The Department of Anesthesiology, Perioperative and Pain Medicine

ANNUAL RESEARCH REPORT

Mount Sinai Hospital

2023

CONTENTS

DEPARTMENT OF ANESTHESIOLOGY, PERIOPERATIVE AND PAIN MEDICINE
ANNUAL RESEARCH REPORT 2023

Another Year of Excellence: A Joint Statement from the Department of Anesthesiology Research Leadership

As we reflect on the past year, we are filled with immense pride and excitement for the department's research accomplishments. 2023 has been a banner year, marked by high-impact publications, groundbreaking grant awards, and a vibrant and growing community of researchers delving into some of the most pressing questions in our field.

Together, we have witnessed the remarkable dedication and talent of our faculty, trainees, and research staff. Their passion for scientific discovery has fueled a remarkable year, propelling us further along the path of excellence in perioperative medicine research.

This year, our department published more than 50 articles in top-tier journals, solidifying our reputation as a leading contributor to the field. These publications tackled a diverse range of topics, including the intricate mechanisms underlying pain management and addiction, the perioperative impact of healthcare disparities, and the optimization of patient outcomes in perioperative settings. Several key review articles and book chapters rounded out a year of highly productive academic work in the department.

Securing the Future of Research:

Our commitment to research is now moving towards seeking external funding. We were thrilled to have secured several new grants this year, totaling over $1 million in funding. These grants will support a variety of innovative projects, that include investigating the role of artificial intelligence/machine learning in the prevention of postoperative delirium, determining the impact of sugammadex in routine practice, and the significance of patient skin color on pulse oximetry accuracy. These grants enhance our department's position as a leader in research, enabling us to continue pushing the boundaries of knowledge and lead to increased funding going forward.

A Flourishing Ecosystem of Research:

Our success is not just measured by publications and grants. It is the vibrant ecosystem of research that truly defines us. We are proud of the more than 30 active research projects currently underway, encompassing a diverse range of subspecialties within anesthesiology. Our regular research meetings remain a cornerstone of intellectual exchange, fostering collaboration and inspiring the next generation of researchers. We are also excited to establish new collaborative relationships with faculty from Neurosciences, Genomics/Precision Medicine, and Health Care Delivery Sciences. These relationships are force multipliers and a main part of a strategic plan to grow our research footprint over the next 3 to 5 years.

Looking Ahead with Optimism:

As we enter the new year, we are full of optimism. The energy and dedication of our researchers are palpable, and we are confident that the coming year will bring even greater achievements. We are committed to providing our faculty and trainees with the support and resources they need to thrive, and we remain dedicated to fostering a collaborative environment where innovation flourishes. One need only look at the amazing work of our Eliasberg Scholars to see that the next generation of researchers is well on their way! We extend our heartfelt gratitude to everyone who has contributed to the department's research success in 2023. Your hard work, passion, and dedication are the bedrock of our department's research mission. Together, we look forward to continuing this journey of discovery and making a lasting impact on the future of perioperative care.

With pride and excitement,

Sam DeMaria, MD
Vice Chair for Research

Matt Levin, MD
Assoc. Director for Research

NEW AND ONGOING GRANTS

Anesthesia Patient Safety Foundation/Medtronic Research Award

Merck Investigator Studies Program Grant

KL2 Mentored Career Development Award

National Institute on Aging (NIA) IMPACT Grant

ANESTHESIA PATIENT SAFETY FOUNDATION MEDTRONIC RESEARCH AWARD

Dr. Garrett Burnett was awarded a $150,000 2-year grant from the Anesthesia Patient Safety Foundation/Medtronic Research Award for his project titled "Pulse Oximetry Accuracy and Skin Pigmentation in Congenital Heart Disease: A Prospective Observational Study".

Recent retrospective studies have demonstrated discrepancies between measured pulse oximeter values and measured arterial oxygen saturation in patients self-identifying as Black or Hispanic. These findings have demonstrated elevated rates of occult hypoxemia (i.e., $SpO2 \geq 92\%$ despite $SaO2 \leq 88\%$) in non-White patients and linked occult hypoxemia to increased mortality and changes in treatment. Self-reported race/ethnicity is not an appropriate surrogate for skin pigmentation and objective measures are needed. **Color spectrophotometry (CS) represents an objective method for skin pigmentation measurement.** It is imperative that the relationship between pulse oximeter accuracy and CS-measured skin pigmentation be determined in order to improve equity in pulse oximeter function across all patients.

This study aims to evaluate the relationship between pulse oximeter accuracy and CS-measured skin pigmentation in pediatric patients with congenital heart disease having cardiac surgery. Accuracy will be tested using United States Food & Drug Administration guidelines (Accuracy Root Mean Square, Mean Bias, and Bland-Altman analysis). As a secondary aim, the correlation between pulse oximetry accuracy with CS-measured skin pigmentation, self-reported race/ethnicity, as well as Fitzpatrick scale. As another secondary aim, we will assess the relationship of occult hypoxemia with CS-measured skin pigmentation.

