

# IMPACT REPORT Winter 2024

#### Advanced Cardiovascular Imaging Among Greatest Areas of Potential Impact in Cardiology

#### NIH Support and Donor Investment Accelerate Advances through Van Tassel Innovation Center

Every day in their clinical practice with patients, MHIF's cardiology and vascular specialists continually unearth challenges that need research to improve care. Cardiovascular imaging is an example of the latest technology that MHIF researchers are utilizing to advance care for patients.

Advanced cardiovascular imaging is useful across all cardiovascular subspecialties, and the Van Tassel Innovation Center at MHIF is focused on moving this area of promise forward. MHIF also receives funding for imaging research from the National Institutes of Health (NIH) through a grant that will help accelerate this work through 2024.

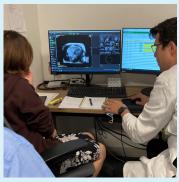
MHIF named the Van Tassel Innovation Center and Endowment to honor Dr. Robert Van Tassel's spirit of innovation and support visionaries for years to come. The Center provides the resources necessary for independent research to answer critical heart and vascular health questions, share the findings with professionals worldwide, and ultimately improve the quality and length of patients' lives.

Donor investment in the Van Tassel Endowment will help ensure MHIF's long-term financial stability and allow researchers to continue groundbreaking, innovative research across a continuum of cardiovascular care — from prevention to diagnosis and treatment. Through the endowment, a gift helps to form the fund's capital that is kept intact over time; only the income from the fund is used for ongoing programs and services. Thus, an endowment gift is the gift that keeps on giving, as it will continue to provide financial support to the Van Tassel Innovation Center for many future generations to come.

## Dr. João Cavalcante Named Inaugural Innovation Chair of the Van Tassel Innovation Center at the Minneapolis Heart Institute Foundation

João Cavalcante, MD, has been named the Inaugural Innovation Chair of the Van Tassel Innovation Center. This Chair supports an Allina Health Minneapolis Heart Institute physician, dedicated to a transformational approach to cardiovascular disease or prevention. Dr. Cavalcante is internationally recognized for his special expertise and research contributions in advanced cardiovascular imaging, in particular cardiovascular magnetic resonance imaging (MRI) and computed tomography (CT).

"I am honored to be named the first Innovation Chair as part of a center that is named after Dr. Robert Van Tassel, MHIF Founder and one of our greatest advocates for innovation," said Dr. Cavalcante. "This Chair also demonstrates



Dr. Cavalcante and the imaging team in the MHIF Core Lab.



An image physicians use as they plan for a transcatheter heart valve replacement or repair done through an artery in the leg.



#### Van Tassel Innovation Center

Continued from front cover

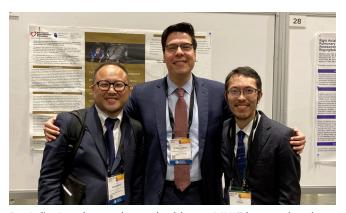
the value of advanced cardiovascular imaging, which is certainly at the core of innovation and a capability that continues to hold great potential in advancing care for patients across so many areas of cardiovascular care."

"Dr. Cavalcante is a brilliant researcher, inclusive leader and widely respected clinician, in short, the perfect choice for this prestigious position within MHIF," said Scott Sharkey, MD, president, and chief medical officer, MHIF. "With Dr. Cavalcante's leadership and donor investment in this work through the Van Tassel Innovation Center, we will advance major breakthroughs for patients suffering with heart disease around the world."

A generous gift from John and Sue Morrison was provided in honor of Dr. John Lesser and designated to support this work. Their gift celebrates Dr. Lesser's commitment to a successful succession in imaging research and Dr. Cavalcante's role in carrying forward innovation patient care through cardiovascular imaging.

Dr. Cavalcante is also director of the MHIF Cardiovascular Imaging Research Center & Core Lab. He also serves as the section head for cardiac imaging at Allina Health Minneapolis Heart Institute®. Dr. Cavalcante has published more than 200 manuscripts, and 7 book chapters and speaks nationally and internationally on cardiovascular imaging. His commitment to education includes training many imaging and research fellows and leading more than 10 international hand-on workshops in both cardiac CT and MRI.

