

Enas Kandil	Anesthesiology and Pain Management	Identification of Key Pitfalls to Prevent Opioid Overdose in Patients Presented to the Emergency Room with Overdose	This project is aimed at elucidating risk factors that may contribute to patient dependency on opioids and risk of overdose event. We hypothesize that factors including demographics, social history, past medical history, substance use history, medication history, prior opioid use, emergency department admission frequency, current events, and pain physician visits play a role in increasing risk for opioid dependency. We also suspect a similar relationship exists between these factors and benzodiazepine dependency. In order to evaluate this hypothesis, this project will involve retrospective chart review at Parkland Memorial Hospital. The Parkland Narcan Report for the date range between January 1st, 2011, and January 31st, 2021, will be used to select patients who were admitted from the emergency department for opioid overdose. The Electronic Medical Record for these patients will be reviewed further, with special focus on ED admission notes, nursing notes, hospital admission reports, physician office visits, progress notes, pain evaluation sheets, history and physical, and pharmacy databases. This information will be used to create a data set for the ten-year data range, which can then be used to draw conclusions about the impacts of certain risk factors over time.
Murat Cobanoglu	Bioinformatics	Decoding Pan-Cancer Transcriptomic Regulation With EPEE	In this project, we hypothesize that the computational strengths of our novel method, EPEE, will improve the understanding of TF activity in cancer. The Cancer Genome Atlas (National Cancer Institute, 2018), often simply called TCGA, provides transcriptomic data on many types of cancer. The Genotype-Tissue Expression Consortium (GTEx Consortium, 2013), GTEx, offers normal tissue transcriptomes. We already used the UT Southwestern BioHPC resource to run EPEE differential analysis of TCGA cancer versus GTEx normal samples using FANTOM5 context-specific networks. Therefore we now have lists of TFs predicted to be differentially active in both cancer and normal for each of 28 different cancer types. In this summer project, the student will conduct literature review to (i) identify TFs with known roles as oncogenes or tumor suppressors, and (ii) categorize the predicted TFs into directly supported, indirectly supported, novel, or counter-indicated categories. Identifying TFs with known roles will enable us to ascertain the robustness of our analysis against the existing body of knowledge relating to that disease. For all other top predicted TFs, there are three possible categorizations.
John Waters	Cardiovascular & Thoracic Surgery	Does Metabolic Profile in Thymoma Correlate with Clinical Disease Features?	We hypothesize that increased FDG-PET signaling in thymomas will correlate with lactate uptake and tumor aggressiveness with ensuing prognostic implications for the disease. We propose two specific aims: 1) to identify the metabolic profile of surgically removed, ¹³ C-glucose infused thymomas with mass spectrometry, and 2) to correlate these metabolic features with pathologic stage and tumor histology.
Kemp Kernstine	Cardiovascular & Thoracic Surgery	Using Magnetic Resonance Imaging to Help Characterize Thoracic Tumors	Hypothesis: The goal of this project is to assess imaging features that can reflect the physiological, metabolic, or malignant nature of lung nodules. It is hypothesized that differences in the perfusion or cellularity of lung lesions can be used as biomarkers to identify malignancy. Second, the imaging features will be combined with other measurements such as histology, molecular, and metabolic analysis, to test if these features can predict the overall survival or recurrence-free survival of patients.

Kemp Kernstine	Cardiovascular & Thoracic Surgery	Does the presence of cancer cells in pleural lavage after curative-attempt non-small cell lung cancer resection increase the likelihood for recurrence and worsen survival?	Objective: Using our database and the hospital record system, demonstrate that there is a poorer overall survival (OS) and shorter disease-free survival (DFS) in those patients that have a positive pleural lavage after lung resection. 1. Compare those patients with a positive pleural lavage (+PL) with a negative pleural lavage (-PL) in the OS and DFS. Identify a predictive model for OS and DFS and determine if +PL impacts contributes to the model. [This should include immunohistochemistry (IHC) and molecular analysis (MA) and metabolism signature.] [Tumor information would include maximum size of tumor, volume of tumor, lobe of tumor, location within the lobe (inner, middle, outer), FDG-PET SUVm of the tumor, overall cTNM stage of the tumor, R status of the resection, number of nodes resected, number of nodes with cancer, percent of nodes with cancer) 2. Compare +PL and -PL patients as to who receives adjuvant chemotherapy and the type of chemotherapy received. 3. Is there IHC and MA features that result in a greater probability of a +PL? Is there a predictive model to predict a +PL? 4. Is there a metabolism signature that leads to a +PL? 5. Compare our results to the literature (meta-analysis), compare to the IASLC database. 6. For the few patients that had a mouse xenograft are there features in those mice that were from -PL to +PL. 7. Comparing -PL to +PL, does the patient more commonly first recur locally, regionally, or systemically.
Rodney Infante	Center for Human Nutrition	Clinical Identification of Mutational Drivers of Cancer Cachexia Development in Non-Small Cell Lung Cancer	Our multi-discipline (nutritionists, oncologists, and gastroenterologists) collaborative research team consists of multiple team members at various stages of their academic career (faculty members, fellows, post-doctoral associates, residents, graduate students and medical students). Our bench and clinical research teams meet separately at weekly meetings each Friday, where each member updates the rest of the team on the progress of their research in a collaborative environment. These sessions offer considerable feedback, open discussion of ideas, interpretation of data and results and serve an additional purpose of developing the research proficiency of each individual regardless of stage of training. Relevant outside papers are frequently discussed during our lab meetings, with particular interest paid to the application of new innovations in laboratory techniques.
Chase Pagani	CORT: The Center for Organogenesis Research and Trauma	Defining the Role of the FAK/YAP/TAZ Axis in Heterotopic Ossification Pathogenesis	BACKGROUND: Heterotopic ossification (HO) involves the formation of extra-skeletal bone in 20% of patients after hip arthroplasty, severe muscular trauma or high grade burn injuries at sites of focal mechanical stress and strain (2,3). Despite significant advancements in the field of musculoskeletal medicine, current efforts have not elucidated the pathogenic mechanotransduction pathways of HO(1). Our group has performed the first unbiased single cell RNA sequencing and ATAC sequencing of traumatic HO and discovered that Fak, Yap and Taz are highly expressed in causative mesenchymal progenitor cells (MPCs) with preliminary data supporting their role as potential critical mediators of disease progression in vivo. As such, we seek to extend these findings in order to define the mechanistic contributions of the FAK/YAP/TAZ pathway in HO. HYPOTHESIS: We hypothesize that genomic deletion of FAK or YAP/TAZ will alter the fate or differentiation of HO-MPCs (MPCs specifically involved in HO pathogenesis).

Benjamin Chong	Dermatology	Validation of a disease-specific quality of life questionnaire in a longitudinal study of patients with cutaneous lupus erythematosus	Hypothesis and Specific Aims: This study is a longitudinal study to investigate changes in CLEQoL scores in comparison with other standard quality of life questionnaires. We hypothesize that changes in CLEQoL scores will closely mirror objective disease activity and damage scores (as measured by the CLASI) in patients with CLE than the Skindex-29 or SF-36. Methods: Patient recruitment and data collection: Patients with CLE will be recruited from outpatient dermatology clinics at University of Texas Southwestern Medical Center and the University of Pennsylvania.
Khang Nguyen	Dermatology	Utilization of Telehealth Services by Dermatologists during the COVID-19 Pandemic	Hypothesis: We hypothesize that there has been a >50% increase in delivery of telehealth services in 2020 compared to 2021. More specifically, we postulate that more patients in areas with higher socioeconomic status will have received telehealth services than those in areas with lower socioeconomic status. Methods: This research project will be a descriptive study utilizing billing claims data for 2019-2021 from the Healthjump EHR unlinked dataset in the COVID-19 Research Database. Research Aims: This research will show the distribution of telehealth services across the country and based on patient demographics. In addition, this study will inform future health efforts to ensure equitable care to the underserved and also efforts to increase the adoption of telehealth services.
Benjamin Chong	Dermatology	Differences in Cutaneous Presentations and Comorbidities in Dermatomyositis Patients With and Without Skin of Color	Dermatomyositis (DM) is one of the major subtypes of idiopathic inflammatory myopathies with characteristic cutaneous manifestations. It is a rare disease that affects 21 in 100,000 per year, affecting females three times as frequently as it does males, and has a bimodal age distribution at 5-14 years and 45-64 years of life. Along with muscle symptoms including myalgia, weakness, or tenderness in the proximal muscles, DM presents with characteristic skin lesions including heliotrope rash, shawl sign, Gottron's papules, tendon streaking, and mechanic hands. Patients with DM also frequently have circulating autoantibodies that can serve as diagnostic markers and provide prognostic information. Amyopathic dermatomyositis is a subset that represents 20% of DM cases, in which patients present with skin manifestations but without the aforementioned muscle symptomatology. DM patients have also been reported to have an increased risk of malignancies and interstitial lung disease (ILD). Prior studies of cohorts of DM patients have not had large representations of patients with skin of color. Furthermore, DM can sometimes be challenging to diagnosis in darker skin types because the violaceous color of the DM rash can be harder to detect than in lighter skin types. Nuances in clinical presentation of patients with skin of color have been reported in other inflammatory disorders such as psoriasis. We postulate that a better understanding of racial and ethnic differences in dermatomyositis may improve delays in diagnosis of DM in patients with skin of color.
Cristina Thomas	Dermatology	Risk factors for Thrombophilia-associated Livedoid Vasculopathy	Specific Aim: Evaluate the association of age, past medical history, and clinical presentation with thrombophilia-associated livedoid vasculopathy. Hypothesis: We predict that these risk factors will provide a guideline on when to screen patients with LV for hypercoagulability. Method: This study will be a single institution retrospective study at

			<p>UTSW that examines patients dating back to April 2005 diagnosed with LV based on clinical diagnosis by a dermatologist or histopathology and identified through ClinDen. Demographics, past medical history, physical examination, laboratory results, and histopathology information will be collected. Statistical exams will be done to determine if any significant associations exist between historical or clinical findings with hypercoagulability-associated livedoid vasculopathy. Specifically, baseline patient characteristics will be summarized with descriptive statistics. After stratifying patients by age, comorbidities, and clinical examination findings, comparisons between groups will be performed using χ^2 tests. A 2-sided P value of 0.05 will be used to determine statistical significance.</p>
Divya Srivastava	Dermatology	Prognostic factors of recurrence, metastasis and death from primary BCC	<p>Hypothesis: A review of our cohort of large basal cell carcinomas will confirm that size, depth, and perineural invasion are associated with increased risk of recurrence but will show very low rates of metastasis and death. Specific aims: 1) To determine if there are predisposing factors that predict local recurrence, metastasis and disease-specific death in patients with BCC. 2) To determine differences in patient and/or tumor characteristics among those that have local recurrence, metastasis, and disease-specific death from those patients that do not have these complications. 3) To determine the rate of recurrence, metastasis and disease-specific death in patients with BCC. Study design and method: The study will be a retrospective cohort study using patient records within the UTSW Dermatology Department.</p>
Kiyoshi Ariizumi	Dermatology	Association between Psoriasis Area and Severity Index (PASI) and Serum DC-HIL	<p>Aims: Determine whether there is a correlation between PASI (an index for psoriasis severity) and serum DC-HIL, and other related serum indicators (including PDL1, VEGF, FG2, and other inflammatory soluble factors). Hypothesis: Serum DC-HIL levels correlate with high psoriasis severity. Aim 1: Quantification of serum factors in psoriasis patients. Untreated new patients (n=20) will be recruited by Dr. Chong MD, Department of Dermatology. Dr. Chong and his dermatology residents will score PASI and collect their blood samples, which will be assayed by ELISA for concertation of immune checkpoint (DC-HIL and PDL1), angiogenesis factors (VEGF and FGF2) and C-reactive protein (marker for inflammation) and determined by FACS for % DC-HIL+ MDSC among peripheral blood mono-nuclear cells (PBMC). Correlation between these levels and PASI will be analyzed by Spearman's Rank Correlation Coefficient. Aim 2: Examine changes in serum DC-HIL levels after topical treatment. New patients (n=10) will be topically treated with steroids, vitamin D analogue, and/or calcineurin inhibitors. At every 2 weeks after onset, blood samples will be collected and determined for serum DC-HIL levels.</p>
Jennifer Gill	Dermatology	Comparing glucose utilization in BRAF WT and BRAF V600E human melanomas	<p>Hypothesis: BRAF mutant melanomas in human patients display increased dependence on glycolysis compared to BRAF WT melanomas. Specific Aim 1: Use existing 13C-glucose tracing data from human patients to determine whether BRAF mutant melanomas have higher glucose incorporation in glycolytic intermediates and lower incorporation into the TCA cycle. Method: Over the past two years, Drs. Gill and DeBerardinis have been acquiring melanoma samples from patients infused with 13C-glucose intraoperatively (STU</p>

			052018-031) as previously described for lung cancer (8). These samples have already been run on GC-MS and are being assessed for a variety of metabolic features. The goal of this summer project is to use this data to compare the percent enrichment of glycolytic and TCA intermediates relative to glucose in BRAF mutant and wild-type tumors.
Rajiv Nijhawan	Dermatology	Rates of Tumor Upstaging in Mohs Debulk Specimens	During Mohs surgery, a tumor sample specimen (known as the 'debulk') is sent for pathological analysis. Sometimes, this analysis results in the tumor stage being increased. We hypothesize that a statistically significant number of these debulk specimens are upstaged. To address this question, we will retrospectively review Mohs surgery charts to determine how many debulk specimens result in tumor upstaging.
Rebecca Vasquez	Dermatology	Gap Years in Dermatology	We hypothesize that students are taking Gap Years more than ever now because of the competitiveness of this field, however; are not necessarily as prone to continuing this research-heavy mindset in their practice. We plan to analyze hundreds of applicants in the 2013-2014, and 2014-2015 ERAS applications to analyze many things. We will find data on whether students matched more frequently if they took Gap Years compared to those who didn't take Gap Years. We will measure the productivity of their gap years including publications, community service, leadership positions, and more. We will investigate what those applicants are doing now and how they are practicing now since all the data is 5-6 years ago so most should be board-certified dermatologists.
Rebecca Vasquez	Dermatology	Prevalence of hidradenitis suppurativa and treatment at a safety net outpatient dermatology clinic	Background: Hidradenitis suppurativa (HS) is a chronic inflammatory disease characterized by recurring abscesses and sinus tracts affecting the axillary, inframammary, and groin regions. It is more prevalent among African Americans (AAs) and females. A recent study showed increased prevalence among those with lower socioeconomic status (SES). Additionally, advanced disease has been associated with patients of low SES. The reasons for these associations are unclear but could be related to social determinants of health, including access to care, education, housing, and/or employment. Hypothesis: We hypothesize 25% of patients (or 1 of every 4) will require a biologic therapy at their initial encounter with dermatology. Specific Aims: To determine the prevalence of HS at a single, safety net hospital (Parkland Health and Hospital System) that supports an outpatient dermatology clinic. To determine the prevalence of HS patients recommended for biologic therapy at their initial visit with dermatology in the Parkland Health Hospital System. To determine the factors associated with biologic use in this patient population. To determine the duration of treatment and evaluate outcomes (i.e., hospital admissions related to HS outcomes).
Ava Pierce	Emergency Medicine	Ventilation Waveforms during Cardiac Arrest in Children	Hypothesis: Ventilation with lung inflation occurs infrequently during 30:2 (and 15:2) CPR. Ventilation in $\geq 50\%$ of pauses will be associated with significantly improved rates of ROSC and survival. Methods: This is a retrospective, observational study of approximately 200 OHCA pediatric patients from the Dallas-Fort Worth Cardiac Arrest Registry from 2005 to 2015. We will measure bioimpedance ventilation (lung inflation) waveforms in the pauses between chest compression segments (Physio-Control LIFEPAK 12 and 15, Redmond, WA) recorded through defibrillation pads. We will include cases < 18