Pulse oximetry is utilized for all patients throughout the perioperative period. Inaccuracies in pulse oximetry may have impacts on patient outcomes and treatments. Determining the relationship between pulse oximetry and CS-measured skin pigmentation works towards the goal of making pulse oximetry equitable for all patients. Results from this study will potentially improve pulse oximeter accuracy in the congenital heart disease population and inform future studies evaluating this relationship in the more general population.

MERCK INVESTIGATOR STUDIES PROGRAM GRANT

Dr. Chang Park was awarded a $200,000, 2-year grant from the Merck Investigator Studies Program for his proposal titled "Using Diet Order Progression to Assess the Impact of Sugammadex Versus Neostigmine/Glycopyrrolate on Postoperative Return of Bowel Function: A Retrospective Observational Propensity Score Analysis." This competitive grant program from Merck supports research that is initiated, designed, and implemented by external investigators.

Postoperative ileus is a common and significant complication after abdominal surgery. Certain anesthetic agents, including those that reverse neuromuscular blockade, can contribute to the complex pathways that lead to postoperative ileus. The impact of the choice of neuromuscular reversal agent on postoperative recovery of bowel function remains unclear.

This study will investigate differences in impact of using sugammadex versus neostigmine/glycopyrrolate for reversal of neuromuscular blockade on diet progression among patients undergoing various abdominal surgeries.

Large-scale assessment of postoperative bowel function remains challenging due to the lack of consensus on which markers for bowel function are used and how they are documented. This analysis will seek to introduce a novel approach that utilizes hospital diet order progression to measure return of bowel function. By using a variable that is widely available in electronic health record systems, this study will aim to elucidate the impact of neuromuscular blockade reversal on postoperative bowel function.

KL2 MENTORED CAREER DEVELOPMENT AWARD

Dr. Nwaneshiudu was awarded a 2-year, $272,000 award for her work in translational research of opioid use disorders for the project titled, "Behavioral, cognitive and genomic determinants of persistent pain and opioid misuse after spine surgery" (CTSA KL2TR004421).

The Institutes for Translational Sciences at the Icahn School of Medicine at Mount Sinai (ConduITS) offers a KL2 Scholars Award for Clinical and Translational Research Career Development for outstanding junior faculty and postdoctoral fellows. This career development program is funded through the Mount Sinai Clinical and Translational Science Award (CTSA) and is administered by ConduITS.

Specific objectives of this program are to:
- Identify and support talented junior faculty and postdoctoral fellows at Mount Sinai who are committed to academic careers in transdisciplinary patient-centered clinical/translational (C/T) research.
- Assure that award recipients have at least 75% protected time for their research career development (exceptions may be made for surgeons who can document that their clinical competence may be diminished by restricting clinical activities to 25%).
- Enable award recipients to design, implement, analyze, and publish rigorous studies in transdisciplinary patient-centered C/T research.
- Provide Scholars with transdisciplinary mentorship and promote the development and implementation of an individually tailored career development plan.
- Enable scholars to plan, write, submit, and acquire funding for an externally sponsored career development award (K award or equivalent or independent research grant (e.g., R01).

The intent of this KL2 career development award program is to assist departmental and institute leadership at Mount Sinai and its affiliated institutions in the support of junior faculty and postdoctoral fellows who have been **identified as premier candidates for careers in C/T research**.

NATIONAL INSTITUTE ON AGING (NIA) IMBEDDED PRAGMATIC ALZHEIMER'S DISEASE (AD) AND AD-RELATED DEMENTIAS (AD/ADRD) CLINICAL TRIALS (IMPACT) GRANT

Dr. Hofer, MD, is not only a practicing anesthesiologist but a leading clinical informaticist. **He was awarded $622,000 to deploy cutting-edge informatics techniques, for a 2-year study entitled "Mitigation of Postoperative Delirium in High-Risk Patients" (U54AG063546-Subaward:0002079).** The intervention consists of clinical decision support alerts in the electronic health record directed towards anesthesiologists caring for patients with preexisting cognitive impairment. This intervention will promote 12 evidence-based best practices during care for perioperative patients.

Dr. Hofer has been working in the field of big data analytics for over 15 years in a variety of leadership roles. His research interests involve leveraging the data from the electronic health records (EHR) to understand, quantify and ultimately mitigate risk in the perioperative period. His work includes some of the first papers to apply machine learning techniques for perioperative outcome prediction and has been featured on the covers of Anesthesiology and Anesthesia & Analgesia. Dr. Hofer has a K01 from the National Heart Lung and Blood Institute and serves as an associate editor for Anesthesia & Analgesia. His research focuses on creating featurization techniques to incorporate a wide range of EHR data into machine learning models to improve discrimination and calibration, and establishing multi-center perioperative collaboratives to better share raw and processed EHR data.

The mission of the NIA IMPACT Collaboratory is to build the nation's capacity to conduct pragmatic clinical trials of interventions embedded within health care systems for people living with dementia and their care partners.
The IMPACT Collaboratory accomplishes this mission by developing and disseminating best-practice research methods available to address core concerns regarding brain health.

