

# Past FAMEPRO Projects (2016-2017)

The inaugural FAMEPRO competition concluded on June 22, 2017 with Grand Rounds presentations of the top three projects. Awardees and topics below. Congrats to everyone who participated in the inaugural year.

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**Characterizing risk factors associated with unplanned hospital readmission at 30 days in patients with ulcerative colitis (UC) undergoing colectomy, **First Place!****

PI: Cheng Zhang, MBBS  
Mentor: Darwin Conwell, MD

Thirty-day readmission rates are a key metric associated with quality of care as established by the Center for Medicare and Medicaid Service (CMS). As a result, the Affordable Care Act mandates CMS to penalize hospitals with excessive 30-day readmissions. Our study is to identify the predictors of unplanned 30-day readmission of ulcerative colitis (UC) patients who received colectomy. Based on the results of the study, we would be able to propose a model to predicate the risk of unplanned 30-day readmission for UC patients before they are discharged. In addition, by intervening certain risk factors, the unplanned 30-day readmission rate might be decreased.

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### **Satisfaction with NO<sub>2</sub> in Labor Analgesia**

PI: Kasey Fiorini, MD

Mentor: Kevin Coombes, PhD

Nitrous oxide for labor pain has become more widely available in US maternity units following FDA approval of a device which patients can use to self-administer 50% nitrous oxide/50% oxygen. Although pain relief from nitrous oxide is inferior to pain relief obtained from labor epidurals, a subgroup of women strongly desires avoidance of epidural placement during labor. Currently, the only alternative option widely available is intermittent doses of intravenous pain medication, with which patient satisfaction is low. We hypothesize that despite inferior pain relief, patients who choose nitrous oxide for labor analgesia will be satisfied with its use.

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### **Healthcare engagement and resource utilization among HIV infected youth vs adult sites**

PI: Charitha Gowda, MD

Mentor: Leon McDougale, MD

U.S. youth between the ages of 13 and 24 years who were infected with HIV through risk behaviors accounted for 22% of all new HIV diagnoses in 2014. Despite having the highest incidence of HIV, behaviorally HIV-infected youth (BIY) have low rates of HIV testing, linkage to care and, ultimately, of virologic control.[1-3] With an age range that spans adolescence into adulthood, BIY often can be seen at either pediatric or adult HIV clinics. Prior studies have found that HIV-infected youth seen at pediatric clinics have higher rates of retention in medical care and adherence with antiretroviral therapy.[1, 2] However, the specific factors driving these disparities in healthcare utilization have not been explored in detail. A qualitative study using semi-structured interviewing is proposed to better understand what clinic-related factors contribute to higher rates of retention in care among BIY in pediatric versus adult HIV clinics. By identifying specific factors that influence a youth's decision to seek care, this work can guide the development of new interventions to broaden a clinic's outreach to this vulnerable population.

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**Automated Analysis of Cerebral Small Vessel Disease Magnetic Resonance Imaging Features in Stroke Patients, **Second runner up!****

PI: Yousef Hannawi, MD  
Mentors: Metin Gurcan, PhD, Michel Torbey, MD

Cerebral Small Vessel Disease (CSVD) features are commonly seen in the elderly and in patients with acute ischemic stroke. It contributes to cognitive decline, stroke risk and impaired gait. These features include white matter hyperintensities, lacunes, microbleeds and enlarged perivascular spaces. Methods to accurately measure the burden of CSVD are currently lacking to all of these features which affect the ability to accurately predict functional stroke outcome. In this project, I will develop and validate automated tools for CSVD features identification and quantification in collaboration with the Clinical Image Analysis Laboratory at the Ohio State University.

