit and considered in-person if at least one visit was in-person. Student’s t-test was used to compare mean proportions in the pre-COVID (January 2018 to February 2020) with the intra-COVID (March 2020 to September 2020) period.

Results: We identified 5676 pharyngitis visits. The number of pharyngitis diagnoses decreased from a mean of 197 pre-COVID to 80 per month intra-COVID (p<0.0001). The proportion of pharyngitis diagnoses for which an antibiotic was prescribed decreased from 26% pre-COVID to 17% intra-COVID (p<0.0001). On average, 37% of pharyngitis diagnoses intra-COVID were made via telemedicine, of which 10% were prescribed antibiotics. Mean in-person antibiotic prescribing rates for pharyngitis diagnoses decreased from 26% pre-COVID to 20% intra-COVID (p=0.0001). The mean proportion of pharyngitis encounters prescribed antibiotics without a strep test was 15% pre-COVID vs 36% intra-COVID (p<0.0001). Conclusion(s): While the proportion of pharyngitis cases prescribed an antibiotic without a strep test increased intra-COVID, the overall number of antibiotic prescriptions decreased given the lower numbers of pharyngitis diagnoses. Providers seem more apt intra-COVID to prescribe antibiotics without a positive throat swab result, perhaps as a nod to the exigencies of the COVID 19 pandemic. Guidance to promote antibiotic stewardship specific to the telemedicine setting is warranted.
Measuring the Impact of an Empiric Antibiotic Algorithm for Pulmonary Exacerbation in Children and Young Adults with Cystic Fibrosis

Background: Pulmonary exacerbations (PEx) contribute to significant morbidity in persons with cystic fibrosis (CF), but there are not national consensus guidelines regarding optimal antibiotic treatment. We sought to decrease the unwarranted use of broad-spectrum antibiotics and assessed the impact of an empiric antibiotic algorithm using quality improvement methodology. Methods: We assembled a multidisciplinary team of pulmonologists, infectious disease (ID) physicians, and pharmacists with expertise in CF. We assessed our baseline antibiotic use for treatment of PEx and developed an algorithm to guide antibiotic therapy based on microbiologic and antibiotic resistance history. We included persons with CF admitted at Children’s National Hospital for PEx and treated for IV antibiotics between January 2017 and March 2020. Our primary outcome measure was reducing unnecessary broad-spectrum antibiotic use as measured by use consistent with the empiric antibiotic algorithm. The intervention was the initiation of an empiric antibiotic algorithm, which occurred in the context of a newly developed antimicrobial stewardship program. Secondary outcomes and process measures included documentation of justification for broad-spectrum antibiotic use, the use of ID consult, and proxies for treatment failure (hospital days, antibiotic days, and readmission in 30 days). Results: Data were collected from 56 persons with CF who had a total of 226 PEx events. The mean (±SD) age at first PEx was 12±6.7 years; 55% were female, 80% were white, and 29% were Hispanic. After initiation of the algorithm, the rate of antibiotic use consistent with the algorithm increased from 46.2% to 79.5%. Further, documentation of justification for broad-spectrum antibiotics increased from 56% to 85%. Meropenem was the most common broad-spectrum antibiotic and use decreased from 24% to 15%. Use of ID consults increased from 17% to 54%. There were no differences in hospital days, antibiotic days, or readmission in 30 days. Conclusion: Initiation of an empiric antibiotic algorithm led to an increase in the use of antibiotics per the algorithm, documentation and justification of broad-spectrum antibiotic use, and consultation with ID without an increase in treatment failure. These findings suggest antimicrobial stewardship quality improvement initiatives can be beneficial in fostering positive working relationships between pulmonologists, ID physicians, and pharmacists and in standardizing care.
Logistics and Recruitment for the Moderna mRNA SARS-CoV-2 Vaccine Trial at The George Washington University (GW)

The NIH-led Coronavirus Prevention Network (CoVPN) and Moderna Therapeutics selected the GW Vaccine Research Unit (VRU) as a site for the Phase 3 COVE (coronavirus vaccine efficacy) study of the mRNA-1273 vaccine for preventing COVID-19 (coronavirus disease 2019) in May of 2020. In the initial phase of preparation, work began with developing a recruitment plan and creating a formal press statement announcing the trial to the public. VRU staff contacted potential participants for screening purposes and responded to various inquiries through a shared email, social media posts, and individual phone calls. Recognizing race-based health disparities, researchers made a substantial effort to ensure that Black and Latino populations were well-represented in the study, as these groups are contracting the virus, developing severe disease, and dying from it at disproportionately higher rates than their White counterparts. Recruitment of local volunteers also focused on those at increased risk for severe disease due to older age (>65) and/or certain medical comorbidities including heart disease, diabetes, chronic lung disease, kidney disease, HIV, and severe obesity. Researchers designed the study as a randomized, placebo-controlled trial in which participants were assigned to receive two intramuscular injections of either the mRNA-1273 vaccine or saline placebo 28 days apart. Using blinded observers, participants were to be monitored for reactions to the injection itself as well as whether they develop COVID-19 over the course of two years using in-person visits with rapid PCR testing, weekly electronic diary entries, and monthly phone calls from VRU staff. Challenges to follow-up included: (1) the desire for participants to receive other available vaccines, such as the one produced by Pfizer, if efficacy was proven sooner, (2) the long duration of the study, as over time participants might travel out of the area or be otherwise less willing to adhere to study requirements, and (3) potential mutation of the virus into variants that might be less susceptible to the immunity produced by the vaccine.
Endotoxin Levels, as Measured by EAA, Are Elevated in COVID-19 Patients Admitted to the ICU

Introduction/Hypothesis: Endotoxin Activity Assay (EAA), which measures the chemiluminescent response of the neutrophils to endotoxin using an anti-endotoxin antibody, has been used to predict mortality in patients with gram-negative sepsis. Recent evidence has shown that this indirect method of endotoxin measurement does not account for other causes that may excite or depress neutrophil activity. We sought to evaluate the levels of EAA in patients with severe COVID-19 infections without bacteremia but rather a systemic inflammatory state and acute respiratory distress syndrome. Methods: This is a single-center, prospective cohort analysis of SARS-CoV-2-positive patients admitted to the ICU at a single academic hospital, from March to June 2020. EAA levels were obtained from each COVID-positive patient at ICU admission. Demographics, as well as the development of bacteremia on blood culture, were abstracted from medical records. Initial EAA values were categorized into low EAA (0.80). Results: A total of 78 patients were included in the study, with baseline characteristics as follows: mean age 62.9 years, 46% female, with a racial distribution of 72% Black, 15% White, and 4% Asian. Of the 78 COVID-positive patients, only eight were confirmed positive for bacteremia, while the remaining patients had two negative blood cultures. Of the eight bacteremic patients, the EAA level was low in zero patients, intermediate in three, high in four, and severely high in one patient, resulting in 100% of patients with intermediate or higher EAA level. Of the 70 patients without bacteremia, the EAA level was low in 13, intermediate in 10, high in 34, and severely high in 13, resulting in 81.4% of patients with an intermediate or higher EAA level. Conclusions: Elevated levels of EAA representing significant endotoxemia are frequently observed in non-bacteremic patients with severe SARS-CoV-2 viral infection. The source of the endotoxemia is unidentified. Possible explanations include gut bacterial translocation from the endothelial cell dysfunction that is known to occur with COVID 19 infection, or that EAA is an indicator of a primed neutrophil state. Further investigation of the elevated EAA levels seen in COVID-19 infections is warranted.
Early Experiences With A Primary Care Centered Long COVID-19 Clinic

Post-Acute Sequelae of COVID-19 (PASC) or “Long COVID” is defined by the presence of ongoing symptoms after resolution of initial, acute infection with SARS-CoV-2. The prevalence, pathophysiology, phenotypes, and risk factors for PASC are poorly understood. In Washington D.C., approximately 6% (~40,000/700,000) of the population has tested positive for COVID-19, with disadvantaged communities disproportionately affected. In parallel to the emergence and recognition of PASC and the growth of the population affected in our region, our group has conducted a needs assessment, launched a clinic, and built-in systems of data collection and linkage to a research biorepository, aiming to better understand and serve the patients affected. An initial needs assessment was conducted in summer 2020. Participants were contacted via telephone and completed a standardized survey assessing illness symptoms, duration, severity, medications taken, and medical history. At 66.7 ± 24.0 days after the date of the initial positive PCR test for SARS-CoV-2, 22/92 (23.9%) participants reported =1 persistent symptom of COVID-19, and 5/92 (5.4%) reported =3 persistent symptoms. Fatigue (8/22), cough (5/22), dyspnea (4/22), and headache (4/22) were most common. Participants were 48.9% male and aged 44.4 ± 13.7 years (range: 23-73 years). Based on these findings we conducted informational meetings with physician specialty leaders, and in fall 2020 launched a patient-centered multidisciplinary clinic to care for patients experiencing PASC. Thus far, >80 patients have been seen with >15 enrolled in the biorepository. Patients commonly report dyspnea, chest pain, tachycardia, orthostasis, post-exertional fatigue, headaches, and neurocognitive impairment. Common laboratory abnormalities include slight elevations in D-dimer and ferritin, and low vitamin D. Standardized data collection tools include a comprehensive clinical assessment, scales (e.g. PHQ-9, GAD-7, PCL-C, QOL, and fatigue scales), and lab evaluation. Data and research participation are tracked in a REDCap database. A primary-care-centered clinic with strong linkages to subspecialties is an effective and easily adaptable model for the care of patients with PASC. There is a robust patient advocacy community in which many are keen to contribute to scientific understanding of the pathophysiology and treatment of their condition. The GW COVID-19 Recovery Clinic provides a model for how specialized care can be coupled with research via the development of a database and a linked biorepository. However, disparities in access to specialty services require pro-active engagement, and strategies are needed to better reach communities of color who face higher barriers in navigating healthcare systems and are at highest risk for COVID-19.
Factors Associated With Clinical Severity In Emergency Department Patients Presenting With Symptomatic SARS-CoV-2 Infection

Objective: To measure the association of race, ethnicity, comorbidities, and insurance status with severity of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection in symptomatic Emergency Department (ED) patients. Methods: This study is a retrospective case-series of patients presenting to a single ED with symptomatic SARS-CoV-2 infection from March 7-August 9, 2020. Patient-level information on demographics, public insurance status, comorbidities, level of care, and mortality was collected via structured chart review. We compared demographics and comorbidities of patients who were (1) discharged home, (2) required admission to general hospital ward (GHW), (3) required admission to intensive care unit (ICU), or (4) died within 30 days of the index visit. Multivariable and univariable logistic regression analyses (MLRA, ULRA) were performed to report adjusted odds ratios (aOR) and the associated 95% confidence intervals (95% CI) with hospital admission versus ED discharge and need for ICU versus general hospital ward admission. Results: In total, 993 ED patients with symptomatic SARS-CoV-2 were analyzed with 370 (37.3%) requiring admission and 70 (7.1%) requiring ICU care. Patients requiring admission were more likely to be Black, African American, Hispanic, or Latino or have public insurance. In MLRA comparing patients requiring admission, Black race (aOR 1.4, 95% CI 0.7-2.8) and Hispanic ethnicity (aOR 1.1, 95% CI 0.5-2.0) were less associated with admission than public insurance (Medicaid: aOR 3.4, 95% CI 2.2-5.4; Medicare: aOR 2.6, 95% CI 1.2-5.3; Medicaid/Medicare: aOR 3.6 95% CI 2.1-6.2). Hypertension (aOR 1.8, 95% CI 1.2-2.7), diabetes (aOR 1.6, 95% CI 1.1-2.5), obesity (aOR 1.7, 95% CI 1.1-2.5), heart failure (aOR 3.9, 95% CI 1.4-11.2), and hyperlipidemia (aOR 1.8, 95% CI 1.2-2.9) were identified as independent predictors of admission. Comparing those needing ICU versus GHW admission, Medicaid (aOR 2.2, 95% CI 1.0-5.1) and Medicare (aOR 2.0 95% CI 0.7-5.8) were associated with ICU admission, but Black race (aOR 0.6 95% CI 0.1-2.4) was not associated, and Hispanic ethnicity (aOR 1.05 95% CI 0.54-2.02) was weakly associated with ICU admission. Conclusion: Comorbidities and public insurance are predictors of severe illness for patients with SARS-CoV-2. This study suggests that the disparities in severity seen among Black and Hispanic COVID-19 patients may be partly due to low socioeconomic status and chronic health conditions.
SARS-CoV-2 specific T cell Epitopes and In Silico HLA Restriction Predictions

Introduction: Understanding T-cell responses to SARS-CoV-2 is crucial for the development of vaccines and adoptive immunotherapy. The HLA presentation of antigenic peptides in particular is essential for generating robust T-cell responses against SARS-CoV-2, which may affect susceptibility to and severity of infection. The purpose of this study was to determine whether SARS CoV-2-specific T-cell epitopes identified in convalescent patients are predicted to be restricted through a wide range of both class I and II HLA molecules. The study also aimed to determine the stability of SARS-CoV-2 predicted epitopes. Methods: T-cell epitope mapping of structural proteins was done using mini-pools containing 5-12 peptides each, with responses measured via IFN-g ELISpot. Once SARS-CoV-2 specific T-cell epitopes were identified, predictive algorithms were used to determine HLA restriction predictions for each epitope of membrane, spike, nucleocapsid and envelope proteins. The predictive algorithms used, NetMHCIIpan and MARIA, provide percent rank scores, normalizing prediction scores by comparing epitopes to a set of random peptides. The stability of SARS-CoV-2 predicted epitopes was determined through comparison to known SARS-CoV-2 variants. Results: T-cell epitopes within the C-terminus of membrane protein were identified at amino acids (AA) 144-163 and 173-192, which were recognized by 8 and 6 convalescent donors, respectively. Mapping of spike epitopes demonstrated three regions at AA 57-75, 205-224, and 449-463, which were recognized by 3 donors. Mapping of nucleocapsid epitopes showed two regions at AA 257-271 and 313-335 recognized by 3 donors. All membrane epitopes were predicted to be MHC Class II restricted. In silico analysis suggested restriction of epitopes through HLA-DR11, DR7, DQ3, and DQ7. Nucleocapsid epitopes between AA 257-271 were predicted to be Class II restricted. Strong binders included HLA-DPA1*02:01 and HLA-DPB1*14:01. Two nucleocapsid epitopes between AA 313-335 were Class I restricted. Five spike epitopes were predicted to be Class II restricted through HLA-DRB1*03:01, HLA-DRB3*01:01, HLA-DPA1*01:03, HLA-DPB1*02:01. One SARS-CoV-2 membrane protein variant, T175M, overlaps with predicted peptide 44. One nucleocapsid variation, T271I, overlaps with predicted epitope 65. Two known spike mutations overlap with predicted epitopes: N74K mutation with peptide 15, S221W with peptide 53. Conclusions: In silico analysis predicted HLA restriction of membrane protein epitopes through alleles which are present in approximately 50% of the population. Identified membrane, nucleocapsid, and spike epitopes appear to be genetically stable. Further study is needed to better understand the biologic activity of SARS-CoV-2 T-cells of various restrictions and to determine if there are risk associations with specific HLA types.
BACKGROUND: The COVID-19 pandemic has drastically changed the practice of dermatology as social distancing guidelines have led to a shift from in-office care to virtual telehealth (teledermatology). We aimed to determine patient satisfaction, perceived barriers, as well as indications for teledermatology appointments during the COVID-19 pandemic. METHODS: A survey was sent out via SurveyMonkey’s online platform to patients of the George Washington Medical Faculty Associates’ Dermatology department who attended telehealth appointments during the COVID-19 pandemic. RESULTS: Out of 894 invitations sent, 168 patients completed our survey. The most common reasons for making a telehealth appointment were for a new rash (11.6%), eczema (9.8%), and psoriasis (9.1%). The most common reasons respondents liked telehealth were because of time efficiency (81.1%), not requiring transportation (74.2%), and maintaining social distancing (73.6%). The most common reasons respondents did not like telehealth were due to lack of physical touch (26.8%) and feeling they received an inadequate assessment (15.7%). Very few patients reported that they were unlikely to undertake another telehealth visit (9.94%) or recommend a telehealth visit to others (6.92%). CONCLUSION: Dermatology patients likely perceive telehealth visits as a convenient and safe method for quality care during the COVID-19 pandemic. The lack of physical touch, inability to provide close inspection and/or procedural intervention can be frustrating for patients and therefore meaningful selection of appropriate cases for telehealth visits can optimize the patient experience. Overall, telemedicine represents an effective and safe vehicle for delivering care especially during a global pandemic.
Sports Participation and the Brain Health of Former High-Level Athletes

Many studies examine the pathophysiology and clinical management of concussions. However, few studies examine the psychosocial factors associated with concussions in former high-level male athletes and their views on brain health. We seek to answer the question “How do former high-level athletes view their time in sports and the effects it has had on their health behavior and brain health?” We recruited former NFL, NCAA DI football, and NCAA DI non-contact athletes to complete a quantitative health survey and a qualitative focus group. Results were analyzed using a mixed methods approach pairing focus group data with de-identified health survey data. Former NFL players reported the greatest number of concussion (mean = 10.8; SD = 11.5), NCAA DI football next greatest (mean = 7.2; SD = 10.0), and NCAA DI non-contact athletes reported the least (mean = 1.9; SD = 3.2). Despite this difference in concussions and shorter playing time, former NCAA DI football players had the same average of worry about brain health as former NFL players. Future research is needed to examine how multiple concussion effect brain health in conjunction with psychosocial factors and what specifically influences former players concerns, or lack thereof, about brain health.
Agenesis of the Corpus Callosum: A Retrospective Study on Fetal and Postnatal Outcomes

Background: Agenesis of the corpus callosum (ACC) occurs in 1:4000 live births and results in a wide spectrum of clinical outcomes. Fetal MRI is increasingly utilized to discern corpus callosum abnormalities that cannot be fully evaluated by fetal ultrasonography (US). This study aims to 1) describe the spectrum of ACC cases diagnosed by fetal MRI; 2) determine the frequency of postnatal confirmation by brain MRI; and 3) understand postnatal outcomes of infants with ACC. Methods: Maternal patient records from Children’s National Hospital’s database from 1 Jan 2012 to 30 Jun 2019 with a 1) prenatal referral for possible brain abnormality, 2) prenatal neurological consultation, 3) complete fetal MRI, and 4) confirmed ACC on imaging were included. Maternal prenatal and postnatal infant data were collected. Cases were defined as isolated if ACC was the only brain finding, and complex if there was another significant brain finding. Each case was categorized as partial or complete ACC and isolated or complex ACC, and group comparisons of outcomes were analyzed. Results: 127 maternal-fetal dyads were evaluated by fetal MRI at 25.8 ± 5.3 weeks gestation and categorized into 45 (36%) isolated-complete, 17 (13%) isolated-partial, 46 (36%) complex-complete, and 19 (15%) complex-partial ACC cases. 71 of 75 (95%) live births had postnatal evaluations; 59 had postnatal imaging (56 brain MRI; 3 head US). In 40 of 59 (68%) cases, postnatal imaging confirmed prenatal ACC finding; 19 cases had differing prenatal and postnatal results. In them, 12 were identified as isolated-complete ACC prenatally and changed to complex-complete (n=10) or isolated-partial (n=2) postnatally. 2 cases were identified as complex-complete prenatally and changed to isolated-complete postnatally. Children with partial or complete ACC had similar rates of developmental delays (44%), while seizures were more common in partial ACC cases (26% vs. 17%). Complex ACC cases had poorer outcomes than isolated ACC, with complex ACC having more delivery complications (44% vs. 16%), NICU admissions (69% vs. 28%), postnatal dysmorphisms (67% vs. 27%), hearing abnormalities (20% vs. 5%), seizures (33% vs. 11%), and hydrocephalus (26% vs. 0%). Conclusions: Children with complex ACC demonstrate poorer neurologic outcome compared to children with isolated ACC. Fetal MRI can help to differentiate isolated and complex abnormalities of the corpus callosum and is a useful tool to guide prenatal counseling and postnatal neurologic care.
Introduction: Imaging in shunted pediatric hydrocephalus patients is utilized to assess shunt function and diagnose shunt failure in symptomatic patients. However, follow-up radiological surveillance in asymptomatic patients is more variable. The objective of this study was to investigate the utilization of imaging in routine follow-up shunt appointments in order to determine whether radiological surveillance is effective at diagnosing early shunt failure. Our secondary objective was to determine the effect of routine imaging on the frequency of subsequent pediatric ER visits related to the shunt. Methods A retrospective chart review was performed on all routine pediatric shunt follow-up clinic visits between January 1, 2018 and December 31, 2019 at Semmes-Murphey Clinic (SMC) (Memphis, TN). A routine follow-up visit was defined as any hydrocephalus-related appointment that occurred at least 6 months after a shunt intervention. Demographic, clinical, and imaging information from each follow-up visit, as well as subsequent ER visits, were documented. Results 319 pediatric shunt patients presented for routine hydrocephalus follow-up visits between January 1, 2018 and December 31, 2019. Out of a total of 527 clinic visits, imaging was obtained in 304 (57.7%) of the visits. A surgical intervention was performed due to a routine clinic visit in 14 patients. Of these, 6 (42.9%) had routine imaging, 6 (42.9%) had imaging because they were symptomatic, and 2 (14.3%) did not have imaging at the time of the visit. There were 72 shunt-related emergency room visits in 60 (18.8%) patients within 6 months of the index visit (range, 1-5). Out of the 72 visits, 31 (43.1%) involved imaging. Conclusion There is a large amount of variability in the long-term follow-up of pediatric shunt patients beyond the first 6 months postoperatively. The frequency of imaging and the type of imaging likely impact the probability a surgical intervention after a routine clinic visit or the probability of an ER visit. It may be beneficial to have a uniform, structured imaging protocol for follow-up evaluations to catch shunt failure early, minimize patient and parent discomfort, and reduce ER visits. Key words: Imaging; Hydrocephalus; Pediatric; Shunts; Follow-up.
Turner syndrome (TS) is a genetic disorder characterized by the absence of part or whole second X-chromosome in a phenotypic female. The clinical presentation is extremely variable and includes skeletal abnormalities, short stature, lymphedema, cardiac and renal abnormalities, primary ovarian insufficiency, autoimmune disease, hearing loss, metabolic syndrome and neurocognitive issues. Girls with TS also exhibit a typical pattern of non-verbal learning issues, with challenges in visual-spatial and executive functioning, attention and memory. They also have a higher incidence of depression, anxiety and social isolation. Mental health is an important priority for these patients and their families, and timely recognition of psychosocial impairment can significantly impact patients' academic achievement and quality of life. Data on self-reported outcomes in TS, however, are limited. A validated 4-question short form was created from the PROMIS (Patient Reported Outcomes Measurement Information System) Pediatric 25 question bank to assess patient and parent self-reported scores for depression, anxiety, and peer relationships in TS patients seen in the multidisciplinary TS clinic at Children's National Hospital between 1/1/2019 and 6/1/2020. Clinical data were abstracted from medical records and correlated with PROMIS scores. Descriptive analyses of the T-scores were completed using a non-parametric Wilcoxon rank-sum test and the dyad results were analyzed for agreement between parent and patient reporting. Completed neuropsychology assessments from the same time frame were also analyzed. Data from 26 patients (mean age 13y, range 4.6-20.6y) were analyzed. The median self-reported outcomes for anxiety, depression and peer relationships did not differ from population norms, and parent and child reported outcomes did not correlate except for the domain of anxiety. These scores did not differ by height, age or estrogen supplementation. Data from comprehensive neuropsychology assessments were also reviewed (N=11, mean age 11.5, range 2.3-20.3y). As expected, these patients had a higher incidence of autism spectrum disorder (3/11), ADHD (2/11), global developmental delays (2/11), special education plans (8/11), learning disorder with impairment in mathematical abilities (3/11), abnormal speech (4/11), anxiety disorder (3/11), difficulties with executive functioning (9/9), and impaired visual spatial abilities (5/9). Subjective evaluation and parent interviews reveal common concerns about peer acceptance and academic performance across all ages. Our preliminary data suggest that generic PROMIS short forms do not adequately capture TS specific emotional, neurocognitive and academic challenges, and highlight the need for a validated disease-specific questionnaire that captures the concerns of this population.
Does Active Rehabilitation Reduce the Risk of Persistent Post-Concussive Symptoms?