			years with presumed cardiac cause of arrest during 30:2 and/or 15:2 CPR. Cases with bag valve-mask ventilation and ≥ 2 min of recorded cardiopulmonary resuscitation will be included. We will then compare outcomes in two a priori pre-specified groups: patients with ventilation waveforms in $< 50\%$ of pauses (Group 1) versus those with waveforms in $\geq 50\%$ of pauses (Group 2).
D. Mark Courtney	Emergency Medicine	Stroke Screening Tool Accuracy Based on Preferred Language	The specificity of the Balance, Eyes, Face, Arm, Speech, Time (BEFAST) stroke screening tool may vary based on patient language preference. Thus, language preference may be a confounding variable in stroke screening tools. We will measure false positive BEFAST evaluations and hypothesize Spanish speaking patients have a higher rate of false positive stroke BEFAST screens compared with English speaking patients. Results from this study will improve Emergency Departments (ED) stroke assessment and may streamline patient care.
James Brugarolas	Internal Medicine	Predictors of Brain Metastasis in Renal Cell Carcinoma	Our hypothesis is that there are other clinical, pathological, and genomic characteristics that are predictors of brain metastasis in RCC. Identifying these characteristics would provide a rational basis for selecting at-risk RCC patients for whom brain imaging is indicated, even in the absence of CNS symptoms or outside of clinical trial enrollment. Our specific aims are as follows: 1. Identify clinical, pathologic, and genomic (where available) characteristics that correlate with incidence of RCCBM using multivariate analysis. 2. Create a risk model to identify when brain imaging is indicated in the absence of CNS symptoms or clinical trial enrollment. To accomplish these aims, we will first identify cohort of RCC patients in the UTSW medical record between the years of 2000-2020 and identify who of these patients have RCCBM. We will then collect clinical, pathological, and genomic (where available) data by systematic chart review and by use of the Kidney Cancer Explorer database. We will then perform multivariate analysis to determine risk ratios and statistical significance for each factor. We will then use the significant risk ratios to create a risk model for the prediction of RCCBM given a set of clinical, pathological, and genomic variables. By identifying the characteristics that predict RCCBM and creating a risk model, we will aid clinicians in making decisions about when to order brain imaging when RCCBM can be reasonably suspected, leading to earlier diagnoses of RCCBM and more successful treatments.
Raksha Jain	Internal Medicine	Retrospective Analysis of Nationwide Data on Women with CF-Related Bronchiectasis	We hypothesize that this study will reveal new insights into the effects of pregnancy on health outcomes of women with CF, with a specific focus on how differences in treatment affect outcomes and the effect of common comorbidities. Specific aims: 1. To understand treatments being used and outcomes of pregnant women with CF. 2. To determine if there are changes in rates of pulmonary exacerbations, lung function, and nutritional status while pregnant. 3. Evaluate the above in the setting of difference co-morbidities (e.g. cystic fibrosis-related disease, the most common comorbidity associated with CF) 4. Characterize the frequency of vaginal vs. c-sections, pre-term delivery, miscarriages, etc. Study design: A REDCap database has been designed to capture information from multiple CF centers around the country on their pregnant women with CF from 2010-2019. We plan to analyze

			lung function/spirometry (FEV1) longitudinally prior to, during, and after pregnancy to evaluate changes in trajectory, while controlling for variables including CF gene mutations, co-morbidities, age, etc. Secondary analysis will include evaluation of pulmonary exacerbations prior to, during and after pregnancy as above.
Tony Babb	Internal Medicine	Respiratory Effects of Obesity in Children: Implications of Body Composition for Lung Function	We hypothesize that children who become more obese (i.e., increase in percent body fat) over the course of a year will have a decrease in lung function as represented by a lower FRC in comparison to their FRC one-year prior. Conversely, we also expect that children with obesity who have a decreased percent body fat (regardless of an increase in overall body weight) will have an increase in FRC. 2. We hypothesize that children who have an increase in percent body fat will have an increased rating of breathlessness during submaximal exercise compared with their rating one-year prior. We also hypothesize that children who have a decrease in percent body fat would likewise have a decreased rating of breathlessness during submaximal exercise. SPECIFIC AIMS The aims of this project are centered around examining the respiratory effects of obesity in early pubescent children. As the first analysis of over four-years of measurement data in children with obesity, this project will specifically examine changes in body composition, FRC, and breathlessness over the course of one year.
Abey Thomas	Internal Medicine	Hyperbaric Oxygen Therapy increases telomere length and decreases immuno-senescence in isolated blood cells.	Evaluate whether HBOT affects TL and senescent cell concentrations in a normal, non-pathological, aging adult population. 10 healthy independently living adults aged 50 and older will be enrolled to receive 60 daily HBOT exposures. Whole blood samples will be collected at baseline, at the 30th, and 60th session, and 1-2 weeks following the last HBOT session. Peripheral blood mononuclear cells (PBMCs) telomeres length and senescence will be assessed.
David McFadden	Internal Medicine-Biochemistry	Elucidating the Mechanism of Action of a Novel Anti-Cancer Toxin to Uncover Small Cell Lung Cancer Vulnerabilities	We hypothesize that CP82 targets a chemically tractable essential protein in SCLC and other NE tumors. We propose 2 specific aims: 1) to identify and validate putative resistance mutations present in CP82-resistant clones, 2) to examine the role of the putative CP82 target in SCLC cells. Study Design Aim 1: to identify and validate putative resistance mutations present in CP82-resistant clones. The McFadden lab has generated 7 CP82-resistant clones in the MSH2-knockout SCLC cell line and validated that these clones exhibit specific resistance to CP82. Exome sequencing is currently underway, and recurrent mutations will be identified prior to May 2021. Protein encoding genes will be ranked based on the number of clones in which they are mutated. Based on prior studies by the McFadden lab, a putative compound target is usually mutated in at least 50% of compound-resistant clones with mutations often clustering within the protein-coding sequence. Putative resistance mutations will be engineered into SCLC cells using CRISPR/Cas9 technology. After confirming the presence of the engineered mutation via Sanger sequencing, mutant cells will be tested against CP82 to confirm the single mutation was sufficient to endow specific resistance to CP82 using dose-response viability assays. Aim 2: to examine the role of the putative CP82 target in SCLC cells. Specific dependency.

Jarett Berry	Internal Medicine-Cardiology	Association between adiponectin levels and risk of cognitive impairment as measured by MOCA and global/regional brain volumes.	Hypothesis: We hypothesize that higher adiponectin will be associated with a lower risk of cognitive impairment as measured by MOCA and global/regional brain volumes. Method: Prospective cohort study using measured adiponectin levels at the 1st Exam of the Dallas Heart Study and neurocognitive and neuroimaging outcomes at the 2nd Exam of the Dallas Heart Study.
Nikhil Munshi	Internal Medicine-Cardiology	Measuring metabolic flux in dilated cardiomyopathy	We hypothesize that the flux through glycolysis and oxidative phosphorylation remains unchanged in dilated cardiomyopathy despite alterations in preferred substrate utilization. The aim is to measure and compare Pyruvate Dehydrogenase (PDH) flux in patients with stable dilated cardiomyopathy to healthy controls. Four end stage dilated cardiomyopathy (DCM) patients undergoing heart transplant evaluation and four age- and sex- matched healthy controls will be selected for the study. We will use non-invasive hyperpolarized [1-13C]-Pyruvate MRI to measure flux through the Pyruvate Dehydrogenase enzyme which serves as the committed step for carbohydrate oxidation. Metabolism of [1-13C]-Pyruvate through the enzyme would yield [13C] bicarbonate. However, if mitochondrial oxidation is limited, cytosolic metabolism of the [1-13C]-Pyruvate would yield [1-13C] lactate. These products can be measured by magnetic resonance and comparison of the [1-13C] lactate/[13C] bicarbonate ratios in DCM patients versus the healthy controls will demonstrate any changes in metabolic flux of the diseased heart. This study is a first step towards finding metabolic vulnerabilities in the failing heart. Further studies examining genomic controls of these metabolic changes could reveal targets for pharmacologic therapies to halt the progression of heart failure.
David Gerber	Internal Medicine-Hematology/Oncology	Analyzing Immune Biomarkers in the Combination of Immunotherapy and Radiation Therapy in Advanced Stages of Lung Cancer	Our hypothesis is that patients receiving radiotherapy and immunotherapy will have increased levels of key circulating immune biomarkers leading to better patient outcomes relative to those patients receiving only immunotherapy. By analyzing the relevant immune biomarkers, we hope to optimize care for advanced stages of lung cancer. Methods I will use an existing and expanding cohort of more than 300 patients with cancer treated with immunotherapy for whom clinical data and serial blood samples have been collected. Biospecimens have undergone several assays, including multiplex cytokines, systemic and organ-specific autoantibodies, RNA sequencing, and HLA typing.
Ankit Kansagra	Internal Medicine-Hematology/Oncology	Effect of COVID-19 monoclonal antibody therapy on COVID-19-related hospitalizations in cancer patients	Hypothesis: We hypothesize COVID-19 monoclonal antibody therapies casirivimab/imdevimab and bamlanivimab will reduce COVID-19-related hospitalizations in cancer patients compared to a COVID-19 patients without malignancy. Specific Aims: Compare the efficacy of COVID-19 monoclonal antibody treatment in COVID-19 patients with versus without malignancy Compare the adverse event profile for COVID-19 patients with malignancy. Study Design: In the proposed project, a retrospective study will be performed using patient data from the UT Southwestern Medical Center Bone Marrow Transplant Program. Patient data will be collected on demographics, cancer diagnosis,

			<p>associated cancer treatments, type of COVID-19 monoclonal antibody therapy received, adverse events/outcomes, hospitalizations and length of stay, patient status (alive or deceased) from COVID-19-positive patients with malignancy who received either casirivimab/imdevimab or bamlanivimab. A COVID-19-positive patient population without malignancy who received either casirivimab/imdevimab or bamlanivimab will be used as a control group. After data collection, both sets of patient data will be statistically analyzed and compared to determine the efficacy of COVID-19 monoclonal antibody therapy in reducing hospitalizations in patients with malignancy compared to patients without malignancy. Analysis comparing adverse event profiles for the two groups will also be performed. Disease Relevance The SARS-CoV-2 virus has devastated the human population, with nearly 500,000 deaths in the United States alone (1). Specifically, data suggests cancer patients experience 3-fold increases in adverse events, including death, due to SARS-CoV-2 infection (2,3).</p>
David Hsieh	Internal Medicine-Hematology/Oncology	Characterizing the heterogeneous patterns and predictors of clinical outcomes to immune checkpoint inhibitors in cancer therapy	<p>Hypothesis: We hypothesize that immune check point inhibitors are associated with heterogeneous patterns of clinical benefit including conferring prolonged overall survival (OS) for a subset of patients that is not associated with an objective response or prolonged progression free survival (PFS). Specific Aims: 1) Construct a dataset of ICI treated patients at UTSW including demographics, cancer characteristics, and outcome data. 2) Assess associations/correlations between overall response rate, progression free survival and overall survival across select solid cancer types. 3) Perform exploratory analyses on the role of demographics and somatic cancer mutations on divergent patterns of clinical outcomes. Study Design: Our study is a cohort analysis of anti-PD-1/PD-L1 antibody treated patients at UTSW encompassing all cancer types. Patients will be categorized by duration of progression free survival and overall survival using different cutoffs so that differences in proportions among patients with different types of response (complete, partial, stable, or progressive disease) may be examined using the Chi-square test. Pearson coefficient and coefficient of determination will be calculated to assess the correlation and explained variance of progression free survival and overall survival in patients treated with immune checkpoint inhibitors. Data from ICI treated patients will be compared to results from chemotherapy treated patients using additional patient cohorts.</p>
Kavita Bhavan	Internal Medicine-Infectious Diseases	Treatment of Chlamydia patients and their partners in a Safety-Net Emergency Department: A Quantitative and Qualitative Observational Study	<p>We hypothesize that there are unique social and logistical barriers specific to the treatment of chlamydia in the Emergency Department that prevent physicians from prescribing EPT. These barriers may include test results not being available by the time patients are discharged, lack of established rapport between physicians and patients necessary to discuss intimate details regarding sexual history, or lack of follow up for positive results post discharge. Specific aims: Aim 1: To evaluate the effectiveness of chlamydia infection follow up post emergency department discharge. Aim 2: To identify barriers to patient and partner treatment for chlamydia post emergency department discharge. Study design: This cohort study will include patients over the age of 18 who test positive for any chlamydia culture collected in the ED. Baseline data will be collected to describe the</p>

			effectiveness of current chlamydia treatment and follow up practices post emergency department discharge. Effectiveness will be measured by capturing: % of patients treated within 30 days of diagnosis and % of patients receiving partner treatment within 30 days of chlamydia diagnosis. Based on the findings, a structured interview incorporating qualitative and quantitative data will be administered to describe provider perceptions of chlamydia treatment in a large safety-net ED with a vulnerable population.
David Greenberg	Internal Medicine-Microbiology	Effectiveness of Combinations of Peptide-Conjugated Phosphorodiamidate Morpholino Oligomers Against Multidrug-Resistant Pseudomonas Aeruginosa	The goal of this project is to build upon the work previously described by testing the effect of combinations of PPMOs on the growth of P. aeruginosa in vitro and in vivo resistant Pseudomonas. In the previous study, three PPMOs were shown to individually inhibit growth of multidrug-resistant pseudomonas in vitro. The PPMOs also reduced the size of biofilms alone and in combination with conventional antibiotics. In vivo testing of PPMOs in a mouse model of pneumonia showed reduced bacterial burden after administration of PPMOs. As the project described above only tested single PPMOs, this represents a gap in knowledge that should be tested. The goal of this project is to build upon the work previously described by testing the effect of combinations of PPMOs on the growth of P. aeruginosa in vitro and in vivo.
Susan Hedayati	Internal Medicine-Nephrology	The Effect of COVID-19 on Kidney Disease Incidence and Outcomes	Background: Acute Kidney Injury (AKI) is frequently noted as a complication in hospitalized patients. It has also been shown in patients hospitalized with coronavirus disease (COVID-19). The reported prevalence of AKI in the setting of COVID-19 has been variable. Risk factors associated with AKI and effect on long-term outcomes is not yet fully understood. Hypothesis: 1. A significant number of patients hospitalized with COVID-19 will also be affected by AKI, which will be associated with increased risk of ICU admission and worse outcomes including in-hospital death. 2. Specific factors associated with AKI in these patients will include inflammatory biomarkers, pre-existing CKD, diabetes mellitus, cardiovascular disease, and degree of illness. 3. Presence of pre-existing Chronic Kidney Disease (CKD), kidney transplantation, and end-stage Renal Disease (ESRD) will be associated with more severe and adverse outcomes, including ICU admission and in-hospital mortality Aims: 1. To focus on investigating the incidence of AKI in patients with COVID-19 and the clinical factors independent of COVID-19 contributing to AKI. Specifically, the study will identify the proportion of patients presenting with proteinuria and whether the severity of proteinuria varies depending on ethnicity. 2. To create an EPIC-specific predictive model for AKI development in patients hospitalized for COVID-19, as well as those which AKI requiring renal replacement therapy (RRT) using deep machine learning techniques including a random forest approach. 3. To investigate whether COVID-19 patients who are affected by CKD, kidney transplantation, and ESRD are at increased risk for ICU admission and death.
Elizabeth Solow	Internal Medicine-Rheumatology Division	Cardiovascular disease and comorbidity burden across rheumatoid	Hypothesis: RA patients from neighborhoods of socioeconomic deprivation (high ADI) will have greater burden of cardiovascular disease and higher Charlson Comorbidity Index scores compared to those of less deprivation. Specific Aims: Determine the burden of cardiovascular disease and the Charlson Comorbidity Index in UTSW rheumatoid arthritis