NEW AND ONGOING TRIALS

Angiotensin-2 trial

IMPACT Trial

Novel Wireless ECG

Obstetric Anesthesiology

SATA multicenter liver
transplant database

ANGIOTENSIN-2 TRIAL

Drs. Ryan Wang and Natalie Smith

We are participating in a multicenter randomized controlled trial led by UCSF investigating the use of angiotensin-2 in liver transplantation. Liver transplant patients were excluded from the initial trial of angiotensin-2, ATHOS-3, which examined the use of angiotensin-2 in treating vasodilatory shock. Vasoplegia is common during liver transplantation, and these patients are likely to benefit due to the derangement of the renin-angiotensin-aldosterone system associated with end stage liver disease. Additionally, the ATHOS-3 trial found patients requiring renal replacement therapy (RRT) who received angiotensin-2 had higher survival rates and lower rates of RRT at 7 days. High Model for End Stage Liver Disease (MELD) patients frequently have concomitant renal dysfunction and may derive further benefit from the use of angiotensin-2.

Consented patients will receive either angiotensin-2 or a placebo (i.e., normal saline) as an infusion when a norepinephrine infusion of 0.05 mcg/kg/min is not sufficient to achieve the desired intraoperative blood pressure goal. The primary outcome of the study will be the reduction in norepinephrine dosage required to achieve a Mean arterial pressure > 65 mmHg. The results of this trial will inform a future study investigating the use of angiotensin-2 during liver transplant and its impact on postoperative acute kidney injury.
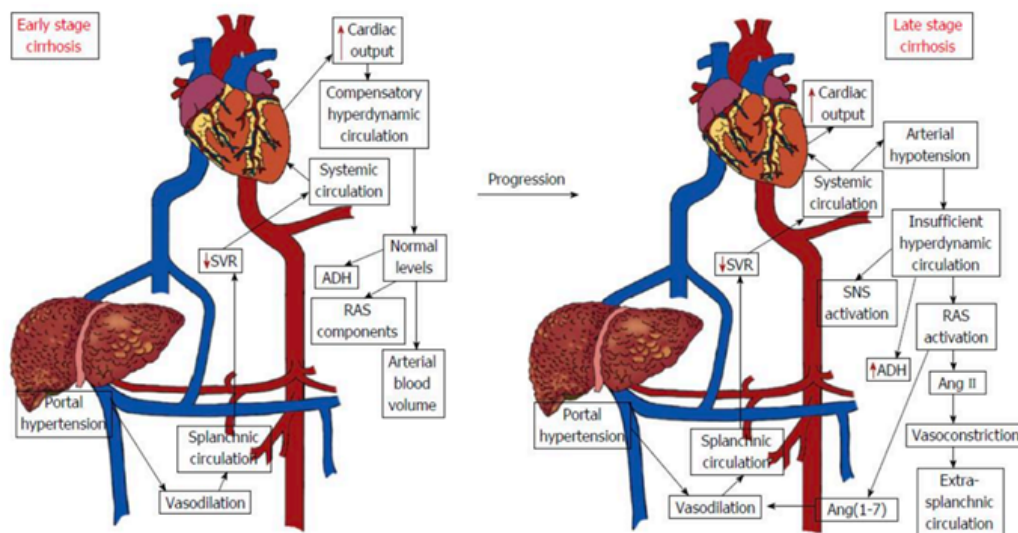
Simões e Silva AC, Miranda AS, Rocha NP, Teixeira AL. Renin angiotensin system in liver diseases: Friend or foe? *World J Gastroenterol* 2017; 23(19): 3396-3406 [PMID: 28596676 DOI: 10.3748/wjg.v23.i19.3396]

Figure 1. Derangement of renin-angiotensin system in liver disease.

IMPACT TRIAL

Dr. Ira Hofer

After launching in late June, the NIA funded IMPACT trial is off to a strong start. We have enrolled more than 3,500 patients at MSH with nearly 500 patients having received a screen for postoperative delirium (POD). Importantly, 50% of those patients who are enrolled have POD, meaning that we are effective at targeting high risk patients. If you get an alert about your patient being at high risk for POD - pay attention! We have also started integrating our interns into the study with a moonlighting opportunity for residents to help with the POD assessments - so far this has been very popular. As a next step we are looking to expand the study to MSW and MSQ early in 2024 and will be doing an interim analysis in the spring.
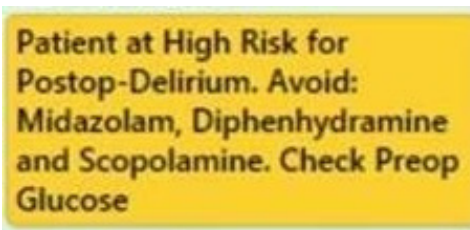

Figure 1. Postoperative delirium (POD) alert.