Concussions historically have been managed with both cognitive and physical rest. However, recent evidence has found rest may not lead to faster recovery from acute concussions and may lead to an increased risk of Persistent Post-Concussive Symptoms (PPCS). Additionally, emerging evidence suggests light exercise may decrease post-concussive symptoms and speed recovery. The objective of our study was to determine if active rehabilitation compared to standard care reduced the risk of PPCS. The primary outcome was the rate of PPCS. A prospective non-blinded randomized trial of 8-18 year-olds diagnosed with an acute concussion in a tertiary care children’s hospital emergency department was conducted from July 2019 through December 2020. Participants completed the PCSI at diagnosis and were randomized to an active rehabilitation group (10,000 steps/day for five days) or a control group (standard of care). Participants were followed up one-month post injury and repeated the PCSI to determine PPCS. A total of 34 participants were enrolled with a median age of 13.0 (IQR 11.0-15.0). 64.7% (n=22) of the participants were male. 76.5% (n=26) completed the one-month follow-up and 38.4% (n=10) of the participants had PPCS. A chi-square analysis was used to compare the rate of PPCS between the control and active rehabilitation groups. The rate of PPCS was 54.5% (6/11) for the control group and 26.7% (4/15) for the active rehabilitation group; p=0.15. The median of positive symptoms was 4 (IQR 0-8) for the control group and 1 (IQR 0-4) for the active rehabilitation group; p=0.52. In our preliminary pilot data, participants in the active rehabilitation group trended towards a decreased risk of PPCS, but results were not statistically significant. Further larger scale studies are necessary to assess the relationship of activity on risk of PPCS.
Pregnancy and Child Outcomes Following Fetal Intracranial Hemorrhage

The pregnancy and child outcomes following fetal intracranial hemorrhage (ICH) have not been well described. Existing literature defines fetal ICH and outcome based on prenatal ultrasound, however fetal MRI may add additional diagnostic accuracy and is increasingly available in large centers. Our objective was to advance understanding of pregnancy and child outcomes of fetal ICH as diagnosed by fetal MRI. We performed a retrospective study of fetal ICH cases diagnosed by fetal MRI at Children’s National Prenatal Pediatrics Institute from 2012 to 2020. Maternal characteristics, prenatal and postnatal imaging, pregnancy outcome, ICH type, and infant developmental outcomes were recorded. Abnormal outcomes were categorized as: mild for hypertonia or physical/occupational therapy without intellectual disability or language delays; moderate for intermediate multi-domain developmental delays; severe if non-ambulatory, non-verbal, or significant intellectual disability. We identified 57 cases with ICH on fetal MRI. The mean (SD) maternal age was 31.1(6.9) years, gestational age at fetal evaluation was 28.1(5.3) weeks, and birth gestational age was 38.2(1.3) weeks. Pregnancy outcome was 75% (n=43) live births, 14% (n=8) termination, and 11% (n=6) intrauterine demise (IUD). 81% (n=46) of ICH were intraventricular, 28% (n=16) were intraparenchymal and 16% (n=9) were both. In 39% (n=22) the intraventricular hemorrhage was bilateral. Ventriculomegaly was the most common additional finding, seen in 49% of patients. Live births decreased from 90% to 33% and IUD increased 10% to 22% from unilateral IVH to more extensive hemorrhages. 86% of live born infants had clinical follow-up to 1.8(1.6) years. Neurodevelopmental outcome was normal in 57%, mildly abnormal in 24%, moderately abnormal in 14%, and severely abnormal in 5%. 30% of patients required physical therapy. 11% of patients had epilepsy. In 5 cases, an etiology was identified; 3 had placental pathologies, including low placental birth weight and placental hemorrhages, and 2 had genetic findings (FNAIT and COL4A1 mutation). Pregnancy and child outcomes following fetal ICH have a wider spectrum of outcome than previously recognized. Our findings will enhance counseling to expectant mothers. Many infants have normal to mildly affected neurodevelopmental outcomes. Fetal MRI description of ICH location may aid in pregnancy outcome prediction and relate to postnatal outcomes. Further studies should evaluate fetal ICH location, size, and timing in relation to prognosis for specific postnatal outcomes.
The early management of traumatically injured children is error-prone. Implementation of real-time decision support may prevent errors and improve outcomes for these patients. The objective of this study was to develop an algorithm for the management of pediatric traumatic brain injury based on observed activity sequences obtained using video review. Development of an algorithm that aligns with actual practice is a required component for a decision support system that tracks activity performance and makes activity recommendations. The algorithm was first developed through a top-down review of the relevant literature on best practices for managing traumatic brain injuries. Using an iterative process, the algorithm was modified to reflect the actual practice observed in 10 recorded resuscitations of traumatic brain injury of varying severity. The algorithm was further refined by inclusion of feedback from interviews with trauma team members. The final algorithm has multiple branch points, the most central being the patient’s vocalized Glasgow Coma Scale score. The multiple decision points prioritize observable and vocalized information that trigger necessary follow up actions. We observed 1,610,613,000 possible linear paths that teams can pursue for managing children with traumatic brain injury. We have developed an algorithm for structuring the actions taken by teams to manage traumatic brain injury. This algorithm provides the structure required to develop real-time decision support in this setting and is in continued development.
Parkinson’s disease (PD) is a neurodegenerative disease defined by reduced dopaminergic neurotransmission in the basal ganglia, resulting in both motor and non-motor symptoms. PD requires complex medication management to maintain the delicate balance of striatal dopamine to treat symptoms. Maintaining this regimen is challenging in the inpatient setting. Medication errors involving mistimed PD medications and the use of contraindicated medications, such as neuroleptics or other dopamine-blocking agents, are common in hospitalized PD patients. Medication mistiming has previously been shown to be associated with longer lengths of stay and more complications. However, limited data exists examining the relationship between the use of contraindicated medications and hospital outcomes in the PD population. We aimed to investigate the incidence of medication mismanagement in hospitalized PD patients at The George Washington University Hospital (GWUH) and examine the potential relationship of medication mismanagement on lengths of stay, 30-day readmission rates, falls, and delirium. A retrospective chart review of hospitalized PD patients was performed. Lengths of stay, 30-day readmission rates, falls, and delirium incidences among PD patients were compared to matched controls. To identify specific medication errors in the PD cohort, medication errors were grouped into 2 categories: mistimed administration of PD medications by more than 30 minutes and the use of contraindicated medications. Statistical analyses were performed to determine whether medication errors were associated with lengths of stay, 30-day readmission rates, falls, and delirium. 377 PD patients were included in this study. Compared to controls, PD patients had approximately doubled lengths of stay (p<0.001), 30-day readmission rates (p<0.001), and delirium incidences (p=0.009). No differences were observed between PD and control cohorts regarding falls (p=0.320). Medication timing errors occurred in 88.1% of PD patients. 14% of PD patients were prescribed a contraindicated medication, and those patients experienced significantly longer lengths of stay (p<0.001) and significantly more delirium incidences (p=0.001). No statistically significant differences were observed in 30-day readmission rates (p=0.248) or falls (p=0.408). The most commonly used contraindicated medications were haloperidol (38.18%), prochlorperazine (14.55%), and metoclopramide (12.73%). Our analysis suggests that medication mismanagement of PD patients at this center is prevalent, and the use of contraindicated medications is associated with longer lengths of stay and higher delirium incidents. This supports several reports in the literature regarding the frequency and potential impact of medication mismanagement on hospitalized PD patients and represents an important step in recognizing and addressing the quality of care hospitalized PD patients receive.
Context: To date, reversal of Alzheimer’s disease associated cognitive decline has been met with a paucity of success. However, a novel treatment using 40hz light and sound therapy has emerged with promising results in AD rodent models. Studies using this treatment approach demonstrate both reduction in disease biomarkers and memory related cognitive task performance. This intervention holds potential as a non-invasive, non-pharmacological option for MCI and AD patients. Objectives: The goal of this study is to pilot 40hz light and sound therapy using a novel smart tablet application, translating the therapy from a rodent to a human model. 60 minute daily treatments will be implemented over a 6 month span, with individual cognitive outcomes to be tracked and compared to established baselines. Design: Participants were primarily recruited from the GWU Center for Integrative Medicine. Inclusion criteria was age 50 years or older with presence of any subjective or objective cognitive complaints. Participants were excluded for history of epileptic or febrile seizures and macular degeneration. Participants provided their own smart tablet device. The Montreal Cognitive Assessment Scale (MOCA) was used to track participant’s cognitive function over time with 0, 3, and 6 month initial and follow up testing. This initial pilot will be comprised of 20 participants, with three initial cases highlighted in this report. Results: All three participants improved their MOCA scores from baseline by the 6th month. The Memory Index Score (MIS) is a subscore of the MOCA assessment and also improved among all three participants between baseline and 6th month testing. Conclusions: Three of the first participants to complete the therapy course demonstrate promising case examples of the therapy’s potential and utility in continuing the pilot study. All three participants were able to adhere to the treatments. While overall MOCA scores uniformly improved, it is important to note the high initial scores for participants 1 and 2, making it hard to concretely gauge therapy benefits. Additionally, fluctuations in performance between month 3 and 6 are worth bearing in mind. The uniform improvement in the MIS is also of interest. These participants noted difficulties with memory and word finding upon intake, and participants 1 and 2 specifically noted on exit interview that these domains subjectively improved with therapy use. Given these preliminary results, continued exploration of this treatment is warranted to explore the full potential on cognitive outcome improvement.
Background: Recently, environmental enrichment (EE) has been championed as a robust approach to augment white matter health. This experimental paradigm, which exposes animals to increased social interactions, novel stimuli, and voluntary exercise, is a powerful promoter of neuroplasticity that leads to functional improvement in neurological injury models. We previously reported that early and continuous EE attenuates cellular, behavioral, and ultrastructural deficits caused by hypoxic brain injury by stimulating oligodendrocyte maturation, myelination, and functional recovery. While the value of an EE intervention after injury has been demonstrated, the utility of EE in normal development has not been fully elucidated. Here, we aimed to understand whether EE affects normal developmental myelination through adulthood. Methods Mice were randomly assigned to be housed in either an enriched or standard environment. The enriched environment consisted of larger cages that had chains hanging from the roof, a running wheel, and balls and other objects spread over the floor. These objects were changed every 3 days to preserve novelty. The standard environment consisted of smaller cages without any of these objects. Control mice were reared with 2-5 animals per cage, while mice housed in an enriched environment were reared in groups of 8-12 animals. Immunohistochemistry and electron microscopy analysis was performed. An inclined beam walking test was used to examine differences in subcortical white matter myelination between groups. The time that it took each mouse to reach the top of the beam as well as the number of foot slips was recorded. Analysis was performed at postnatal day (P) 60. Results We first assessed the effects of prolonged EE on oligodendrocyte precursor cells (OPCs) and proliferating OPCs versus normoxic (NX) controls and found no changes in oligodendrogenesis. To examine effects of myelination at the ultrastructural level, we performed electron microscopy analysis on the corpus callosum of P60 mice. In comparison to NX mice, EE mice had axons with thicker myelin, as indicated by lower g-ratio values. Furthermore, enriched mice had improved motor coordination on a beam walking test, as demonstrated by the decreased number of foot slips. No significant difference between groups was noted for the amount of time that it took to reach the target. Conclusions The cellular, ultrastructural, and behavioral experiments conducted in this study demonstrate that prolonged EE can increase developmental myelination and lead to functional improvement in behavior. Future research should work towards translating EE protocols into clinical interventions for improving locomotor function.
Joubert Syndrome and Related Disorders Case Report: Neurophysiology of Dysphagia and Nutritional Management

INTRODUCTION: Patients with Joubert Syndrome and Related Disorders (JSRD) present at birth with cerebellar hypoplasia and midbrain-hindbrain defect with related craniofacial, ocular, renal, or hepatic anomalies. Reported incidence rates range from 1/100,000 to 1/80,000 live births. (1) Clinical diagnosis stems from identifying the “molar tooth sign” on neuroimaging, and findings include ataxia, abnormal respiratory and ocular patterns, and language and developmental motor delays. (1–5) Present research has focused on discovering the genetic mutations associated with JSRD. (6–9) Neurophysiology of swallowing, including the nucleus tractus solitaries, nucleus ambiguous, and the reticular formation, has been detailed extensively in literature, regulated by descending cortical signals. (10–12) It stands to reason that the JSRD midbrain anomalies would affect swallowing pathways. To the authors’ knowledge, studies have yet to describe JSRD patients presenting with failure to thrive (FTT) attributed to dysphagia. CASE A 5-10-year-old boy with a history of JSRD presented to Children’s National Hospital for FTT work-up. His growth chart showed his height and weight between age 1 and 3 in the 10-15th percentile range. He progressively lost weight, and now, with his height, weight, and BMI all below 1st percentile. Laboratory investigations were all normal. Transglutaminase IgA antibody and fecal fat test were both negative. A 24-hour pulse oximeter was placed to measure periods of apnea-induced hypoxemia but was negative. An upper GI series obtained was also normal. The speech team reported significant dysphagia, with nasal regurgitation of food and drinks. With a negative work-up for increased metabolic demand, malabsorption, and anatomic malformations, patient’s FTT was attributed to dysphagia from JSRD. Gastric tube was placed successfully, and the patient was tolerating feeds well on discharge. DISCUSSION The pathophysiology and molecular underpinnings of JSRD have been extensively studied. However, case reports have yet to extensively describe the dysphagia experienced by JSRD patients. The patient described here after workup was shown to have no metabolic demands, malabsorption, gastro-esophageal anatomic abnormalities that would explain his dysphagia. We hypothesize that the anomalous cerebellum and midbrain of JSRD modulate descending cortical swallowing signals. All JSRD patients should be monitored carefully for dysphagia and managed with proper nutritional counseling and a low clinical threshold for gastric tube placement. Work Cited: 12 articles cited
Plasma Cell Vulvitis: A Systematic Review

Objective: This systematic review aims to present the available literature on plasma cell vulvitis (PCV), a relatively uncommon form of inflammatory vulvovaginal dermatitis. Methods: A literature search was performed in PubMed, Science Direct, and Google Scholar using the following keywords: “plasma cell vulvitis”, “Zoon vulvitis”, and “vulvitis circumscripta plasmacellularis.” Specific variables were assessed in each article, including patient age, menopausal status, comorbidities, presenting symptoms, symptom duration, histological description, treatment, and treatment response. Results: Thirty-nine articles met inclusion criteria, including 38 case reports and one observational study, with a total of 96 cases of PCV reported. Mean age of diagnosis was 52.9, with an age range of 8-76 years old. Most common presenting symptoms included pruritis and vaginal discomfort, with average duration of symptoms 28.2 months (range 2 months to 10 years). All reports demonstrated subepithelial plasma cell infiltrate on histology. Five percent of PCV cases reported concomitant autoimmune conditions and 6% sexually transmitted infections. Most common treatment modalities included topical corticosteroids (n=41), tacrolimus (n=6), imiquimod (n=6). In 53 reported outcomes, 88.7% of patients had resolution of symptoms with treatment. Conclusion: Clinical research is needed to better determine the diagnostic criteria and to assess the efficacy of treatment options for PCV.
Uterine leiomyomas (fibroids) are extremely common, negatively impacting quality of life. Although definitive treatment is surgical, uterine artery embolization (UAE) is described as an alternative resulting in fibroid devascularization and involution. UAE may offer a shorter hospital stay, faster recovery and lower complication rate than surgical intervention, especially abdominal myomectomy. Although UAE has a high procedural success rate, UAE has a clinical failure rate of 10-23% at 1-2 years, resulting in repeat intervention. To date, few studies examine independent variables associated with treatment failure following UAE. Both surgical management of fibroids and UAE are associated with post procedural pain and narcotic utilization, yet narcotic utilization following UAE is less studied. There are no defined variables, such as number or size of fibroids, location of fibroids, demographics, or embolization technique, that may be predictive of increased post-procedural pain. In this retrospective cohort analysis study, we sought to identify independent patient-level variables associated with UAE failure and describe the narcotic utilization pattern following this procedure. In this study, patients who underwent UAE at the George Washington University Hospital between January 2015 and March 2019 were identified. We identified 77 women for inclusion in the final analysis. Unsuccessful UAE was defined as any patient who underwent a hysterectomy more than 30 days following their UAE. Chi-squared test was used for categorical variables and Mann-Whitney test for continuous variables, with a p value <.05 used for statistical significance. Among those with uterine volume documented (n=67), the median volume of those that did not undergo hysterectomy was 616.8mL (337.0-1142.7mL) compared to those who underwent hysterectomy 1196.3mL (842.4-1456.0mL) with significant difference in distribution (p=.02). Increased body mass index (BMI) was significantly associated with failed UAE (30.0±7.3 vs. 39.5±13.2; p=.002). Number of fibroids and mean fibroid volume =539 mL were not associated with failed UAE. For patients undergoing UAE, the median morphine milligram equivalents (MME) used was 55. Neither uterine volume nor fibroid number was associated with MME. Uterine volume and BMI were predictive of failed UAE, whereas there was no association between fibroid volume or number and failure. To our knowledge this is the first study identifying patient factors that may inform individualized counseling regarding risk of failed treatment and subsequent intervention. No variables were identified as predictors for increased narcotic use after UAE. Further study is needed to evaluate our findings on this topic, which is underrepresented in the gynecologic literature.
INTRODUCTION: Corneal erosions can be debilitating for patients and difficult to treat in a clinical setting. In Ophthalmology, topical Mitomycin C (MMC) is used to reduce fibrosis and enhance recovery, particularly after refractive surgery. Previous in vivo studies in a mouse model have shown that the application of MMC reduces the frequency of corneal erosions. In vivo studies on humans have also shown that MMC reduces collagen deposition by corneal fibroblasts, and enhances the deposition of epithelial basement membrane proteins by human corneal epithelial cells. Understanding the full extent by which MMC reduces corneal erosions thereby facilitating healing warrants further study. The primary objective of this study was to use RNAseq analysis to study the impact of Mitomycin C treatment on secretion of human corneal limbal epithelial cells.