Dr. Cavalcante earned his medical degree in Brazil and came to the United States for his residency and cardiology fellowship at Henry Ford Hospital. Prior to MHIF and the Allina Health Minneapolis Heart Institute, he was appointed chief fellow for the two-year advanced cardiovascular imaging training program at the Cleveland Clinic and spent six years as senior faculty at the University of Pittsburgh Medical Center.



Dr. João Cavalcante (center) with two MHIF international scholars, Drs. Go Hashimoto and Hideki Koike, at ACC 2023.

# Minneapolis Heart Institute Foundation (MHIF) is committed to lifesaving cardiovascular research and education.

Part of that commitment is an ongoing effort to share learnings from MHIF research with physicians and communities around the world. That happens through publications in leading medical journals and at national and international conferences throughout the year.

In 2023, MHIF had more than **600 publications**, posters, abstracts and presentations sharing research to help improve care and outcomes for patients around the world.

Researchers from MHIF attend international conferences throughout the year, sharing learnings from research and tracking innovations and insights from colleagues around the world.

Society of Thoracic Surgeons
Society for Cardiovascular Magnetic Resonance
American College of Cardiology CV Summit
Cardiovascular Research Foundation CTO Plus
Cardiovascular Research Technologies
American College of Cardiology
CRF Technology and Heart Failure Therapeutics
European Society of Cardiology
European Heart Rhythm Association
International Society for Heart and Lung Transplantation
EuroPCR

Society for Cardiovascular Angiography & Interventions
Heart Rhythm Society

Cardiovascular Innovations

American Society for Preventive Cardiology
Society of Cardiovascular Computed Tomography
Heart Failure Society of America

Transcatheter Therapeutics American Heart Association PCR London Valves

## Dr. Robert Hauser's Novel "Blood Summer 1862" Unveils the Untold Story of the Dakota Sioux War in Minnesota



Dr. Robert Hauser, a retired cardiologist and longtime MHIF researcher recently authored a new historical novel, *Blood Summer 1862*, revealing a gripping tale of tragedy, survival, and justice. Set against the backdrop of the Dakota Sioux war in Minnesota, the heart of the narrative follows the plight of a Swedish immigrant family and a devout

Christian Dakota Sioux who becomes their unlikely savior amidst the terror. Dr. Hauser draws inspiration from his own Minnesota roots and weaves together the historical tapestry of this forgotten chapter in American history. The novel is available at major bookstores and online retailers. Dr. Hauser's previous work, *Heart Stories*, focused on the great advances in heart care during his career and culminated in his personal battle with heart disease.

## V

**MHIF** 

## MHIF Valve Science Center on the Biggest Stage in Cardiovascular Research and in the News

Years of effort are invested in research to advance care for patients and the results are shared with the world through international conferences and top-tier medical journals.

The 2023 American College of Cardiology's 72nd Annual Scientific Session Together with World Heart Federation's World Congress of Cardiology (ACC/WCC) in New Orleans is one example of this journey where the Minneapolis Heart Institute Foundation team was proud to stand on one of the biggest stages in cardiology research to share primary outcomes from the TRILUMINATE Pivotal Trial of the TriClip™ (manufactured by Abbott). The new, investigational technology is a catheterbased, non-surgical treatment being studied as an option for tricuspid regurgitation (leaky tricuspid heart valve). The data are part of what the manufacturer uses to seek regulatory approval from the U.S. Food and Drug Administration. Paul Sorajja, MD, Roger L. and Lynn C. Headrick Family Chair for the MHIF Valve Science Center and national principal investigator for the TRILUMINATE Pivotal trial, presented the late-breaking, clinical trial data at ACC.



### The NEW ENGLAND JOURNAL of MEDICINE

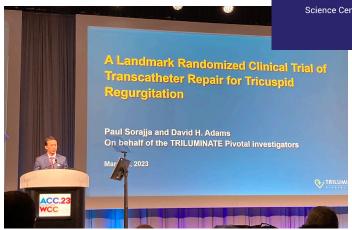
Dr. Sorajja is also lead author of the manuscript, "Transcatheter Repair for Patients with Tricuspid Regurgitation," simultaneously published online in the *New England Journal of Medicine*.