		arthritis patients of varying socioeconomic deprivation	subjects stratified by socioeconomic deprivation as measured by the ADI. Study Design: The investigation will be a retrospective cohort study assessing RA populations in our University and Parkland Rheumatology clinics.
Bradley Lega	Neurological Surgery	Local field potential analysis of time cells	Hypothesis: Ramping behavior exists in a subset of cells in the entorhinal cortex and hippocampus and can be detected by observing and analyzing low gamma waves. Method: I will be using previously written code that analyzes brain wave data (which was collected from intracranial microelectrodes) to determine whether ramping activity exists in the local field potential (which is signal consisting of 1000s of neurons). Additionally, I will be writing my own functions to accurately analyze the signals. Generalized linear models will be used to determine the component of the signal that contributes to ramping. Preprocessing of the signal will occur in multiple stages, such as eliminating aperiodic noise using iterative methods, and removing outliers with kurtosis. The code is mostly written in MATLAB and there exists a large codebase from other lab members to aid me in doing my analysis. Once the ramping signal is confirmed, we would like to be able to compare it to other brain regions (prefrontal cortex, for instance) which shouldn't have ramping activity, to verify the validity of our techniques. Appropriate statistical figures will then be used to verify our data and confirm that ramping cells exist.
Bradley Lega	Neurological Surgery	Effects of Cholinergic Blockade on Hippocampal Oscillations and Gene Expression	Memory is integral for shaping our experiences and molding who we are. The devastating effects of memory disruption are shown in patients with conditions such as Alzheimer's disease. Dementia incidence is one per seven people over the age of seventy. In order to alter the course of cognitive diseases, we must first strive to understand the basic mechanisms of memory. The most common treatments for Alzheimer's disease are acetylcholinesterase inhibitors, relaying the importance of the cholinergic system on memory formation. There is evidence that muscarinic acetylcholine receptor antagonists, like scopolamine, impair proper free recall of both verbal and nonverbal stimuli in humans. These free-recall tasks require the remembering of the spatiotemporal context in which stimuli are presented, indicating that administration of scopolamine (or cholinergic blockade) impairs episodic memory-memory for specific events or experiences. The purpose of my project is to further explore the effects of scopolamine on episodic memory. The neural basis of episodic memory formation and retrieval is thought to be via hippocampal oscillations, specifically theta and gamma synchronization. However, the oscillatory characteristics of successful memory formation in humans are poorly defined and warrant further exploration.
Bruno Braga	Neurological Surgery	Assessing the Utility of Intraoperative Imaging in Pediatric Brain Tumor Resection	Hypothesis: The project hypothesis is that surgeons utilizing intraoperative imaging, specifically ultrasound and/or StealthStation stereotactic imaging, will perform greater tumor resection compared to those who do not utilize intraoperative imaging. Additionally, we predict that surgeons employing these imaging methods will demonstrate a more accurate estimated resection intraoperatively. Study Design: A review of charts of patients who have had brain tumor resections performed at Children's Hospital between

			2015 to 2020 will be conducted. The estimated resection by the performing surgeon will be compared to the post-operative actual resection determined by MRI. The results will be analyzed in the context of the surgeon's operative approach, including preoperative and intraoperative imaging modalities used. Statistical analysis will be performed to determine the significance of the results.
Carlos Bagley	Neurological Surgery	Examination of Health Disparities and Attitudes in Patients Undergoing Neurosurgery	The aim of this comprehensive study is to examine the prevalence of institutional health disparities within the neurosurgical population at UT Southwestern. We predict that the sociological determinants of health will have an association with postsurgical operations. Our project will be 3-fold and will include, 1) Delivery of a pre-surgical survey analyzing patients' attitudes toward surgical interventions in neurosurgery 2) Examination of pre-surgical characteristics of patients and 3) Analysis of post-surgical outcomes of patients. Surgical intervention is defined as any surgical treatment for patients in UT Southwestern's neurosurgery spine clinic. Study data will be collected and managed using the Research Electronic Data Capture (REDCap) tool. Questions will be generated and evaluated via a pilot survey administered to patients at the UT Southwestern Medical Center. Patient pre-surgical and post-surgical characteristics will be collected by accessing EPIC records.
Carlos Bagley	Neurological Surgery	Indirect Health Benefits Following Spine Surgery for Degenerative Spine Conditions	Hypothesis: Surgical intervention for degenerative spinal conditions leads to an improved quality of life. This increased quality of life is demonstrated through improving the medical co-morbidities of hypertension, diabetes, dyslipidemia, obesity, tobacco use, depression, and anxiety, which will allow for a more active and independent lifestyle. Specific aims: The primary aim of this study is to assess whether patients experience improvements in co-morbidities, following spine surgery for a number of degenerative spinal conditions, such as lumbar spinal stenosis with neurogenic claudication, cervical spinal stenosis with myelopathy, chronic back pain due to mechanical instability, and global spinal imbalance due to adult spinal deformity. A secondary aim of this study is to correlate the findings with improvements in functionality and pain control. Methods: Inclusion criteria will be defined by patients over 18, who are undergoing a spine operation at UTSW, and have imaging demonstrating a degenerative spine pathology. Exclusion criteria are defined by surgeries done for malignancy, surgeries done for trauma (e.g. acute fracture), and surgeries done for infection (e.g. discitis-osteomyelitis).
Kalil Abdullah	Neurological Surgery	Real-time, non-invasive optical metabolic imaging of glioma organoids	Hypothesis: We hypothesize that the ratio of endogenous fluorophores NADH:FAD (redox ratio) will represent the molecular and genetic changes within glioma cancer cells and will correspond to tumor behavior in response to therapeutics. Effective therapeutic response of glioma organoids should result in OMI findings that correlate with tumor response observed under hematoxylin and eosin (H&E) and immunohistochemistry (IHC) stains. Specific Aim: To evaluate the real-time therapeutic response in glioma organoids using optical metabolic imaging. Study Design: We propose a standard OMI protocol to assess the response of glioma organoids to therapeutics. Prior collected human glioma samples from patients who underwent surgical resection will be developed into organoids by current lab members. Illumination by dual photon fluorescence emission will excite the

			<p>fluorophores NADH and FAD. The images will then be captured and analyzed for generation of redox ratio, fluorescent lifetimes, and intra-tumoral morphology. Then, the results of OMI will be correlated to fixed and stained organoids for histopathology (current standard). Tissue will be fixed in formalin, sectioned, and stained with H&E and IHC to evaluate Ki67, Cleaved Caspase 3 (CC3), and GammaH2ax levels. The correlation between the H&E and IHC cell count and the results of OMI will be computed using existing laboratory methods, including QuPath image software analysis. This will determine levels of Ki67, CC3, GammaH2ax, and the fluorescence parameters of OMI in samples of IDH-mutant and IDH-WT glioma organoids following therapeutic delivery. While organoid and OMI protocol will be undertaken by existing lab members and methods, image analysis and quantification of OMI, H&E, and IHC results will be conducted in a remote manner.</p>
Salah Aoun	Neurological Surgery	Blood Transfusion Guidelines in the Context of Neurosurgical Tumor Surgery: An Analysis of Current Evidence	<p>Hypothesis: Our hypothesis is that the current transfusion guidelines may not be optimal for neurological tumor surgery. Specifically, we suspect the threshold for red blood cell transfusion should be higher in patients undergoing neurological tumor surgery as the current transfusion guidelines are derived from critically ill, intensive care unit patients.</p> <p>Method: A systematic review of the literature using PubMed, Google Scholar, and Web of Science electronic databases according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines. We will focus on studies evaluating thresholds for blood transfusion in adult neurosurgical tumor patients, as well as complications associated with transfusion after acute surgical blood loss in the operating room (OR) or in the direct postoperative period.</p>
Deborah Friedman	Neurology	Sleep Disorders in Patients with Migraine	<p>Many patients with migraine report that irregularities in sleep patterns trigger their migraines, and sleep hygiene is routinely recommended. However, data regarding the link between sleep disorders and migraine are limited. This retrospective study will investigate sleep disorders in patients with migraine referred to sleep medicine for an evaluation at UT Southwestern. In particular, it focuses on variables found during polysomnography studies. It is unique as it studies patients evaluated by headache specialists with confirmed diagnoses of sleep disorders by sleep medicine specialists. The aim of the study is to determine whether specific sleep disorders or parameters found on polysomnography correlate with migraine frequency, severity, or disability. Data from survey responses for anxiety, depression and PTSD will also be collected.</p> <p>Hypothesis: Patients with increased disturbances in sleep (as indicated by a decrease in slow-wave sleep, increased awakenings, and decreased sleep efficiency among other polysomnographic variables) or with clinical diagnoses of sleep disorders will tend to have significantly more severe and frequent migraines.</p>
Peter Tsai	Neurology	Cerebellar Network Dynamics during	<p>Hypothesis: Crs1 Purkinje cells are necessary for initiating and sustaining brain-wide network synchrony between the VTA, PFC, and NAcc during feeding and social behavior.</p> <p>Method: To test this hypothesis, we will use optical in vivo calcium imaging combined with</p>

		Social and Feeding Behavior	transgenic mice to determine neuronal activity within the cerebellum and across the brain during feeding and social behavior. Stereotaxic Viral Injections and Optical Fiber Implantation: Transgenic mice with a Pcp2-Cre transgene, a Purkinje cell specific Cre, will be used for all studies. Pcp2-Cre mice will be injected with an adenovirus expressing GCAMP6f, a genetically encoded calcium indicator into the brain using stereotaxic surgery. For Crus1 injections, an AAV8 adeno-associated virus serotype encoding for a Cre-dependent GCAMP6f viral construct will be used to allow for Purkinje cell specific expression of GCAMP6f. For downstream targets of the cerebellum, we will use an AAV2 adeno-associated virus serotype encoding for a neuronally specific GCAMP6f. To allow for optical imaging of GCAMP6f, optical fibers will be implanted into sites with viral injection. Mice will be given three weeks to recover after surgery prior to behavioral testing.
Deborah Friedman	Neurology	Quality of Life in Patients with Headache from Suspected or Confirmed Spontaneous Intracranial Hypotension (SIH)	Quality of Life in Patients with Headache from Suspected or Confirmed Spontaneous Intracranial Hypotension (SIH). Background: Spontaneous intracranial hypertension (SIH) is a condition that results from spontaneous cerebrospinal fluid (CSF) leakage. The most common side effect of SIH is severe headache that typically worsens when upright, rendering some patients bedridden. Other possible symptoms include cognitive slowing, dizziness, movement disorders, and neck and interscapular pain. Treatment of SIH is difficult and often unsuccessful, as current spinal imaging techniques may fail to find the exact site of the leak. It is apparent that SIH affects patient physical and mental health, but there are currently no studies in the literature that have investigated this impact. Hypothesis: SIH adversely affects patient quality-of-life (QOL) on a level comparable to other neurologic disorders, such as pseudotumor cerebri syndrome, multiple sclerosis, and migraine. Specific Aims: 1. Gather data on QOL measures for SIH patients using validated questionnaires, including SF-36 (general QOL), PHQ-9 (depression), GAD-7 (anxiety), FACIT-Sp (spirituality in chronic illness), HIT-6 (headache-related) and C-SSRS (suicidality) 2. Determine features and characteristics of SIH using a SIH-specific questionnaire, including symptoms, diagnosis, and treatments received. 3. Collect NIH-defined demographics of the SIH patient population
Rong Zhang	Neurology	Measurement of Cerebral Blood Flow Using Magnetic Resonance Imaging and Ultrasonography	Background: A number of different techniques and methodologies have been applied to quantify cerebral blood flow (CBF) in clinical and research settings. Because measurements of CBF differ in regards to observation of locations as well as techniques, it is not clear how well these measures that are supposed to reflect the same CBF are related. Hypothesis: Measurements of cerebral blood flow with different techniques and methodologies are comparable. Method: Interrelationship between different measures of cerebral blood flow will be evaluated in 160 apparently healthy subjects varying in age (20 - 80 years). CBF will be quantified using four different methods: 1) arterial spine labeling MRI, 2) phase contrast MRI, 3) duplex ultrasonography, and 4) transcranial Doppler. All data are already corrected and partially analyzed. All data needs to be quality checked.