METHODS: Human corneal limbal epithelial cells, both primary (PHCLE) and telomerase immortalized (IHCLE), were studied in vitro and RNA was isolated to compare the differences in gene expression between the two cell lines, with and without MMC treatment. RNA expression profiling of PHCLE and IHCLE cells with and without treatment of conditioned media from MMC-treated human corneal fibroblasts was obtained through the NIAMS Genome Core Facility at the NIH. Four different comparisons were performed: IHCLE+MMC vs. IHCLE, PHCLE+MMC vs. PHCLE, IHCLE vs. PHCLE, and IHCLE+MMC vs. PHCLE+MMC. Gene ontology analysis was done using the TopFun analysis on TopGene Suite to find the statistically significant pathways pertaining to the 2 and 5 fold up and down regulated genes in the extracellular matrix for both IHCLE and PHCLE cell lines. Results: CXCL2 and SERPINB2 were 5 fold up-regulated in both IHCLE and PHCLE cells following MMC treatment. COL4A2 and PDGFA were 2 fold down-regulated in both IHCLE and PHCLE cells following MMC treatment. Conclusion: CXCL2 and SERPINB2, which were both 5 fold up-regulated following MMC treatment, are involved in pathways encoding for extracellular matrix proteins. COL4A2 is involved in a pathway encoding for extracellular matrix proteins and PDGFA is associated with growth factor activity. The in depth analysis of RNAseq data indicates that MMC may be affecting pathways regulating the extracellular matrix proteins.
Uncontrolled opioid use and the opioid crisis continue to be a growing problem worldwide. In the field of Oculoplastics and Reconstructive surgery, the current body of literature examining opioid use and opioid abuse are limited. The scope of oculoplastic surgery consists of a wide-array of procedures ranging from cosmetic eyelid surgery to enucleations and evisceration procedures to orbital fracture repair. There are currently no standardized prescribing guidelines specifically for oculoplastic surgery. We conducted a survey of oculoplastic surgeons to obtain information about currently utilized opioid regimens for some of the most common functional oculoplastic procedures. An online survey was created using Microsoft Forms and sent to 817 American Society of Ophthalmic and Reconstructive Surgery (ASOPRS) members. The first set of questions included demographic information about the survey participants: sex, age, years in practice, and location of practice within the United States. The second set of questions asked if the surgeon used opioids postoperatively for pain control and if so, their preferred regimen for twenty-five different ophthalmic procedures. Seventy-two responses to the survey were recorded. The demographics of responders in this study were predominantly male with a reported age range of 51-60 and on average at least 20 years of practice experience. Location of practice was equally spread across the United States. Orbital procedures had the highest percentage of opioid use in the post-operative period. Average morphine equivalents prescribed per day in the post-operative period ranged from 22.6 to 28.0, which was similar across the variety of procedures queried. The average number of days opioids were used for was also greatest for orbital procedures compared with the number of days of opioid use for other procedures. Trauma related procedures such as corneal and scleral lacerations and canalicular lacerations may have had higher opioid parameters due to non-ocular trauma related pain. Understanding how opioids are currently being used in the field of oculoplastics is crucial to modulating future drug use. This study provides insight into opioid use practice patterns within oculoplastic surgery, and we hope that this data will guide and inspire future inquiries into appropriate pain control within our field.
Sub-Macular Hemorrhage Following Aflibercept Intravitreal Injection

Introduction: While Anti-vascular endothelial growth factor ocular injections have been the treatment gold standard for wet age-related macular degeneration (AMD), there have been some reports of sub-macular hemorrhage (SMH) following treatment of bevacizumab and ranibizumab. Aflibercept has been reported to cause SMH in cases of polypoidal choroidal vasculopathy but not wet AMD. Methods: A case series of two patients with wet AMD who developed SMH after treatment with aflibercept injections. Results: The first patient is an 84-year-old female with wet AMD in both eyes who presents with SMH four days after aflibercept injection in her right eye. Due to her age, she refused surgery and was treated by switching her to bevacizumab. The second patient is a 77-year-old female who presents with wet AMD in her left eye and SMH one month following aflibercept injection. She was switched to bevacizumab and treated by pars plana vitrectomy (PPV), subretinal injections of tissue plasminogen activator (tPA) followed by fluid-air exchange and intravitreal injection of a non-expansible gas bubble. Conclusion: SMH in patients treated for wet AMD is a rare yet possible complication of aflibercept injection that requires further research to establish its incidence and risk factors.
Practice Patterns in the Management of Pediatric Horner’s Syndrome: A Survey of AAPOS Members

Purpose: To assess pediatric ophthalmologists’ current approach to Horner’s syndrome (HS) in pediatric patients, as well as explore the relationship between HS and neuroblastoma. Methods: An 8-question multiple-choice questionnaire was e-mailed to members of the American Association of Pediatric Ophthalmology and Strabismus (AAPOS) discussion group and listserv in May and June of 2019. Respondents provided information about their experience, practice setting, frequency at which they diagnose HS, procedure for making the diagnosis, procedure following diagnosis, and frequency of diagnosing neuroblastoma as the underlying cause. Results: Two hundred thirty-nine AAPOS members completed the survey. Of the respondents, 98% were attending physicians and 46% had been in practice for more than twenty years. Although 91% reported seeing at least one patient per year with HS in their practice, 66% had never made the diagnosis of neuroblastoma in these patients. Fifty-one percent of respondents reported making the diagnosis of HS through pupillary evaluation in light and dark. Following the diagnosis of HS, 69% instructed their patients to obtain either magnetic resonance imaging (MRI) or a computed tomography (CT) scan of the head, neck, and chest. Conclusion: HS is infrequently seen among pediatric patients. Although the diagnosis and work-up of HS varies among pediatric ophthalmologists, neuroblastoma is seldom diagnosed as the underlying cause.
Ocular Symptoms in COVID-19 Infection: A Survey Study

Introduction: Ocular symptoms have been reported during Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection, but there are very few large-scale studies that examine the specifics of ocular symptoms. This study aims to evaluate and characterize the range of ocular symptoms, as well as their frequency and duration in association with COVID-19. Methods An anonymous, retrospective survey was developed using the online software Research Electronic Data Capture (REDCap) to capture ocular symptoms in association with COVID-19. The survey was distributed to NIH employees who had tested positive for SARS-CoV-19 and was also advertised to the general public through social media and patient recruitment mailing lists. Responses were included for those who consented to the survey, confirmed that they were at least 18 years old and had tested positive for SARS-CoV-19, and fully completed the survey. This study was deemed exempt by the National Institutes of Health (NIH) Office of IRB Operations. Results 181 complete survey responses (20.4% male and 79.0% female) were analyzed, including 9.9% from hospitalized respondents (90.1% non-hospitalized) and 27.1% from NIH employees (72.9% general public). Most respondents (77.9%) endorsed ocular symptoms associated with SARS-CoV-2 infection (mean number of ocular symptoms per participant: 2.19 +/- 2.36). The most commonly reported ocular symptoms were light sensitivity (28.1%), itchy eyes (26.0%), tearing (25.4%), eye redness (24.9%), mucous discharge (20.1%), foreign body sensation (17.1%), and new onset floaters (15.4%). The onset of ocular symptoms occurred most frequently at the same time as systemic symptoms (53.8%) compared to before (18.9%) and after systemic symptoms (27.3%). Notably, 10.6% of respondents with ocular symptoms sought medical attention by an eye care professional and 21.2% reported eye symptoms lasting =14 days. Conclusion This study shows that ocular symptoms are a common occurrence in COVID-19, but the most common ocular symptoms involved the surface of the eye with a low rate of vision-threatening symptoms. These conclusions offer support to previous studies describing ocular symptoms associated with COVID-19. It is important to note that the results of this survey may be biased due to its distribution by the National Eye Institute (NEI), which likely resulted in more responses from individuals experiencing eye symptoms. Overall, additional research is still required to accurately identify the extent of ocular symptoms associated with SARS-CoV-2 infection.
No Increase in Post-Surgical Complications in Total Knee Arthroplasty following Geniceral Nerve Radiofrequency Ablation

Introduction: Genicular nerve radiofrequency ablation (GNRFA) is an increasingly utilized nonoperative treatment modality for patients with advanced knee osteoarthritis (OA). Previous studies have demonstrated this to be an effective and safe method to decrease pain and increase functionality in this patient population. The purpose of this study was to compare two-year postoperative complication rates between subjects undergoing total knee arthroplasty (TKA) after previous GNRFA with a matched control group. Methods: Patients who underwent primary TKA after prior GNRFA (TKA-GNRFA) of the ipsilateral knee were identified in a national all-payer claims database from 2010-2019. This TKA-GNRFA group was subclassified into patients receiving GNRFA within 6 months and greater than 6 months prior to undergoing TKA. Both subgroups were propensity matched to subjects undergoing primary TKA without history of GNRFA based upon age, sex, Charlson Comorbidity Index, and obesity status. Univariate analysis was performed to analyze differences in two-year complication and revision rates between cohorts. Results: In total, 1,020 patients in the GNRFA-TKA cohort were compared to 2,040 patients in the post-match control. Patients in the GNRFA-TKA cohort had lower rates of blood transfusions, bleeding complications, and prosthetic joint infection compared to primary TKA controls. There was no significant difference in the other surgical outcomes between cohorts. Additionally, GNRFA-TKA subjects had lower rates of prolonged opioid use. There were no clinically significant differences in complication rates or opioids use between the subclassified GNRFA cohorts. Conclusion: GNRFA is a safe and efficacious nonoperative treatment modality in the management of end stage osteoarthritis. This study demonstrates no increased rate of complications in GNRFA-TKA as well as a potential long-lasting pain-relieving effect, leading to decreased opioid use postoperatively.
INTRODUCTION: PIEZO2 encodes a large mechanosensitive cation channel that plays a principal role in proprioception1,2. Two single nucleotide polymorphisms (SNPs) rs3748428 and rs7234309 are G to A missense variants in the coding region of PIEZO2. Given the known role of PIEZO2 in the skeletal system, we sought to explore if these variants in PIEZO2 are associated with musculoskeletal phenotypes in a cohort of healthy young adults. METHODS: Cohort: Functional Single Nucleotide Polymorphism Associated with Human Muscle Size and Strength (FAMuSS) Phenotypes: Baseline cortical and total bone volume in dominant and non-dominant arms Genotyping: Applied Biosystems QuantStudio 7 Flex Real-Time PCR System and Applied Biosystems Taqman Allelic Discrimination Assays. Statistical Analyses: Hardy Weinberg Equilibrium, analysis of covariance (ANCOVA), post-hoc pairwise comparison, and p-values were adjusted via the Sidak method. RESULTS: The PIEZO2 variants, rs374828 and rs7234309, were in Hardy Weinberg equilibrium in the FAMuSS cohort and found to be in complete linkage disequilibrium (inherited together). In males only, the GA genotype was found to be associated with higher baseline cortical bone volume in both arms (p=0.0235, p=0.0072, respectively). Similarly, in males only, the GA genotype was found to be associated with higher total bone volume in both arms (p=0.0137, p=0.0306, respectively). In females only, the GA genotype was associated with an increase both in cortical and total bone volumes in the dominant arm (p=0.0211, p=0.0111, respectively). DISCUSSION: This study suggests novel, sex-specific contributions to musculoskeletal phenotypes by variants rs374828 and rs7234309 in PIEZO2. Given the known significance of PIEZO2 in proprioception, our results support evidence that proprioception plays a role in bone volume, which is inextricably tied to bone quality, including bone mineral density. Further study is needed to further delineate the role of PIEZO2 variants and proprioception in determining bone quality.
Is Epidural Analgesia Necessary for Unilateral Hip Reconstruction in Children with Neuromuscular Conditions?

**Background:** Epidural and non-epidural analgesia are both widely used for post-operative pain control in patients with neuromuscular conditions undergoing unilateral hip reconstruction, but there have been no studies investigating the effectiveness between the two modalities in this specific patient population. **Objective:** The purpose of this study was to determine if there was a difference in pain control and length of stay between the use of epidural analgesia versus non-epidural analgesia for patients with neuromuscular conditions undergoing unilateral hip reconstruction. Additionally, we sought to quantify differences in duration of pain control, duration of Foley catheter, and complication rates between the epidural and non-epidural analgesia groups. **Methods:** We performed a retrospective chart review of pediatric hip reconstructive procedures in which either epidural or non-epidural analgesia was administered for postoperative pain control. We identified patients who underwent unilateral or bilateral proximal femoral osteotomies, pelvic osteotomies, or hip open reductions from 01/01/2009 - 12/02/2019. We excluded patients who had a revision surgery and those without neuromuscular conditions. **Results:** Of the 58 patients meeting inclusion criteria, 28 used non-epidural analgesia, and 30 used epidural analgesia. Both groups were comparable in terms of baseline characteristics except for BMI. We compared pain scores (mean, median, high, and low), length of stay, duration of Foley placement, duration of pain control modality, and complication rates between the two groups. Average pain scores were similar between the two groups. Duration of Foley placement was significantly higher in the epidural group compared to the non-epidural group (p=0.008). Although complication rates were higher in the epidural group, it was not statistically significant (p=0.121). A multiple linear regression analysis adjusted for age, BMI, procedure-type, and immobilization-type revealed that length of stay (p=0.032) and duration of Foley placement (p=0.013) was significantly higher and pain score low (p=0.022) was significantly lower in the epidural group compared to the non-epidural group. **Conclusions:** These results suggest that epidural analgesia does not provide additional benefit to postoperative treatment compared to non-epidural analgesia in this specific patient population.
Background: Femoral and acetabular osteotomies are the primary surgical interventions for hip disorders in patients with neuromuscular conditions, but there is no consensus on postoperative immobilization. Currently, postoperative immobilization method is determined by surgeon preference. Objective: The purpose of this study was to evaluate the effects of several postoperative immobilization methods in patients with neuromuscular conditions following hip reconstruction and determine which method yields the fewest complications. Methods/Design: We performed a retrospective chart review of pediatric hip reconstructive procedures in which a spica cast, Petrie cast, or abduction pillow was placed for postoperative hip immobilization. We identified patients with neuromuscular conditions who underwent unilateral or bilateral proximal femoral osteotomies, pelvic osteotomies, or hip open reductions from 01/01/2009 - 12/02/2019, excluding those who had revision surgery. Results/Discussion: Of the 70 patients meeting inclusion criteria, 27 received Spica casting, 28 received Petrie casting, and 15 received an abduction pillow. We compared the length of stay, duration of Foley placement, duration of pain control modality, and complications between three groups. The median length of stay was significantly lower in the Spica immobilization group (p=0.042) compared to the other two groups. Mean duration of Foley placement and mean pain control duration were similar between three groups. Although complications were higher in the Pillow immobilization group, it was not statistically significant (p=0.634). Using multiple linear regression to adjust for potential confounders (age, BMI, procedure type, open reduction, number of comorbidities) did not show significant differences in the length of stay, duration of Foley placement, and mean pain control durations between these groups. The complication rate was also not significantly different across these groups in the adjusted analysis. These results suggest that patients with neuromuscular conditions undergoing hip reconstruction do not additionally benefit from spica or Petrie casting in the setting where an open reduction is not performed. We are hopeful that this will allow practitioners to standardize postoperative hip immobilization in this patient population.
INTRODUCTION: Expression of PIEZO1, a gene coding for a mechanically activated ion channel, has been implicated in the formation of structurally strong bones. Several genetic variants of PIEZO1 have been associated with decreased bone mineral density (BMD) and increased fracture risk. Notably, the single nucleotide polymorphism (SNP), rs62048221, has been associated with compromised bone quality, with each copy of the effect allele T corresponding to additional decreases in BMD (Bai et al., 2020).

OBJECTIVE: The purpose of this study was to explore musculoskeletal phenotypes associated with the rs62048221 polymorphism in two cohorts of healthy young adults.

METHODS: Cohorts: The Assessing Inherited Markers of Metabolic Syndrome in the Young (AIMMY) and Functional Single Nucleotide Polymorphism Associated with Human Muscle Size and Strength (FAMuSS) were used for DNA samples and phenotypes. Genotyping: Applied Biosystems QuantStudio 7 Flex Real-Time PCR System genotyped the FAMuSS and AIMMY cohort DNA samples. Statistical Analysis: Analysis of covariance (ANCOVA), using additive genetic models, were used to test relationships among SNP genotypes and phenotypes for bone quality. Statistically significant associations underwent post-hoc pairwise comparisons and p-values were adjusted using the Sidak method.

RESULTS: The genotype distribution for rs62048221 of PIEZO1 was in Hardy Weinberg equilibrium in the FAMuSS and HU-AIMMY cohorts. Among females in the FAMuSS cohort, homozygous variants in rs62048221 were significantly correlated with lower baseline one arm strength (p=0.0161) and percent change in one arm strength (p=0.0214) in the non-dominant arm.

DISCUSSION: Our results did not find a significant association between total BMD and rs62048221, but instead showed an association with baseline one arm strength and response to training strength. This study supports previous associations between PIEZO1 and mechanical-load induced strength. These results may be used in the future to help inform exercise regimens for those at higher risk of fracture through their genetic variants.
INTRODUCTION: Genome-wide association studies (GWAS) have recently identified genetic variants associated with BMD and fragility fracture risk, such as single nucleotide polymorphism (SNP) variation in a non-coding region of the genome C7ORF76. In studies of adult women, C7ORF76 rs4727338 and rs4342521 variants have been associated with low BMD and osteoporotic fracture. OBJECTIVE: The goal of this study is to investigate whether C7ORF76 rs4727338 and rs4342521 polymorphisms are also associated with measures of musculoskeletal health in two cohorts of healthy young adults. METHODS: The Assessing Inherited Markers of Metabolic Syndrome in the Young (AIMMY) and Functional Single Nucleotide Polymorphism Associated with Human Muscle Size and Strength (FAMuSS) cohorts were used for DNA samples and phenotype data. Applied Biosystems QuantStudio 7 Flex Real-Time PCR System was used to genotype the FAMuSS and AIMMY cohort DNA samples. Analysis of covariance (ANCOVA), using additive genetic models, were used to test relationships among SNP genotypes and phenotypes for bone quality. Statistically significant associations underwent post-hoc pairwise comparisons and p-values were adjusted using the Sidak method. RESULTS: The GG genotype in rs4342521 in FAMuSS males demonstrated a significant association with lower percent change in 1-RM strength in non-dominant arm (p=0.0108). In AIMMY, individuals with TT at rs4342521 demonstrated associations with increased weight (p=0.0021 and p=0.0066) and increased BMI (p=0.0003 and p=0.0006) in males. DISCUSSION: These findings suggest a potential relationship between the effects of C7ORF76 variants on muscle strength, weight, and BMI in young adults. This study suggest a sexually dimorphic role of both rs4727338 and rs4342521. These significant associations warrant further study to evaluate the role that genetic variants play in BMD and fracture risk. SIGNIFICANCE: This study expands existing understanding of genetic SNP variations in the C7ORF76 gene that impact musculoskeletal and anthropometric phenotypes in young adults.
Background: The purpose of this study was to assess the nationwide incidence of ear foreign body (FB) presentations to the emergency department (ED) and analyze the most common FB consumer products encountered. Methods: The National Electronic Injury Surveillance System (NEISS) was evaluated for ED visits that included “ear foreign bodies” from 2010 through 2019. The most frequent foreign bodies were identified and organized by demographics. Results: A total of 20,545 ear FB cases were found, with an estimated 608,860 ED visits nationwide. Female patients (56%) were more likely to have jewelry and first aid equipment FBs. Males between the ages of 5 and 15 years were significantly (p < 0.05) more likely to have paper products, pens/pencils, and desk supplies in their ears. Conclusion: Ear FBs represent a substantial proportion of healthcare expenditures. Although children are the most commonly affected individuals, all ages require further education and preventive measures. Key Words: foreign bodies, ear foreign bodies, national electronic surveillance system, consumer product safety, jewelry foreign bodies, cotton-tipped applicators
Upper airway obstruction (UAO) in association with micrognathia and glossoptosis are the hallmark signs of Robin sequence (RS). Mandibular distraction osteogenesis (MDO) has been increasingly used to address airway obstruction in infants with RS by enabling gradual mandibular lengthening and soft tissue stretching. While many complications associated with this procedure have been well documented, there is a paucity of literature describing the incidence and timing of facial nerve dysfunction (FND) associated with MDO. A 16 question anonymous survey designed through REDCap was digitally distributed to members of the American Cleft Palate-Craniofacial Association (ACPA) and International Society of Craniofacial Surgery (ISCF). Surveys with contradictory responses were excluded from analysis. Eighty-four responses were collected, with eighty being included for analysis. A majority of respondents reported FND as a complication of MDO in patients with RS (63.8%, n=51); 58.8% (n=47) experienced transient FND and 21.3% (n=17) noted permanent nerve palsy. On a further sub-analysis, respondents who reported using 3 turns per day (n=8) did have a greater proportion of permanent facial palsy (50%, n=4) compared to those who turned twice (15.1%, n=8 of 53) or once daily (27.8%, n=5 of 18). For those respondents who reported experiencing a palsy upon removal of a device, there was a greater proportion who experienced permanent nerve injury (59.1%, n=13 of 22) following MDO when compared to those who had not encountered palsy upon device removal (13.8%, n=4 of 29). Interestingly, a greater proportion of respondents who experienced facial palsy did not use virtual surgical planning (VSP) (69.2%, n=27 of 39). Of the 51 respondents who experienced FND following MDO, 45.1% (n=23) reported occurrences immediately following initial device placement/osteotomies, 47.1% (n=24) during distraction, 19.6% (n=10) during consolidation, and 45.1% (n=23) following device removal. Thirty of these respondents reported resolution of FND between 1 and 3 months (37.5%, n=30). In conclusion, FND after MDO in patients with RS appears to be common consequence, as reported by most respondents. While temporary FND was the most common, over 20% of physicians reported permanent dysfunction. Further research should seek to establish risk factors associated with FND and identify surgical and perioperative prevention strategies.
Objective: In the absence of randomized trials for adult pineal parenchymal tumors (PPT), we use a national database to evaluate treatment trends and the survival impact of surgery, radiation, and chemotherapy. Methods: The National Cancer Database was queried for adult patients with histologically confirmed PPT diagnosed from 2004 to 2016. Univariate and multivariate Cox regressions were used to evaluate the prognostic impact of covariates. Kaplan-Meier survival curves were generated for comparative subanalyses. Results: A total of 202 patients met inclusion criteria. A plurality of pineoblastoma (PB) patients were treated with trimodal therapy (43.6%, 24/55). Pineal parenchymal tumor of intermediate differentiation (PPTID) patients were most commonly treated with either surgery alone (35.1%, 47/134) or with surgery and radiation (32.8%, 44/134). Factors associated with improved overall survival on multivariate analysis included younger patient age, female sex, lower comorbidity score, receipt of surgery, and receipt of radiation (each p < .05). Receipt of chemotherapy is not associated with survival. Subanlyses revealed that the effect of radiation on survival is most prominent in PB patients and in PPTID patients who had not received surgery. No survival benefit of adjuvant radiation is demonstrated in surgically treated PPTID patients. Conclusion: Currently, there is a paucity of data regarding treatment outcomes for adult PPT tumors, and this is the largest study to date. While radiotherapy and surgery were found to increase survival in all PPT patients, there was no demonstrable survival benefit of adjuvant radiation in surgically treated PPTID. This suggests that adjuvant radiotherapy may not add significant benefit in many PPTID adult patients.
Challenges and Solutions to Addressing Female Leadership Issues in Global Health Sectors in Nepal

From pay gap to job entry opportunity, females across the globe face a variety of challenges towards achieving equal treatment as male counterparts in the workplace. While these challenges have been recognized in high-income countries, there is a lack of information regarding the unique challenges faced by female professionals in lower-middle income countries such as Nepal. This qualitative research examines the perceived barriers faced by females in academia and recommended strategies to overcome these challenges. 22 qualitative interviews of key informants (16 females and 6 males) working as professionals in the global health sector in Kathmandu, Nepal were conducted. Respondents included early, mid and late careers from across six sectors: government, academic, non-governmental organizations, international non-governmental organizations, and the private sector. Interviews were conducted in Nepali between May 2018 to March 2019, and were transcribed, and translated to English by professionals. Thematic analysis was used to generate common themes and code the interviews. The challenges and potential solutions to mitigate barriers for females entering leadership positions in global health fields can be organized at individual, group, organizational, and sociocultural levels. Individual and group level challenges faced by females related to a lack of support from family and peers. Due to a lack of understanding on the familial side and competition between female peers, respondents believe that a lack of interpersonal support is a barrier to professional development. Suggestions provided by respondents to tackle these barriers include creating support networks within groups whereby females share challenges with each other, provide advice, and also support each other professionally. Challenges faced on organizational and societal levels related to the stigma of females in the workplace and lack of policies that provide accommodations for female specific needs such as those related to menstrual or maternity leave. Respondents suggest that organizations create gender sensitive policies that are more accommodating of females with children and have gender sensitive policies that permit maternity leave. On a sociocultural level, the stigma of traditional gender roles can be mitigated through early childhood education that teaches gender equality and female empowerment to be proactive and search for opportunities. Generally, respondents noted the lack of gender sensitive policies within their organizations that present as barriers to advancement in career. Strategies to support female professionals include personal capacity building up, implementation of peer groups, and policies that allow women to feel supported in the field of global health.
Post-traumatic stress disorder (PTSD) is a debilitating psychiatric disorder affecting an estimated 8.3% of adults in the United States (Kilpatrick et al., 2013). With a growing awareness and prevalence of the disorder, it has become clearer that traditional therapeutic methods and pharmacologic modalities are rarely sufficient. This literature review strived to determine the efficacy of multiple alternative treatment options for PTSD, such as mindfulness-based stress reduction, neurofeedback, and transcranial magnetic stimulation. Via search on PubMed, eight studies were included in this review and all were found to have statistically significant improvement of PTSD symptoms. As research continues to emerge regarding the psychopathology and development of PTSD, more extensive, innovative, and revolutionary therapies are being developed which require further investigation and evaluation before becoming mainstay therapy.
A Case for Intersectional Capacity Assessments