"The data confirm the benefit of this advanced repair option for tricuspid valve disease that can safely address symptoms of the disease and allow patients to live life to the fullest," said Dr. Sorajja. With support from a multi-disciplinary team across cardiac surgery and imaging, we are proud to drive ongoing innovation that is changing the course of tricuspid valve disease for patients."

#### Key Findings from the TRILUMINATE Pivotal Study

The trial met its composite primary endpoint demonstrating superiority of the TriClip system compared to the control group (win ratio 1.48, p=0.02), primarily driven by improvement in quality of life. Other positive findings include:

- Significant reduction in TR grade. Significant reduction in TR to moderate or less (grade < 2) was achieved in 87% of patients with the device at 30 days vs. 4.8% in the control group, with TR reduction sustained and durable at one year.
- Significant improvement in quality of life. 50% of patients who received the device achieved at least a 15-point improvement in the Kansas City Cardiomyopathy Questionnaire (KCCQ) score (a self-assessment of social abilities, symptoms and quality of life) at one year vs. 26% in the control group.
- A strong safety profile. At 30 days, only 1.7% of patients who received the device experienced major adverse events, with no urgent surgery or endocarditis. There were no occurrences of device embolization or thrombus.



MHIF was the first to provide this technology to a patient (first-in-human procedure) in 2017, as part of the early feasibility study. MHIF was also first-in-the-world to enroll a patient in the TRILUMINATE Pivotal trial in September 2019. The team carried that commitment to innovation as a top enroller (enrolling the first and largest number of patients) of all 75 clinical sites across the United States, Canada and Europe.

Severe tricuspid regurgitation is a debilitating condition that is often associated with morbidity and poor quality of life. In the U.S. alone, approximately one in 30 people over the age of 65 have moderate to severe tricuspid regurgitation.

#### The New Hork Times

We celebrate this important spotlight on behalf of patients living with the debilitating effects of heart valve disease, sharing the *New York Times* article published following ACC: *New York Times*, March 4, 2023: New Treatment Could Help Fix the Heart's 'Forgotten Valve'.

nytimes.com/2023/03/04/health/tricuspid-valve-clip-leakage.html

The Joseph F. and Mary M. Fleischhacker Family Foundation funded MHIF digital applications across heart valve and coronary artery disease; the work to date includes four apps with more than 60,000 downloads around the world.



Valve in Valve (Aortic)



Valve in Valve (Mitral)



Valve PPM



PCI: Opening Coronary Arteries

#### Center for Coronary Artery Disease

# CORONARY Center for Coronary Artery Disease

# Announcing the 2023-2024 Frank J. and Eleanor Maslowski Charitable Trust CHIP-CTO Fellow at the MHIF Center for Coronary Artery Disease

Complex High Risk Indicated Percutaneous Coronary Interventions (CHIP) - Chronic Total Occlusion (CTO) Fellowship

The Center for Coronary Artery Disease at the Minneapolis Heart Institute Foundation® (MHIF) is dedicated to improving clinical practice and ultimately discovering lifesaving treatments through innovative cardiovascular research. As part of the educational aim for the center, a one-year fellowship was created to provide a robust experience to an individual interested in training in complex percutaneous coronary interventions and interventional cardiology research.

MHIF welcomed Ahmed Al-Ogaili, MD, as the Frank J. and Eleanor Maslowski Charitable Trust CHIP-CTO Fellow as of July 1, 2023.

Dr. Al-Ogaili joins us from Rush University Medical Center, Chicago, where he completed his training in interventional

cardiology. He obtained his medical degree from Jordan University of Science and Technology in Jordan. Subsequently, Dr. Al-Ogaili moved to the United States and completed his Internal Medicine residency and Cardiovascular Disease fellowship at Cook County Hospital in Chicago. During his training he served as a Chief medical resident and Chief cardiology fellow and won multiple clinical excellence awards.