Rohit Das and Laura Howe-Martin	Neurology (Das) Psychiatry (Howe-Martin)	Systematic Evaluation of Psychogenic Non-Epileptic Seizure Patient Referral Outcomes	<p>Hypothesis/Research Questions</p> <ol style="list-style-type: none"> 1. What are the relevant demographic and clinical characteristics of patients who are diagnosed with PNES at the Parkland EMU and subsequently referred for treatment at the Parkland PNES program? 2. What are the number and characteristics of patients who are: <ol style="list-style-type: none"> a. Referred for treatment at the Parkland PNES program and are unable to be contacted. b. Ineligible for treatment at the Parkland PNES program. c. Refuse treatment at the PNES program. d. No-show for their initial psychiatry appointment at the PNES program. e. No-show for subsequent Group Therapy appointment(s). f. Do not complete the minimum 2-month group therapy sessions and are lost to follow-up. 3. What are potential areas for improvement in the referral process, beginning with initial diagnosis, referral, and initiation of PNES treatment? We also hypothesize (preliminarily) that: <ol style="list-style-type: none"> 1. Patients who are referred to the Parkland PNES program are less likely to initiate or complete treatment within the Parkland Program if they <ol style="list-style-type: none"> a) are male, b) are racial/ethnic minority status, and c) have experienced PNES symptoms for > 2 years prior to diagnosis with PNES, when compared to female, racial/ethnic majority, and more recently diagnosed counterparts. 2. Patients are also less likely to initiate or complete treatment if they have had no prior interactions with a mental healthcare provider within the Parkland system.
Marc Diamond	Neurology- Center for Alzheimer's and Neurodegenerative Diseases	RNA-driven tau self-assembly	<p>Hypothesis: Regional and species differences in small RNA expression will explain differential susceptibility to tau pathology in cerebellum vs. other brain regions, and between mouse and human brain.</p> <p>Specific Aims:</p> <ol style="list-style-type: none"> 1) Identify specific small RNAs that exhibit significant overexpression in the human brain and/or negligible/under-expression in the mouse brain. 2) Identify specific small RNAs that are significantly negligible/under-expressed in the cerebellum of the human brain in comparison to the rest of the brain regions. The small RNA differential expression comparisons will be generated via the integration of existing genomic data contained in Atlas databases mapping the human and mouse brains. 3) Compare and characterize the small RNA sequences that are overexpressed in the human brain (vs. the mouse) and in the brain regions excluding the cerebellum via computational genomic analysis to identify common and discrete sequences. The small RNAs identified will additionally be classified based on chemical mapping of structural, kinetic, and thermodynamic properties to support potential for driving tau aggregation.
Catherine Spong and Joseph Fixler	Obstetrics & Gynecology	Surgical Site Infection after Multifetal Cesarean Delivery	<p>Background: Infection accounts for 12.5% of pregnancy-related deaths in the United States(1), with cesarean delivery associated with an increased risk of infection compared to vaginal delivery(2). While twin delivery has been identified as a possible risk factor for surgical-site infection following cesarean delivery(3, 4), other groups noted a comparatively lower risk of postpartum infection in twin compared to singleton cesarean delivery(5). Given the high rate of cesarean delivery in the setting of twin pregnancy(6,7), clarifying whether this particular group of patients is at elevated risk of infection following cesarean delivery would assist in identifying patients most likely to contract infection and therefore allow further research and management to be targeted toward those at highest risk.</p>

			<p>Hypothesis: The null hypothesis is that those undergoing cesarean delivery in the setting of a twin pregnancy are no more likely to experience surgical-site infection than those undergoing the same procedure in the setting of a singleton pregnancy.</p>
Christina Herrera	Obstetrics & Gynecology	Human Placental Project Review	<p>The human placenta is the most overlooked organ in the human body. It is the only organ that can be created and discarded multiple times in a woman's life. It functions as many organs for the developing fetus, removing toxins like the liver and kidney, producing hormones, providing oxygen like the lungs and nutrition like the GI tract. Furthermore, the human placenta matures across gestation, just like the developing fetus. Similar to the human brain, the human placenta is relatively inaccessible for study until it is discarded after delivery, thus current understanding of the changes in the placenta across gestation are relatively unknown. However, understanding these changes is critically important. When placental development is abnormal, there are consequences to the developing fetus - resulting in unique pathologies such as fetal growth restriction and preeclampsia. If abnormal development could be predicted during pregnancy, therapies could be developed to optimize pregnancy outcome. The National Institutes of Health launched the Human Placenta Project in 2014 to focus on advancing understanding of human placental structure, development, and function, in real time across gestation. The goal included advancing technology - imaging, biomarkers, and novel devices. The NIH has awarded more than \$48 million in Human Placenta Project grants, funding 38 grants as of the end of 2020. The objective of this study is to characterize the areas funded, the major advances achieved over the past six years, and the knowledge gaps that persist. Our hypothesis is that projects focusing on imaging advances are most likely to be funded and that biomarkers are the least likely to have achieved clinical advancement. Aim 1: Characterize the grants funded by the NIH under the Human Placenta Project. These can be found through the NIH RePORT system (https://projectreporter.nih.gov/reporter.cfm). Each grant will be reviewed for its research focus, funding amount, and NIH institute. Aim 2: Characterize the advances from the funded NIH Human Placenta Project grants. These include the publications and patents that have been supported from these grants. These will be identified through both the NIH RePORT system and will be confirmed through PubMed search.</p>
Christina Herrera	Obstetrics & Gynecology	Maternal Infection and the Development of Neurocognitive Deficits in Extremely Preterm Infants	<p>Background: Of the almost 4 million women who give birth every year, approximately 35,000 infants are born prior to 29 weeks, or extremely pre-term. One out of every two extremely preterm neonates exhibits some degree of cerebral white matter injury. Studies have observed a correlation between white matter injury/reductions in brain volume and the development of neurological deficits, but the pathogenesis remains unclear. Animal studies have demonstrated that maternal inflammation leads to fetal inflammation, which appears to be major factor in developing brain injury in preterm infants. One method of inciting maternal inflammation is via maternal infection. However, there are limited studies in pregnancy definitively assessing the effect of maternal infection on the consequent development of brain injuries and neurodeficits among extremely preterm infants.</p>

			<p>Hypothesis: We hypothesize exposure to maternal inflammation via maternal infection during the fetal period leads to fetal inflammation, specifically neuroinflammation, and will correlate with in-utero brain injury and development of neurocognitive deficits in the neonate by 20-24 months of age. Specific Aim: To determine the relationship between antepartum maternal infection and 1) postnatal brain injury and 2) neurodevelopmental outcomes in extremely preterm infants.</p>
Lee Kraus	Obstetrics & Gynecology	The Bivalency Motif in Placenta Tissue Over the Course of Pregnancy	<p>Hypothesis: Due to the presence of trophoblast stem cells in the placenta, particularly early in pregnancy, it is reasonable to hypothesize that bivalent motifs will be present and functioning to control differentiation; however, this has not been investigated. I hypothesize that bivalent motifs will be present predominantly in the first trimester placenta and decreasing over time, often corresponding to a change in gene expression. Methods and specific aims: To explore this phenomenon, I will perform bioinformatic analyses on existing datasets, including CHIPseq and RNAseq data from placenta samples originating from various timepoints in the pregnancy. The pipeline consists of the following analyses: thresholds for determination of bivalent sites, identification of sites from any time point, analysis of these sites over the course of the pregnancy, and finally correlation of findings to RNAseq data.</p>
Angeline Wang	Ophthalmology	Comparison of Surgical Outcomes: Scleral Buckling versus Pars Plana Vitrectomy versus combined Scleral Buckling/Pars Plana Vitrectomy for primary repair of uncomplicated rhegmatogenous retinal detachment	<p>Submitting for IRB approval currently. To assess the outcomes of patients who underwent surgical intervention for uncomplicated rhegmatogenous retinal detachment using three various surgical techniques, including scleral buckling, pars plana vitrectomy, and combined scleral buckling/pars plana vitrectomy. The subject pool will include patients operated on over the past 5 years at Clements University Hospital, Parkland Hospital, and the Veterans Affairs North Texas Health Care System. Rhegmatogenous retinal detachment is a serious acute medical condition that will undoubtedly lead to severe vision loss without surgical intervention. Currently, no definitive conclusion has been made between which of the three mentioned surgical techniques provides the greatest primary anatomical success or longitudinal integrity. The hospital systems included treat a large number of patients with rhegmatogenous retinal detachment and a comprehensive review of these patients' surgical outcomes would contribute to the understanding and management of this condition.</p>
Karanjit Kooner	Ophthalmology	Advanced Image Analysis of Prelaminar Retinoschisis in Non-Glaucomatous Patients	<p>Glaucoma is the second leading cause of blindness in the US and globally. Unfortunately, the majority of patients are detected late because the disease is symptomless. The risks factors for glaucoma are: age greater than 55 years, black race, family history of glaucoma, elevated intraocular pressure (IOP), myopia, hypertension, and diabetes. There is an acute need for early detection of glaucoma. Retinoschisis is a condition in the eye where the retina splits into several layers and may cause loss of vision correlated to the area of the retina affected. Some studies have shown the presence of prelaminar and peripapillary retinoschisis in patients with glaucoma. However, the occurrence of prelaminar and</p>

			peripapillary retinoschisis in non-glaucomatous patients is not well known. Therefore the purpose of our research is to evaluate the use of image analysis software ImageJ in detecting, tracking, and grading the prelaminar retinoschisis in non-glaucomatous patients. Image analysis will be done on OCTA images of non-glaucomatous patients seen at the eye clinic at Aston. Optical Coherence Tomography Angiography (OCTA) provides both qualitative and quantitative information regarding the retina and the optic nerve. In addition, the use of ImageJ may enhance the finding of OCTA, allowing for the creation of standards that could be used in the diagnosis and treatment of diseases of the eye.
John Hulleman	Ophthalmology	In-person: Structural characterization of fibulin-3, a secreted protein associated with retinal degeneration. Virtual: Automated imaging platform generation for quantification of autofluorescence and retinal cell layer thickness in Stargardt disease.	Hypothesis In-person: We hypothesize that two mutants of F3, R345W and L451F misfold and cause changes to the tertiary structure of the protein and its aggregation propensity. Virtual: We hypothesize that activated microglia cells in the retina of Stargardt mice are responsible for inducing retinal pigmented epithelium degeneration in late-stage disease. Specific aims In-person: Specific Aim 1: Produce and purify microgram quantities of secreted wild-type, R345W and L451F F3 from Expi293 cells. Specific Aim 2: Determine the native tertiary structure of F3 variants by size exclusion chromatography and their aggregation propensity by light scattering and thioflavin T reactivity. Virtual: Specific Aim 1: To develop an imaging platform that enables unbiased quantification of autofluorescent images and number of autofluorescent foci. Specific Aim 2: To develop an automated imaging platform to process 3-dimensional OCT data and obtain retinal layer thickness information.
Karanjit Kooner	Ophthalmology	Significance of Prelaminar Retinoschisis in Glaucoma	Hypothesis: We hypothesize that the presence and number of prelaminar retinoschisis are correlated to the degree of glaucomatous damage in glaucoma patients (mild, moderate, severe). Methods: We plan to perform a retrospective qualitative study of patients with primary open-angle glaucoma (POAG) seen in Dr. Kooner's clinic at Aston Center. The following patient information will be collected: age, gender, race, family history of glaucoma, IOP, vision, central corneal thickness (CCT), and cup-to-disk (C/D) ratio. The optic nerve features will be studied from optical coherence tomography angiography (OCTA) scans. This technology provides objective, reliable scans of the vascular and structural features of the optic nerve and the retina. In addition, we will use Image J to study the features of retinoschisis further.
Karanjit Kooner	Ophthalmology	Measurable differences in optical coherence tomography angiography and funduscopy images of normal and glaucoma eyes	Hypothesis: We hypothesis that combining OCTA, funduscopy, and ImageJ will produce quantifiable and measurable differences between healthy and glaucoma eyes in OCTA and funduscopy images. Methods OCTA and funduscopy images of patients seen by Dr. Kooner at the Aston Clinic will be mined from a retrospective normative database that contains anonymized patient information. In addition to the images, the following patient information will be recorded: age, gender, race, family history of glaucoma, intraocular pressure (IOP), vision, central corneal thickness (CCT), cup-to-disc (C/D) ratio, and over 30 variables from OCTA scans. Images will be categorized into normal eyes, mild glaucoma

			<p>eyes, moderate glaucoma eyes, and severe glaucoma eyes based on the recorded patient diagnosis and the Hodapp-Parish-Anderson criteria. These images will then be analyzed using ImageJ (National Institute of Health, Bethesda MD) to measure various parameters and all values will be recorded. A statistical analysis will be performed on the data collected to uncover if and which parameters demonstrate significant differences between normal, mild, moderate, and severe glaucoma eyes.</p>
Nathan Niraj	Ophthalmology	Outcomes of trainee-performed minimally invasive glaucoma surgeries at Parkland Memorial Hospital	<p>Hypothesis: We hypothesize that MIGS at the hands of trainees at Parkland have no worse outcomes in regards to IOP lowering, surgical complications, and post-operative visual parameters when compared to outcomes of MIGS at the hands of more experienced faculty. Study Design: The study design is a retrospective chart review. Methods: We will obtain charts of patients at Parkland who underwent minimally invasive glaucoma surgeries from 1/1/2011 to the present day. We will document type of glaucoma, sex, race, age, laterality (left or right), other pre-existing ocular conditions, and both pre-operative and post-operative IOP at multiple visits both prior to and after the surgery. We will also document pre and post-operative visual acuity as well as any complications of the surgery. We will then compare the pre and post-operative intra-ocular pressure as well as number of IOP-lowering medications to determine the effectiveness of the individual types of MIGS procedures for our patients. Visual acuity will be analyzed to determine if there is a significant change in visual acuity outcomes for patient's undergoing these procedures. We will also document and watch for trends in complications associated with the procedures</p>
Rafael Ufret-Vincenty	Ophthalmology	Impact of COVID-Related Lifestyle Changes on Systemic and Retinal Health Parameters	<p>Background: Disruption of the blood-retinal barrier in diabetic retinopathy leads to retinal edema and secondary vision loss, known as diabetic macular edema (DME). The development of this breakdown is multifactorial, but leading mediators are advanced glycation end-products and vascular endothelial growth factor (VEGF), which promote damage to the blood vessels, growth of abnormal new blood vessels and increases in vascular permeability. The compromised capillaries and fluid buildup cause the macula to swell and thicken, leading to distorted vision. No noticeable symptoms may appear at first, but blurry vision near the central field of vision, floaters, and double vision are typical when present. It is paramount to detect early signs of DME in order to preserve visual acuity. Diagnosis occurs via optical coherence tomography, which can detect edema that is located in the center of the macula. Primary treatment of DME includes intravitreal injections of anti-VEGF agents (bevacizumab, ranibizumab, aflibercept) and laser photocoagulation. Treatment with VEGF inhibitors has demonstrated improved visual acuity when compared to placebo. The optimal method for preservation of vision in patients with diabetes is prevention of diabetic retinopathy and its complications. Controlling systemic conditions, including HbA1C levels and hypertension, has proven to reduce the rate and progression of diabetic retinopathy in a direct relationship. Additionally, regular exercise and increased physical activity may reduce retinopathy. Lifestyle largely influences these risk factors, which the recent COVID-19 pandemic drastically impacted. However, it is unclear how such lifestyle adaptations altered the various risk factors and incidence of DME. Hypothesis: We</p>

			<p>predict that there will be an increase in the incidence of Diabetic Macular Edema since the onset of the coronavirus pandemic in February 2020 due to adapted lifestyles that negatively impact systemic and retinal health parameters. Specific Aims: The purpose of this study is to evaluate the impact of COVID-19-related lifestyle changes on systemic and retinal health parameters and the incidence of diabetic macular edema (DME) in a large metropolitan area. The long-term goal is to improve patient care, education, and prevention of potential vision loss in the future of an adapted world.</p>
Alexandra Callan	Orthopaedic Surgery	Functional and Quality of Life Outcomes in Pediatric Patients After Limb Sparing Surgery for Bone and Soft Tissue Sarcomas of the Lower Extremity	<p>Background: Due to the rare incidence of pediatric bone and soft tissue sarcomas, there is limited data on quality of life and functional outcomes in pediatric orthopedic oncology patients. Wearable activity monitors can objectively quantify activity and return to function after surgery. Fitbit is a particularly well-tolerated activity monitor able to monitor activity and sleep patterns that is also both non-invasive and user-friendly. Fitbit exports .json files that can be particularly hard to work with to those with no formal computer science experience. Hypothesis: Patients will have a significant decrease in activity post-operatively. Those patients with a level of activity in the third and fourth quintiles will have the lowest risk of adverse outcomes post-operatively. Those in the fifth quintile will have a high level of adverse outcomes due to over activity, and those in the first and second quintile will have adverse outcomes due to underactivity. Specific aims: This project seeks to capture postoperative functional and quality of life metrics in pediatric patients undergoing wide resection and limb sparing reconstruction for bone or soft tissue sarcomas of the lower extremity. Data will be collected for up to one month prior to surgery, and for 3 months after surgery. It will also help clinicians counsel patients on the risks, benefits, and expectations after major limb sparing surgery. Early targeted interventions may improve the patient's long term functional status and quality of life. This study will lay the groundwork for future research evaluating the efficacy of specific interventions</p>
Alexandra Callan	Orthopaedic Surgery	Growth Predictions and Stanmore Non-extendible Endoprosthetic Outcomes in Pediatric Patients with Osteosarcoma	<p>Background: Limb salvage surgery (LSS) is now the preferred surgical treatment for primary malignant bone tumors in pediatric patients with the goal of physically preserving limb as well as preserving functional outcomes while minimizing complications (Sambri et al., 2019). Currently, approximately 80-95% of patients diagnosed with osteosarcoma in their extremity undergo limb-salvage surgeries and there is a 5-year survival rate in these patients of 60-75% (Grinberg et al., 2020). However, one of the main challenges of limb-salvage surgery is that children who undergo surgical excision and placement of an endoprosthetic often have a limb length discrepancy upon reaching skeletal maturity. This is largely due to the fact that the tumors in these children are commonly located in the metaphysis of distal femur and surgical resection involves removing the distal femoral physis. In addition, there is a component of the prosthetic that must insert through the proximal tibial physis. (Sambri et al., 2019). This is of particular relevance because 60-70% of lower-limb growth occurs around the knee between the distal femur and proximal tibia physes (Adesegun et al. 2005). Many papers have previously evaluated the complication</p>