Clinical Case Presentation: Ms. R., a 72-year-old African-American female with no past psychiatric history and medical history of DM and HTN presents to the psychiatric consult service with significant altered mental status and tangential speech. The medical team’s initial workup revealed uremic encephalopathy and concern over the patient’s decision-making abilities, with regards to dialysis initiation is present. Capacity assessment is conducted by the psychiatric team, who deems she does not have capacity to refuse dialysis. Of note, during the encounter she reveals she is a Jehovah Witness. Providers consulted the ethical committee and facilitated meetings between the patient, spiritual leaders and her family, which resulted in the patient and next of kin agreeably transitioning to home care. Case Discussion: At baseline, this case underscores the importance of assessing spiritual history of capacity evaluations surrounding refusal of medical treatment, but even greater is the complex ethical situation that arises in wanting to respect a patient’s autonomy with religious beliefs in the setting of impaired capacity. Importance should be placed on obtaining collateral information to understand the patient’s depth and longitudinal relationship to religion, as well as increasing provider knowledge on the belief system at play. While Jehovah Witnesses’ beliefs necessitate the refusal of blood products, acceptance of dialysis varies individually. In terms of primary prevention in the outpatient setting, clinicians can advocate for patients with significant religious considerations to have an advanced directive to aid in complex ethical healthcare situations such as this one. In our poster, we present the considerations and strategies psychiatrists can employ during decision-making capacity evaluations complicated by religious beliefs and when an ethical consult is warranted. 1 Herschkopf, M., & Peteet, J. (2016). Ethical considerations regarding religion/spirituality in consultation psychiatry. Spirituality in Clinical Practice (Washington, D.C.), 3(3), 155-158. 2 Panico, M., Jenq, G., & Brewster, U. (2011). When a Patient Refuses Life-Saving Care: Issues Raised When Treating a Jehovah’s Witness. American Journal of Kidney Diseases, 58(4), 647-653.
Post-traumatic stress disorder (PTSD) is a debilitating psychiatric disorder affecting an estimated 8.3% of adults in the United States. With a growing awareness and prevalence of the disorder, it has become clearer that traditional therapeutic methods and pharmacologic modalities are frequently insufficient. This literature review strived to determine the efficacy of multiple emerging alternative treatments for PTSD, such as mindfulness-based stress reduction, neurofeedback, and transcranial magnetic stimulation. Via search on PubMed, thirty-two clinical trials were reviewed with eight studies included in this review. All eight studies were found to have statistically significant improvement of PTSD symptoms, with TMS showing reproducible results across three studies. As research continues to emerge regarding the psychopathology of PTSD, more innovative and neurologically informed therapies are being developed; however, feasibility, reproducibility, and further global investigation are needed before adapting therapy recommendations for PTSD.
Investigating the Effect of Oxytocin on Respiratory Parameters in an Animal Model

Obstructive sleep apnea (OSA) is a very common disorder in the United States, affecting nearly a fifth of the population. The large disease burden is compounded by harmful long-term sequelae, including hypertension, cardiac arrhythmias, myocardial ischemia, and ventricular hypertrophy, to name a few. Additionally, the majority of cases remain undiagnosed and the gold-standard of treatment, continuous positive airway pressure, is prone to early termination. Oxytocin, which has previously been shown to increase respiratory rate (RR) and reduce event duration and oxygen desaturation in OSA patients, provides an opportunity to investigate pharmacologic treatment for a disease with few existing treatment options. Our work examined the changes in respiratory parameters following oxytocin administration, in a sample of Sprague-Dawley rats, and we posited that intranasal oxytocin administration would increase respiratory rate (RR). Following administration of oxytocin or controls including saline, rats were observed for 3 hours in whole body plethysmography chambers to measure respiratory parameters including inspiratory and expiratory time, tidal volume, and RR. Video data for 3 rats was collected and analyzed in an effort to correlate respiratory changes with sleep/awake behavior changes. Minute to minute behavior of REM sleep, non-REM sleep, or awake state was determined and recorded. Among our 2 rats observed following intra parenteral saline treatment and intranasal oxytocin treatment we noticed a decrease in the awake state from 36% to 10.67%, for rat A, and from 10.67% to 8.67%, for rat B, or 54 minutes to 16 minutes, and 16 minutes to 12 minutes, respectively. Additionally, a third rat observed following intranasal saline treatment and intranasal oxytocin, demonstrated a decrease from 12.67% to 11.33%, or 19 minutes to 17 minutes spent awake. Rat A demonstrated average tidal volume increases from 0.96 L/min to 1.16 L/min, and average RR changes from 159.33 breaths/min to 104.96 breaths/min. It is impossible to draw any major conclusions from our analysis of such a small sample size. The respiratory data demonstrated an increase in the tidal volume, but a decrease in RR, on average, when comparing saline treatment to oxytocin treatment. This decrease in RR runs counter to our hypothesis, however, it might be explained by the observed increase in time spent sleeping for rats in our oxytocin trials. Research is ongoing to improve the sample size and our ability to form conclusions.
AutoCPAP Changes as a Function of Weight Loss Over Time in Bariatric Surgery Patients with Obstructive Sleep Apnea

Introduction: Obesity is a global epidemic associated with significant comorbidities including obstructive sleep apnea (OSA). Continuous positive airway pressure (CPAP) remains the mainstay treatment for OSA, traditionally provided via pre-set pressure settings that require in-person titration. A newer modality called AutoCPAP, can titrate pressure settings in real-time based on user requirements and wirelessly transmit data to the provider. Bariatric surgery has been shown to decrease CPAP pressure requirements post-operatively. However, the relationship between weight loss over time after bariatric surgery and reduction in AutoCPAP settings is unknown. Methods A retrospective chart review was performed of all patients that underwent sleeve gastrectomy or gastric bypass at a single academic institution from 2018-2019. Patients with a preoperative diagnosis of OSA and at least 6 months of AutoCPAP data with a minimum of 4 usage days per week were selected for inclusion in the study. AutoCPAP settings over the initial 6 to 12 months postoperatively were obtained from AirView or Care Orchestrator, which populate data wirelessly from patients’ machines. AutoCPAP settings including 95th percentile pressure, max pressure and apnea-hypopnea index (AHI) were trended in comparison to body mass index (BMI), percent excess weight loss, and time. Preliminary Results 49 patients were evaluated for inclusion in the study. Of those, 11 had sufficient post-operative compliance with their AutoCPAP to generate data and were included in subsequent analyses. In 9 patients, the 95th percentile pressure and max pressure settings decreased or remained stable for the first 15-20% excess weight loss. In 8 patients, 95th percentile pressure and max pressure settings tended to decrease with BMI until a BMI of 40, after which both settings either remained stable or increased again. The decrease in 95th percentile and max pressure with initial BMI reduction appeared to be greater in patients with a starting BMI > 45. There were no trends observed between AHI and reduction in BMI or excess weight loss. Conclusions 95th percentile and max pressure appeared to decrease with initial weight loss after bariatric surgery, more drastically in patients with a higher starting BMI. This trend was not seen after more profound weight loss (BMI20%). This suggests bariatric surgery may be associated with decreased 95th percentile and max pressure in the initial postoperative period. However, after achieving a critical threshold of weight reduction, further weight loss may not be associated with continued reduction in 95th percentile and max pressure.
Purpose/Objectives: The IMPACT DC Asthma Clinic is an intervention program which transitions children in the D.C. region who are heavily dependent on the emergency department for episodic asthma care to more effective longitudinal care in their primary medical homes. We sought to study the implementation of a telemedicine model for IMPACT DC during the COVID-19 pandemic designed to address barriers to care and to continue caring for these patients in a safe manner. Design/Methods: A telemedicine model of IMPACT DC was implemented using rapid-cycle improvements and process mapping. Measures for adoption of this model were collected including primary language, patient satisfaction, visit completion, and visit show rate. Patient healthcare utilization data (emergency department visits, hospital admissions, and systemic corticosteroid use) was collected for the six months prior to the IMPACT DC intervention. This data was compared to in-person clinic visits over the same six-month period during the previous calendar year. Results: 360 patients successfully completed a telemedicine visit between April 2020 and September 2020 with an average visit show rate of 52%. The primary language was English in 89% of patients. Patients seen by telemedicine had an asthma diagnosis that was most frequently classified as mild-persistent and well-controlled. The satisfaction survey response rate was 33%; overall average satisfaction with the telemedicine model was high. In the six-month period prior to intervention, healthcare utilization of patients in the telemedicine cohort was as follows: 56% had =1 emergency department visit, 15% had =1 hospital admission, and 49% had =1 oral corticosteroid course. In the comparison group, 701 patients successfully completed an in-person clinic visit between April 2019 and September 2019 with a visit show rate of 39%. The primary language was English in 84% of patients. Patients seen by telemedicine had an asthma diagnosis that was most frequently classified as mild-persistent and not well-controlled. In the six-month period prior to intervention, healthcare utilization of patients in the in-person cohort was as follows: 67% had =1 emergency department visit, 26% had =1 hospital admission, and 61% had =1 oral corticosteroid course. Conclusion/Discussion: The use of telemedicine provides IMPACT DC a feasible and adoptable model to continue caring for children with asthma during the confines of the COVID-19 pandemic, with overall high patient satisfaction. This model addresses access barriers and promises to be an adjunctive tool for reaching families who have traditionally had low show rates and high healthcare utilization.
Impact of Cochlear Dose on Hearing Preservation Following Stereotactic Radiosurgery and Fractionated Radiotherapy in the Treatment of Vestibular Schwannoma

Background: Vestibular schwannomas are benign tumors that develop from the myelin-forming Schwann cells that surround the vestibulocochlear nerve. Stereotactic radiosurgery (SRS) and fractionated stereotactic radiation therapy (FSRT) are novel treatment options for patients with vestibular schwannoma. While these new methods have been successful with high tumor control and few adverse effects, hearing loss remains a well-documented side-effect of radiotherapy. Current literature has poorly identified which variables contribute to worsening hearing outcomes for patients after treatment. Objectives The goal of this study is to determine the effect of tumor volume, patient demographics, cochlear radiation dose and other radiotherapy parameters for the treatment of vestibular schwannomas (VS) on hearing deterioration. We also hope to clarify the role of pre-treatment hearing status on audiological outcomes following radiotherapy. Methods Through retrospective, multicenter analysis, 614 patients who had undergone SRS for vestibular schwannomas from 1990 to 2020 and had both pre- and post-treatment audiograms were studied. Statistical analysis was performed to evaluate the strength of relationship between the radiation parameters and the audiometric change (PTA or WRS) data. Results Prior to treatment, unaffected ears were found to have significantly lower PTAs and higher WRS compared to the tumor ears. At 12 months and 60 months post radiation therapy, there was a significant decline in hearing status in the treated ears. By 60 months, 61% of patients showed PTAs that had declined relative to baseline hearing levels. There was no measured relationship between adjusted PTA change after treatment and any of the clinical predictor variables (age, number of radiation fractions, total tumor radiation dose, maximum tumor radiation dose, tumor volume, mean cochlear radiation dose and maximum cochlear radiation dose) when measured at 12, 36 or 60 months. A moderate, negative correlation was measured between tumor volume and WRS measured at 12 months (rs(89) = -0.38, p
Purpose/Objective(s): Timely care is critical for individuals diagnosed with cancer—despite the ongoing COVID-19 pandemic—as delays adversely affect cancer outcomes. Patients presenting for radiotherapy (RT) at a single institution who underwent COVID-19 screening procedures prior to RT were analyzed regarding treatment delays and disparities. Materials/Methods: Our institution is an urban multidisciplinary cancer center. In April 2020, our Radiation Oncology department implemented universal COVID-19 screening protocols prior to RT initiation to ensure patient/staff safety. Patients did not start RT until testing negative. We collected patient demographics and COVID-19 testing information on patients planned for RT from April to October 2020. We studied trends of other lifetime COVID-19 testing that these patients received to evaluate for overall delays. Summary statistics were analyzed within REDCap. Results: 177 consecutive patients with cancer were scheduled to begin RT. 15 (8.5%) declined pre-RT COVID-19 testing and proceeded to RT. Of patients who consented to pre-RT testing, 99 (61.1%) were female; mean age was 60.6 (range 24-94). Most patients were Black (n=98, 60.5%). 61 (37.7%) and 41 (25.3%) were insured through Medicare and Medicaid, respectively. Common primary cancer sites were breast (n=52, 32.1%), prostate (n=27, 16.7%), and lung (n=23, 14.2%). 58 (35.8%) patients presented with metastatic disease; the most common metastatic sites were bone (n=26, 44.8%) and brain (n=12, 20.7%). Most patients received external RT (n=152, 93.8%), primarily adjuvant (n=66, 40.7%) and palliative (n=59, 36.4%) RT. One (0.6%) asymptomatic patient tested “presumptive positive” for COVID-19 pre-RT. The patient was COVID-19 negative on immediate repeat testing and proceeded to RT. Overall, the 162 patients who consented to pre-RT testing received 549 total lifetime COVID-19 tests. Mean number of total COVID-19 tests per patient was 3.4 (range 1-14). Only 32 patients (19.8%) were administered a solitary pre-RT COVID-19 screening test. 24 (14.8%) patients had at least one positive COVID-19 test over the study period. In total, 32 (5.8%) positive COVID-19 test results were documented; 11 patients (6.8%) experienced a mean RT delay of 4.0 (range 3-8) weeks until testing negative. Other care delays included surgical/diagnostic procedure delays (n=4), delayed presentation due to COVID-19 fears (n=2), and travel restrictions (n=1). Conclusion: The majority of patients with cancer planned for RT tested negative for COVID-19 and proceeded to RT without delay. However, delays prior to radiation oncology consultation due to diagnostic workup, imaging, or biopsies, as well as testing positive for COVID-19, could intensify underlying disparities affecting our urban patient population.
The Anterior Fontanelle (AF), a diamond-shaped membranous gap that is bounded by the fusion of the metopic, sagittal, and coronal sutures, allows for a depression of the skull as the infant passes through the birth canal. The AF also permits continued postnatal cephalic expansion. We present a novel method to assess the surface area of the AF (AFSA) in an infant from computed tomography (CT) images using the ‘freehand tool’ of ImageJ, a Java-based software. These values were compared to measurements of the AFSA using the conventional rhomboid method established by Dubowitz and colleagues in 1970 (AFSA = (anteroposterior distance*transverse distance/2) in cm_). In our study, we retrospectively reviewed the head CTs and demographics of a cohort of 43 infants with single-suture craniosynostosis from the Children’s National Hospital between the ages of 0 and 136 days. Patients with cranioschisis, plagiocephaly, and hydrocephalus were excluded from our statistical analysis, as well as patients born under gestational circumstances that predispose to the development of craniosynostosis in utero (i.e. maternal use of clomiphene citrate, twin gestation, oligohydramnios, gestational diabetes). We then evaluated the fontanelle size in patients with craniosynostosis compared to 43 age and gender-matched controls using both the conventional method and the freehand method. Three independent reviewers conducted measurements with high inter-rater reliability (intraclass correlation coefficient (ICC) of 0.96 with a 95% confidence interval (CI) [0.93, 0.97]). The ICC was calculated by treating the rater as a fixed-effect and the patient as a random-effect followed by a bootstrap simulation in IBM SPSS to obtain the 95% bias-corrected CI for the ICC. We determined that the rhomboid method “overestimates” the AFSA and assumes an ideal geometric shape of the AF. The difference among measurements is statistically significant (p<0.05). In conclusion, our freehand ImageJ calculation of the AFSA essentially utilizes the actual borders of the fontanelle, instead of a geometric template, to obtain a SA. By using a method that considers the actual irregular shape of the fontanelle such as ours, a clinical professional can potentially diagnose craniosynostosis earlier (in utero) and with greater accuracy.
Successful personalization of immunosuppressive therapy for transplant recipients can reduce the risk of graft loss and post-transplant complications, improving the quality of life in transplant recipients while making more kidneys available to the end-stage renal disease (ESRD)/dialysis patients who are currently on the transplant wait list. The present study focuses on two potential approaches to personalize the immunosuppressive therapy in kidney transplant recipients at the GW Transplant Institute (GWTI). The personalization was sought based on: i) the recipient’s genetic markers (particularly cytochrome P450 enzymes including CYP3A5 and CYP3A4) that influence the metabolism of tacrolimus (Tac), the commonly prescribed immunosuppressive medication; and ii) the recipient’s gut microbiome conditions that influence the risk of post-transplant infection, neurotoxicity and nephrotoxicity. While the project was delayed due to the COVID-19 pandemic, GWTI were able to collect 10 blood and stool samples from living- and deceased-donor transplant recipients as of March 2021. The blood samples will provide the information on the expression and the activity of CYP3A4 and CYP3A5 while the stool samples collected pre- and post- transplant will provide the information on the possible changes in the abundance and the composition of gut microbiome as a result of Tac. These samples are currently getting sequenced and we intend to get the results of our preliminary analysis done by May 2021. The preliminary analysis will focus on the correlations between the gene expressions and the administered Tac dose, as well as the changes in the microbiome diversity level (measured in terms of Shannon and Symptom diversity indices) pre- and post-transplants. Our ultimate goal is to examine the interplay between the gut microbiome compositions, expression of P450 enzymes, and Tac intake since prior studies suggest that some microbes may regulate host gene expression in the gut, which in turn could induce changes in the expression of a large number of host genes. This longitudinal observational study will continue to take place over the course of two years, targeting to collect the information from 100 transplant recipients. Though this particular project focuses on kidney transplant recipients, the algorithm developed under the current project can be tailored to build algorithms to treat other organ transplant recipients including pancreas, liver, heart, lung, intestine, bone marrow and stem cell transplant recipients who receive almost identical immunosuppressive drugs.
The mendosal suture begins to close in-utero and joins the interparietal and inferior portions of the occipital bone. When persistently patent, infants may develop bathrocephaly, a skull deformity recognized by an extrusive occipital bump on physical examination. The prevalence of a patent mendosal suture varies in the literature and can be misdiagnosed as infant skull fractures. This study documents the prevalence of mendosal suture patency in infants, and estimates the timing of normal suture fusion. A retrospective review of medical charts and Computerized Tomography (CT) scans of patients from 0 to 12 months who presented to the Emergency Department between 2010 to 2020 was performed. Patients with craniosynostosis, ventriculoperitoneal shunts, or syndromes associated with brain or cranial abnormalities were excluded. Two craniofacial surgeons reviewed the CT scans for mendosal sutures. Demographic information, history, prematurity, radiology report and percentage of mendosal patency were recorded. A descriptive analysis was used to summarize patency percentages by age, and a prediction model was used to predict timing of beginning of normal suture closure prenatally. Upon review, 234 patients (51.7% male) met inclusion criteria. Mean age was 5.2 ± 3.3 months at the time of imaging. Chief complaints were largely related to trauma (62%), followed by non-accidental trauma or abuse (27%), and other complaints (11%). The majority (62.8%) of patients had a closed mendosal suture, followed by 34.2% patients with a partially fused suture, and 3% of patients with complete patency at the time that the CT scan was taken. Analysis of the suture closure throughout different ages demonstrated that all patients younger than 30 days had some degree of patency of the mendosal suture. In the majority of patients, the prevalence of open mendosal suture progressively declined until 12 months, when no patient was noted with a patent mendosal suture. Nevertheless, a smaller and abnormal subset of patients (n=7) presented a complete open mendosal suture at various ages, from 1 to 7 months of age. A prediction model using an exponential equation predicted that suture closure in this group started between 1.6 months to 2.1 months before birth (predicted mean value 1.8 months before birth). This study demonstrates two different subsets of patients, one, in line with previous studies, which demonstrated an age-related mendosal suture closure; and another smaller group, who presented with a complete open mendosal suture. Finally, larger studies are warranted to determine the persistent eventual closure in older patients.
Masculinized Male Chest Contouring: Creating the Armor Plate