NOVEL WIRELESS ECG TRIAL

Drs. Matthew Levin and Philip Susser

We have concluded enrollment for an initial study evaluating the efficacy of a novel, bluetooth enabled, single lead, nanoelectrode ECG for use in the operating room. The prospective observational study enrolled and consented 27 general surgery patients at MSH from April to September 2023. Preliminary data analysis demonstrated agreement between the standard of care GE electrodes and the novel electrode. However, the nanoelectrode experienced greater interference by the electrosurgical unit and did not transfer data reliably via bluetooth, leading to some missing pockets of data. Further data analysis, accounting for these unanticipated missing pockets of data, is ongoing. An abstract with preliminary Bland-Altman analysis was submitted to the Society for Technology in Anesthesia (STA) annual conference. We have recently received IRB approval for a follow-up study, evaluating a next generation device that will incorporate two leads, a more reliable data acquisition/antenna hardware, less interference from the electrosurgical unit via a filtering circuit, and better adhesion to the patient.

OBSTETRIC ANESTHESIOLOGY TRIALS

Dr. Daniel Katz

The obstetrical anesthesia team is at the forefront of several areas of research in obstetrical anesthesiology. Some of our current projects aim to examine the process by which we interact with patients on the labor floor to not only enhance care, but to figure out what really matters to patients when it comes to outcomes. With this knowledge, we will better design future studies aimed at these patient centered outcomes. For example, a recent study we completed looked at those patients who had declined participation in a now completed randomized control trial on the labor floor. **We looked at the reasons as to why patients declined to participate and looked for relationships and predictors to enhance enrollment while ensuring that future works include a more diverse patient population.** Another study is looking at postpartum women to investigate how priorities in their care change over time and examine what are the core components of the experience that matter to them most. For example, does it matter to patients more that their pain is controlled or that they do not experience nausea? This is a common tradeoff encountered in this patient population. In another study, we are looking to examine the baseline level of trust that our patients have in both the anesthesiology team and the hospital in general. We aim to improve and repair some of the trust in their medical care that may have been recently lost. Finally, our **DECORUM study is an interventional study examining the impact of having a discussion about disparities in pain management in labor prior to epidural placement. Would this conversation change the trajectory of their pain management plan? Could it change their outcomes in regards to trust and satisfaction?**

In the interventional realm the team has 3 randomized control trials that are ongoing. In one study, we are examining the impact of a novel drug, remimazolam, on the patient experience during the placement of labor epidurals and spinals. **We aim to demonstrate that this ultra-short-acting anxiolytic can provide a safe degree of anxiolysis without causing maternal/fetal compromise, as well as minimize the potential trauma of block placement.** In another study, we are examining whether or not a prophylactic dose of ephedrine can reduce the incidence of uterine

tetany and category two tracings after the placement of a combined spinal-epidural anesthetic. If successful, this could change the way this technique is utilized. **Finally, building on the success of our study on intrathecal epinephrine, our team is embarking on a study examining a head-to-head trial between intrathecal epinephrine and dexmedetomidine.** We hypothesize that these agents will prolong blockade in a similar manner as well as enhance block quality compared to typical care. The impact of the medications on perioperative shivering will also be examined.

Our team is also investigating the utility of a noninvasive cardiac output monitor on the labor floor. We have already established that using the monitor to calculate stroke volume is a more sensitive indicator of blood loss during delivery than relying on vital sign changes such as heart rate and blood pressure. We are also looking into using the device to risk stratify patients with preeclampsia and patients with congenital heart disease. **In a new project, our team is partnering with scientists from Penn State University to explore the utility of a novel biosensor, which can measure electrolytes and other laboratory assessments in real-time, at a low cost.** We will examine its utility in patients with gestational diabetes as a pilot project.

Postpartum hemorrhage (PPH) is a major morbidity and leading cause of mortality in the parturient, and this has led us to study hemostasis and coagulation. We have already completed several studies building an in vitro model of obstetrical hemorrhage. We have also assessed platelet trends in women with preeclampsia and the association between platelet count and postpartum hemorrhage. Currently, we are investigating the impact of anticoagulation on those models, as well as exploring the utility of procoagulant on those models, as well as exploring the utility of procoagulant and reversal agents. **We have also co-founded a hemorrhage consortium with other academic institutions and have obtained approval for a multi-site study examining phenotypic profiles of women suffering from severe obstetric hemorrhage.** The data from this study will inform a prospective multi-site RCT examining the role of fibrinogen concentrate in this patient population. We plan to investigate the optimal dose of oxytocin to prevent PPH.

Finally, our group is in the process of joining an international registry examining the use of general anesthesia for cesarean delivery. We hope to investigate these data for commonalities in patient populations as well as analyze outcomes in ways that would not be possible in a single site due to the rarity of the event.

SATA MULTICENTER LIVER TRANSPLANT DATABASE

Drs. Ryan Wang and Natalie Smith

This is a multicenter prospectively collected database of liver transplants across 18 centers. Additional transplant centers are in the process of obtaining approval to contribute to the database. While multicenter studies are important for research in any field of medicine, they are particularly essential for liver transplantation because the busiest centers approach only 200 cases per year, events of interest can be quite rare (e.g., 2-3% for intracardiac thrombus or intraoperative arrest), and practice variation across institutions can lead to different outcomes. The group accepts project proposals on a rolling basis. Any proposed project is presented to a group of anesthesiologists from participating centers, and each institution decides for itself if they wish to participate in a given study.