			<p>rate, types of complications present, and functional outcomes for the patients who have received endoprostheses (Picardo et al. (2012), Tsagozis et al. (2018), Sambri et al., (2019), Beauchamp (2010)). Among the most common complications was achieving full lengthening of the endoprosthetic prior to the adolescent patient reaching skeletal maturity. This required prosthetic removal and sometimes another surgical procedure. In a 2019 study by Sambri et al, 47 patients out of 101 total (46.5%) required at least 1 additional surgery after placement of their Stanmore endoprosthetic implant and the projected implant survival for this group (based on the Kaplan-Meier method) was only 52.4% and 32.6% at 5 and 10 years post-operatively. 40 out of these 47 patients had to have their implant removed due to reaching full extension of the implant prior to the adolescent achieving skeletal maturity, which the authors of this paper attributed to the size of the implant and considered a "predictable event" as opposed to a complication. 15 patients underwent an epiphysiodesis and 18 patients underwent replacement of their implant to achieve the lengthening they needed. Despite these interventions, 22 patients had a large leg length discrepancy of >2 cm at final follow-up (Sambri et al., 2019). Typically, the amount of growth a child has remaining is calculated prior to surgery based on a variety of growth prediction tools including Mosley graphs, the multiplier method, and estimated growth per year calculations. The amount that an implant can be extended is based on the size of the implant determined by the amount of femur that is surgically removed during surgery. The Stanmore non-invasive extendable endoprosthesis will be the exact endoprosthetic focused on in my research study, and it comes in 3 sizes: ones that can extend 50, 70, or 90 mm with the corresponding implant size (correlating to the amount of femur resection required to fit each one) of 190, 210, and 230 mm, respectively. Finally, I will be taking into account the impact of chemotherapy on pediatric growth. In a 2005 study looking at the effects of chemotherapy on 21 pediatric patients who were treated for acute lymphoblastic leukemia, 30% of these patients experienced decreased bone growth and age (Moshang Jr. & Grimberg, 2005).</p>
<p>Alexandra Callan</p>	<p>Orthopaedic Surgery</p>	<p>Surgery for Impending versus Actual Pathologic Fractures: Postoperative Opioid Use, Length of Hospital Stay, Discharge Disposition, and Post-Operative Physical Therapy</p>	<p>Hypothesis: Compared to patients who received post-fracture repair surgery, patients who received prophylactic fixation of impending pathologic fractures will have better functional outcomes including reduced post-operative opioid use, decreased length of hospital stay, increased likelihood of discharge destination of home, and decreased physical therapy visits. Methods: Using the PearlDiver database, we will perform a retrospective data analysis comparing functional outcomes of patients who received prophylactic fixation of an impending pathological fracture versus patients who received repair of an actual pathologic fracture. Functional outcomes to be analyzed include post-operative opioid prescription use (indicator of post-operative pain levels), length of hospital stay, discharge destination, and physical therapy visits. Finally, we will consider additional affecting factors of functional outcomes including psychiatric comorbidities and the presence of spine metastases in addition to primary tumor type and Charleston comorbidity index.</p>

Alexandra Callan	Orthopaedic Surgery	Texas Sarcoma Outcomes by Ethnicity and SES	It is to be investigated how cancer stage of presentation, symptom duration, tumor size, metastasis, and course of treatment (like number of follow up visits and surgeries) and a few other characteristics differ across ethnicities. The question is novel in how it intends to compare patients at a Texas public hospital (Parkland) against a private hospital (UT) using the Texas Cancer Registry in a retrospective format. They will be categorized by race, SES, and other patient characteristics, like age and marital status, and the database will also be used to retrospectively analyze some social determinants of health, like the patients distance to their treatment facility, for instance. It is our hypothesis that Black and Hispanic patients will see decreased follow up care and display later stage presentation which may account for their increased prevalence of worse sarcoma outcomes. Unitarians and multivariate analysis will be used to better understand what factors contribute to these ethnic groups facing poorer outcomes.
Alexandra Callan	Orthopaedic Surgery	Comparing Outcomes of Surgical Tumor Resection, Chemotherapy, and Radiation in Efforts to Treat Malignant Peripheral Nerve Sheath Tumor and the Possibility of Preventative Care	<p>Description of the Study: Retrospectively, malignant peripheral nerve sheath tumor (MPNST) patients with and without NF-1 will be compared by therapeutic approaches and clinical outcomes. Through this study, we hope to elucidate more prognostic indicators of MPNST, the best therapeutic intervention for both populations, and support for early screening of pre-malignant lesions in NF-1 patients and patients with family histories of NF-1.</p> <p>Specific Aim: 1. Report on pre-operative disease severity and presentation of MPNST in classic and NF-1 patients with possible identification of prognostic factors. 2. Comparison of therapeutic options - surgical resection or surgical resection with adjunctive radiation, chemotherapy, or both - for treating MPNST within and between both patient populations by utilizing post-operative clinical outcomes. 3. Report any correlations between NF-1 and MPNST presentation and outcomes, guiding future standardized genetic testing and screening in patients with NF-1 or in patients with a family history of NF-1.</p> <p>Hypothesis / Research Question: H0: There is no significant difference in clinical outcomes between NF-1 and sporadic MPNST patients. When different therapeutic interventions are compared, there will be no significant difference in outcomes between and within both patient populations. HA: There is a significant difference in clinical outcomes between NF-1 and sporadic MPNST patients. When different therapeutic interventions are compared, there will be a significant difference in clinical outcomes between and within both patient populations.</p>
Alexandra Callan	Orthopaedic Surgery	Orthopaedic Oncology Registry and Prospective Database	The purpose of this orthopedic oncology database is to gather prospective information on all patients seen in orthopedic surgery clinic that present with tumors of the musculoskeletal system. Musculoskeletal tumors (both benign and malignant) are rare entities. Orthopedic oncologists specialize in the treatment of life-threatening sarcomas, pathologic fractures, and a variety of other benign musculoskeletal lesions and diseases. We perform lifesaving, yet, morbid surgeries utilizing innovative, cutting-edge limb salvage techniques. There are over 1.6 million new cancer diagnoses each year in the USA. Approximately 50% of all cancers will metastasize to bone leading to debilitating pain, pathologic fractures, and loss of function. More specifically related to sarcoma, over 3,000

			<p>new bone sarcomas and 12,000 new soft tissue sarcomas are diagnosed annually. When dealing with diverse cancers such as sarcoma or varied causes of pathologic fractures, building a prospective database and contributing to national databases is essential for meaningful research.²⁻⁵ Outcomes research in orthopedic oncology has been hampered in the past because of the wide range of unusual diagnoses and procedures. All patients that come to the orthopedic surgery clinic with a musculoskeletal tumor will be asked to voluntarily respond to an orthopedic oncology questionnaire regarding their current medical health history, overall health, pain, functional status, quality of sleep, and impact of their diagnosis on mental health and daily living. Data points from these surveys will be consequently analyzed for frequency, trends, and relationships between independent variables. Additionally, the database will gather information including patient demographics, comorbidities, diagnosis, treatments (surgery, chemotherapy, radiation), tumor characteristics (location, size, grade, necrosis), local recurrence, metastatic disease, and complications.</p>
Michael Huo	Orthopaedic Surgery	Implicating factors and postoperative complications of conversion total hip arthroplasty	<p>The purpose of this study is to review the implicating factors and clinical outcomes of a consecutive series of conversion total hip arthroplasty procedures following previous hip fractures. We hope to use the data obtained to advance surgical technique and decision making, as well as realize improvements in patient surgical outcome and after care. We look to further improve the multi-discipline team protocol to optimize the patients undergoing cTHA and to reduce the re-admissions and the costs of managing cTHA and the targeted patient population. Hypothesis: The goal of this study involves two specific aims. We first aim to categorize patients undergoing conversion total hip arthroplasty procedures by identifying factors which predisposed the necessity of the revision procedure. In addition, we aim to analyze the complications and readmission rates for patients who underwent cTHA at our institution in the past decade in an attempt to enhance the quality of care delivered in future treatments. Method: A registry of patients who underwent cTHA at UT Southwestern Medical Center and Parkland Hospital from 01/01/2010 - 12/31/2020 will first be curated. Upon establishment, the registry can be used in the long term to inspect for and report outcomes that may influence future decision making on surgical indication for total hip arthroplasty, implant design selection, as well as surgical strategies.</p>
Yinshi Ren	Orthopaedic Surgery	Characterizing the Influence of BADGE on Bone Marrow Stem Cell Differentiation	<p>Background: Osteonecrosis of the femoral head (ONFH) is the most frequent form of osteonecrosis (ON), and one of the most severe hip diseases which affects young adults with an average age of 33-38 years old at first treatment. ONFH often happens bilaterally and involves a rapid progression to femoral head collapse, which is the major cause of total hip arthroplasty in the US. The current treatment for ONFH is limited to surgical intervention and demonstrates inadequate effectiveness in preventing the disease advancement as the biological pathogenic process remains unclear. Recent studies showed that increased marrow adiposity accompanies ONFH progression, and inhibition of adipogenesis using Bisphenol A Diglycidyl Ether (BADGE, an inhibitor of adipogenesis via</p>

			<p>blocking PPARγ) improves bone healing in a rabbit model of ONFH. The mechanisms by which BADGE influences MSC differentiation and osteogenesis has yet to be characterized. Thus, my goals for this project are to determine the effects of BADGE on osteogenesis, chondrogenesis and adipogenesis in primary bone marrow stem cells (BMSCs), and to investigate the protective role of BADGE on Necrotic Bone Fluid (NBF) treated BMSCs. Hypothesis: BADGE protects against NBF induced inflammatory gene upregulation in BMSCs, and inhibits adipogenesis, and promotes osteogenesis and chondrogenesis of BMSCs.</p>
Joel Wells	Orthopaedic Surgery	Measuring the Lateral Center Edge Angle, Anterior Center Edge Angle, Tonnis Angle on 3D MRI, 3D CT, and Radiographs	<p>The Lateral Center Edge Angle (LCEA), Anterior Center Edge Angle (ACEA), and Tonnis angle have historically been used to identify and approximate the severity of hip abnormalities. The LCEA is a radiographic measurement for the coverage of the femoral head by the acetabulum. The ACEA measures the acetabulum's anterior coverage of the femoral head. The Tonnis angle is used for quantification of the acetabular sourcil. These measurements have been well documented in research, and researchers have developed reference values, above or below which patients have abnormal hips. However, multiple factors including lack of clarity (e.g., using sourcil-edge vs. bone-edge measurements and influences from pelvic position) and lack of predictive power make solely radiographic measurements insufficient in categorizing hip abnormalities. As such, more modern literature recommends using these measurements in conjunction with more advanced visualization methods including computerized tomography (CT) and magnetic resonance imaging (MRI) to view acetabular coverage morphology.</p>
Joel Wells	Orthopaedic Surgery	Defining Borderline Acetabular Dysplasia with 3D MRI, 3D CT and defining differences from mild dysplasia and moderate-severe dysplasia	<p>Hypothesis: Comparing borderline acetabular dysplasia, mild dysplasia, and moderate-severe dysplasia with additional characterizations derived from 3D MRI and 3D CT scans along with clinical outcomes can help better categorize borderline acetabular dysplasia and its associated hip complication risk, which may give better indications for treatment. Specific Aims: 1. Determine the extent of labral tear and cartilage damage on 3D MRI between the three DDH groups. 2. Use 3D CT to compare the extent of bump, anterior CEA, femoral and acetabular version, and spine anomalies on X-rays among DDH groups 3. Evaluate the symptoms, range of motion, and outcomes of conservative and PAO treatments on patients belonging to each DDH group Study Design: Using available hip registry to retrieve data on borderline dysplastic (LCEA 20-25$^{\circ}$), mild dysplastic (LCEA 15-20$^{\circ}$), and moderate-severe dysplastic hips (LCEA <15$^{\circ}$). Then statistical analysis will be performed to compare between dysplasia groups, along with analyses of available scans (3D CT/MRI) to delineate their different morphological features as mentioned in the study's aims. These findings will be used to characterize and suggest indications for the treatment course of borderline dysplastic hips.</p>
Henry Ellis	Orthopedic Surgery	A Better Approach to Patellofemoral Instability in Adolescents	<p>Background: Our study is on patellofemoral instability in skeletally immature patients, which is when the patella is forcefully dislocated or is not well situated in the trochlear groove and slips out frequently. There are several causes for this: congenital dislocation, traumatic injury, or possessing predisposing factors such as tendon laxity or muscle</p>