Male patients are routinely consulted regarding dislike of their chest appearance. To date, majority of patients have desired elimination of their feminine-appearing breast, termed gynecomastia. These patients have associated their overweight body image, with the femininity of their breasts as presented by fullness and roundedness of their breasts and subsequently have desired maximal flattening of their breast. We present a new set of patients who desire a more muscular-appearing chest than a gynecomastia repair that is interposed on a chiseled abdominal contour. In contrast to the former set of patients, these patients desire bulking of their breasts with a bolder-appearing armor plate look. We present an alternative to traditional gynecomastia repair which involves a novel approach to chest contouring creating a flat, yet bold, pentagonal-shaped breast with linear borders utilizing both fat and gland removal as well as strategic fat grafting back into the chest. We present a novel protocol to create an armor plate male chest appearance as an alternative to traditional gynecomastia contouring. All patients treated to date demonstrate a muscular-appearing chest that is harmonious on an interposed masculine-appearing abdomen.
Objective: Mega-fistulae of autogenous arteriovenous (AV) access could result in arterial steal, high-output cardiac failure, or rupture with resulting hemorrhage. Current treatment options which include ligation with or without jump prosthetic graft or imbrication are suboptimal leaving possible need for new accesses to be placed, cosmetically unappealing results, or future recurrent dilations. We describe a technique which allows for a complete resection of the mega-fistula while allowing continuous use of the AV access. Methods: This study is a retrospective, single-center, observational series of patients undergoing revision for mega-fistula from 2018-2020. The mega-fistulae were completely resected from the proximal to distal portion of the aneurysmal segment, including all pseudoaneurysms, followed by tunneling of a prosthetic graft lateral to the incision and dissection plane with an end-to-end anastomosis to the remaining arterial and venous ends of the previous AV access. Outcomes reviewed were immediate technical success, need for long-term catheter placement, time to access use, and short and long-term patency and complications. Results: There were 12 patients who underwent mega-fistula revision. Immediate technical success was achieved in all cases. Eight patients received Propaten (W.L. Gore Assoc, Inc. Flagstaff AZ) and four patients received Acuseal (W.L. Gore Assoc, Inc. Flagstaff AZ) grafts. Long-term catheters were placed in all eight patients receiving Propaten grafts, and one receiving an Acuseal graft. The average time to access use was six weeks for the Propaten graft and 3.75 days for the Acuseal graft. At 30-days, three patients that received Propaten graft developed complications including: one with skin necrosis requiring skin grafting, one with a seroma and one with a hematoma both requiring evacuation; one patient with Acuseal graft developed central venous occlusion. Of the five patients with follow-up after six weeks, three report no complications and continuous use of the access, including one who underwent renal transplant. One patient required thrombectomy and venous angioplasty, and one required a new AV access 17 months postoperatively due to graft thrombosis. Conclusion: Complete mega-fistula resection and replacement with Acuseal graft maintains existing AV access and eliminates the need for long-term catheter placement. Our early experience with this technique is encouraging, but further follow-up is required to determine the durability of this approach.
Introduction: Numerous angiography-based peripheral arterial disease classification schemes have been developed to stratify severity of preoperative patient disease, but few studies have correlated angiography-based anatomic classification schemes to postoperative outcomes. This study examined whether a novel pre-operative angiography scoring system was predictive of short- and long-term isolated common femoral endarterectomy with profundaplasty (CFEP) outcomes. Methods: Patients treated with isolated CFEP for claudication and/or rest pain at a single institution from 2016-19 were included. Pre-operative angiograms were assessed quantitatively by four blinded surgeons across three domains: profunda stenosis, profunda disease length, and outflow disease severity. Internal consistency reliability of rater scores was calculated using Cronbach alpha. Outcomes included clinical improvement, further interventions, major amputations, mortality, and mean increase in ankle-brachial index (ABI) at 30 days, six months and one year. McNemar tests, between-group t-tests, Pearson correlations and linear regression were used. Results: Clinical Outcomes 88% of patients (n=22) had clinical improvement at 30 days; the remaining 12% of patients (n=3) required further interventions. Three patients required major amputations between six months to one year. There was 0% mortality. Mean ABI increased by 0.15 ± 0.21 at 30 days, and by 0.06 ± 0.21 at six months. Angiography Scoring System Profunda stenosis score was associated with clinical improvement at six months (p=0.04). A profunda stenosis score of = 2.6 was strongly associated with six-month clinical improvement (64% of those = 2.6 improved, versus 15% of those <2.6, p=0.15). Profunda stenosis score was associated with ABI improvement at 30 days (r=0.73, p=0.01), six months (r=0.82, p=0.007) and one year (r=0.86, p=0.03). Profunda disease length score was associated with clinical improvement at 30 days (p=0.002). 100% of patients with a profunda disease length score of =1.5 clinically improved at 30 days, versus 67% of those with <1.5 (p=0.4). Angiography scores were not found to be associated with further intervention, major amputation, or mortality. Cronbach alpha for profunda stenosis, profunda disease length, and outflow severity scores were 0.90, 0.90, and 0.79, respectively, indicating strong internal consistency. Conclusion: This institutional angiography scoring system successfully predicts clinical improvement following CFEP. Higher profunda stenosis and profunda disease length scores were most predictive of long-term operative success. Future validation studies will investigate these outcomes in a larger population, and over a longer period.
Objective: The Global Vascular Guidelines’ “Global Limb Anatomical Staging System” (GLASS) was designed to provide an angiography-based anatomic classification of peripheral vascular disease and to guide revascularization strategies. Our study uses GLASS to evaluate outcomes after open and endovascular isolated infrapopliteal (IP) revascularization for chronic limb-threatening ischemia (CLTI). Methods: This is a single institution study which retrospectively reviewed patients undergoing below-knee popliteal-to-tibial bypass (PTB) or tibial angioplasty/atherectomy/stenting (TA) for CLTI from 2014 to 2020. A panel of blinded surgeons scored preoperative angiograms using established GLASS criteria. After examining preoperative characteristics, we compared rest pain improvement, wound healing, major reintervention, major amputation, and mortality at six weeks, six months, and one year. We evaluated patency rates for PTB. We compared the above outcomes based on procedure only, then on GLASS stage within each procedure cohort. Results: 25 PTB patients and 47 TA patients met inclusion criteria. There were more patients with preoperative dialysis in the TA cohort, otherwise the cohorts were similar. (8% PTB vs 28.9% TA; p=0.03). Most patients in both cohorts underwent intervention for tissue loss (80% PTB vs 87% TA; p=0.18). Procedure based results: Most patients (68%) were GLASS III, however this varied by procedure (84% PTB vs 58% TA; p=0.05). There was no difference in rest pain improvement, major intervention, major amputation, or mortality at six weeks, six months, or one year. The TA cohort had significantly greater foot-wound healing at one year compared to the PTB cohort (12.5% PTB vs 71.4% TA; p=0.04). Cumulative patency was 89%, 89%, and 69% at six weeks, six months, and one year, respectively. GLASS based results: Within the PTB cohort, GLASS I was associated with rest pain improvement at six weeks (100%, p<0.0001) while GLASS I and III were associated with rest pain improvement at six months (100% vs 8.3%; p=0.029). GLASS I and II exhibited improved wound healing at six months (p=0.005). Alternatively, in the TA cohort, patients with GLASS I required more reinterventions at six weeks than those with higher GLASS stage (20%, p=0.04). Conclusion: Our study revealed improved wound healing after TA at one year, compared to PTB. This may be due to a drop in patency rates between six months and one year seen in the PTB cohort. GLASS stage did not consistently correlate with expected clinical outcomes. Larger studies will be needed to confirm these findings.
Introduction: Partial nephrectomy (PN) for the management of renal cell carcinoma (RCC) has become the standard of care for patients with tumors <7cm and individuals with imperative indications for nephron preservation. The impact of synchronous renal calculus disease, a rare but important consideration given potential for ureteral obstruction and resulting urine leak after PN, is not widely reported. In this study, we sought to describe a multi-institution experience on calculus management, perioperative complications, and outcomes on patients who had concurrent renal calculi at the time of surgery. Our objective was to provide a descriptive analysis of the management of synchronous nephrolithiasis (definitive management, cystoscopy, and ureteral stenting) in patients who underwent PN for suspected RCC and to assess complication rates in this setting. Methods: A multi-institution chart review and retrospective analysis of all patients who had undergone partial nephrectomy from 2013-2020 was conducted from an IRB-approved database. Demographic information, imaging, stone characteristics, operative management (i.e. definitive management, cystoscopy, ureteroscopy, ureteral stenting), and perioperative characteristics, were gathered. Statistical analysis using Fisher’s exact test of association were used to assess complication rates between those treated for calculus disease before or during surgery.

Results: A total of 32/256 (13%) patients screened had concurrent renal calculi at the time of surgery; 14/32 (44%) ipsilateral, 9/32 (28%) contralateral, and 9/32 (28%) bilateral. 5/32 (16%) patients received stents at the time of surgery; 2/32 (6%) had intraoperative ureteral catheter which was removed at the end of the case; 2/32 (6%) patients received concurrent pyolithotomy during partial nephrectomy. 4/32 (16%) patients had obstructing stones. 1/7 (14%) patients with complications had been treated before surgery. Pertinent post-op urinary system complications in patients with stones included hematoma (2), urine leak (1), urinary retention (1), IVC thrombosis (1), acute kidney injury (1), and flank pain (1). Complication rates did not differ between treated and untreated patients (7 treated, 25 untreated; p = 1) Conclusions: Our results indicate that untreated nephrolithiasis was not associated with a greater complication rate compared to treated patients. Based on these findings, patients with asymptomatic stone disease may be able to delay treatment of calculi until after PN.
Introduction and Objectives: The primary objective of this study was to query the National Surgical Quality Improvement Program (NSQIP) database to compare perioperative outcomes and characteristics for Minimally Invasive Surgical (MIS) vs open Retroperitoneal Lymph Node Dissection (RPLND) along with trends over time for the management of testicular cancer. Methods The NSQIP database (2005-2018) was queried for patients with non-disseminated testicular cancer ± retroperitoneal lymph node involvement. Patients with distant metastasis, a history of chemotherapy, or a history of radiation therapy were excluded. Chi-square, Fisher’s exact test, independent samples t-test, and Mann-Whitney U test were used to identify unadjusted associations and potential confounding covariates. Multivariable logistic regression and multivariable generalized linear models were used to analyze independent associations between treatment approach and perioperative outcomes. Trends over time were analyzed by way of Spearman’s rank correlation coefficient analysis. All statistical analysis was performed using SAS version 9.4 (SAS Institute Inc., Cary, NC) with a two-sided p-value < 0.05 considered statistically significant. Results Inclusion criteria identified 646 patients; 337 (52.2%) with MIS treatment and 309 (47.8%) with open treatment. Compared to open, MIS RPLND was significantly associated with older age, non-White race, diabetes, hypertension, weight loss >10% 6 months prior to surgery, and lymph node involvement. MIS RPLND was significantly associated with 35 ± 9 minute shorter adjusted operative time and 51% ± 7% shorter adjusted hospital stay (respective p<0.05). RPLND volume has increased since 2005 (r= 0.724; p=0.003) with the open approach being utilized more often in recent years (r= 0.101; p=0.013) Conclusion MIS RPLND demonstrated comparable perioperative outcomes to open RPLND with decreased length of hospital stay, despite higher burden of comorbidities. Although lymph node yield could not be assessed within the limitations of NSQIP, the shorter operative time of MIS reinforces the importance of thorough dissection and adherence to template-based or full bilateral dissection as indicated, regardless of the surgical modality.
Use of the T-1470 LiteTouchTM Laser in the En Bloc Resection of an Upper Tract Urothelial Cancer- Case Report

Abstract Background: Endoscopic laser-ablative therapy of upper tract urothelial carcinoma offers kidney-sparing treatment for well-selected low-risk tumors. Traditional technique consists of tumor biopsy with flexible forceps or nitinol basket for pathologic assessment of stage and grade, followed by laser ablation of the tumor. In this case, we present the use of the new T-1470 LiteTouch TM laser for intraoperative tumor en bloc resection, affording both tissue acquisition and tumor ablation. Case Presentation: An 81-year-old female with a past medical history significant for stage 4 chronic kidney disease, peripheral artery disease, coronary artery disease, type 2 diabetes mellitus and gout was diagnosed with a 2cm left upper tract high-grade papillary urothelial carcinoma confirmed by cytology with cell block preparation. Using a novel approach, the tumor was resected, en bloc, using the T-1470LiteTouchTM laser which allowed for sufficient tissue resection for pathologic examination, and strong hemostasis. This new technique is the first recorded example of tumor en bloc resection using the T-1470LiteTouch laser of an upper tract urothelial carcinoma. Conclusion The use of the T-1470 LiteTouchTM laser offers promise for its use as a novel laser for the endoscopic treatment of upper tract urothelial carcinoma. It shows potential for advantages over current techniques through its ability to achieve en bloc resection and superior hemostasis.
Background: Student mistreatment continues to be a pervasive and ongoing issue within medical schools. Students have different perceptions regarding what constitutes mistreatment. Mistreated students have increased rates of burnout, anxiety, and depression. Data from the AAMC Graduation Questionnaire has shown that the ombudspersons are one of, if not the least likely option students choose when reporting mistreatment. Current literature indicates that using an educational intervention designed to clarify mistreatment improves the ability of students to identify and report mistreatment episodes in the clinical setting. Intervention: Our innovative approach seeks to deliver an ombudsperson-led lecture to third-year medical students that will increase their fund of knowledge on what constitutes mistreatment through examples, an explanation of the advisory role of the ombudspersons, the absolute maintenance of student confidentiality in their interactions with the ombudsperson, and the procedural venues that are open to the students in the mistreatment reporting process. The lecture will be given in the transition course for students prior to embarking on clinical rotations. Evaluation: We will assess the effectiveness of our intervention by comparing students’ responses to the AAMC Graduation Questionnaire at our institute in the years before and after the lecture was implemented. This questionnaire is sent annually by the AAMC to graduating medical students across the different schools and includes questions about mistreatment. We will also track mistreatment reports to the ombudspersons at GW in the years before and after the lecture-based intervention. Finally, we will administer an IRB-approved survey before the lecture to obtain baseline data on knowledge regarding mistreatment, immediately following the lecture to determine what was learned in the short-term, and finally at both six months and one year intervals after the lecture to assess long-term retention. This survey will, amongst other things, ask about student comfort-levels in reporting, trust in the school’s ability to ensure confidentiality, and overall understanding of what constitutes mistreatment. We expect that our lecture will improve students’ understanding of what constitutes mistreatment. We also expect that our intervention will increase mistreatment reporting and reports specifically to the ombudspersons. Discussion: Some medical schools have a stand-alone lecture and discussions on mistreatment, while others do not. In the spirit of the well-regarded slogan “nothing about us without us,” students’ inclusion in the conversation is critical as they are ultimately the ones experiencing the mistreatment.
Purpose: We describe a virtual two-week elective that equips third and fourth year medical students with essential tools, such as media interviewing and video making, to use media to share health information. Description: Social media has gained significant popularity as points of access for health information. In the backdrop of healthcare disparities and rampant health misinformation, physicians play a vital role in sharing credible health information and in health advocacy. Advocacy is considered a professional responsibility, yet medical students are often not taught how to effectively engage in it within traditional medical school curricula. We created our elective to address this discrepancy. Outcomes/evaluation: Curricular elements, resources, and student feedback and perspectives will be shared. Examples of final products: student-produced video public service announcements (PSAs) will be shared, including COVID-19 specific PSAs. Al Shabeeb, R. (2020). Forget Corona, Let’s Hang Out. shorturl.at/fjyBJ Good, E. (2019). The Person You Needed. shorturl.at/nAFN2 Lessons learned: Students utilized skills learned for different projects, showing the utility of this elective.
Impact of the COVID-19 Pandemic on the Education of Plastic Surgery Trainees in the United States

The current COVID-19 pandemic has vastly impacted the health care system in the United States, and it is continuing to dictate its unprecedented influence on the education systems, especially the residency and fellowship training programs. The impact of COVID-19 on these training programs has not been uniform across the board, with plastic surgery residency and fellowship programs among the hardest hit specialties. Implementation of social distancing regulations has affected departmental educational activities, including preoperative, morbidity and mortality conferences and journal clubs; operating room educational activities; as well as the overall education of plastic surgery trainees in the United States. Almost all elective and semi-elective surgeries across the United States were suspended for a few months during the COVID-19 pandemic; this constitutes a significant portion of plastic surgery cases. Considering the current staged reopening policies, it may be a long time, if ever, before restrictions are completely lifted. Here, we review the impact of the current COVID-19 pandemic on the requirements for resident certification: didactics, departmental educational activities, and education in the operating room (OR). Although all potential solutions have their benefits and downfalls, possible educational tools include utilizing online reading and teaching materials (allowing to learn individually in an unstructured manner), using texting-based educational material, watching surgical videos, and using mannequins and online platforms to maintain surgical skills. While there is a multidimensional impact of the current COVID-19 pandemic on the training programs of plastic surgery residents and fellows in the United States and worldwide, there are some potential solutions on how to address existing challenges. Furthermore, more alternatives must be utilized in plastic residency and fellowship programs in terms of didactics, departmental educational activities, and operating room education so residents and fellows receive adequate training and are confident in their surgical skills upon graduation. Keywords: COVID-19; coronavirus; education; impact; plastic surgery fellowship; plastic surgery residency; surgery residency; trainee.
Feedback is a key component of medical education, and students and doctors alike use various forms of feedback to improve knowledge, skills, and behaviors. Recent research shows the utility of peer feedback in medical schools, especially to help students realize areas of improvement in their professional development and cultivate a more trusting team-learning environment. Our cross-sectional descriptive study aimed to assess third year GW medical students' experiences with and perspectives on peer feedback during their clinical clerkships. Drawing on the literature, an anonymous survey with multiple choice, Likert scale, and 2 open-response questions was created and sent to all 186 students from the MD class of 2022. Descriptive statistics were used to analyze quantitative responses, and open-ended responses were categorized by two separate reviewers. The survey response rate was 24.2%. Most (97.8%) of the respondents reported having spent at least 25% of their clerkships so far in some sort of team setting with at least one peer. A majority (73.3%) of the students endorsed identifying a way that a peer might improve their professional behavior. However, only 30% of those respondents reported actually sharing the feedback with that peer. For those who didn’t share feedback, when asked why not, the most common responses were “not my place,” followed by “unsure how.” When it came to receiving feedback, 73.3% of the students reported identifying ways that they could improve their own professional behavior. However, only 17.8% of students reported receiving feedback from a peer. When asked to provide words and phrases that came to mind when they thought of peer feedback, students included both characterizations of the feedback process, such as “constructive” or “awkward,” and characterization of feedback intent and reception, such as “judgmental.” Overall, 73.3% of students agree that engaging in peer feedback can contribute to their growth and learning in medical school, and even more so as a physician in the future (80%). However, less than half of students agreed that GW's formal preclinical and clinical curriculum prepared them to engage in peer feedback. Though students have mostly positive experiences receiving peer feedback and view it as something that can benefit their growth, many stated that they did not feel that it was their place to give it. Students may benefit from more encouragement or incentives to engage in peer feedback and/or instruction on how peer feedback, when done appropriately, can be helpful in the clinical learning environment.
Objectives: It was previously demonstrated that healthcare professionals would
like additional education on medical cannabis. However, there has not yet been a
review of the status of medical cannabis curriculum for allied healthcare trainees
worldwide, even though future healthcare workers will be placed on the forefront of
patient care and must be prepared to counsel patients. This study was designed to
address this gap in knowledge. Design A search syntax was generated and databases
PubMed, ERIC, CINAHL, and Web of Science were searched for relevant articles.
A gray literature search of Google Scholar, MedEd, Medline, and the Proquest
Dissertations and Theses section was also performed. All titles and abstracts were
screened. Selected articles were subsequently screened using predetermined
inclusion and exclusion criteria. Results Allied healthcare trainees lacked sufficient
knowledge about medical cannabis and do not feel prepared to counsel patients
on this subject. Additionally, they expressed a growing interest in medical cannabis
and would like more standardized education on the topic. Finally, faculty and deans
in various institutions agreed on the need to educate students on the subject, and
aimed to implement courses on medical cannabis or expand their existing curricula.
Conclusions While the medical cannabis landscape is developing, medical and allied
health students are not properly educated and knowledgeable on this emerging
field of clinical care. The findings suggest that the implementation of competencies-
based curricula on medical cannabis is essential for allied healthcare trainees to
have the appropriate level of knowledge to counsel and educate their patients.
About 10% of all Americans have a diagnosis of diabetes with up to $327 billion in healthcare costs (1). Yet, despite the ubiquity of this disease, it is known that diabetes greatly affects persons of color and those with lower socioeconomic status greater than other populations. Similarly, it is known that insured individuals receive more appropriate care in terms of diabetic eye and foot exams and Hgb A1C labs compared to those without insurance (2). Over the past decade, student-run free clinics (SRFCs), similar to the George Washington University’s Bridge to Care Clinic, have exponentially increased and have often served as safety nets for uninsured and low-resourced individuals (3). However, there are scarce data examining the quality of diabetes care in these SRFCs. Using the 2018 American Diabetes Association (ADA) guidelines on laboratory testing, we underwent a 6-month internal review of patients with a chief complaint or active problem of type II diabetes. This review revealed that patients were receiving appropriate lab care only 17.5% of the time. In an attempt to improve the care of these patients, we ran three PDSA (plan-do-study-act) cycles within a four-month period - creating templates, written guidelines, and editable macros for documentation. Each PDSA cycle was trialed for a 1-1.5 month period. By the end of the four months, the appropriateness of lab ordering increased from 17.5% to 89%. Prior to the interventions, Hgb A1C were mistakenly repeated 27% of the time, while liver function tests and urine protein studies were missed entirely 47% and 57% of the time, respectively. After the third PDSA cycle, only 1 out 12 patients had missed a protein study and vitamin B12 level, with all other labs being appropriate. While these results show significant improvement in our care, there are limitations to this study. Due to the limited number of patients (n=12), the study size is small. Additionally, due to the nature of the Bridge to Care’s model, fourth-year medical student providers change every academic year therefore these results can only be applied to the current class in which the PDSA cycles were run. For future studies, it would be interesting to take these results as a baseline, continue using the newly created macros that led to significant documentation changes, and apply them to the next fourth-year class.
Objective: The COVID-19 pandemic compelled U.S. medical schools to suspend clinical rotations and transition to virtual curricula. Our institution sought to supplement students’ education by creating a medical student-run COVID-19 patient registry. This registry research project was designed to provide an opportunity for medical students to contribute to a needed health service goal by documenting the clinical characteristics of COVID-19, while supporting experiential and collaborative learning about this patient population and research methodology. The purpose of this study was to develop and utilize a survey tool to characterize medical students’ perceptions of their learning through participation in this team-based registry research project. Methods: Students were surveyed about their experience with this registry, assessing their perceptions regarding impact on clinical knowledge/skills, documentation/hospital operations, altruism, and research process, with select questions modeling principles of informal learning as it applies to the medical education context. Quantitative data and open-ended comments were analyzed in order to characterize the impact of registry work on informal learning. Results: Survey response rate was 62.7% (32/51). 87.5% of respondents affirmed that participation supplemented their medical education. 78% of participants felt they contributed to the COVID-19 response. 68.8% of students endorsed they gained a better understanding of research methodology, and 87.5% intend to pursue independent research from the registry data. Students commonly reported positive experiences with mentorship, improving their clinical knowledge, teamwork, and sense of altruism through work on the registry. Conclusion: This registry experience serves as a mechanism for informal learning that can be utilized to augment education during future surges when in-person clinical experiences are not feasible or are considered unsafe.
Neurological surgery has long been lauded as one of the most competitive fields of medicine to enter, with it being consistently among the highest standards for matching into residency positions. Per data from the National Resident Matching Program in 2020, matched students had a mean Step 1 score of 248, a mean Step 2 score of 252, and were highly likely to possess other prestigious characteristics such as Alpha Omega Alpha status; multiple research abstracts, presentations, and publications; and other graduate degrees. Residency programs are also incredibly rigorous, with long and intensive duty hours as well as the expectation for academic research output ingrained into many programs. Wellness and burnout are not new concepts to medical literature as a whole, but have recently been called to the attention of not only the broad medical community but the public eye. Burnout has even been called an ‘epidemic’ by several news and research articles. Given this elite level of achievement that medical students must attain in order to first match into neurosurgical residency programs and then maintain their status as high-achieving physician-scientists, the examination of the resilience of these members of the medical community has been a tantalizing prospect for research. As medical literature increasingly focuses on examining burnout and wellness in relation to the health of its future leaders, it is evident that a foundation of resilience is vital to withstand the rigor of the neurosurgical field. The recent COVID-19 pandemic has also allowed some institutions to reflect on their practices of dealing with student and resident wellness and burnout due to the dramatic, abrupt change in medical education necessitated by the pandemic. Medical students have reported concerns that the shift from in-person educational events to online conferencing prevents them from networking as they did previously, detracting from their overall appeal as applicants. Along the same lines, neurosurgical residents have worried that fewer cases due to the cancellation of many elective procedures negatively affects their clinical expertise. These concerns are not limited to just one field of medicine, but are influenced by the unique factors that shape the field of neurosurgical education and training. This review examines the existing literature on wellness and mental health of medical students interested in neurosurgery and neurosurgical residents. Further, we hope to make recommendations for medical education programs, both undergraduate and graduate, on how best to address wellness and burnout in an efficacious manner.
Assessing for Bias in the GW OB/GYN Clerkship Curriculum