Throughout his medical training, Dr. Al-Ogaili has been actively involved in research, with presentations at the major cardiology congresses and peer-reviewed publications. He is Board Certified in Internal Medicine, Nuclear Cardiology, Echocardiography, Cardiac CT, and cardiovascular diseases.

The Center for Coronary Artery Disease at the Minneapolis Heart Institute Foundation is dedicated to improving clinical practice and ultimately discovering life-saving treatments through innovative cardiovascular research. The Frank J. and Eleanor Maslowski Charitable Trust CHIP-CTO Fellowship Program is a 1-year hybrid clinical and research training program for Interventional Cardiologists focused on specialized training in complex and high-risk percutaneous coronary interventions, including patient selection, procedural planning, use of advanced interventional techniques, and prevention and management of complications. The program also includes a clinical research focus on complex percutaneous coronary interventions and coronary artery disease.

The curriculum for the program consists of:

- Chronic total occlusion (CTO) interventions
- Advanced intravascular imaging and physiology
- Bifurcations, thrombus management, treatment of acute coronary syndromes
- · Calcification and tortuosity
- · Hemodynamic support and treatment of cardiogenic shock
- Complication prevention and management, radiation safety
- Research in complex percutaneous coronary interventions and coronary artery disease

MHIF is strongly positioned for success with the Center for Coronary Artery Disease through its partnership with 70+ Minneapolis Heart Institute® cardiologists, who see more than 50,000 individual patients at more than 60,000 clinic visits each year at Abbott Northwestern and United Hospitals.

MHIF is also pursuing a newly funded international scholar to investigate Type 2 heart attacks, made possible by an anonymous donor.

# MHIF Center for Coronary Artery Disease Current Research Highlights:

REBIRTH is a randomized prospective trial that will compare radial (wrist) artery access to state-of-the-art femoral (groin) artery access for cardiac catheterization and PCI procedures. The objective of this trial is to determine the optimal method for obtaining arterial access in various clinical settings, improve patient outcomes, and assess overall safety and success.

PROGRESS-BIFURCATION is a registry following blockages that occur when there is narrowing of a main coronary artery and an adjoining sidebranch vessel. These are more challenging to treat than blockages that do not involve side-branch vessels, because current stents do not come in a "Y" configuration. The registry will examine current strategies for treating bifurcation (branching) coronary artery lesions, and determine the impact of new techniques and strategies on clinical outcomes.

#### Joseph F. Novogratz Family Heart Rhythm Center

# MHIF RHYTHM Joseph F. Novogratz Family Heart Rhythm Center

#### PATIENT STORY: ALICIA BRAVO

#### Athlete wants bystanders to 'be brave'

Alicia Bravo experienced sudden cardiac arrest (SCA) six years ago at age 37 – "in the best shape of my life" – as she swam in a lake, training for a triathlon.

Thanks to her father and other bystanders, who performed manual CPR until first responders arrived, she survived. She's grateful to be alive. Since that time, Alicia has been working with her physician, Dr. Jay Sengupta, at the Allina Health Minneapolis Heart Institute to care for her heart.

"My SCA redefined who I was," she says, and the transformation brought frustration and grief as well as gratitude."

As part of Alicia's ongoing care, she follows regular visits with her cardiologist Dr. Sengupta, who also is the director of the Joseph F. Novogratz Family Heart Rhythm Center at the Minneapolis Heart Institute Foundation. This center focuses on research that will bring new insights to the diagnosis and treatment of patients who are impacted by arrhythmias (irregular and life-threatening heart rhythms). For Alicia, it means she is part of a system that can help search for answers related to why she had her original cardiac event. So far, they do not think there is any hereditary link in Alicia's case, but ongoing research like that will continue to further the understanding of how to best manage her case.

Alicia is an ER nurse at Hennepin County Medical Center (HCMC). Since her SCA, Alicia has transferred the passion she once poured into her fitness and triathlon training into making sure as many as people as possible understand the importance of bystander hands-only CPR. "Part of my own healing was making sure people won't have to go through what I went through. I want everyone to be able to help. My mission in life is to teach hands-only CPR."

#### Be brave

The biggest obstacle to saving lives with hands-only CPR is a bystander's personal discomfort with touching a person they don't know. According to the American Heart Association, bystander CPR can double or triple a person's chance of survival.