			<p>weakness that can lead to chronic dislocations. Primary patellar dislocations are often associated with locking or giving out of the knee combined with simultaneous femoral anteversion and valgus directed movement. Dislocation can occur in anyone, but because of this mechanism of injury, patients with genu valgum or other limb abnormalities are at higher risk of primary and recurring patellofemoral instability. A non-surgical approach is usually considered best, but surgery is still indicated when conservative treatment fails. Some evidence suggests surgery is better at reducing recurrence but caution around open growth plates limits options for stabilization. These issues may contribute to skeletally immature patients having worse outcomes than older patients. While outcomes are usually still good, there is a high risk of not being able to return to previous level of activity. This is why study of better treatments is necessary. High risk patients with open physes at Scottish Rite commonly undergo a medial patellofemoral ligament (MPFL) reconstruction because of the role of the MPFL in preventing lateral displacement of the patella, the most common direction of displacement in non-iatrogenic cases. Often, guided growth (temporary hemiepiphyseodesis (TH)), is achieved by bracing the medial leg in hopes of correcting the biomechanical risk factors described earlier. There is a possibility for complications with these procedures, but modern modified procedures reduce that risk, and we believe the benefits outweigh the risks. Hypothesis: Our hypothesis is that a significant percentage of pediatric patients who present with patellofemoral instability will have idiopathic genu valgum, and addressing the genu valgum with a hemiepiphyseodesis will not only correct the valgus deformity with no complications, but will improve the clinical outcomes and recurrent patellofemoral instability in combination with an MPFL reconstruction.</p>
Michael Huo	Orthopedic Surgery	Surgical Implications of Soft Tissue Depth of the Hip in Primary Total Hip Arthroplasty	<p>Background: Total hip replacement (THR) has been proclaimed "The operation of the century" (Learmonth 2007). Projections demonstrate that by 2030 there will be more than a half million primary total hip replacements performed annually in the U.S. (Kurtz 2007). Despite the procedure's popularity, the complications and failures of THR remain a pressing issue. Common complications include infection, dislocation, peri-prosthetic fracture, and component loosening. Given the potentially catastrophic nature of complications in arthroplasty, patient selection is key in order to minimize risk of revision. Obesity as measured by body mass index (BMI) has been identified as an independent risk factor for complications in THR. However, BMI does not take into account the variance in fat distribution among individuals. Papers published regarding the spine and knee have indicated that increasing soft tissue depth leads to increased risk of infection (Mehta 2012, Mehta 2013, Watts 2016). We aim to determine if these findings are consistent in THR. Hypothesis: Increasing soft tissue depth of the operative hip will correlate with increased complication rates in primary total hip arthroplasty regardless of patient body mass index. Methods: The study design is a retrospective review of medical records from Parkland Memorial Hospital and The University of Texas Southwestern campuses. Chart review will be conducted to identify a cohort of patients who are 18 years or older and who underwent primary THR for any indication and have at least 90 days follow-up. Information</p>

			from the medical record will then be extracted, including radiographic measurements of soft tissue depth. A matched-cohort analysis will then be performed as well as a power analysis to ensure reliability of data.
Joel Wells	Orthopedic Surgery	Assessing Outcomes of Patients Undergoing Total Hip Arthroplasty with Higher Activity Levels	Hypothesis: We hypothesize that there is no difference in patient reported outcome measures for total hip arthroplasty between individuals with high activity levels and individuals with low activity levels. Specific Aims: To determine the impact of activity level on functional outcomes following total hip arthroplasty. To determine factors contributing to activity level following total hip arthroplasty. To determine comorbidities associated with activity level following total hip arthroplasty.
Jacob Hunter	Otolaryngology	Factors Influencing Cochlear Implant Outcome	Hypotheses: 1. We hypothesize that engagement in cognitively and physically demanding activities will correlate to better outcomes post-implantation. Higher overall activity will likewise correlate to better outcomes post-implantation. 2. We hypothesize that greater depressive symptoms (measured as a higher score on the PHQ-9) will correlate to poorer outcomes post-implantation. 3. We hypothesize that greater strength of social network (measured as a higher score on the DUFSS-Q) will correlate to better outcomes post-implantation. Study design: We will email the modified VLS-ALQ, PHQ-9, and DUFSS-Q to all UTSW patients either previously implanted or currently under evaluation for cochlear implantation. Patients will complete questionnaires to provide information about their daily activities following cochlear implantation (VLS-ALQ), their depressive symptoms (PHQ-9) and the strength of their social network (DUFSS-Q). We will assess outcome of cochlear implantation by measuring the difference in speech perception testing before and after implantation.
Walter Kutz	Otolaryngology	Endoscopic and Microscopic Tympanoplasty Outcomes in Pediatric Patients	Repair of the tympanic membrane is a common surgical procedure, performed more than 150,000 times annually in the United States (Saadi). Historically, this surgery was performed with an operating microscope through a post-auricular incision, but in the last two decades the transcanal endoscopic technique has increased in popularity (Thomassin et al.). The endoscopic technique has advantages, including increased visualization of the operative field and the use of a transcanal approach, which requires no post-auricular incision, thereby decreasing healing time and better cosmesis (Tarabichi). Recent research has found no significant difference in postoperative outcomes between the two techniques (Tsetsos, Vlachtsis, Stavarakas, & Fyrmipas), but most of this research focuses on adults or does not differentiate between adult and pediatric patients. Therefore, it is unclear if surgical success rates are similar between microscopic and endoscopic techniques in children. We hypothesize that there is no significant difference in measurable outcomes between endoscopic and microscopic tympanoplasty procedures performed on patients under the age of 18. This project has two specific aims: (1) To compare the outcomes of the two procedures and determine if either results in better outcomes for pediatric patients. Outcomes include postoperative healing, postoperative complications, and hearing improvement determined by pure tone audiometry and word recognitions scores.

			(2) To determine if any specific factors at presentation (e.g., age, history of infection, past tympanoplasties, etc.) favor either the endoscopic or microscopic technique.
Walter Kutz	Otolaryngology	Lateral Graft Tympanoplasty Outcomes in Diabetic, Smoking and Aging Patient Populations	<p>Chronic tympanic membrane perforation is commonly associated with chronic otitis media, trauma, or cholesteatoma (Sinkkonen, Jero, and Aarnisalo 2014). Patients with chronic tympanic perforation are at increased risk for middle ear infection and hearing loss (Dolhi and Weimer 2020). While most tympanic perforations heal on their own, a subset of patients with larger, persistent perforations require surgical intervention (Fagan and Patel 2002). Most commonly, otolaryngologists place a small patch of autologous tissue (usually cartilage or fascia) under the tympanic membrane perforation in an outpatient procedure known as tympanoplasty. The graft is placed below the tympanic membrane to encourage healing. Patients are seen four to six weeks post-operatively to assess graft healing. Depending on the specific nature of the tympanic membrane perforation, otolaryngologists may choose to perform either a lateral or medial graft tympanoplasty where the grafted tissue is placed either lateral or medial to the malleus handle, respectively. Additionally, the procedure can either be done through an endoscopic approach through the ear canal or through a post-auricular incision (Brar, Watters, and Winters 2020; Tringali, Dubreuil, and Bordure 2008). While lateral and medial graft tympanoplasties have been proven to be effective and safe long-term, there still remains some uncertainty about the success of the procedure in certain patient populations. The prognostic factors of age, smoking, and diabetes mellitus are traditionally associated with poorer post-operative healing and success regardless of surgical technique (Maxwell et al. 2019; Khullar and Maa 2012; Dagogo-Jack and Alberti 2002). Previous studies have found no associations between smoking, age, sex, and perforation type, and medial or lateral graft tympanoplasty outcomes (Naderpour et al. 2016). Some studies comparing adult and pediatric populations noted similar rates of lateral graft tympanoplasty success (Tang and Brown 2015; Creighton et al. 2019). Nevertheless, many of these studies have had small patient sample sizes and exclude these populations at risk for adverse outcomes. Additionally, the grouping of these two surgical techniques makes it difficult to distinguish any particular associations with either procedure. Given its high post-operative success rate and utility in a variety of tympanic membrane perforations, we will be focusing on outcomes following a lateral graft tympanoplasty technique.</p>
Lesley Childs and Ted Mau	Otolaryngology-Head & Neck Surgery	Associations Between Phonotraumatic Vocal Fold Lesions and Singing Genre	<p>Background: The demands placed upon the voice, especially in a professional performance environment, can lead to an array of laryngeal pathologies. Differing vocal demands across genres of singing have the potential to predispose different types of vocal performers to a particular set of laryngeal pathologies. However, little is known about the relationship between genre classification and vocal fold lesion types. Only one prior study, Rotsides et al. (2020), has attempted to examine the relationship between vocal lesions and genre. That study, however, focused on lesion frequency rather than type and came to inconclusive results. Examining a larger patient population with more in-depth analyses may yield results that can serve as the foundation for uncovering links between singing</p>

			<p>styles and phono-traumatic lesions. Hypothesis: We hypothesize that singers who self-identify as "musical theatre" or "praise and worship" singers will present with a different lesion type profile when compared to opera and choral singers. Specific aims: The aim of my proposed study for the summer research program is to further define the relationship between types of vocal pathology and genres of singing. In the future, this work will serve as the foundation for other projects within the Voice Center related to the causality of any uncovered linkages derived from the results of this research. Study Design/Method: Taking advantage of a large database at UT Southwestern collected over 10 years, I will be conducting a chart review of over 470 patients with vocal lesions and self-reported genres of performance. We will then identify associations between genre and pathology by comparing patient diagnoses with their self-identified performance style.</p>
Ted Mau	Otolaryngology-Head&Neck Surgery	Investigation into the Pathogenesis and Diagnostic Criteria of Vocal Fold Paresis	<p>Hypothesis: The primary hypothesis in this research is that measurements of vocal fold angular velocities can increase the sensitivity and specificity of the diagnosis of VFP. Our secondary hypothesis is that mathematical analysis of the vocal fold angular velocity data will reveal patterns in abnormal vocal fold motion that may account for the gestalt among clinicians that "I know it when I see it" [1]. Regardless of whether the trend is controversial among clinicians or difficult to concretely describe, we expect that mathematical analysis should help pinpoint the exact differences between normal and abnormal vocal fold movement. Specific aims In order to validate our hypotheses, we have set specific and concrete aims. While the overall goal is to improve the diagnosis of VFP by qualitatively understanding vocal fold motion, our aims serve as waypoints to measure our achievement of the goal. Aim 1: To quantify vocal fold angular velocities in patients with VFP and compare the normal vs. the paretic side. This comparison will be analyzed to determine the sensitivity and specificity of commonly employed diagnostic laryngoscopic signs for VFP. Aim 2: To determine if there is a threshold of angular velocity change that is perceived as abnormal. The data from Aim 1 will be analyzed to determine whether the angular velocities in VFP represent a continuum from normal to paralytic, or if there is a threshold present to qualify as abnormal.</p>
May Lau	Pediatrics	Adverse Childhood Experiences (ACEs), Depression, and Suicide Among Transgender Youth	<p>Hypothesis: We hypothesize that: 1) transgender youth, compared with cisgender youth, will have higher ACE scores; 2) there is a positive association of ACE scores with current symptoms of depression and suicidal ideation as well as previous suicide attempts among transgender youth; and 3) transgender youth that are also a part of another marginalized group (e.g. low socioeconomic status or racial/ethnic minority) will have higher ACE scores, more severe depression, and an increased incidence of suicidal ideation and/or suicide attempts than transgender youth that are not part of another marginalized group. Study Design This is a retrospective chart review. All data will be pulled through EPIC from the GENECIS clinic and Adolescent and Young Adult clinic. We will be analyzing ACE scores of youth 12-21 years old, as measured by ACE questionnaires that will be given to adolescents during their first clinical visit and yearly thereafter. This questionnaire provides the patient with a list of ACEs (e.g., has a household member swore at, insulted, humiliated, or put you</p>

			<p>down in a way that scared you?) and will request the patient to identify how many ACEs they have experienced. The patient will have also completed the Patient Health Questionnaire-9 modified for Teens, which screens for depression and suicidal ideation in adolescents, during every visit. History of suicide attempts will be evaluated through chart review. Descriptive statistics and multivariate analyses will be used to examine ACE scores among transgender youth compared with cisgender youth and determine its relationship with depression and suicide.</p>
May Lau	Pediatrics	Transition from Pediatric to Adult Care for Transgender Youth	<p>Background: Transgender youth continue to face discrimination in healthcare settings as physicians remain ill-equipped to care for their specific needs. The barriers to healthcare become pertinent when transgender youth transition from pediatric to adult care, and struggle to find affirming providers. They also struggle to navigate insurance policies and complex care over many specialties, especially due to the increased incidence of anxiety and depression in this group. Building on the work of Pham et al., we intend to interview several pediatric and adult healthcare providers to identify specific changes that can be made to ease this transition of care, and enact these changes at the GENECIS clinic. QI project Method: Building on the work of Pham et al., we will create a list of interview questions regarding transition of care procedures at the GENECIS clinic. We will then interview 7-10 providers for 30 minutes each to get their perspective on measures that can be feasibly enacted. We will then enact some of these changes, and follow up in several months to assess impact.</p>
Rita Saynhalath	Pediatrics-Anesthesiology	Complications associated with Anesthesia in Pediatric patients with SARS-CoV-2 - a Multicenter Retrospective Cohort Study	<p>A multicenter retrospective observational cohort study 1) to determine the risk of respiratory complications in children having anesthesia with non-severe SARS-CoV-2 infection compared to matched controls with a negative SARS-CoV-2 test, and 2) to determine the temporal relationship between a primary positive SARS-CoV-2 test and perianesthetic complications in pediatric patients who underwent anesthesia. We plan to submit the protocol to IRB in the next 2 weeks</p>
Erin Butler	Pediatrics-Hematology/Oncology	Characterizing patient-derived xenografts (PDX) in pediatric mixed germ cell tumors and soft tissue sarcoma	<p>Cancer is the number one cause of disease-mediated deaths in children under the age of 15. Although treatment options have improved drastically over the last several decades, disease states and outcomes still vary widely between patients. A new era of precision medicine accounts for the uniqueness of individual cancers and promises more targeted therapy. Patient-derived xenografts (PDX) are in vivo engraftments of human tumors into animal models that show successful disease recapitulation in the lab setting. These powerful models characterize tumors in terms of signaling pathways, drug response, and cancer progression more effectively than previous models. The current literature on pediatric soft tissue tumors focuses on in vitro cell culture or diagnostic patient biopsies, which cannot account for time-sensitive changes or systemic interactions. This study will characterize tumors and PDX from pediatric patients enrolled in the Children's Health Biorepository, focusing on mixed germ cell tumors and soft tissue sarcoma.</p>

Rana Said	Pediatrics- Neurology	Infantile Spasms in Neonatal Ischemic Stroke	<p>We hypothesize that birth complications and maternal conditions are associated with worse developmental outcomes in patients with neonatal ischemic stroke and infantile spasms. We also hypothesize that a shorter time between infantile spasms onset and starting anticonvulsant therapy is associated with better treatment outcomes. We will conduct a chart review from the International Pediatric Stroke Study database, Children's Medical Center Electronic Medical Record, and EEG database. We will collect data regarding gestational age at birth, age at presentation/identification of stroke, age of onset of infantile spasms, when treatment of infantile spasms was started, which antiseizure medications were used, development of other seizure types, developmental status of the patient before the infantile spasm, and the developmental progress of patients. Developmental progress of patients will be assessed in relation to timing of diagnosis of infantile spasms and initiation of treatment. Patient factors that could be related to the etiology of the stroke will also be recorded such as stroke risk factors, complications during delivery, premature status, infections during or after pregnancy, Protein C deficiency, elevated Lipoprotein(a), and Factor V Leiden mutation status. We will also use the EEG findings and developmental process of patients to compare outcomes of different treatment regimens. The hypsarrhythmia pattern on EEG must resolve for the treatment to be considered effective. The current treatments for infantile spasms that will be measured during the study include prednisolone, ACTH, anticonvulsants, or combination therapy including both a steroid and an anticonvulsant.</p>
Susan Iannaccone	Pediatrics- Neurology	Evaluation of mexiletine effects in congenital myotonic dystrophy: a retrospective chart review	<p>There is currently no treatment for myotonic dystrophy. Thus, supportive management aims to maximize health and functional independence. A few preliminary trials have suggested that the class 1B anti-arrhythmic drug mexiletine which has high affinity for muscle sodium channels is safe and effective in reducing handgrip myotonia. There is also anecdotal evidence that mexiletine can improve GI motility. Aim 1: We plan to conduct a retrospective chart review of up to 100 patients seen in the pediatric neuromuscular clinic at UTSW who have been diagnosed with congenital myotonic dystrophy. Of these patients, we expect less than 30 to have been prescribed mexiletine at any point during the course of their disease. Aim 2: We will be analyzing the effects of mexiletine on both gross motor function, GI motility, and related symptoms. We will determine how many of the congenital myotonic dystrophy patients benefited from taking the mexiletine. We also plan to evaluate any adverse effects experienced while taking mexiletine.</p>
Devika Rao	Pediatrics- Respiratory Medicine	COVID-19 pandemic vaping patterns in adolescents with and without a history of EVALI	<p>Hypothesis: I hypothesize that there will be little difference in changes in vaping habits and coping behaviors due to COVID-19 between both groups due to the non-discriminatory effects of COVID-19 on both groups. I also hypothesize that e-liquid cartridge contents will be more variable in individuals with a history of EVALI, which may explain their increased severity of symptoms. Methods: Potential subjects will be contacted via the telephone number(s) or email addresses recorded in the EMR, directly during tele-health or in-person visits, or email addresses submitted to a study specific account. Upon submission of a valid email address, subjects will be sent an online survey via an individualized link. We are</p>