Introduction: Recent literature highlights the need to critically examine how medical students are taught about race and gender identity, in order to lessen physician bias. However, analyses of entire pre-existing curricula for bias are scarce in the literature. This study seeks to demonstrate the use of a novel curricular analysis tool in assessing the GW OB/GYN clerkship curriculum for bias by analyzing both its implicit content (assumptions made) and explicit content (topics discussed or omitted). Methods: After literature review, an excel spreadsheet tool was created to allow a reviewer to analyze lectures. The tool allows the reviewer to record the number of times that identifiers of race and gender identity were mentioned, along with corresponding information about how and in what context those identifiers were used (i.e. how these identifiers were obtained and defined, if racial/gender identity was linked to disease risk, or within discussion of systemic inequities). 19 OB/GYN clerkship lectures were given by 15 lecturers, recorded via WebEx in July-August 2020. Corresponding lecture slides were uploaded to Blackboard. Both verbal and written materials were reviewed and analyzed using this tool. Results: Patient race was mentioned in 4/19 lectures. Race was not defined in any lecture, nor did any lecturer describe how patients’ racial identities were determined. Black or “minority” race was mentioned in discussion of increased prevalence and risk for disease in 3 of these lectures, however none of these lecturers provided further exploration of why these racial health disparities exist. The remaining lecturer made a negative association between patients’ race and compliance with prenatal care. No lecturer explicitly discussed racial systemic inequities impacting patient health outcomes. All lecturers used female terminology when discussing patients. The number of times ranged from 7 to 169 times per hour lecture (mean=61). No lecturer described how patients’ gender identities were established. Transgender or gender nonconforming patients were not mentioned in any lecture. Only one lecturer defined their use of gender. No lecturer discussed health disparities faced by non-cisgender individuals. Conclusion: The lecture analysis showed that exploration of racial health disparities and systemic inequities is conspicuously absent in the OB/GYN Clerkship curriculum. When race was mentioned, it was in a way that reinforced either racial biologic difference or negative stereotypes. The analysis also showed that lecturers unanimously use female-gendered terminology, while excluding discussions about non-cisgender patients and the health disparities they face. This study identified important curricular gaps and areas for improvement.
Background: Medical gross anatomy typically involves in-person laboratories and lectures; however, COVID-19 pandemic restrictions created challenges to this format. The purpose of this study was to create a virtual musculoskeletal (MSK) anatomy curriculum for second-year medical students at The George Washington University School of Medicine and Health Sciences during Fall 2020. The MSK curriculum covers embryology, gross and microscopic anatomy, and relevant pathophysiology and pathology of the MSK system, spinal cord, and peripheral nervous system. Based on best practices in online learning, we created this curriculum anchored in four principles: 1) brief asynchronous lecture videos; 2) virtual laboratory sessions with asynchronous cadaveric videos and associated formative quizzes; 3) weekly synchronous interactive review sessions; and 4) regular frequent communication between faculty and students. Methods To assess the effectiveness of the curriculum, we examined performance and student evaluation data. Performance data consisted of percent-correct on anatomy questions from both the integrated block exams and the block's National Board of Medical Examiners (NBME) subject exam. Student feedback data consisted of several 5-point Likert scale statements related to organization, communication, facilitation of material comprehension, and overall effectiveness of the curriculum. To determine if there was any difference in anatomy scores or student perceptions, we compared Fall 2020 performance data and student feedback data with that of Fall 2019, which was given in-person. Data were analyzed using Mann Whitney U tests (a=0.05). Student free responses were collected and analyzed for themes. Results In 2020, students performed slightly, but not significantly, better than 2019 students for anatomy questions on the integrated block exams. The analysis identified a significant increase (P<0.001) in scores on anatomy NBME questions in the 2020 cohort. Faculty evaluations were better in 2020 than in 2019, though not significantly. Free responses suggested positive perceptions of the curriculum; however, students noted the virtual anatomy sessions were not comparable to in-person anatomy laboratory sessions. Conclusion Our online anatomy curriculum demonstrated positive student feedback and slightly higher exam scores among the medical students. However, higher scores may not be solely attributed to this new curriculum format. Moreover, the students felt that the online format was not a truly comparable replacement, suggesting in-person anatomy laboratories are still a desired component for student learning. The impact of the curriculum on other areas (e.g., psychosocial skills) will need to be further investigated to make larger conclusions about its efficacy.
Introduction: YouTube is the most used platform for case preparation by surgical trainees. Despite its popular use, studies have noted limitations in technique, safety, and vetting of these videos. This study identified the most viewed laparoscopic cholecystectomy (LC) videos on YouTube and analyzed the ability of faculty, residents, and medical students to identify critical portions of the procedure, technique, and limitations of the videos. Methods: An incognito search was conducted on YouTube using the term “laparoscopic cholecystectomy.” Results were screened for length, publication date, and language. The top ten videos were presented to general surgery attendings, residents, and medical students at a single institution. Established rubrics were used for evaluation, including the Critical View of Safety (CVS) for LC, a modified Global Operative Assessment of Laparoscopic Skills (GOALS) score, a task-specific checklist, and visual analog scales for case difficulty and operator competence. Educational quality and likelihood of video recommendation for case preparation were evaluated via Likert scales. Attending assessments were considered the gold standard. Results: Six attending surgeons achieved excellent internal consistency on CVS, educational quality, and likelihood of recommendation scales, with Cronbach alpha (?) of 0.93, 0.92, and 0.92, respectively. ? was =0.70 in all the other scales measured. Only one of the ten videos attained all three established CVS criteria. Four videos demonstrated none of the CVS criteria. The mean educational quality (mEQ) was 4.63 on a 10-point scale. The mean likelihood of recommendation (mLoR) for case preparation was 2.30 on a 5-point scale. Senior resident assessments (Postgraduate Year (PGY)4+, N=12) aligned with attending surgeons, with no significant differences in CVS attainment, mEQ, and mLoR. Junior residents (PGY1-3, N=17) and medical students (MS3-4, N=20) exhibited significant difference with attendings in CVS attainment, mEQ, and mLoR for more than half the videos. Both groups tended to overrate videos compared to attendings. Conclusion: To our knowledge, this is the first study to examine faculty, resident, and student assessments of surgical videos on a social media platform. The most viewed LC videos on YouTube did not attain the CVS, had low educational value, and were inappropriate for case preparation. Senior resident video assessments closely align with attendings, while junior trainees are more likely to overstate video quality and value. Faculty guidance and direction of trainees to high-quality, vetted resources for surgical case preparation is needed, and surgical societies should prioritize creation and dissemination of high-quality videos on public platforms.
Can We Use Design Thinking to Improve How Medical Students in India Learn to Care For Multi-Lingual Patient Populations?

Introduction: India is a country of tremendous language diversity. Currently the Indian medical curriculum does not formally incorporate language training despite the fact that many medical students do not speak the majority languages of their training site and professional translation services are not available. Methods: In response to this learning need, we created a novel 20-session curriculum that focused on teaching medical interviewing to preclinical medical students in 1) English 2) the majority language of the training site 3) the primary languages (mother tongues) of the student. The curriculum was developed through an iterative, design-thinking methodology in collaboration with faculty and students at St. John’s Medical College in Bangalore. As part of this process a group of medical students at this institution attended a weekly, after-hours Multilingual Medical Interviewing Course that started in February 2018 and was completed in July 2018. We subsequently conducted a mixed methods evaluation of the pilot course that included enrollment and exit surveys, with analysis of attendance records and semi-structured interviews with students and faculty. Results: 116 students enrolled in our 20 session voluntary after-hours course. On average the enrollees reported speaking 3 languages. None of the enrollees spoke Kannada and 33% reported some problems with English. Major non-English languages were Malayalam and Hindi. The course schedule was extended because of scheduling difficulties and the initially planned 20 sessions was reduced to 15. Attendance dropped to 20 students by session 4, and these students continued until the sessions were completed. Feedback surveys revealed that only a small percentage of regular students intended to use Kannada after they completed their internship training. Major design innovations that were viewed positively by the students were structured Student Worksheets and Instructor Manuals, context specific phrasebooks and Anki flash card decks. Recurrent positive themes included a systematic teaching curriculum, innovative learning styles through role play, and educators who were invested in student’s success. Conclusions: There is increasing language diversity among the Indian medical student body as well as among patients at urban training sites. The learning needs of trainees that arise from these sites have historically been unaddressed in the curriculum. This project demonstrates the potential of using insights from the field of applied linguistics and design thinking to create novel curricula and educational resources that are feasible, acceptable and effective in improving language and communication skills of preclinical medical students.
The Virtual Mock Oral Examination: A Multi-institutional Study of Resident and Faculty Receptiveness

Due to the coronavirus disease 2019 (COVID-19) pandemic, several American Board of Medical Specialties members have implemented board exams in an online format. In response, we decided to evaluate the efficacy and receptiveness of otolaryngology faculty and residents to a web-based virtual mock oral examination (MOE). Faculty and residents from D.C. metropolitan institutions were recruited for decentralized virtual MOE in early 2020. A total of 28 faculty and 20 residents signed up. Follow-up included a survey study consisting of Likert scale and free-text questions to evaluate receptiveness. Helpfulness of the exercise was rated as an average of 8.8 and 9.06, respectively, by faculty and residents on a 10-point Likert scale. Likelihood to recommend a similar exercise to others was 9.2 and 9.3, respectively, for faculty and residents. All survey respondents said they would participate again if given the opportunity. We conclude that existing video-conferencing technologies can be effective tools for conducting virtual MOE by otolaryngology residency programs.
Background: The American Academy of Pediatrics and the American College of Obstetrics and Gynecology recommend that primary care providers and pediatricians address sexuality and reproductive health with their young adult and adolescent patients in a developmentally appropriate manner, however, recent studies report that reproductive health is often not addressed. Additionally, studies have shown that pediatricians feel ill-equipped to have these discussions with their IDD patients.

Objective: To understand the perceived preparedness of pediatricians to address the reproductive health of their patients with IDD through the use of a survey. An additional goal is to understand the barriers that limit pediatricians’ preparedness and ability to provide reproductive health education to their patients with IDD.

Methods: Pediatric health care providers associated with Children’s National were surveyed anonymously using an IRB approved RedCap survey. Results: There were 35 respondents with the majority of our respondents being pediatric attendings from academic institutions (61%). Sixty-three percent of respondents were pediatric attendings physicians, the other respondents included pediatric physician trainees and pediatric nurse practitioners. In general, the respondents felt that the reproductive and sexual health education needs of their adolescent patients with IDD were being met fairly well, though 54% had never received any training or resources in this area (medical school lectures or workplace trainings). Most respondents reported discussing reproductive and sexual health with their IDD patients at only some visits and time was the largest barrier to having these conversations. Eighty-six percent of respondents reported they believed they would benefit from additional resources or trainings to address the reproductive and sexual health needs of their patients with IDD.

Conclusion: Pediatric healthcare providers receive little training or resources about discussing reproductive and sexual healthcare for their patients with IDD. While the majority healthcare providers feel they are adequately addressing the needs of their patients with IDD, they also believe they would benefit from additional training or resources.
The Crossroads of Wellness and Second Victim Syndrome: Identifying Factors that Alter the Pathway of Caregiver Recovery Following an Unanticipated Adverse Patient Outcome

Introduction: Second Victim Syndrome (SVS) describes the phenomenon in which a caregiver experiences a traumatic psychological and emotional response to an adverse patient event or medical error. Using quantitative survey analysis, we aim to better understand the personal factors that affect SVS development and recovery. Methods: Caregivers at a small urban academic medical center who had experienced an adverse patient event in the past six months were invited to take part in this institution-wide, voluntary, quantitative, cross-sectional study. Three surveys were administered; the Holmes-Rahe Life Stress Inventory (HRLSI) was used as a surrogate to measure stressful life events. The Impact of Event Scale-Revised (IES-R) was used as a measure of the stress a provider senses following a traumatic event. The Second Victim Experience and Support Tool (SVEST) was used to assess the medical provider’s emotional response and level of institutional support in response to an adverse clinical event. Results: Analysis of SVEST vs. IES-R demonstrated that respondents with greater self-perception of personal distress reported increased psychological (p=0.0008) and physical (p=0.0015) distress. Respondents who reported higher HRLSI scores had a greater perception that non-work-related support (p=0.04) such as family support was inadequate; however, these respondents were less likely to perceive institutional support (p=0.04) as inadequate. The results indicate that caregivers with more perceived life stresses believe that they do not have strong non-work-related support services, which is a known protective factor; thus, they may perceive any institutional support as more adequate. Conclusion: This study suggests that personal life risk factors, institutional support, and non-work related support may play an important role in the development of SVS and the perception of stress and wellness in the setting of SVS.
The COVID-19 pandemic has challenged global health care providers with its myriad of clinical presentations, infection rate, and ease of spread. With the implementation of Operation Warp Speed, the scientific community was able to create a vaccine against the SARS-CoV-2 virus in an unprecedented fashion. Yet, despite this triumph, vaccine hesitancy remains a major barrier to ensuring broad dissemination. The World Health Organization’s Strategic Advisory Group of Experts (SAGE) described the term ‘vaccine hesitancy’ as the ‘delay in acceptance or refusal of vaccination despite availability of vaccination services…that is complex and context specific, varying across time, place, and vaccines’ (1). Prior to the Food and Drug Administration’s Emergency Use Authorization of the Pfizer/BioNTech and Moderna mRNA vaccines in June 2020, it was estimated that almost 70% of the population expressed a willingness to get the vaccine, yet rates were substantially lower among certain populations, such as African Americans (2). This qualitative study explores perceptions of District of Columbia residents about COVID-19 public health recommendations and attitudes towards potential receipt of the vaccine. We interviewed residents within the District of Columbia who presented to the George Washington University Emergency Department representing wards with both high and low rates of COVID infection. Our goal was to sample individuals from all 8 geographic wards which are historically divided by race and socioeconomic status. Our preliminary results (n=22) show that 82% of participants are willing to take the vaccine. Reasoning behind this decision ranged from personal protection, altruism for the greater good, and trusting the scientific process. Two participants expressed skepticism about receipt of the vaccine due to limited information about side effects and longitudinal data. Two participants were unwilling due to distrust of the previous political administration and lack of knowledge regarding the vaccine creation process. While it is promising that many District residents are interested in receiving the vaccine, more information is needed about overcoming negative perceptions and attitudes of those less willing to obtain it. By better understanding barriers and attitudes towards the vaccine, we can help devise strategies to improve vaccination rates across the city. We hope to elucidate further information as we proceed with more interviews.
Latino children and youth often have distinct needs and are at greater risk for significant chronic disease. They also face special barriers to care such as language challenges, immigration difficulties, poverty, lack of insurance, and stressors such as discrimination. The results are intended to enable improved targeting of resources to meet priority needs for this population. This study intends to provide a current snapshot of the socioeconomic determinants of health of the Latino community in Washington, D.C. Surveys in Spanish and English were given to children 13 years or older, or parents of younger children who were receiving care in an urban children’s health clinic. The surveys asked about their health needs and were completed online. The surveys were sent via email between July to November 2020 during the covid pandemic. 148 participants responded to the survey. All of the survey respondents were from parents of the children. 90% identified as Latino or Hispanic. 44% of the survey participants indicated they belonged to predominantly Spanish-language households, with 40% in households with dual English-Spanish usage and 11% in predominantly English-language households. 56% indicated they were receiving some form of government assistance for needy families. 49% indicated anxiety about food insecurity in the past year, and 38% indicated that it was sometimes or often true that their family ran out of food before they could afford to purchase more. 18% of respondents indicated interest in their family receiving help to stay legally in the U.S. All respondents indicated having some form of health insurance (80% Medicaid, 20% Private). Of note, D.C. provides health insurance to all children including undocumented. Respondents revealed significant socioeconomic factors that should be considered in providing care to the Latino youth population. Providers should understand and assess factors’ relevance when making assessments and providing care, such as inadequate nutrition due to food insecurity and identify local resources (e.g., food banks or legal assistance). Additionally, medical institutions can consider the importance of hiring Spanish-speaking staff to ensure high-quality communication. Future research to understand the circumstances of patients not seeking healthcare (due to immigration, language, insurance, etc.), and are therefore not represented in this study, is recommended.
Healing Through Action: The Changemakers Policy and Advocacy Workshop Pilot

Healing-Centered Engagement is a model of thought around community focused resilience building that suggest that engaging in advocacy and action around community needs can improve the healing process for people who have experienced trauma. The Changemakers Workshop was developed as a 25-hour curriculum conducted entirely online with an emphasis on semi-structured discussions, interactive activities, engaging with stakeholders, and experiential learning in health policy and advocacy. In the pilot workshop, the students focused on addressing issues regarding trash disposal, littering, and the built environment in Philadelphia. During the July 2020, students ages 14-19 (n=15), successfully completed the workshop. Students met with nine speakers with expertise in policymaking, economics, community leadership, and topic-specific efforts. They worked through interactive activities to solidify important concepts around policy and equity aimed with a focus on generating solutions. After meeting with community and city stakeholders, youth participants reviewed tools provided by federal agencies, analyzed policies implemented in other regions across the United States, and developed a policy proposal. Students focused on building advocacy skills, culminating in an oral presentation and Q&A session with a live online audience focused on providing testimony and proposing their policy solution. Participants completed a pre- and post-survey consisting of 3 scales and a variety of qualitative questions focused on workshop feedback. There was an average 39.3% increase in scores (p<0.001) related to participant familiarity in concepts covered, an average 15.5% increase in scores (p=0.068) related to participant comfortability with skills developed and an average 8.8% increase in scores (p=0.054) using the Connor-Davidson Resilience Scale. Participant feedback was overwhelmingly positive, with two thirds of participants indicating they would not change anything about the program. Students emphasized enjoying the workshop’s meaningful discussions, interaction with speakers, and the focus on helping their communities. In addition to the pre- and post-surveys, students were asked to rate the usefulness of each speaker on a scale from 1-5 and all speakers had an average score of 4.2 out of 5 or higher. The pilot workshop and evaluation is currently being used to inform the development of a community-focused, youth-led policy lab initiative for Philadelphia students to continue to engage in policy and advocacy work they care about in their communities.
Building Evidence Behind Strong Families: A Review of the Evaluation Methods for Parent Cafes

In the Washington D.C., 47.1% of children have experienced at least one Adverse Childhood Experience (ACE), demonstrating a significant need for community-based interventions to improve health outcomes that can result from a high rate of ACEs. Parent Cafes are a model developed in 2007 aimed at bringing parents together in semi-structured discussions founded in the notion that parenting is part innate and part learned. Parents engage in peer-to-peer learning around five evidence-based protective factors that improve childhood resilience and discuss how to bring them or reinforce them into their homes: resilience, relationships, support, knowledge, and communication. There is limited published evidence to demonstrate the efficacy of this process. Researchers reviewed the evaluation methods used in unpublished data sets from existing programs (n=5) that have implemented the Parent Café model in locations across the United States. Researchers identified unique questionnaires and several validated scales used to build an evidence base for the Parent Café model including the Connor-Davidson Resilience Scale and the Protective Factors Survey. Researchers developed an evaluation plan in collaboration with community partners and parent café participants based on the data from this review. This evaluation plan is currently being used in the rollout of the Parent Café model through Children’s National Hospital and the Early Childhood Innovation Network.
Relationship between Mental Illness and COVID-19 Outcomes

Importance: Individuals with pre-existing mental illnesses are at high risk for COVID-related morbidity and mortality. They have high rates of the chronic medical conditions that have been found to be risk factors for severe COVID-19 illness and may experience heightened barriers to receiving prompt medical attention for COVID-related symptoms.

Objective: To determine if pre-existing mental illness is associated with worse outcomes among patients with severe COVID-19 illness. Design: Retrospective cohort study. Setting: Single urban academic medical center. Participants: All patients admitted to inpatient or observation status for symptomatic COVID-19 illness from the emergency department (ED) and discharged from March to September 2020. Exposure: Pre-existing mental illness defined as a secondary discharge diagnosis of depression/anxiety disorder or bipolar/psychiatric disorder from the COVID-19 hospitalization. Main Outcomes: Intensive care unit (ICU) utilization, in-hospital mortality, and length of stay for patients who were alive at time of discharge. Results: Our study population included 561 COVID-19 related admissions. 12.8% of patients had depression, anxiety, or trauma disorders and 11.2% had bipolar or psychotic disorders. After controlling for demographics, comorbidities, socioeconomics, clinical presentation at time of ED arrival, and time trends, COVID-19 patients with pre-existing depression or anxiety disorders had an 11.1% (95% CI 0.8% to 21.4%; p=0.035) greater predicted probability of ICU use, a 9.6% (95% CI 0.8% to 18.5%; p=0.033) greater predicted probability of death, and a 4.4 day (95% CI 1.8 to 7.0; p=0.001) greater predicted length of stay than COVID-19 patients without mental illness. We did not find differences in outcomes between patients without mental illness and patients with bipolar or psychotic disorders. Conclusions and Relevance: Severe COVID-19 patients with depression and anxiety are at high risk for poor outcomes, even after accounting for differential demographic and health factors. As it is currently unclear what can be done in the short term to reduce the risk of severe outcomes in this patient population, consultation-liaison psychiatry should be engaged early in the hospitalization to ensure psychiatric optimization and public health officials should prioritize strategies to protect this group from SARS-CoV-2 infection.
Assessing Community Causes of Vaccination Hesitancy in the Era of COVID-19

Background: Widespread uptake of COVID-19 vaccines is critical in the effort to contain the pandemic. Despite proven efficacy and safety profiles of available vaccines, hesitancy remains a significant barrier impeding widespread vaccination.

Methods A mixed-methods survey was administered to participants waiting in line for COVID-19 testing at a federally qualified health center. Survey questions focused on potential reasons for hesitancy toward a COVID-19 vaccine including confidence in the safety and efficacy of the vaccine, potential cost to the recipient, and complacency surrounding the virus itself as well as a single question on intent to be vaccinated.

Results A total of 245 adults of 296 approached participants (82.8% acceptance rate) completed the survey (median age 33 [interquartile range, 27-45] years). This study found that Black/African American (OR = 0.05, 95% CI 0.001-0.24, p<0.01), Hispanic/Latino (OR = 0.06, 95% CI 0.01-0.55, p=0.01), and female (OR = 0.55, 95% CI 0.31-0.98, p=0.04) respondents were less likely to seek vaccination when compared to White/Caucasian and male participants. Confidence and cost of the vaccine were the leading drivers of vaccination hesitancy among participants. No statistically significant difference was found between participants when asked about complacency toward the virus as most respondents agreed that COVID-19 poses significant risk.