We have been contributing studies starting in July 2022. Every adult liver transplant is eligible for inclusion and is consented during our preoperative patient evaluation. The database includes patient demographics, donor characteristics, intraoperative data, and postoperative data. Three studies are in progress using this database: one investigating predictors for extubation in the OR after liver transplant; another looking at risk factors for postoperative acute kidney injury and new need for dialysis; and one examining the impact of machine perfusion on intraoperative hemodynamics. We are participating in all three and leading the effort on the machine perfusion study.

Current participating transplant centers include:

Mount Sinai	UCLA	Georgetown University
Mayo Clinic Arizona	UCSF	Beth Israel Lahey Health
Mayo Clinic Florida	Stanford	Montefiore Medical Center
Mayo Clinic Rochester	Emory	UC Denver Colorado
University of Wisconsin	University of Chicago	University of Pittsburgh
University of Nebraska	University of Washington	University of Louisville

THE ELIASBERG CLINICIAN-SCIENTIST TRAINING PROGRAM

David Chang, MD

Gabriela Hernandez-Meza, MD

Michelle Lim, MD

Talia Scott, MD

Blaine Stannard, MD

DAVID CHANG, MD

Predictive Modeling of Medial Branch Blocks/RFA Response

The goal of this project is to train a model to predict whether a patient would have a positive response to medial branch blocks. Using the anesthesia data warehouse, we plan to extract various input features to train the models: Age, gender, BMI, history of prior lumbar spinal surgery, chronic opioid use, race/ethnicity, imaging findings, ICD codes, medications, pre-procedural pain score, presence of discogenic pain and volume of local anesthetic given. To automate extraction of these data from Epic, we will use natural language processing and we plan to train the following models: SVM with linear kernel, linear discriminant analysis, logistic regression, and random forests. We will then evaluate performance of these models by a metric called area-under-the-curve, derived from the rate of true positives vs false positives.

Virtual Reality for Preprocedural Planning of Peripheral Nerve Stimulator

Extended reality is becoming an ever more popular tool to enhance pre-procedural planning in patients with complex anatomy. We present a case of a 67 year-old male presenting with axial neck pain who had prior cervical fusions and hardware. Determining an appropriate approach trajectory for the peripheral nerve stimulator (to be placed at the medial branch of C5/C6) was challenging given the distorted anatomy and presence of hardware. Thus, a reconstruction made in Elucis was used to visualize the patient's anatomy and determine an appropriate trajectory. The procedure was successful and the patient received pain relief from the peripheral nerve stimulator.
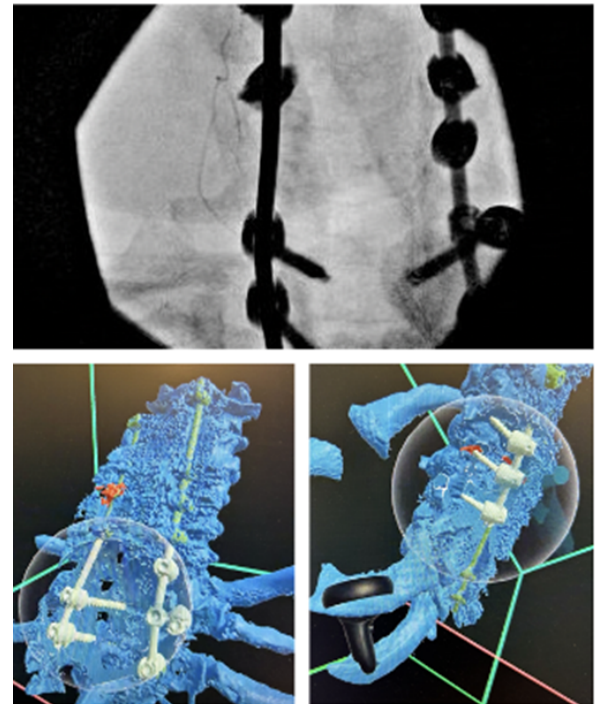
Cryoneurolysis in Chronic Pain

This is a narrative review article that provides an overview of cryoneurolysis in treating chronic pain conditions, including axial back pain, peripheral mononeuropathies, abdominal pain, joint pain, and phantom limb pain. We discuss the mechanism of action, as well as compare advantages / disadvantages of cryoneurolysis versus other modalities like radiofrequency ablation. Although the literature suggests that the modality is efficacious and safe, more head to head and controlled randomized trials are needed to establish this.

GABRIELA HERNANDEZ-MEZA, MD

During my time as an Eliasberg scholar I've focused primarily on developing and running clinical trials with the goal of advancing our clinical knowledge and improving patient care. I am currently involved in 2 clinical trials, one is ongoing and one is ready to begin recruitment. The ongoing trial is evaluating the potential to prevent uterine tetanic contractions which may occur after placement of a combined spinal epidural for a laboring patient by using a prophylactic dose of intravenous ephedrine. For the second trial, our department will use intraoperative cell salvage in anemic women who will undergo elective cesareans in order to determine their post-operative outcomes. As an Eliasberg scholar I am also involved in writing review articles and book chapters in topics pertaining to anesthesiology.