			requesting a waiver of parental permission per 45 CFR 46.408(c) consistent with standard practice when assessing drug use in teens. Informed consent will be obtained from adolescent patients via online agreement prior to beginning the study questionnaire. An online survey has been developed for this study in REDCap that includes Section B of the Environmental influences on Child Health Outcomes (ECHO) COVID-19 Questionnaire - Child Self-Report Primary Version (ECHO-wide Cohort Version 01.30 / April 9, 2000) and unique questions regarding vaping habits, screening for symptoms of EVALI, social distancing and symptoms of COVID-19 infection.
Yasin Dhafer	Physical Medicine & Rehabilitation	Do Sex-Specific Endocrine States Affect the Efficacy of Treatments that Target Cytokines in Osteoarthritis?	Hypothesis: Genetic and endocrinological differences between men and women affect the progression of osteoarthritis via inflammatory molecular pathways. Method: This investigation will be undertaken in two parts - clinical and biological. In the clinical method, we seek to establish a unique paradigm leveraging data provided by a large data base of insurance claims, known as the Pearl Diver data base (70 million claims) to perform an epidemiological study on the effect of canakinumab, an IL-1b inhibitor, on male and female patients with OA. The cohort will include men and women with osteoarthritis who used canakinumab and exclude patients with certain comorbidities, patients over 50, and patients using oral contraceptives.
Yasin Dhafer	Physical Medicine & Rehabilitation	Harnessing intrinsic sex hormonal state in modulating spinal cord plasticity	Hypothesis: While the findings in animal models seem promising, evidence that estradiol-dependent plasticity in spinal motor circuits can be generalized to humans is up for question. Hence, our overarching hypothesis is that spinal cord plasticity can be modulated by the systemic levels of the endogenous sex hormone estradiol. In this context, we will leverage a naturally occurring model to test this effect in healthy young women at menses and pre-ovulation, examining the isolated neurophysiological role of E2 in response to injury to the spinal cord in the SCI cohort. Specific Aims In this study, we seek to determine the influence of estradiol fluctuations on spinal motor circuit excitability following afferent (sensory) mediated priming and descending drive (motor) mediated priming in young healthy females during their menstrual cycle. Additionally, we seek to characterize the input-output property of spinal circuit excitability following a novel descending drive (motor) mediated priming tested on young healthy males with no fluctuating estradiol levels.
Yasin Dhafer	Physical Medicine & Rehabilitation	Exogenous Effects of Estrogen and Progestin on Musculoskeletal Injury and Its Implications for Injury Prevention in Young Females	Hypothesis: In this retrospective cohort study, we expect to find a positive correlation between the use of hormonal contraceptives with low ethinyl estradiol (<20 mg), with low androgenic progestin, or with triphasic dosing and increased incidence of bone stress injuries. We also expect an increased incidence of ligament tear and muscle strain in females not using hormonal contraceptives in comparison to males and to females using hormonal contraceptives. Methods: The PearlDiver database will be used to extract data on patients who present with muscle-tendon strain, ligament tears, or bone stress injuries. From this data, hormonal contraceptive use and past medical history will be examined for women. Hormonal contraceptive data will be divided by type (oral contraceptive pill, implant, IUD, shot, vaginal ring, patch). Oral contraceptive pill use will be further divided by

			<p>monophasic vs. multiphasic dosages and by estrogen dose, progestational potency, and androgenicity. The frequency and degree of injury in these hormonal contraceptive use groups will be compared to the frequency and degree of injury in the male cohort and the female cohort with no current/past history of hormonal contraceptive use. Just as hormonal contraceptives are widely used for dermatological purposes in teenagers, we hope that findings from this study can guide hormonal contraceptive prescription and use according to the patient's athletic regimen-in addition to their birth control needs-to prevent musculoskeletal injury in young females.</p>
Karen Kowalske	Physical Medicine and Rehabilitation	Spinal Cord Injury After High Voltage Electric Burn	<p>While previous research has studied the acute care of Spinal Cord Injury (SCI) after high voltage electric burns, little work has been done to investigate the pattern of recovery or functional outcomes of these patients. This project aims to review the patterns of recovery of these SCI patients by performing a retrospective chart review of patients with spinal cord involvement after high voltage injury. SCI following a high voltage burn is a rare but disabling consequence. Furthermore, consequences of neurological injury may present in a delayed fashion for days to month following the burn injury. Initially following a burn injury, the patient is stabilized in an acute care setting and may be transferred to an acute rehabilitation facility for further therapy involving wound healing and managing the sequelae of spinal cord injury (SCI). Neurogenic pain may be controlled with gabapentin or similar medications, and musculoskeletal pain is controlled with opioids. Therapy with Physical and Occupational therapists is conducted 5 days a week for 3 hours a day. If the pattern of recovery was able to be more accurately mapped in these patients who suffer SCI injury secondary to electrical burns, we may better tailor the therapy programs to meet these expected outcomes. Therapists may be able to set more accurate goals and thus optimize rehabilitation potential. We can also provide the patient with a more accurate prognosis for recovery. Additionally, rehabilitation teams will be better equipped to effectively transition the patient to long term follow up in the outpatient setting.</p>
Thiru Annaswamy	Physical Medicine and Rehabilitation	Identifying Low-Value Interventions to De-implement: Systematic Review of Low Back Pain Clinical Practice Guidelines	<p>Background: Low-value care can be defined as diagnostic or therapeutic practices that provide no demonstrable benefit or where the benefits are outweighed by harms. It is estimated that \$75.7 billion to \$101.2 billion is spent yearly on low-value care practices with to up to \$28.6 billion that could be saved by existing interventions. De-implementation is a systematic effort to end the use of low-value care, regardless of whether a specific alternative is available or not. This is done with the goal of preventing patient harm and improving healthcare value, access, and timeliness. Although the literature on low-value care or medical overuse has been increasing over recent years, medical overuse does not seem to be improving. As physicians, it is imperative that we strive to not only discover new, effective practices, but also review past or current practices in the light of evidence-based medicine. Low back pain (LBP) is one of the most common reasons for a healthcare visit. While there have been many reports of novel treatments of LBP, there is a paucity of literature regarding treatments that are no longer recommended. Clinical practice guidelines (CPGs) are evidence-synthesis tools assembled</p>

			by providers and other stakeholders to present a set of evidence-based clinical recommendations on a specific clinical condition or circumstance intended to improve quality of care and decrease variability in practices and healthcare costs. Therefore, the main objectives of this project are to perform a systematic review of LBP CPGs and identify low-value interventions that may be appropriate for de-implementation. Specific Aim: By conducting a systematic review of CPGs on LBP, we aim to identify and summarize a list of low-value interventions that have been recommended by the CPG as appropriate for de-implementation.
Nicholas Haddock & Sumeet Teotia	Plastic Surgery	The Effects of Operating Time on Postoperative Complications, Cost, and Length of Stay in Breast Cancer Patients undergoing Bilateral DIEP Flap Breast Reconstruction	Hypothesis: Breast cancer is most commonly treated with surgery. In fact, more than 100,000 breast cancer patients elect to undergo mastectomy every year ⁷ . 25-50% of the patients who have mastectomies undergo post-mastectomy breast reconstruction ⁸⁻⁹ . With surgical procedures, it has been demonstrated that for every 30 minutes of anesthesia time there is a 14% increase in the likelihood of complications. We hope to elucidate the specific postoperative complications and challenges associated with increased operating time in autologous breast reconstruction with DIEP flaps. With longer anesthesia time during bilateral DIEP flap procedures, we hypothesize an increase in the number of patient postoperative complications and the rate of more severe complications, such as flap failure and systemic infection. We also predict that prolonged operative duration will lead to an increased postoperative length of stay. Finally, we predict that breast cancer patients with extended anesthesia time will have a higher total cost from the treatment of complications and prolonged hospitalization.
Nicholas Haddock & Sumeet Teotia	Plastic Surgery	Implications of Acquired versus Hereditary Hypercoagulable States in Autologous Breast Reconstruction	Hypothesis: We hypothesize that acquired hypercoagulability confers an increased risk of anastomotic and flap failure when compared to patients with hereditary hypercoagulability. Furthermore, we expect the result of this study to demonstrate a weak association between hereditary thrombophilia in the absence of clinical history and poor breast reconstruction outcomes.
James Thornton	Plastic Surgery	Effectiveness Of Biologic Products On Facial Reconstruction Using Face-Q Metrics	retrospective chart review of existing patients treated with biologic wound healing agents- end points are wound closure and patient satisfaction using existing FACE-Q surveys
Shai Rozen	Plastic Surgery	Long Term Outcomes of Facial Reanimation	Hypotheses: 1. Increased time interval after surgery may result in improved symmetry at rest and animation. 2. "Brain Plasticity" will occur over the years as brain cortical centers adapt from one role to another. 3. Technical variations in source innervation (facial nerve/trigeminal nerve/combo) will significantly affect symmetry, synchronicity, and spontaneity. Methods: 1. A detailed review of our facial palsy database will include: a. Demographics - age, sex, race, BMI. b. Medical history as it relates to facial palsy and

			<p>reanimation - etiology of paralysis, duration of paralysis, medical co-morbidities, history of chemotherapy, history of radiation. c. Detailed surgical history - technique, primary, secondary, tertiary surgeries, complications. 2. Detailed review of our photograph and video database. a. Objectively and semi objectively measure outcomes of symmetry in repose and animation via validated software used for facial landmark recognition - facegram, emotrics, imageJ. b. Assess synchronicity and spontaneity of patients with current techniques such as emotion detection software (Affdex) and review additional development of software with our bioinformatics core group.</p>
Carol North	Psychiatry	Trauma Exposure and Suicidal Ideation Among Survivors of the 9/11 World Trade Center Attack in New York City	<p>Background: Existing research on the impacts of 9/11 and suicidality have mixed results. A 2006 study looked at suicidal ideation in police officers using data from a confidential hotline available to the New Jersey police force. From this data, they discovered an upward trend in hotline calls during the three years following 9/11. However, one limitation in this study was that they had scarce information on the caller's location the day of the attack, as well as their involvement in the 9/11 disaster response. Meanwhile, a 2009 study that analyzed the monthly suicide rates of residents in New York City (NYC) before and after the World Trade Center (WTC) attack revealed a decrease in suicide cases over time. A limitation in this study is that they only looked at successful suicide cases. This is vastly different from those who may have attempted suicide or may have considered suicide as an option. Likewise, the suicide data they collected was from the broader population in NYC, which may have diluted the responses from those that were more directly impacted. Thus, our study offers a unique perspective by using a more focused data set that involves structured interviews from individuals who were in close proximity to the WTC on 9/11, and possibly, at higher risk for suicidality. Hypothesis: Survivors who had more direct exposure to the 9/11 terrorist attack will be at an increased risk for endorsing suicidal ideation.</p>
Ryan Butler	Psychiatry	Identifying Potential Biomarkers for Peroxisome Biogenesis Disorders caused by PEX gene mutations	<p>Concise Summary of Project: This project aims to explore and quantify levels of biomarkers in fibroblast cultures of patients with PBD-ZSD related PEX gene mutations. Fibroblast cultures will be requested from Coriell Institute for Medical Research from patients with PEX mutations along with clinical data. Fibroblast analysis will take place in the Butler Lab at UTSouthwestern Medical Center in a de-identified manner. Any remaining fibroblasts cultures will be kept in storage in the Butler Lab for future biomarker discovery. Additional clinical data will be requested from participants whose fibroblasts have been received from Coriell Institute for Medical Research. This will include basic demographic data, along general clinical information such as date of symptom onset, presenting symptoms, date of diagnosis, clinical disease course, treatments, and interventions. We are striving for representations of as many PEX mutations as possible to be analyzed in this study.</p>
Kiran Kumar	Radiation Oncology	Total skin electron beam therapy in primary cutaneous T-cell lymphoma:	<p>We hypothesize that low-dose TSEBT given in 6 fractions, compared to 12, will have similar toxicity and efficacy with the additional convenience of half as many treatments, and that TSEBT with concurrent or adjuvant systemic treatments will result in improved outcomes without significant increase in toxicity compared to TSEBT alone. By evaluating both the</p>

		Analysis of toxicity with dose and adjuvant treatment	positive and negative impacts of radiation therapy with concurrent and adjuvant treatments for patients with CTCL, we hope to highlight combined treatment regimens as alternative options for possibly supplementing the efficiency of radiotherapy or reducing the need for recurrent radiation altogether.
Kiran Kumar	Radiation Oncology	"Pediatric Hodgkin Lymphoma: Assessment of Patterns of Failure after PET-adapted Treatment and Exploration of AI-based PET/CT Predictive Algorithm"	We hypothesize that high-risk pediatric HL patients have a higher risk of local recurrence with the omission of RT, especially in high-risk sites such as those that are initially bulky, even if early AR is achieved after 2 cycles of chemotherapy. Further, we also hypothesize that certain sites are at higher risk of relapse than other sites, and through the use of an AI-driven predictive algorithm incorporating PET/CT radiomic parameters with patient and other clinical risk factors, higher risk sites can be identified and, in the future, potentially selectively irradiated instead of the current standard of radiating all initial sites of disease. Methods: We will conduct an IRB-approved retrospective review of all patients with pediatric HL who were treated at UTSW/Children's over the past 5 years, which is ~100 patients total. Demographic and treatment characteristics will be collected for all patients, as well as outcomes and toxicities.
Xun Jia	Radiation Oncology	A Clinical Outcome-driven Deep Reinforcement Learning Model for IGABT Treatment Planning	Hypothesis: DRL-based virtual treatment planning for IGABT is feasible and can generate plans with non-inferior quality than those generated manually by human planners as quantified by non-inferior local control and OAR toxicity rates computed by outcome models. Specific aims: Our overarching goal is to improve patient survival by building and validating a DRL model that outperforms human-directed IGABT treatment planning for cervical cancer. More specifically, we will 1. Retrain the current DRL-based virtual planner to learn to maximize local control while minimizing complications due to normal tissue damage. 2. Validate the virtual planner by computing outcomes of the plans it generates and drawing comparisons to plans previously developed by human planners
Robert Mattrey	Radiology- Abdominal Imaging	Optimization of catalase-containing silica nanoparticles as an ultrasound contrast agent for detection of pathophysiologic concentrations of hydrogen peroxide	Hypothesis: The goal of this research project is to evaluate different SiNP formulations to determine the optimal combination of factors yielding maximum bubble formation for detection with US. The primary factors are particle concentration, CAT activity per particle, solid vs hollow particle formulation, and mechanical index (MI) of the ultrasound transducer. We hypothesize that particle concentration will have the largest impact on microbubble (MB) formation due to an increase in available nucleation sites in solution. Additionally, we hypothesize that bubble nucleation occurs within hollow particles, and that hollow particles will therefore have improved MB formation over solid particles.
Basak Dogan	Radiology- Breast Imaging	Prediction of Lymph Node Metastasis Using a Primary Breast Cancer DCE-MRI-Based 4D Convolutional Neural Network	Background: Breast cancer clinical stage and nodal status are the most clinically significant drivers of patient management. A combination of anatomical and pathological biomarker information is key to determine the next step in the patient's overall care. Purpose: To develop a custom deep convolutional neural network (CNN) to help identify breast cancer nodal metastasis. Materials and Methods: In an IRB approved study, 351 patients with primary invasive breast cancer who underwent dynamic contrast-enhanced (DCE) breast MRI in our institution between July 2013 and July 2016 were retrospectively reviewed.