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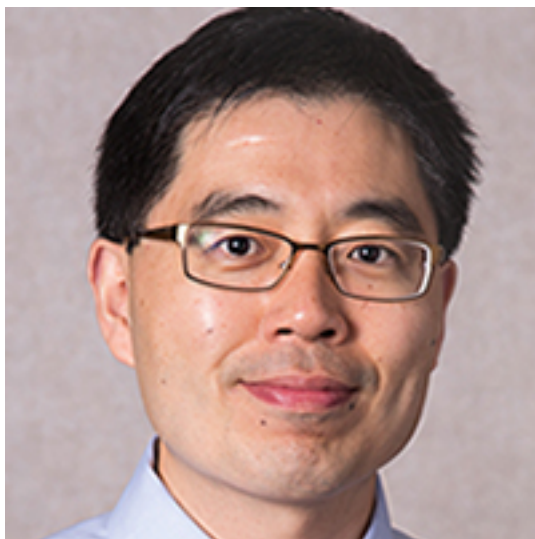


**VTE prophylaxis among ischemic strokes**

PI: Archana Hinduja, MD  
Mentors: Michel Torbey, MD, Michael Go, MD

Despite prophylaxis, 3% of strokes in general, and 35% of severe strokes develop venous thromboembolism. Although the half-life of tPA (recombinant tissue plasminogen activator) is few minutes, the current guidelines recommend withholding anticoagulants even at low doses for VTE prophylaxis for 24 hours following thrombolysis due to risk of intracerebral hemorrhage. This has been challenged by the periprocedural use of heparin during endovascular therapy in these patients.

We propose a pilot, safety trial using early pharmacological prophylaxis among ischemic stroke patients that received intravenous thrombolysis with or without additional mechanical thrombectomy or mechanical embolectomy alone.

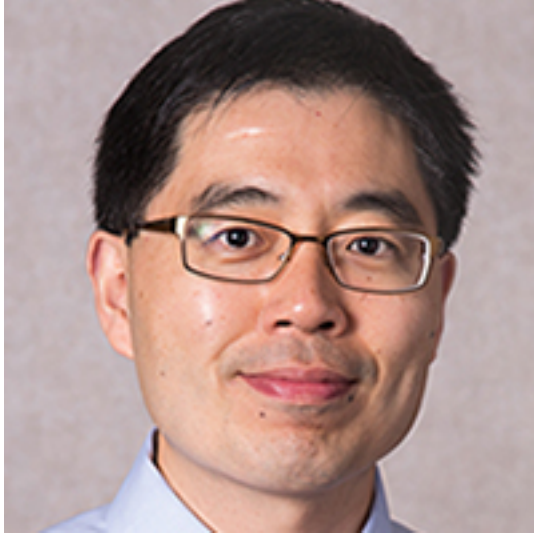


**Assessment of HER2 intratumoral heterogeneity by a novel gene-protein assay to predict response to anti-HER2 targeted therapy in patients with HER2-positive breast cancer**

PI: Zaibo Li, MD, PhD  
Mentor: Anil Parwani, MD, PhD, MBA

HER2+ breast cancer can be effectively treated with drugs that target HER2 receptor. However, resistance to anti-HER2 targeted therapy is frequent. HER2 intratumoral heterogeneity may be a potential mechanism of resistance to anti-HER2 targeted therapy and it has not been well studied. A novel method called Gene Protein Assay (GPA) that combines HER2 immunohistochemistry (IHC) and HER2 in-situ hybridization (ISH) on a single slide can detect HER2 intratumoral heterogeneity accurately. We will investigate the impact of HER2 intratumoral heterogeneity determined by GPA on response to anti-HER2 targeted therapy and clinical outcomes in patients with HER2+ breast cancer.

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**Evaluating the checkpoint immune system in breast carcinoma with anti-PD-L1 multiplex immunohistochemistry and its association with the response to neoadjuvant chemotherapy, **Runner up!****

PI: Zaibo Li, MD, PhD

Mentor: Anil Parwani, MD, PhD, MBA

Programmed death 1 ligand 1 (PD-L1) is an immune regulatory molecule that limits antitumor immune activity. Targeting of PD-L1 and other immune checkpoint proteins has shown therapeutic activity in various tumor types. The expression of PD-L1 in tumor cells and/or immune cells has been reported in breast cancer; however, its correlation with response to neoadjuvant chemotherapy has not been well studied. In this study, we will use anti-PD-L1 multiplex immunohistochemistry to simultaneously assess PD-L1 expression, cytotoxic CD8+ T cells and macrophages in breast cancer and their association with clinical characteristics of the cancer, and response to neoadjuvant chemotherapy.