MICHELLE LIM, MD

As an Eliasberg scholar, I have had the opportunity to start several different projects. I am currently spearheading a study to evaluate if patients with anxiety or depression admitted post-op after general anesthesia for elective surgery have longer PACU LOS or hospital LOS compared with patients who do not have anxiety or depression. I am going into fellowship in regional anesthesia next year, so my research projects have started to reflect that. I am involved in a study evaluating the addition of liposomal bupivacaine to the erector spinae plane block to multilevel lumbar spinal fusion surgery. As this is the first year that regional anesthesia programs participated in the SF match, I am working on a study surveying the regional anesthesia fellowship program directors. Through the Eliasberg program, I have also had the opportunity to write educational articles. I submitted a chapter on Alcohol and Substance Misuse to Anesthesia Secrets, and I published an Open Anesthesia keyword on Post Cesarean Delivery Pain Managem fellowship program directors. Through Eliasberg, I have also had the opportunity to write educational articles. I submitted a chapter on Alcohol and Substance Misuse to Anesthesia Secrets, and I published an Open Anesthesia keyword on Post Cesarean Delivery Pain Management and on Alcohol and Substance Misuse to Anesthesia Secrets, and I published an Open Anesthesia keyword on Post Cesarean Delivery Pain Management.

TALIA SCOTT, MD

I have mainly focused on obstetric anesthesia as my area of research, as I will be doing my fellowship in this field. The first study that I started through Eliasberg examines trust in obstetric anesthesia and validates a trust survey in the anesthesia setting. I have collected 300 surveys and am currently in the data analysis phase. I recently published an article in the Canadian Journal of Anesthesia titled "Motivations and demographic differences in pregnant individuals in the decision to participate in research" in which we explored reasons why pregnant patients decline or elect to enroll in randomized control trials. We found that those with a college degree or higher were more likely to participate in the study. Though race and ethnicity were not predictive of participation, those who self-identified as Black were more likely to select reasons of aversion for why they did not participate in the trial. I recently wrote an Open Anesthesia Keyword on Magnesium in Pregnancy, and I am in the process of writing a simulation for the SOAP Sim Provider Education Resource. Finally, I am writing the protocol for a new non-inferiority study on intrathecal dexmedetomidine vs intrathecal epinephrine as an adjuvant in spinal anesthesia for cesarean delivery.

BLAINE STANNARD, MD

I am involved in informatics research harnessing the wealth of "big data" available from the perioperative care of patients undergoing anesthesia. My research utilizes intraoperative data to identify clinically relevant trends that correlate with patient outcomes, with the goal of identifying surgical patients who could benefit from increased intervention and/or surveillance. To carry out these studies, I write code in SQL and R to extract, process, and analyze intraoperative and patient-level data from our department's data warehouse.

I have published several studies on the applications and pitfalls of intraoperative monitoring technology (such as pulse oximetry and cerebral oximetry), which I have continued to explore during the research track. Our study "Intraoperative Occult Hypoxemia is An Independent Risk Factor for 30-day and 1-year Mortality" is currently undergoing peer review. Building upon our prior findings that certain patient populations may be vulnerable to inaccurate pulse oximetry measurements, we investigated the relationship between intraoperative occult hypoxemia and postoperative mortality among patients undergoing anesthesia and surgery.

In our cohort of over 25,000 patients, we found that occult hypoxemia is associated with increased risk of 30-day and 1-year mortality.

I am also carrying out a study evaluating whether patients that develop postoperative acute kidney injury (AKI) have a greater decline in long-term renal function than patients who did not develop postoperative AKI. In this study of nearly 40,000 patients, postoperative AKI was associated with significantly increased risk of a persistent 40% decline in glomerular filtration rate up to 36 months after surgery. The lasting effects of postoperative AKI on renal function found in this study demonstrate the importance of strategies to prevent and mitigate perioperative renal injury. I presented this study at the Foundation for Anesthesia Education and Research Resident Scholar Program at the ASA Annual Conference this year. Key figures from this presentation are shown below.

Lastly, I am also collaborating on several projects on liver transplant anesthesiology, including investigations on racial disparities in analgesia for hepatectomies as well as intraoperative management of liver transplantation using machine perfusion.