Conclusion Our findings exemplify the importance of community level surveillance of hesitancy for creation of focused interventions to increase vaccination rates. These could include direct community engagement from health authorities, community meetings, and improved dissemination of information pertaining to available vaccines.
Background: Preventative care visits, declared essential by government entities, hospitals, and professional organizations, decreased during the COVID-19 pandemic putting infants at risk of poor health outcomes. Parental reasons for visit decline have not been formally studied, especially among those who are disproportionately impacted by COVID-19. Objectives: Understand barriers to infant preventative care during the COVID-19 pandemic. Methods: Retrospective EMR chart review of three academic outpatient centers in Washington, D.C. identified patients who missed a 2, 4, 6, or 12-month preventative visit by at least 1 month between March 16th, when the shutdown of nonessential services in D.C. began, and September 30, 2020. Respondents who verbally consented completed a telephone survey in English or Spanish. The survey included self-reporting of primary mode of transportation to the clinic, nine closed-ended (yes or no) questions, and an opportunity for one open-ended response. Demographic information was collected via the EMR. No financial incentives were provided. Appointments were made by the study team when necessary and requested. Results: 347 patients met all inclusion criteria. A total of 66 parents participated in the survey with 177 parents eligible but not reached and 104 parents who declined participation. Respondents and non-respondents did not differ by insurance type, race/ethnicity, or difference in age of visit missed; respondents primarily represented Black/African American parents (87.9%) with public insurance (87.9%) and primary care providers in under-resourced neighborhoods. The most common responses were concern about exposure to COVID-19 during the clinic visit (74.2%) and belief that well visits were not exempt from the government stay-at-home order (60.6%). Concern for exposure during travel to the visit (42.4%) and lack of childcare for other children (36.4%) were cited. Insurance lapse was not a frequent response (10.6%). Conclusions: The leading concern from parents was exposure to COVID-19. The eligible respondents were overwhelmingly representative of a community with higher burden of disease which may have increased perception of risk. Inconsistent messaging about types of services available contributed to decline in preventative visit compliance. To many respondents, it was not clear that non-emergency medical offices were an essential business. Improved communication between parents and the providers of medical services is important to improve compliance with well visits. Results, although limited by small sample size show that addressing real and perceived threats of COVID-19 infection and clarifying recommendations from trusted institutions are necessary to avoid future gaps in care, especially for communities with disproportionate COVID-19 disease burden.
Improving high quality, respectful maternity care is a global priority to advance maternal and neonatal health. Recent data from the United States (US) suggest that one in six women reported experiencing mistreatment in maternity care. Despite lower access to prenatal care and increased reports of discrimination, stigma, and infringements on reproductive rights, the maternity care experiences of immigrant women remain understudied. This article extends the literature of person-centered maternity care (PCMC) by applying recently validated frameworks to a US context. Methods The Research on Immigrant Health and State Policy Study is a convergent parallel mixed methods study. Semi-structured, in-depth interviews were conducted from August 2018 to August 2019 with Mexican and Chinese women living in Los Angeles or Orange County who gave birth within the past two years. Interviews (n=18) were conducted by bilingual interviewers, transcribed, and coded. Coded data were mapped onto the domains of PCMC. Results Women described several preferences when establishing prenatal care, including provider qualifications, linguistic, and ethnic concordance. Most Chinese women cited linguistic and ethnic concordance as their main criteria in provider selection. Across ethnicity, county, and immigration status, women shared the expectation that more difficulties arose for those who did not speak English. Despite overall positive experiences, all participants pinpointed instances of mistreatment. Negative experiences ranged from long wait times to denial of necessary medical care. Translation services were often quoted as unavailable or flawed. However, Mexican women, overall, reported greater ease of accessing translation services or bilingual providers compared to Chinese participants. For women who spoke English, or attended clinics with bilingual staff or adequate translation services, language and cultural concordance were not defining features in their perception of care. Some women utilized informal support systems to enhance communication such as enlisting a family member or using available technology to translate. Chinese women were more likely to utilize these strategies. Discussion This study is the first to apply concepts of PCMC to a US context among immigrant women. There is significant overlap with our study findings and the experiences of lower status women in international contexts and among communities of color in the US. However, areas unique to US immigrant context include . These include judgements related to fertility, language challenges, and preferences for provider cultural concordance. with providers. Understanding immigrant experiences of respectful maternity care can offer insight to clinicians and policymakers, contextualizing the future of patient-centered care research and immigrant life.
The high rates of morbidity and mortality from COVID-19 among Black patients has been of ongoing concern in medicine and public health. Research suggests that disproportionate exposures to both the virus and causes of underlying chronic illness underpin these disparities; however, the role of air pollution as an environmental determinant has not been fully explored. Evidence increasingly suggests a relationship between exposure to air pollution and adverse outcomes from COVID-19. Race is a significant predictor of living in a polluted area within the United States and prolonged exposure leads to chronic inflammatory stimulation, even in young and healthy people. Pre-2020 research demonstrates links between race, pollution, and respiratory conditions. With COVID-19, a severe inflammatory response syndrome, marked by fever, hypoxia, and increased inflammatory markers, is a significant factor in morbidity and mortality. Increased inflammatory stimulation from air pollution exposure may exacerbate risk of severe disease. Few studies have investigated the biological mechanisms behind such disparities. Our analysis reviews the relationship between COVID-19, race-linked health disparities, and atmospheric pollutants: fine matter particulate, particulate matter 10, nitrogen dioxide, sulfur dioxide, and ground level ozone. We summarize current findings and implications for future research. Though race is often cited as an independent “risk factor” for poor outcomes in respiratory diseases, it is better understood as a composite rather than essential variable. Care must be taken not to conflate social and environmental factors that disproportionately impact communities of color -- including air pollution -- with biology.
Background: In response to the COVID-19 pandemic, many health systems postponed routine screening and care. Subsequently, we have seen a decline in the diagnosis of new cancer cases, a process that relies heavily on routine screening. The Washington D.C. area has a heterogeneous patient population and one of the highest income gaps in the United States. Patterns in healthcare inequality in the area mirror these disparities. This study aims to identify the impact of the COVID-19 pandemic on cancer diagnosis rates compared to previous years and analyze whether vulnerable populations were disproportionately affected.

Methods Data was collected from the George Washington University (GWU) Cancer Registry. The study population included adults residing in D.C., Maryland or Virginia diagnosed with any cancer at a GWU facility within the date ranges: April 1 to September 30 of 2018, 2019, 2020 and September 1, 2019 to February 29, 2020. Data collected included age at diagnosis, race, ethnicity, cancer site, stage at diagnosis, and zip code as a proxy for socioeconomic status (SES). Median income by zip code was labeled as low, middle or high. Chi square analysis was used to compare changes in each of these demographic and SES categories between each time frame. Results There were 372 new cancer diagnoses during the COVID-19 period. During this time period in 2018 and 2019, there were 525 and 539 new cancer diagnoses, respectively. Immediately before the COVID 19 period, September 1 2019 to February 29 2020, there were 588 new cancer diagnoses. Patterns of cancer type, age at diagnosis, sex, stage at diagnosis, and SES did not significantly differ between the COVID-19 period and any other time period (p>0.05). However, the number of Hispanic patients diagnosed during the COVID-19 period was significantly higher compared to 2018 and 2019 (p=0.041) and the September 2019 to February 2020 period (p=0.0005). Conclusion We observed a decrease in cancer diagnoses during the COVID-19 period with no significant differences in patient age, sex, cancer type, stage or SES. There was a slight increase in cancer diagnoses among Hispanic patients during the COVID-19 period. This suggests that most groups were equally impacted by COVID-19 with respect to cancer diagnosis. However, this may be limited by population size and our means of collecting data on SES. Further studies comparing early and late impacts of COVID-19 on cancer care will be important to identify specific communities for targeted outreach and intervention.
Immigration legal status affects an immigrant family’s ability to access health care, economic opportunity, and social services in the community. These disparities result in adverse physical and mental health outcomes through mechanisms such as toxic stress, anxiety, and depression. Changes to immigration law during the Trump Administration, alterations to the Public Charge rule in 2020, and the societal effects of the COVID-19 pandemic have exacerbated these challenges for immigrant families. To address immigration status as a social determinant of health, this project evaluated how connecting families presenting to Children’s National Columbia Heights Health Center that are eligible for immigration legal services to an immigration lawyer affected their mental health and awareness of immigration legal services. Pediatricians identified potential participants during clinic visits and referred them to the study team. The team contacted participants by phone to complete a pre-survey questionnaire to assess levels of stress regarding their immigration status and to determine their knowledge of available legal services. Participants were led through the online screening survey www.immi.org to determine their eligibility for legal protection. The research team connected those who screened as possibly qualifying for legal relief options with pro-bono or low-cost immigration legal services in their community. Individuals were contacted two weeks after the initial interview and asked to complete the post-survey to assess changes to their mental health and their knowledge of immigration legal services. From June 2020 to January 2021, 36 participants were contacted and 24 (67%) qualified for a potential immigration legal status and were connected with legal services. Seven individuals received full legal representation for their immigration case. Results showed that 97% of participants were worried that their unstable immigration status could lead to deportation, and 97% were anxious about their status. Participants stated that they became more aware of the different protective legal immigration statuses (improving from 33% to 63% in pre- versus post-survey). Only 50% and 62% of participants felt confident in their abilities to handle problems and find help surrounding their legal status, respectively. This project demonstrates the negative impact that unstable immigration status has on family’s well-being. Further work with more participants and increased follow-up assessments is needed to draw clearer connections of benefit and to determine statistical significance for our intervention. Immigration legal services can integrate into the primary care setting through medical-legal partnerships in order to wholly serve the multi-dimensional needs of immigrant families.
In Jordan, the increasing prevalence of diabetes has been accompanied by a need for educational material for affected individuals, as well as for their families. Effective diabetes management entails a holistic approach that places medical management in the context of everyday life. Therefore, educational material should be culturally competent and sensitive to social and cultural norms. Additionally, information on diabetes management is most widely available in English, with less that is available in Arabic, or that is specific to Arabic-speaking populations. The Jordanian Society for the Care of Diabetes (JSCD), a branch of the International Diabetes Federation, is poised to play an important role in patient education. Partnering with the JSCD, our aim was to develop educational material on diabetes management and care that is culturally relevant and specific to Jordan, and that would be available in Arabic. Key topics around which to develop educational material were identified and researched using peer-reviewed literature. To best apply this information in the context of Jordanian daily life and sociocultural norms, JSCD-affiliated healthcare professionals were interviewed and actively involved. The consolidated information was then written in a style accessible to the target audience. Currently, this material is being translated into Arabic. Next steps entail assessing and analyzing efficacy and impact, which may create opportunities for further development. There may also be potential for expanding the use of such educational material to other Arabic-speaking countries in the Middle East and North Africa (MENA), who share similar sociocultural and spiritual backgrounds and norms, and who are also seeing a rise in the prevalence of diabetes. Although this initiative has been impacted and limited by COVID-19, we have remained committed to working towards improving culturally competent patient education, as well as advocating for individuals affected by diabetes.
Emergency Capacity Analysis in Ethiopia: Results of the First Baseline Emergency Facility Assessment

Introduction: In Ethiopia, the specialty of Emergency Medicine is a relatively new discipline. In the last few decades, policymakers have made Emergency Medicine a priority for improving population health. This study aims to contribute to this strengthening of Emergency Medicine, by conducting the country’s first baseline gap analysis of Emergency Medicine Capacity at the pre-hospital and hospital level in order to help identify needs and areas for intervention. Methods: This is a cross sectional investigation that utilized a convenience sampling of 22 primary, general and tertiary hospitals. Trained personnel visited the hospitals and conducted 4-hour interviews with hospital administrators and emergency care area personnel. The tool used in the interview was the Columbia University sidHARTe Program Emergency Services Resource Assessment Tool (ESRAT) to evaluate both emergency and trauma capacity in different regions of Ethiopia. The findings of this survey were then compared against two established standards: the World Health Organization’s Essential Package of Emergency Care (EPEC), as well as those set by Ethiopia’s Federal Ministry of Health. Results: The tool assessed the services provided at each hospital and evaluated the infrastructure of emergency care at the facility. Triage systems differed amongst the hospitals surveyed though triaging and emergency unit infrastructures were relatively similar amongst the hospitals. There was a marked variability in the level of training, guidelines, staffing, disaster preparedness, drug availability, procedures performed, and quality assurance measures from hospital to hospital. Most regional and district hospitals did not have nurses or doctors trained in Emergency Medicine and over 70% of the hospitals did not have written guidelines for standardized emergency care. Conclusion: This gap analysis has revealed numerous inconsistencies in health care practice, resources, and infrastructure within the scope of Emergency Medicine in Ethiopia. Major gaps were identified, and the results of this assessment were used to devise action priorities for the Ministry of Health. Much remains to be done to strengthen Emergency Medicine in Ethiopia, and numerous opportunities exist to make additional short and long-term improvements.
Pediatric Cerebral Malaria Prevention Strategies

Malaria is the most important parasitic disease of humankind. Cerebral malaria is malaria’s deadliest clinical manifestation and has a profound public health impact in endemic areas. In Africa, it is primarily a disease of childhood. Prevention strategies, including long-pursued efforts in vaccination as well as physical barriers, particularly in combination, hold great potential to decrease the disease’s public health impact. Newly developed biological methods of combatting malaria have some promise as creative ways to combat malaria in the future.

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Medicare Graduate Medical Education Provides Significant Support for the Dental and Podiatry Workforce

Medicare provides an estimated $14.6 billion annually in graduate medical education (GME) payments to teaching hospitals, and explicitly supports dental and podiatry residency programs. We used Medicare hospital cost reports to examine Medicare GME payments for dental and podiatry residents from 1998 to 2018, as well as the distribution of payments between states. In 2018, Medicare provided $730 million in dental and podiatry GME payments to teaching hospitals - an estimated 72% of positions were dental. The number of residents supported nearly doubled between 1998 and 2018 and Medicare payments for dental and podiatry GME increased 2.6-fold. Medicare GME payments varied widely between states with GME payment per state population ranging from $0 to $14.24 per person. Dental and podiatry GME represent a significant public investment and deliberate policy decisions are needed to target this $730 million and growing investment to address the nation’s priority oral and podiatry health needs.
BACKGROUND Patients diagnosed with IBD are recommended to have surveillance colonoscopies to enable early detection of colorectal malignancy. Patients with ulcerative colitis (UC) and Crohn’s colitis are advised to have surveillance colonoscopies every 1-3 years beginning 8 years after diagnosis. This study evaluated patient factors that may affect adherence to colonoscopy surveillance in inflammatory bowel disease. METHODS A retrospective chart review of all IBD patients managed at an academic gastroenterology practice for the past 3 years was performed. All patients with a diagnosis of UC or Crohn’s colitis for =8 years were included. There were no exclusion factors. Patient gender, race, IBD subtype, current age, age at diagnosis, medication regimen, insurance status (private; public: Medicaid and Medicare) and the date of the most recent colonoscopy were obtained. Patients were deemed compliant with surveillance colonoscopy guidelines if they had a colonoscopy 8 years after initial diagnosis or within 3 years of the previous one. A confidential database was created using Microsoft Excel. Statistical analysis was performed using Fisher’s exact test with significance set at p<0.05. The study was IRB approved. RESULTS 171 patients were evaluated. 131 (76.6%) had a diagnosis of UC, 38 (22.2%) had Crohn’s colitis, and 2 (1.2%) had indeterminate colitis. 103 (60.2%) were female and 68 (39.8%) were male. The mean age was 47.8 years (range: 22-83). 94 (55.0%) were White, 48 (28.1%) African American, 6 (3.5%) Asian, 1 (0.6%) Hawaiian/Pacific Islander, and 22 (12.9%) declined identification. 106 patients (62.0%) had surveillance colonoscopies within the recommended timeframe, and 65 patients (38.0%) were not compliant with recommendations. There was no significant difference in the rate at which surveillance colonoscopies were performed based upon patient’s current age (67.3% <50 years vs 54.3% ≥50 years, p=0.109), race (56.4% White vs 70.8% African American, p=0.1046; 56.4% White vs 66.7% Asian, p=0.6971; other racial group comparisons p=1.000) or disease subtype (65.6% UC vs 50% CD, p=0.0899). There was a significant difference in the rate at which colonoscopies were performed based upon gender (p=0.0103), age at diagnosis (67.6% ≤30 years vs 51.7% >30 years; p=0.0483), medication regimen (54% biologic / immunologic vs 71% other medications; p=0.023) and insurance status (66.2% private vs 47.5% public; p=0.0412). CONCLUSIONS Overall, only 62% of patients had their colonoscopies at the recommended time. Men and individuals diagnosed > 30, on biologic / immunologic therapy or on public insurance were less often adherent to colonoscopy guidelines.
Association of Insurance Status with Access to Care and Survival in Advanced Papillary Thyroid Carcinoma

Purpose: To determine whether insurance status affects treatment access and outcome in patients with late-stage papillary thyroid cancer (PTC). Materials and Methods: Data on demographics, insurance status, treatment access, and survival for patients with stage III and IV PTC in the National Cancer Database from 2004 to 2015 were examined. Multivariate Cox regression was used to examine overall survival, and multivariate logistic and linear regressions were used to analyze the association of insurance status with treatment access and time to treatment. Results: Of the 30,270 patients with late-stage PTC, 89.1% had private insurance; 7.1% had Medicaid; and 3.8% were uninsured. When controlling for stage and demographic factors, private insurance was associated with increased overall survival (aHR, 0.68; p<0.001) compared to uninsured patients, while Medicaid was associated with worse overall survival (aHR, 1.61; p<0.001). Patients with private insurance were more likely to receive multimodal therapy compared to unimodal therapy (OR, 1.22, p<0.001). Private insurance and Medicaid patients received surgery 45.1% (p<0.001) and 43.6% (p=0.032) sooner than uninsured patients. Private insurance patients received radioisotope 17.1% and TSH suppression therapy 29.7% sooner than uninsured patients (p<0.001). Conclusions: This study demonstrates reduced access to treatment and worse overall survival among both Medicaid and uninsured patients with advanced PTC compared to private insurance. In fact, patients with Medicaid demonstrated a decreased overall survival compared to uninsured patients. Medicaid, despite providing insurance to the low income population, may not adequately reduce healthcare inequity in patients with late-stage PTC.
Purpose: The relationship between Medicaid expansion and thyroid cancer outcomes has not been well established. We use papillary thyroid carcinoma (PTC) to demonstrate the impact of the 2014 Medicaid expansion on treatment access and outcomes.

Materials and Methods: Using the National Cancer Database, we constructed a longitudinal panel model with facility-level aggregate data to evaluate the impact of Medicaid expansion on treatment access between participating and non-participating states. The pseudo-random process of Medicaid expansion and construction of facility-level panel data allowed for an isolated analysis of Medicaid expansion on treatment modalities with minimal confounders. Similarly, Kaplan-Meier was used to examine survival differences between pre and post-expansion cohorts. Results: 442 facilities with data aggregated from 5,979 PTC patients with no insurance or Medicaid were followed from 2011-2016. Medicaid expansion resulted in a $1.51\pm0.26$ percentage point decrease in uninsured rate ($p<0.001$). However, longitudinal panel models showed that Medicaid expansion had no impact on likelihood of receiving treatment or time to treatment. In stage 3 and 4 PTC, no difference in overall 3-year survival was observed between participating and non-participating states in the pre-expansion period (log-rank $p=0.703$) and post-expansion period (log-rank $p=0.568$).