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**Laryngeal injuries in the intubated ICU patients**

PI: Laura Matrka, MD  
Mentor: Tom Williams, MD

We seek to define the typical patterns of injury and appearance of the larynx immediately after intubation with three objectives 1)To guide practitioners in determining which injuries may have the potential for more severe sequela, 2)To further define the spectrum of injury we are causing when we intubate patients, and 3)To define factors associated with greater degrees of injury. Patients intubated for longer than 24 hours will undergo flexible laryngoscopic exams within 1-2 days after extubation. These will be recorded and blinded reviewers will record findings of any laryngeal injury. Chart review will then identify the length of intubation, size of ET tube, presence of enteral feeding tubes, and use of acid prevention medications, along with basic demographic data.

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### **Using Simulation to Assess Critical Care Fellow Competencies**

PI: Claire Stewart, MD  
Mentor: David Bahner, MD

This project is a biyearly simulation curriculum to assess pediatric critical care fellow competencies, specifically in medical knowledge and communication. Simulation at our center is currently used only for education, however, there is a growing need for other methods of assessing competencies. We plan to assess fellows twice per year using high-fidelity, in-situ simulation with two common pediatric resuscitation scenarios. Each scenario will be assessed using checklists and global ratings scales. The sessions will be filmed and in depth feedback provided to each fellow.

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### **Bedside foot measurements in high arch patients**

PI: Amro Stino, MD

Mentor: John Kissel, MD

We are evaluating the utility of foot architecture measurements to ascertain if certain measurements are more predictive of patients with genetic neuropathy (e.g. Charcot Marie Tooth disease). Working in conjunction with podiatry, and using radiographic images and additional clinical measures, our goal is to ultimately validate this in a prospective fashion moving forward to help clinicians screen for genetic neuropathy at the bedside using easy to apply bedside foot measures.

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### **Towards a validated mobility scoring system for the Intensive Care Unit**

PI: Daniel Vazquez, MD

Mentors: Danny Eiferman, MD and Steven Steinberg, MD

This study aims to prospectively assess and measure mobility in patients in the Intensive Care Unit by using an activity tracking device, sensitive enough to record patients' motion, as minimal as this might be. The objective measurement of mobility with an automated system in this setting has not been studied. Therefore, we will conduct a pilot study, with patients randomized either to wear a tracking device or not, in order to develop a validated mobility scoring system, as well as, identify ICU complications, mainly delirium and length of overall stay.

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### **Integrate proteomic and genomic data for thyroid cancer subtype characterization**

PI: Yan Zhang PhD

Mentor: Kun Huang, PhD

Papillary thyroid carcinoma (PTC) is the most common type of thyroid cancer, making up 80-85% of all thyroid cancer cases. Although we have PTC subtypes (variants) defined based on pathological features, ambiguity exists in subtype identification because of complex features shared between different subtypes. Genomic and proteomic studies of PTC have been carried out respectively, however, there is no study integrating both types of data to yield a more complete picture of thyroid cancer biology. Here, we utilize both genomic and proteomic datasets for cancer subtype characterization, which might also help reduce overtreatment of low-risk thyroid tumors. A focus of this study is finding pseudogenes that are somatically acquired and expressed in cancer tissues. These novel biomarkers will complement traditional histotyping of PTC.

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### **Investigating Novel Genetic Causes of Skeletal Myopathy and Cardiomyopathy**

PI: Jennifer Rogenbuck, LGC

Mentors: John Kissel, MD and Ray Hershberger, MD

The genetic evaluation of patients with skeletal myopathies and cardiomyopathies now frequently includes sequencing of many genes. While this technology has increased the number of cases which receive a genetic diagnosis, the full clinical implications of a specific diagnosis are not always well-established. Emerging data suggests that many genes, such as *TTN*, may be associated with a broader range of phenotypes than previously recognized. We propose to embark on a line of interdisciplinary research investigating novel genetic causes of combined skeletal myopathy/cardiomyopathy phenotypes. As a first step, we will conduct a pilot study examining genotype-phenotype correlations in the *TTN* gene.