Survival Curves for Time to First GFR 40% decline during FU
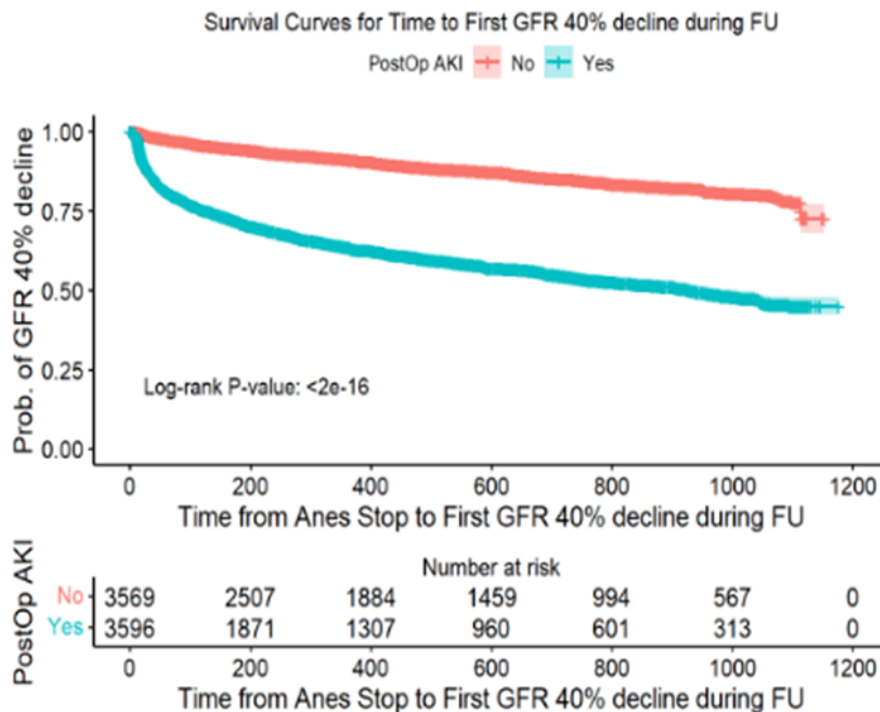
Model output for time to first GRF 40% Decline

	Time to first GFR 40% decline		
Predictors	Hazard Ratios	CI	p
postop AKI	4.10	3.68 – 4.57	<0.001
R² Nagelkerke	0.060		
AIC	29622.236		

RESEARCH AT MOUNT SINAI WEST

Mount Sinai West/Morningside is an academic powerhouse in the making! The environment is conducive to learning, and conducting investigations which are transforming anesthesiology practice. Our research committee has been responsible for engaging intra- and interdepartmental collaborations, resulting in book chapters, medically challenging cases, retrospective reviews, and clinical trials. The regional, pain, cardiac, obstetric, and critical care divisions currently have numerous ongoing projects, and our residents and fellows present their scholarly activity at regional, national and international meetings. Some recent trials and publications:

- Dr. Ali Shariat
  - Quadratus Lumborum Block vs Conventional Therapy for Laparoscopic Sleeve Gastrectomy Truncal Blocks for Subcutaneous Cardioverter-Defibrillator (S-ICD) Implantation
  - Erector Spinae Plane Block vs Pecto-Intercostal Fascial Plane Block vs No Block for Sternotomy Rectus Sheath Block vs Conventional Therapy (No Block) for Chest Tube Placement in the Context of Cardiac Surgery
- Dr. Michael Lazar
  - Elevated Interleukin-6 Levels and Serum Phosphorus is Associated With Higher Mortality for Covid-19 Induced Respiratory Distress
  - Use of Etomidate for Covid-19 Related Emergency Airway Management is Associated with Increased Mortality: A Retrospective Study
- Drs. Yan Lai and Poonam Pai
  - The effect of combined intravenous and topical tranexamic acid in major multilevel spine surgery: A prospective RCT

INVESTIGATOR SPOTLIGHT

Chinwe Nwaneshiudu, MD PhD

Suzan Uysal, PhD

Chinwe Nwaneshiudu, MD PhD

I serve in the Pain Medicine Division taking care of patients with various acute, surgical and chronic pain conditions, and I lead clinical translational research projects to help us better understand mechanisms of pain and development of opioid addiction. I want to examine the biological conditions that make an individual become "dependent" on opioids.

Opioids are powerful analgesics but they come with many side effects that can be life threatening and life altering (i.e. developing opioid use disorder (OUD) and chronic pain). On the contrary, patients after surgery are often concerned that using opioids for pain relief would make them "addicted" to them, and risk undertreating their pain symptoms.
By using a combined approach with behavioral, cognitive and genomics, we can better understand what conditions precede the diagnosis of an OUD in a person with pain. It can change the ways opioids are used for pain management, and drive discovery of novel analgesics and other treatments for pain.

My ongoing funded work examines individuals with chronic back pain and their genomic profiles using novel single cell RNA sequencing (Study #23-01287). I encourage all eligible patients to participate to advance science and medicine.

Suzan Uysal, PhD

Suzan Uysal, PhD is a board-certified clinical neuropsychologist and an associate professor in the Department of Anesthesiology, Perioperative and Pain Medicine. She serves in multiple roles as researcher, author and educator as well as clinician. As a researcher with a strong background in neuroscience, her work has focused on postoperative cognitive outcomes and perioperative neuroprotection.

Recently she has turned her attention to studies of cognitive predictors of chronic pain and opioid misuse in at-risk patients (collaborating with Chinwe Nwaneshiudu, MD, PhD). As an author, she recently wrote a textbook and reference on functional neuroanatomy and clinical neuroscience, and has co-edited two books with other departmental faculty (Leibowitz AB, Uysal S (eds.). Modern Monitoring in Anesthesiology and Perioperative Care, Cambridge University Press, 2020; Reich DL, Mayer SA, Uysal S (eds.). Neuroprotection in Critical Care and Perioperative Medicine. Oxford University Press, 2018.). As an educator, she founded and co-directs a clinical neuropsychology postdoctoral fellowship program in the Department of Neurology, where she teaches and mentors fellows.