Conclusion: Despite increasing coverage, Medicaid expansion did not significantly impact treatment modality, time to treatment, or short-term survival in PTC.
Variation in State and Federal Reimbursement in the Treatment of Upper Extremity Fractures

Background
Medicare and Medicaid are two of the largest government-run healthcare programs in the United States. While Medicare reimbursement is determined at the federal level by the Centers for Medicare and Medicaid Services, Medicaid reimbursement rates are set by each individual state. The purpose of this study is to compare Medicaid reimbursement rates with regional Medicare reimbursement rates for 12 orthopaedic procedures performed to treat common fractures of the upper extremity. Methods
Twelve orthopaedic procedures were selected and their Medicare reimbursement rates were collected from the 2020 Medicare Physician Fee Schedule. Medicaid reimbursement rates were obtained from each state’s physician fee schedule. Reimbursement rates were then compared by assessing the ratio of Medicaid to Medicare, the dollar difference in Medicaid to Medicare reimbursement, and the difference per relative value unit. The range of variation in Medicaid reimbursement and Medicare wage index-adjusted Medicaid reimbursement was calculated. Comparisons in reimbursement were calculated using coefficient of variation and student T tests to evaluate the differences between the mean Medicaid and Medicare reimbursements. Two sample coefficient of variation testing was used to determine whether dispersion in Medicare and Medicaid reimbursement rates differed significantly. Results
There was significant difference in reimbursement rates between Medicare and Medicaid for all 12 procedures, with Medicare reimbursing on average 46.5% more than Medicaid. In 40 states, Medicaid reimbursed less than Medicare for all 12 procedures. Regarding the dollar difference per relative value unit, Medicaid reimbursed on average $18.03 less per relative value unit than Medicare. The coefficient of variation for Medicaid reimbursement rates ranged from 0.26 to 0.33. This is in stark contrast with the significantly lower variability observed in Medicare reimbursement, which ranged from 0.06 to 0.07. Conclusion
Our findings highlight the variation in reimbursement that exists among state Medicaid programs for 12 orthopaedic procedures commonly used to treat fractures of the upper extremity. Furthermore, average Medicaid reimbursement rates were significantly lower than Medicare rates for all 12 procedures. Such discrepancies in reimbursement may act as a barrier, impeding many Medicaid patients from accessing timely orthopaedic care.
Reimbursement for Complex Carpal Trauma

Purpose The purpose of this study is to compare Relative Value Unit (RVU)-based reimbursement of operative fixation of complex carpal trauma versus primary operative fixation of distal radius fractures. Methods The 2015 to 2018 American College of Surgeons - National Surgical Quality Improvement Program (ACS-NSQIP) database files were queried using Current Procedural Terminology (CPT) codes to identify patients who underwent surgery for complex carpal trauma or operative fixation for an isolated distal radius fracture. From these data, we extracted the mean and median work Relative Value Unit (wRVU) per minute for each procedure as well as mean and median reimbursement per surgical case. For comparison, we examined the mean and median total wRVU, surgical time, wRVU/minute, reimbursement/minute, and reimbursement/surgical case. Results 139 patients who underwent operative fixation of complex carpal trauma and 222 patients who underwent operative fixation of distal radius fractures were included in this study. The mean wRVUs were 10.56 for the complex carpal trauma group and 12.46 for the distal radius fracture group. Complex carpal trauma cases were an average of 30.49 minutes longer than distal radius fracture cases. Mean wRVU/minute (33.68%) and median wRVU/minute (62.23%) were higher for distal radius fracture cases than for complex carpal trauma cases. Lastly, the mean ($378.85) and median reimbursement ($383.29) per surgical case for complex carpal trauma was lower than that of the mean ($447.19) and median ($516.08) of distal radius fractures. Conclusion Despite longer operative times and increased procedural complexity, surgical treatment of complex carpal trauma was found to reimburse significantly less than operative fixation of distal radius fractures.
Background: Currently, little research has examined the psychosocial impact of concussions on former high-level football players and their perception of brain health and wellness as they age. This study seeks to examine the worry of former NCAA DI football players compared to former NFL players regarding concussion history and brain health. Purpose: To identify how concussion history and concerns about brain health differ between former NCAA DI football players and former NFL players. Methods: This study consisted of a health survey administered via video conferencing. Former NFL players (N = 17) and former NCAA DI football players (N = 107) were surveyed. Questions on the survey included: number of concussions sustained, level at which the concussions occurred, resulting symptoms, and medical follow-up. Demographic variables included age, race, range of playing years, and positions played. The results from the health survey were analyzed using the Neurobehavioral Symptom Inventory (NSI), a tool used to assess severity of post concussions symptoms. Mann-Whitney U tests were used for comparative analysis in regards to number of concussions, NSI score, and worry about future brain health. A simple linear regression model was generated to assess the relationship between NSI scores and the total number of concussions sustained by each athlete surveyed. Results: Overall, a significant difference in the average number of concussions sustained over the course of one’s playing career between former NFL players and former NCAA DI football players was observed. However, there was no significant difference in worry about future brain health or post concussive symptoms between the two groups. A simple linear regression was used to model NSI as a function of the number of concussions sustained, and the model was found to be statistically significant (p-value = 0.0184). A linear regression was used to model NSI score as a function of number of concussions sustained for the NCAA DI football players, and this model was not found to be statistically significant (p-value = 0.685). Conclusions: This data shows that former NFL and former NCAA DI football players had no significant difference in worry about brain health even though, on average, NCAA DI football players had significantly fewer concussions and played for a shorter duration. The impact of concussions on brain health is an important part of the medical evaluation of athletes. It is significant for healthcare professionals to recognize that worry about sequelae from concussions can occur at different levels.
Background: In the last five years, mechanical thrombectomy has revolutionized the standard of care for patients suffering from acute stroke. The mechanical thrombectomy procedures for removal of clot from large vessel of the brain has been shown to be cost effective compared to the traditional medical therapy. Given the fact that clinical outcomes are strongly dependent on time to recanalization (removing the blood clot), it is important to examine the socioeconomic disparity of geographic living distance from thrombectomy capable stroke centers as related to patient outcomes. The objective of the study was to determine the current geographic distribution of population with 1 hour access to mechanical thrombectomy capable stroke centers and understand underlying economic disparities. Methods: The data on the US population and geographic location of thrombectomy capable stroke centers was obtained from the US Census Bureau and the websites of accrediting agencies and state governments. Using previously validated methods we estimated the population with 1 hour access to TCC. We additionally acquired median household income data for each state in the US. The proportion of population with 1 hour access to TCC was compared between low, middle and high median household states. Results: There was a total of 316 TCCs in the analysis, and approximately 65% of all US residents have within one-hour access to a specialized stroke center by way of air or ground. The states with >50% of the population having less than 1-hour access to thrombectomy centers, had the average median income was nearly $10,000 more when compared to states with <50% of the population with 1-hour access to TCC. In high-income states, 69.0% of the population had one-hour access to TCCs. In the middle-income states, 49.5 % of the population had one-hour access to TCCs, while only 21.4 % states one-hour access to TCCs, p-value = 0.01. A positive and significant relationship between economic status and percentage population with one-hour access was observed (r=0.44, p-value = 0.01). Conclusion: One-hour access to thrombectomy capable stroke centers is available to 65% of the US residents. A positive and significant relationship between economic status and percentage population with one-hour access was observed.
Pervasion of Racist Terminology in Medical Literature

Introduction In medicine, some commonly used vocabulary is tainted by racist connotations. In this article, we focus on one example of racist terminology in today’s medical lexicon: the use of the word “slave”. The frequency of the racist descriptor “slave” in medical literature and the context in which this terminology appears are currently unknown. In this article, we analyze use of the word “slave” in U.S. medical publications in the past decade and propose alternative terminology. Methods We generated a list of peer-reviewed journal articles that employed the “slave” analogy in a medical context by searching the term “slave” and excluding the term “enslaved.” We included English-language articles published in peer-reviewed journals between January 2010 and December 2020. Articles were screened by title and abstract by two independent reviewers. Full texts reaching inclusion criteria were published in the United States and used the word “slave” in a medical context. We defined medical context as one in which the word “slave” is used as a synonym for a system, item, or role in medically based research. Reviewers extracted data onto a customized extraction form. Results Of 816 articles assessed for eligibility, 84 were included in this systematic review and represented 45 different journals. 70% were full manuscript articles, while 30% were published conference proceedings. Journal mean impact factor was 3.4, and articles were cited on average 26 times. 49% of journals were open access. 54% of first authors were PhDs and 16% were MDs. 21% of first authors were affiliated with U.S. institutions. Articles exemplified 13 research areas: biopsy needles, catheters, cardiology, genetics, imaging, neurology, operating room monitors, physiological monitors, memory, rehabilitation, prosthetic limbs, circadian clocks, and robotic surgery. Discussion This review demonstrates persistence of use of slave analogies in U.S. peer-reviewed medical journals. Each article was cited on average by 26 articles, thus expanding potential readership and proliferation of the term “slave.” The injurious effect of racist terminology diminishes and devalues patients and physicians representing communities of color. Removing “slave” from medical vernacular is an essential first step to building trust and addressing healthcare disparities in underrepresented communities. We identified publications using alternative language for “master-slave” systems for 12 of the 13 identified themes. First authors of 79% of the articles are affiliated with institutions located outside the United States. Peer review is a compelling platform with authority to eliminate racially charged language from medical literature vernacular.
A longstanding nursing shortage in the United States coupled with increasing emergency department (ED) patient volume have led to a need for both additional hospital personnel and more efficient management of ED patient flow. In most hospitals, the Emergency Department Technician (EDT) has become an indispensable member of the treatment team, performing a variety of important roles to actively support other healthcare providers. However, there is no literature or data that addresses statewide regulations of the ED technician position and scope of practice. To better understand the regulatory environment, an email requesting information about a state’s ED technician regulatory structure was sent to both the Nursing and EMS Boards of all fifty states and the District of Columbia. Majority of responses noted that their boards do not have specific rules governing the ED tech’s scope of practice. Additionally, we found that many regulatory bodies, including Centers of Medicare/Medicaid Services (CMS), The Joint Commission, and D.C. Department of Health, do not have standards for ED technicians. This paper further examines the current regulatory landscape for EDT practice and the training required of the EDT in US emergency departments throughout all fifty states and D.C. With these findings, we believe a standardized process of training EDTs can relieve the burden of reduced availability of registered nurses. If properly trained, ED technicians can perform time-consuming procedures, allowing clinicians and nurses to concentrate on higher level diagnostic and therapeutic operations. By emphasizing the role of the EDT with appropriate training and oversite, the industry can significantly improve the delivery of acute care in the ED setting.
Background: In 2007, the American Academy of Pediatrics published its last set of clinical practice guidelines for the management of obesity. A number of studies have reported the challenges with implementation of guidelines with a more recent 2018 internal mixed methods analysis completed at the Children’s National Hospital. This review showed a lack of confidence in the laboratory assessment and management of obesity along with other diet related chronic diseases. Objectives: The main objective of this project was to develop a comprehensive evidence based weight management and diet related disease clinical pathway to improve the knowledge and confidence of pediatric clinicians at a large primary care pediatric health network in Washington, D.C. Methods: An iterative process was used to develop agreed upon tools to implement in the clinical practices. First, an extensive literature review was conducted to compile clinical management recommendations and protocols shared by national associations and current peer reviewed guidelines pertaining to management of abnormal labs for pediatric patients with diet related chronic diseases and obesity. Extensive interviews were conducted with subspecialists at the pediatric health network in order to ensure institutional support and joint collaboration. Lastly, health network colleagues reviewed, tested, and gave feedback on resources before approving for implementation. Results/Discussion: Research team created an extensive list of clinical practice pathways for conditions including dyslipidemia, hypertension, type 2 diabetes mellitus, polycystic ovarian syndrome, non-alcoholic fatty liver disease, acanthosis nigricans, hidradenitis suppurativa, obstructive sleep apnea, and special concerns in radiology. Along with the algorithm, a clinician guide on how to navigate weight bias and stigma was created. Moreover, patient handouts were created with the goal to better educate and engage patients and their families on managing health conditions with sensitivity to and recognition of the dangers of weight bias and stigma. The algorithms and resources have been incorporated into a health network wide quality improvement project starting March 1, 2021 and will be integrated throughout the course of the next 1-2 years.
Reproductive and Sexual Health Curriculum for Adolescents with Intellectual and Developmental Disabilities

Background: Adolescents and young adults with intellectual and developmental disabilities (IDD) are less likely to receive comprehensive reproductive and sexual health education. The American Academy of Pediatrics and the American College of Obstetrics and Gynecology (ACOG) recommend that primary care providers and pediatricians address sexuality and reproductive health with their young adult and adolescent patients in a developmentally appropriate manner, however, recent studies report that reproductive health is often not addressed. Additionally, adolescents with IDD, especially those in vulnerable communities, are subjectively much less likely to receive any health education in their classrooms or communities. Objectives: The objective of this study is to review available resources and lesson plans currently being used to teach reproductive and sexual health education for adolescents. In addition, the short-term goal is to create an eight-lesson, digitally distributable, reproductive and sexual health education curriculum for adolescents with IDD. Methods: The curriculum development process was divided into five broad phases: background research, lesson plan development, implementation, evaluation, content adjustment. The current project has proceeded through the first two phases. In order to identify relevant lesson plan themes, we conducted a preliminary literature review and search of health and reproductive education resources for adolescents. Common subjects were narrowed down in order to determine our lesson topics. From there, we developed eight comprehensive lessons with options for differentiated instruction based on students’ individual developmental and educational needs. Lesson Plan Structure: The preliminary literature review and search of resources found that there were limited lesson plans available for teaching safe sex and body autonomy to adolescents with IDD. From this information, the broad eight lesson themes we identified were: Safe Spaces and Trusted Adults, Healthy Relationships and Consent, Puberty, External/Internal Anatomy, Pregnancy, Options for Safe Sex or No Sex, Online Safety, and Body Image and Self Confidence. Each lesson was planned for forty-five minutes and included main objectives, clearly stated instructions for warm-up, main instructional period, and wrap-up activities, necessary materials, and recommended differentiated instruction for each activity. Future Directions: Our goal is to complete the additional three phases of the curriculum development process, implementation, evaluation, content adjustment, once in person instruction is resumed. Then, we will compile the curriculum into a distributable digital portfolio with necessary resources. This potentially would help meet a larger objective: bridging the gap in access to a comprehensive reproductive and sexual health curriculum that meets the unique needs of adolescents with IDD.
Concealment of COVID-19 Evaluations from Close Contacts and Attitudes Towards Digital Contact Tracing Services

Background Conventional contact tracing (CCT) approaches have not kept pace with the scale of the COVID-19. The aim of this study is to measure the performance of CCT programs, stigma related to the notification of COVID-19 close contacts, and acceptability of a platform for digital contact tracing (DCT). Materials and Methods This study involved a cross-sectional, online survey of individuals who underwent recent COVID-19 evaluation and were recruited via Amazon Mechanical Turk. The survey inquired about testing notification and contact tracing timeframes, notification of close contacts, and interest in mobile phone applications and website services for DCT. Results A sample of 668 individuals met inclusion criteria. 14.2% of participants tested positive for COVID-19 and received notification after a median of two days. Of those who tested positive, 63.2% received communication from a CCT program a median of two days after receiving their test results, 62.1% had close contacts, and 37.1% of participants who tested positive and had close contacts did not disclose their testing results to all of their close contacts. Regarding the disclosure of test results to close contacts, 30.7% of participants reported perceiving stigma with this action; of those participants, 58.7% reported a website service for contact tracing would decrease their concern for stigma. Discussion CCT programs did not comprehensively contact individuals who tested positive. DCT innovations may address these shortcomings though the low adoption rate of mobile application services indicates a suite of DCT tools, such as website services, are warranted for a more exhaustive coverage of the population.
A Pilot Student Patient Navigation Program: Transforming Lifestyle and Health

BACKGROUND: Patient navigation programs serve as mediators between hospitals and the community, helping individuals to access resources and overcome barriers. Currently, majority of patient navigator services are focused on mitigating health care challenges among cancer patients; however, there are very little programs in place to assess the impact of connecting patients and their families to local lifestyle services such as nutrition and physical activity programs outside the medical field. DESCRIPTION: At Children’s National Hospital in Washington, D.C., several providers identified gaps in families’ knowledge about the availability and access of local resources to support healthier lifestyle decisions. As a result, a pilot patient navigation program was developed to connect families at the hospital to community lifestyle resources. Ultimately, the goal of creating this program is to decrease rates of food insecurity and diet related chronic diseases in D.C. Development and designs, including interviews, recruitment, evaluation, and management, were created by a research team of four medical students and three physicians from The George Washington School of Medicine and Health Sciences and Children’s National. Due to COVID restrictions, the program transitioned from being in person to a phone service. It is in process of being implemented as of April 2021. METHODS: From March 2020-March 2021, I conducted literature searches in PUBMED and ProQuest Medical for research about community-oriented patient navigation systems. In addition, I qualitatively interviewed 10 established patient navigation programs across the United States to develop a best practice chart and logic model for the pilot program. The research team decided on a student run program after interviews as the benefits of recruiting students outweighed the costs. Based on preliminary research and interviews, I developed foundational materials for the program including training modules, patient navigation manuals, evaluation forms, recruitment resources, and call scripts. Materials are currently being analyzed and edited by the research team. EVALUATION AND NEXT STEPS: Future program evaluation will be based on qualitative data measures such as patient interviews and case studies. Process and impact evaluation materials regarding data from connecting families and patient navigator competency are in the process of being finalized. In April 2021, recruitment and training of student navigators will be conducted. CONCLUSION: Patient navigator programs may be the key to connecting families to local community resources that provide support for their lifestyle decisions. Navigation programs focused on lifestyle require further studying to determine the impact on patients and their families’ health.
Firearm Safety Screening and Counseling Among Emergency Department Visits for Children at Risk for Suicide

Background: Suicide is the second leading cause of death among US youth ages 12-17; with half involving a firearm. Previous studies have demonstrated that parents who are advised by emergency department (ED) providers to restrict access to firearms after a child presents with a mental health concern are more likely to do so than parents who are not advised to restrict access. Identification of factors related provider documented screening of firearm accessibility could inform prevention efforts. Objective: To identify the frequency and thoroughness of provider documented screening of firearm accessibility during ED visits for patients found to be at risk for suicide on standardized screening. Design/Methods: Standardized suicide screening for all patients ages 6-18 years with a behavioral health complaint was implemented on May 2, 2019. Lethal means screening was included in the assessment for all patients who screened positive for suicide. We conducted a retrospective cross-sectional study using electronic health records (EHR) of children ages 6-18 presenting to the two urban EDs completed suicide screening between July 1, 2019 and January 31, 2021. We performed descriptive statistics for frequency estimates and to summarize demographic variables, including means, medians, and ranges for continuous variables. Bivariate and multivariate logistic regression modeling will be performed to evaluate factors associated with documentation of firearm access. Results: On preliminary data analysis, 4091 patients were screened for suicide during the study period, of which 59% (2414/4091) had a positive screen. 70% of children with positive screens were female and 30% were male. Approximately 20% were ages 6-11 years and 80% were ages 12-17 years. 59% were Black, 18% were White, 21% were of other race and for 2% race was unknown. 94% of those who screened positive had completed suicide assessments documented in the medical record. Lethal means counseling was documented in xx% of these patients and included additional details for xx% of the charts. Documentation of lethal means was associated with xx. Thorough documentation was associated with xx. Conclusion(s): Our study describes lethal means screening among patients presenting to the ED with suicide risk. Suicide risk was high among patients with behavioral health complaints. Recent data demonstrates that suicide decedents are more likely to have visited the ED for both physical and mental health conditions in the six months before their death. Future work should consider universal suicide and lethal means screening in children visiting the ED.
A Retrospective Review of Consent Documentation for Procedural Sedation in the Pediatric Emergency Department

Background: There is broad consensus that the key elements of informed consent of procedures include: procedure to be performed, benefits, risks, alternatives and signatures of the provider as well as person providing consent. Objective: 1) To examine the completeness of written consent documentation for procedural sedation in a pediatric emergency department (PED) and to determine the association with provider level of training. 2) To evaluate the frequency that a Spanish language consent form is used for patient encounters requiring a Spanish language interpreter. Design/Methods: We performed a retrospective review of the electronic medical record for patients who had procedural sedation in an academic, free-standing children’s hospital between January 2017 and December 2019. Encounters were identified by procedural sedation billing code and by an order for ketamine. One third of the encounters were selected at random. Charts were excluded if the consent form was missing or consent was not obtained by a PED provider. Consent documentation was reviewed for elements included, provider level of training. The medical record was reviewed for use of a Spanish language interpreter during the visit. Results: There were 2115 encounters identified. Of the 705 charts selected, 655 met inclusion criteria. The treating provider was a pediatric emergency medicine (PEM) attending in 321 encounters (49%), a PEM fellow or ED-based pediatrician (ED-peds) in 231 encounters (35.3%), resident in 74 encounters (11.3%) and advanced practice practitioner (APP) in 9 encounters (1.4%). AAPs were excluded from analysis due to small sample size. PEM fellows and ED-peds were more likely to document elements compared to PEM attendings. A Spanish language interpreter was required for 89 (13.5%) patients and a Spanish language consent form was used for 71 (80%) of these patients. The odds of having documentation on benefit of sedation, risk of nystagmus, risk of medication allergy, alternative of general anesthesia and any benefits, risks or alternatives listed were higher on Spanish language consent forms. Conclusion(s): PEM attendings are less likely than PEM fellows and ED-peds to document elements of consent. Future investigations will include whether standardized, pre-completed written consent forms could improve documentation and decrease variability across provider type.
Factors Affecting Long-Acting Reversible Contraceptive Uptake and Continuation in Postpartum Adolescents

Background: The American College of Obstetrics and Gynecology (ACOG) has advised increased provider and patient education about the efficacy and safety of immediate postpartum long-acting reversible contraceptive (LARC) insertion to prevent unintended and/or rapid repeat pregnancy (RRP). RRP is defined as pregnancy within 24 months of a live birth. In adolescent populations, RRP has negative health (preterm delivery, stillbirth, underweight) and social (welfare reliance and mother leaving school) implications (Han et. al 2014.) Purpose: To analyze papers and studies that explore trends and practices in peri and post-partum care in adolescent mothers, particularly as pertains to LARC uptake and continuation. Methods: Use MeSH searches on databases (PubMed, Cochrane Library, and Scopus) corresponding to search parameters including “long-acting reversible contraception” and “postpartum” and stratified by age (adolescents or teenagers or young adults.) Results: In the general adolescent population, LARC continuation has been found to be higher than for other contraceptive methods. (Usinger 2016.) Reasons for discontinuation often relate to associated side effects, including pain and abnormal uterine bleeding. Studies have reported higher IUD expulsion rates in adolescent parum patients than in the general population. (Teal & Sheeder 2012; Cohen et. al 2016.) Overall, adolescent parous patients are unlikely to request early discontinuation, but additional support and education could improve continuation rates. (Cohen et. al 2016.) Other studies have shown that other inter-related variables factor significantly into RRP, including an adolescent’s self-worth, self-efficacy, and autonomy. (Conroy et. al 2016.) Conclusions: Studies have shown that postpartum LARC implantation reduces RRPs; however, due to a myriad of factors, including barriers to access, education, and early discontinuation, many parous adolescents opt not to uptake or for early discontinuation of LARC therapy. (Chacko et. al 2016.)
Introduction The George Washington Cancer Center (GWCC) now provides cancer care services via tele-visits for patients at high risk of morbidity and mortality secondary to COVID-19. Patients and providers were surveyed to assess baseline usability of tele-visits. Surveys included demographics, Telehealth Usability Questionnaire (TUQ), and perceived safety and preferences around telemedicine. Subjects also provided open-ended feedback for quality improvement. Results For patients (n=133) most were aged 60-69 (26%), 70-79 (24%), 50-59 (22%). Mean patient TUQ scores based on a 5-point scale (1 strongly disagree, 5 strongly agree) were: 4.4 for Interface Quality (IfQ), 4.3 for Ease of Use (EU), 4.2 for Usefulness (U) and Satisfaction (S), 4.1 for Interaction Quality (ItQ), 3.4 for Reliability (R). No association was found between mean TUQ and age (p=0.33), sex (p=0.79), timing of diagnosis relative to telemedicine visit (p=0.67), stage of diagnosis (p=0.98), or treatment type (p=0.65). However, patients with more telemedicine visits did score significantly higher in Reliability (P=0.018) and Satisfaction (P=0.039). 77% of patients agreed/strongly agreed that telemedicine made them feel safer, 75% agreed/strongly agreed that it reduced stress, and 72% expressed interest in future use with other medical specialties. For providers (n=109) most were aged 30-39 (33%) or 40-49 (21%), and 41% had 50+ experiences with telemedicine. The predominant specialty was Internal Medicine (27%). Mean provider TUQ scores were 4.3 for U, 4.1 for S, 3.8 for EU, 3.7 for ItQ, 3.6 for IfQ, and 2.7 for R. No association was found between mean TUQ and telemedicine experience (p=0.31), age (p=0.06), or specialty (p=0.53). However, providers with more telemedicine experience scored significantly higher in Satisfaction (p=0.01) and Usefulness (p=0.02). Most providers (97%) agreed/strongly agreed that telemedicine improves access to care, yet 59% expressed concern about loss of personal interface. Older providers rated reliability lower (p=0.03), and showed greater concern about losing personal interface with patients with the use of telemedicine than younger providers (p=0.006). Conclusion All patient groups scored highly on perceived safety, reduced stress and improved access, independent of subject characteristics. Older providers were more wary of the reliability of telemedicine and its effects on patient-provider relationships. These findings provide a useful benchmark for advancement of virtual care delivery in cancer care, beyond the COVID-19 pandemic.