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### **A Double Blind, Placebo Controlled Trial Evaluating the Effects of Acupuncture on Mood in Parkinson's Patients receiving Dopaminergic Therapy**

PI: Reversa Joseph MD, MS  
Mentor: Sergio Bergese, MD

Non-motor symptoms of Parkinson's disease can be as disabling as the motor symptoms. The present pilot study is designed to assess the extent to which acupuncture may improve mood in Parkinson's disease patients requiring dopaminergic therapy. The primary objective is to assess improvement in the Hospital Anxiety and Depression Scale (HADS) from baseline to Week 8. The secondary objective is to assess changes from baseline to Week 8 in the Unified Parkinson's Disease Rating Scale (UPDRS), motor examination subscale (Part 3) version 3 score, Beck Depression Inventory Scale (BDI-II), the Hamilton Anxiety Rating Scale (HAM-A) and the Depression, Anxiety and Stress Scale (DASS).

This is a randomized, placebo-controlled, double-blinded study to evaluate the effect of acupuncture on mood in Parkinson's patients on dopaminergic therapy. The study consists of a screening period of up to 10 days, followed by an 8-week double-blind treatment period involving a treatment arm (acupuncture group) and a control arm (sham acupuncture). All eligible patients will be allocated in a 1:1 ratio at enrollment into 1 of the two groups based on a randomization scheme. Patients will receive 1 treatment (30 min session) per week over 8 weeks for a total of 8 treatments of either acupuncture or sham acupuncture. Assessments will be performed for all groups at Screening/Baseline visit and at Week 8 visit.

Patients with Idiopathic Parkinson's disease with a mood disturbance and a minimum score on the DASS subscale will be eligible for the study. The DASS will be used to measure the presence of depression, anxiety and stress in order to establish the presence of a mood disturbance and will serve as an inclusion criterion for study participation. At least one of the following scores from the DASS subscale will be required; Depression subscale range of 10-28 (inclusive), Anxiety subscale range of 8-20 (inclusive), Stress subscale range of 15-34 (inclusive). Patients with extremely severe depression (DASS score > 28), anxiety (DASS score >20) or stress (DASS score >34) will be excluded.



### **Outcomes of Stress Incontinence Treatment with Device**

PI: Catherine Hudson, MD  
Mentor: Andrew Hundley, MD

Stress urinary incontinence (SUI) is the complaint of involuntary loss of urine on effort or physical exertion, or on sneezing or coughing. First line management has consisted of non-operative therapy, followed by surgery in those individuals that have failed previous management. This includes behavioral therapy with pelvic floor muscle training or a continence pessary. Continence pessaries are inexpensive, reusable vaginal inserts made of flexible silicone that are provided by clinicians and can be managed by the patient. In 2014, the FDA approved an over-the-counter disposable intravaginal device as another nonsurgical treatment for SUI. This device, the Poise Impressa®, is made of a non-absorbable nylon mesh that covers a core with 4 support poles made of resin and is housed in an applicator. There have been limited prospective studies evaluating these two devices, especially the Poise Impressa®. To date, there have been no randomized controlled trials comparing these two devices. However, the Poise Impressa® has been marketed as being the most effective device available to females with stress urinary incontinence based on their original 4 week trial in 2008. No studies have been published since on the effectiveness of the device. Key differences, such as length of time devices can be used and cost, are noted between the 2 devices, thus making it important to have a randomized controlled trial. We hypothesize that a physician fit continence pessary will provide greater subjective improvement in SUI symptoms, greater improvement in quality of life, greater patient satisfaction, and be lower cost as compared to the Poise Impressa®. In order to test our hypothesis we will use previously validated questionnaires in the field of Female Pelvic Medicine and Reconstructive surgery to evaluate effectiveness of the devices and patient quality of life improvement. Patients will also report adverse reactions in both study groups for evaluation of safety. In addition we will perform a cost analysis in order to determine which line of treatment will be the most cost effective.