She also teaches in the departments of Psychiatry and Rehabilitation Medicine, and she teaches the neuropsychology course at New York Univerity's (NYU) Graduate School of Arts and Sciences. As a clinician, she has a thriving practice specializing in aging and dementia neurocognitive assessments. Dr. Uysal also serves as a reviewer for the American Board of Clinical Neuropsychology.

STATISTICIAN'S CORNER

Natalia Egorova, PhD

Yuxia Ouyang, PhD

NATALIA EGOROVA, PHD

Director of the Large Dataset Analysis Unit
Department of Population Health Science and Policy

The overall theme of my research is assessing the effectiveness of clinical interventions in actual practice settings. I have applied my expertise in analyzing non-experimental datasets to cardiovascular and peripheral vascular interventions, cancer therapy, anesthesiology, and quality improvement.

As the Director of the Large Dataset Analysis Unit in the Department of Population Health Science and Policy, I have developed an extensive library of administrative and clinical datasets providing a resource for 1) real-time assessment of utilization and outcomes of clinical interventions; 2) supplementary claims data for economic analyses; and 3) extrapolating the potential impact of clinical trials findings to the real-world practice.
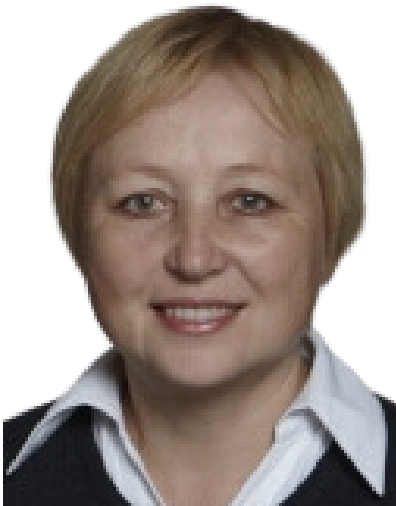
I have been instrumental in advising numerous Ph.D., and Masters students, with best thesis awards in 2011 – 2014, 2016, and 2023. I play a vital role as a co-investigator on many clinical research projects, including NIH and PCORI funded grants, at all stages from study design to manuscript preparation. During 2021-2022, I was a statistical reviewer for JTCVS; currently, I am a statistical reviewer for the Annals of Thoracic Surgery.

YUXIA OUYANG, PHD
Biostatistician

As a biostatistician, I apply my knowledge and skills in research methodology, data management, and statistical modeling to assist faculty, fellows/residents, and students in all statistical and design aspects of randomized trials, observational studies, and feasibility studies. I have particular expertise in longitudinal data analysis, survival analysis, matching methods, and machine learning techniques.

My current concentrated research areas are focused on peri-operative outcome research, hemodynamic and cerebral saturation monitoring, and pain and anesthetic management. Already during my time in the Department I've assisted in several successful grant applications, specifically the Merck funded study on postoperative return of bowel function and the APSF funded study on pulse oximetry accuracy in congenital cardiac surgery.

I have also been collaborating with the Department of Psychiatry on several NIH-sponsored research grants related to lifestyle, blood, and genetic factors affecting the greater brain and cognitive impairment of diabetic individuals.

THE RESEARCH OFFICE

Cynthia Mercedes, MS

Gabrielle Veilleux, BA

Jessenia Lopez, MS

I am a proud New Yorker, born and raised in Manhattan to Dominican parents. I studied Neuroscience at Wheaton College (MA) and returned to NYC to pursue my Master's in Biomedical Science here at the Icahn School of Medicine at Mount Sinai. After defending my thesis, I joined the Anesthesiology, Perioperative and Pain Medicine department as a Clinical Research Coordinator. I have been with the team for 4 years and now am the Clinical Research Manager. I am passionate about women's health and advocacy work, and am excited to join the medical field as a future healthcare provider!
In my free time though, you can find me in a dance studio or relaxing at the spa.

CYNTHIA MERCEDES, MS
Clinical Research Manager

GABRIELLE VEILLEUX, BA
Clinical Research Coordinator

I have been a clinical research coordinator in the Department of Anesthesiology, Perioperative and Pain Medicine for over 2 years. I have worked on a variety of studies related to pain management, novel monitoring technologies, and types of general anesthesia. I graduated from Connecticut College in 2021 with a Bachelor's in Neuroscience, a minor in music, and a certificate in public policy and community action. I have thoroughly enjoyed getting to work with patients, providers, and scientists to help answer some of the most intriguing questions within medicine. In my free time I enjoy acting, going to concerts, and exploring NYC's finest coffee shops.

Hey there! My name is Jess and I have been working in various research settings since 2014, while pursuing my undergraduate degree, and started at Mount Sinai last year. I have a varied experience working on projects in different departments including pediatrics, genetics, public health, medical cannabis, and now anesthesiology. The variety and progress is what I like about working in research!

JESSENIA LOPEZ, MS
Clinical Research Coordinator

NEW & NOTABLE PUBLICATIONS FOR 2023

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Happy New Year!