Ann R. Mootz	Radiology- Breast Imaging	A Tale of Two Hospitals: Disparities in Breast Cancer Stage, Management, and Recurrence Patterns in an Academic Tertiary Care and Safety Net Hospital Served by the Same Breast Cancer Teams	Breast cancer remains the most frequently diagnosed cancer in women, with estimates stating that 1 in 8 women in the U.S. will develop breast cancer over their lives. Better cancer screening has led to a greater number of breast cancer survivors in recent years, with the overall death rate decreasing progressively in women over 50 since 2007. The guidelines from the National Comprehensive Cancer Network (NCCN) and the American Society of Clinical Oncology (ASCO) currently recommend an annual mammogram as the only imaging test required to detect new or recurrent breast cancer. Current NCCN guidelines outline that surveillance mammography should be used as follow-up for breast cancer patients, but there is no consensus on what the intervals, frequencies, or types of mammography (diagnostic versus screening) should be. As a result, considerable variation exists throughout the U.S. as to surveillance mammography practices based on the region of the U.S., practice type (academic versus community), and the qualifications of the imaging personnel (dedicated breast imaging radiologist versus technician). A shift towards more personalized breast cancer treatments may also suggest that a "one size fits all" surveillance approach may be outdated and that more comprehensive and frequent surveillance should be used on patients with greater risks of recurrence.
Frank Yu	Radiology- Neuroradiology	Imaging of Pediatric CNS Demyelinating Diseases	Hypothesis: In pediatric patients with acquired CNS demyelinating conditions, white matter lesions will show decreased MVF and AVF, reflecting demyelination and axonal loss, respectively, as well as increased mean g-ratio. Specific aims: We aim to show correlation between MVF, AVF, and g-ratio with clinical measures of disability. We will also compare these metrics between patient groups (MS, anti-MOG, ADEM, NMOSD, and controls). Study design: A board-certified neurologist specializing in demyelinating diseases (Dr. Benjamin Greenberg) will refer study participants. 60 patients between the ages of 12 through 18 years of age with clinically diagnosed MS, ADEM, or NMOSD will be recruited and imaged with a 3T Siemens Prisma MRI scanner. Imaging data will be de-identified and assigned an individual study code. The MR imaging data will be processed using customized Matlab, bash/shell, and Python scripts.
Diane Twickler	Radiology- Obstetrics & Gynecology	MRI of Placenta Accreta Spectrum: Textural Radiomics Analysis and Machine Learning Prediction of Severe Disease	Hypothesis: We postulate that an algorithm for machine learning segmentation and textural radiomics can predict the severity of PAS from sagittal MR imaging previously obtained in at-risk pregnant patients. Specifically, we will identify radiomic differences in deep learning segmented placentas that will predict the need for hysterectomy in women at high risk for PAS.
Benjamin Levi	Surgery	An Analysis of Macrophage Populations Across	Macrophages are immune cells that involved with phagocytosis and destruction of bacteria, cytokine release, and antigen presentation. They are derived from monocytes in the bone marrow as a part of the myeloid lineage. Macrophages are specialized for the

		<p>Tissue Fibrosis and Aberrant Regulation States</p>	<p>tissues they are located. For example, alveolar macrophages are located in the lungs and play a role in removing particle debris while microglia are located in the brain and remove dead neural tissue. While macrophages in different tissues do share some common characteristics, there is substantial heterogeneity that is only now being discovered. Generally, macrophages are classified into two main subsets: M1, or classically activated macrophages and M2, or alternatively activated macrophages. M1 macrophages are known as 'pro-inflammatory' while M2 macrophages are known as 'pro-healing'. Various ligands and cytokines can activate a certain state. Macrophages play a critical role in the pathology of many diseases. They are required for endochondral ossification during bone fracture healing. The initial inflammatory reaction causes the migration of macrophages to the site of injury. Induction of M2 macrophages has shown to enhance bone fracture healing. Additionally, depletion of macrophages leads to extreme muscle fibrosis in a cardio toxin induced injury model, demonstrating the relationship of macrophages with muscle satellite cells. Pathological inflammation and subsequent lung fibrosis in COVID-19 patients has also been linked to a population of macrophages. Over-activation of the M2 subset can cause pathological bone growth in diseases like heterotrophic ossification while dysregulation of the M1 subset plays a role in tissue fibrosis. Therefore, being able to specifically characterize the features of the macrophage subsets is vital for therapeutic targets.</p>
Matteo Ligorio	Surgery	<p>Using Radiomics to Identify Prognostic and Predictive Biomarkers for Pancreatic Cancer Treatment Efficacy</p>	<p>The objective of this study is to utilize advanced imaging analytics to develop predictive biomarkers for assessing chemotherapy efficacy and for driving the therapeutic strategies in patients with pancreatic cancer. Our overarching hypothesis is that features extracted from CT scans by using dedicated imaging algorithms may serve as novel features to improve and standardize the management of metastatic pancreatic cancer patients. To test this hypothesis, we will first perform a radiomic analysis in patients treated with neoadjuvant chemotherapy who subsequently underwent curative resection. An analysis of this patient cohort will allow us to associate pre- and post-treatment radiomic features with pathologic treatment response; thereby, providing key information regarding true effects of chemotherapy on tumor tissue. This information will then be extrapolated to the primary pancreatic tumor in the stage IV patient cohort, being the chemotherapeutic regimen equivalent .</p>
Caroline Park	Surgery	<p>A Multi-Center Retrospective Study of Trauma Patients Treated with Post-Injury Systemic Anticoagulation.</p>	<p>Hypothesis: Usage of anticoagulant therapy post-injury in trauma patients will lead to a decreased occurrence of thrombotic events with increased incidence of bleeding in comparison to patients who did not receive therapy. Method: This project will be a multi-center retrospective chart review of trauma patients treated with anticoagulation therapy following their admission injury. We will collect information including patient demographics and whether patients were on anticoagulation prior to injury. Patients will be classified by the type of anticoagulation that they received (unfractionated heparin, low molecular weight heparin, warfarin, or DOACs).</p>

Sergio Huerta	Surgery	Risk Factors And Predictors Of Morbidity And Mortality In Diabetes-Associated Major Lower Extremity Amputations In A Veterans Administration Hospital In Dallas, Texas	We hypothesize that a large proportion of patients diagnosed with diabetes mellitus eventually undergo lea. Additionally, we hypothesize that predictors of morbidity and mortality for lea will differ significantly in the vanthcs from the general population. We believe that completion of this retrospective review will yield significant insight into potentially modifiable risk factors for poor outcomes associated with diabetic lea and will fulfill a major gap in literature on characterization of lea in veteran populations.
Melissa Kirkwood	Surgery- Vascular Surgery	Radiation Dose Reduction with Siemens Low-Dose Acquisition Software	Hypothesis: It is expected that the Siemens low-dose acquisition setting will effectively reduce radiation dose while continuing to provide adequate image quality. Specific Aims: Aim 1 will evaluate average patient radiation dose before and after implementing low-dose image acquisition to determine its efficacy. Aim 2 will evaluate the primary operator's radiation dose before and after implementing low-dose image acquisition to determine its efficacy. Study Design: The study will retrospectively review radiation dose during lower extremity angiography procedures performed using the Siemens scanner at Parkland Hospital. Procedures done with and without the low-dose acquisition setting will be compared. Analysis will control for patient size and case complexity. Efficacy will be measured through reduction of the average fluoroscopy dose rate to both the patient and the primary operator.
Harry Kim	Texas Scottish Rite	Assessing Rates and Severity of Avascular Necrosis in Treatments for Developmental Dysplasia of the Hip	Hypothesis/Specific Aims: Medial approach open reductions do not have a higher rate of avascular necrosis or greater severity of AVN compared to anterior approach open reductions. Closed reductions will have a lower incidence of avascular necrosis than open reductions. Determine whether there are differences in the rate and severity of avascular necrosis between the treatment options for DDH: anterior and medial approach open reductions, closed reductions, and Pavlik harness. Create a more functional classification system for avascular necrosis with improved interobserver reliability.
Harry Kim	Texas Scottish Rite	Imaging the Pathological Changes to the Peripheral Nervous System Induced by Avascular Necrosis of the Rat Knee	Hypothesis: We hypothesize that systemic viral infection of AAV-PHP.S: hSyn1:GFP will induce the expression of fluorescent protein in the PNS of the rat knee. Further, AVN of the distal femoral epiphysis will induce first a neuropathy followed by a reactive over-invasion of nerve fibers in the AVN affected knee joint. Specific Aims: Aim 1. Determine the distribution pattern and densities of the PNS in the normal rat knee. Rationale: An adeno-associated virus (AAV-PHP.S) capsid has been reported that is designed to transduce the PNS. When it is used with cell-type specific promoters and reports such as human Synapsin I (hSyn1) and green fluorescent protein (GFP), the systemic administration of the AAV complex of AAV-PHP.S: hSyn1:GFP enables efficient and targetable genetic modification of

			<p>cells throughout the PNS of non-transgenic animals with green fluorescent protein. Animals infected with at least 1×10^{10} vector genomes (vg) of AAV and sacrificed between two and four weeks showed significant fluorescent intensity. This method has been successfully applied to detail the liver, lungs, cardiac and enteric nervous systems. Therefore, we hypothesize that the systemic viral infection of AAV-PHP.S: hSyn1:GFP will induce the expression of fluorescent protein in the PNS of the rat knee.</p>
Harry Kim	Texas Scottish Rite	Development of Post-Collapse Femoral Head Osteonecrosis Model and Potential Restorative Techniques	<p>We hypothesize that restoration of the original spherical shape of the femoral head from a deformed shape will restore hip motion and preserve the lifespan of the femoral head. One potential treatment to restore the spherical shape involves mechanically elevating the collapsed portion of the femoral head and back-filling the elevated space with a bone substitute or a biomaterial in order to restore anatomic shape and provide structural stability while bone healing occurs. Stabilization techniques under consideration include the use of injectable biomaterials. One biomaterial under consideration is Osteocrete, an FDA approved magnesium oxide filler that is injectable, moldable, and 100% resorbable. Osteocrete has four times the compressive strength of cancellous bone and has proven successful in over 1000 bone void filling cases. Tetranite, a tetracalcium phosphate/phosphoserine based mixture, is a second promising biomaterial under consideration. Tetranite is an injectable bone void filler that is capable of bearing load. Currently there is no ex vivo model to study the potential femoral head restorative techniques of a collapsed femoral head. This unexplored area of orthopedic research has stimulated our pursuit of this project and has the potential to develop clinically applicable solutions for patients suffering from Legg-Calve-Perthes disease and other forms of osteonecrosis of the femoral head.</p>
Malcolm MacConmara	Transplant Surgery	Use of computed tomography data in transplant donor population for non-invasive detection of hepatic steatosis and pre-surgical planning	<p>Background: Preexisting pathologies in donor organs, such as varying degrees of macro and micro steatosis of the liver, can lead to poor surgical outcomes [1]. Thus, identification and analysis of such pathologies by the surgical team are critical to successful transplant outcomes. In the case of liver transplants, the current standard of care is to perform a biopsy on the donor liver if steatosis is suspected. These biopsies do not come without risk: they can lead to excessive bleeding, damage to the organ, and infections [2, 3] all of which can make the organ no longer usable. The goal of this study is to obtain comparable results to standard of care while circumventing the risks associated with invasive biopsies. The use of Hounsfield data in the detection of hepatic steatosis has been noted in recent studies [4, 5, 6], often comparing Hounsfield values from the liver to those of the spleen as an important metric. Our goal is to build on this work and look specifically at the donor population as it pertains to these diseases.</p>
Philippe Zimmern	Urology	Predictive Measures from Bladder Biopsy and Urinalysis Prior to Electrofulguration for	<p>Hypothesis: The goal of this study is to determine whether information collected via bladder wall biopsy of candidates prior to EF, including cultured bacterial species, inflammatory markers and active immune involvement, and urinary cytokine markers can be used in the future as a prognostic measure for successful treatment with EF. Our hope is that at least one or several of these parameters will demonstrate correlation to EF</p>

		Recurrent UTI in Post-Menopausal Women	outcome. The implications of predictiveness in treatment from bladder biopsy and urinalysis are wide-ranging, considering the significant burden on the healthcare system from recurrent UTI. Method: Statistical analysis of prior urinalysis and biopsy data, as well as clinical outcome. Continued analysis of as-of-yet performed EF to increase power of study
Aditya Bagrodia	Urology	The role of a multidisciplinary approach in predicating clinical outcomes in stage 2 testicular cancer	This study aims to better optimize the care of stage 2 testicular cancer patients through the use of a multidisciplinary approach with incorporation of relevant bio markers. With the results of this study, we hope to answer questions such as do radiographic features and microRNA blood tests prior to surgery help predict the final tumor pathology. We predict through the use of a multidisciplinary approach, it will be possible to predict the pathological stage, final pathology, and clinical outcomes of patients diagnosed with testicular cancer.
Allen Morey	Urology	Feasibility of Outpatient Artificial Urinary Sphincter	Hypothesis: In this study, we seek to evaluate if same-day surgery (SDS) for AUS insertion is safe and efficient by analyzing our institutional experience transitioning from overnight observation to same-day AUS surgery. METHODS: We will retrospectively review AUS surgeries performed by a single surgeon at our tertiary academic medical center between 08/2013 and 03/2020. Medical records will be reviewed for patient demographics, immediate postoperative complications, timing of postoperative discharge, need for readmission, emergency department (ED) visit, outpatient phone call, or non-routine clinic visit within 7 days of discharge, and need for device explant or revision within 90 days of discharge. Patients will be grouped based on discharge status: OBS vs. SDS. Catheters were removed prior to discharge (OBS group) or self-removed at home (SDS group) on the morning of Postoperative Day 1. Cost savings associated with SDS will be estimated using room and bed charges from a contemporary group of AUS patients (09/2017 through 08/2020).
Philippe Zimmern	Urology	Recurrent urinary tract infections in post-menopausal women	Project Descriptions and Methods: I will focus on three research questions pertaining to rUTI: 1) What is the global prevalence of rUTI among women? Despite the global burden of rUTI, much of the research into the topic focuses on Europe and North America and cites prevalence estimates from two decades ago. We aim to identify global prevalence estimates for rUTI and to systematically assess these estimates for bias. We will include studies with both pre- and post-menopausal women. This project entails a systematic review of global or regional prevalence estimates for rUTI. A search strategy and data extraction tool will be developed. Once studies have been identified and their full text retrieved, a team of reviewers will conduct a title-abstract screen for relevance. Selected studies will then undergo a full text review by the team. The analysis will follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist. 2) What is online support for women with rUTI like? rUTI can be likened to a chronic condition with periodic flares, and risk factors for a recurrence (flare) are either poorly understood or non-modifiable. Given these circumstances, women with rUTI may seek community with and support from others with the same condition.