Alicia trains her own colleagues in the ER for recertification in BLS (basic life support), but her bigger mission is to help non-medical people understand they too can help someone in cardiac arrest. Alicia knows



better than most people

that "SCA can happen to anyone anywhere at any time. If you can learn these skills and be brave enough to step into help, you could save someone's life. My dad's hands were my heartbeat when I didn't have one."

In her personal time, Alicia supports and conducts training in hands-only CPR for groups: hockey teams, churches, neighborhood groups and others. She helps people understand their natural reticence – and overcome it – to save lives.

See Alicia's story as featured on KSTP when the Novogratz Family Center for Cardiovascular Health was established: <a href="kstp.com/kstp-news/top-news/5m-donation-will-help-minneapolis-heart-institute-research-heart-rhythm-conditions/">kstp.com/kstp-news/5m-donation-will-help-minneapolis-heart-institute-research-heart-rhythm-conditions/</a>

#### Committed to Advancing Heart Rhythm Research

Mary Ann and Looe Baker created the 5-year Baker Genetic Arrhythmia Scholar role to develop data and conduct research on arrhythmias that may have familial links.

Carolyn and Buzz Pierce created the 5-year Pierce Heart Rhythm Scholar for a physician who will further develop data in the arterial fibrillation registry, and support general heart rhythm research and analysis, sharing the results with other providers and patients.

#### Penny Anderson Women's Cardiovascular Center

# WOMEN'S Penny Anderson Women's Cardiovascular Center

#### Research Highlight: The Fourth Trimester

The Penny Anderson Women's Cardiovascular Center published original research focused on health equity and outcomes in the fourth trimester of pregnancy (defined as the first 12 weeks after delivery). Cardiovascular disease (CVD) is the leading cause of maternal death, accounting for more than one-third of pregnancy-related deaths. The fourth-trimester study found low levels of guideline-directed care related to conditions that develop during pregnancy, as well as significant disparities in women of color and those on Medicaid who were less likely to receive follow-up to reduce lifetime risk for CVD. The full article, "Fourth Trimester: Assessing Women's Health Equity and Long-Term Cardiovascular Outcomes in a Large Midwestern Health System in 2021," was published in *Circulation*.

"Gestational diabetes, gestational hypertension and preeclampsia are all significant pregnancy-related risk factors for developing cardiovascular disease in one's lifetime," said Courtney Jordan Baechler, MD, MS, medical director of Health Equity and Health Promotion at MHIF and senior author of the publication. "This study found that many women who developed these pregnancy-related conditions did not have evidence-based follow-up to adequately reduce their long-term risk. Given the known cardiovascular disparities among women along racial and socioeconomic lines, postpartum care is a critical step toward prevention."

Blood pressure screening is one example of an important assessment in the first trimester following delivery, especially in women with preeclampsia (a serious blood pressure condition that develops during pregnancy). In the study only 61 percent were prescribed guideline-directed medications and only 12 percent received a referral for risk reduction to a

cardiologist, primary care program, dietitian or lifestyle behavior change program. There were also differences noted across racial groups.

"It's important that we advocate for innovative, creative models that best meet the needs of the patients experiencing the largest disparities," said Dr. Jordan Baechler. "The goal is to support women-- many of whom are balancing young children, careers, suboptimal insurance coverage, health care distrust, lack of transportation, and other known social barriers of heart health and care access.

The fourth-trimester study was designed to understand the proportion of women who received auidelinedirected care within six months postpartum, including receiving medication or riskreduction resources for elevated blood pressure and/or blood glucose. The study also compared rates of care between racial groups to assess health equity.



This research was supported and accelerated by the generosity of the Dubes Family, who provided funding for the MHIF women's clinical research intern.

# 

2022 IMPACT RESULTS

# **Advancing Care and Outcomes for Patients Around the World**



Formed new relationships in the community to contribute change around health equity and access to care



**3,000+ visits with patients** who have hope and options through research studies

Research advancing

options across all areas of cardiovascular medicine and care



350+ new patients enrolled in research each year; 220+ active studies with 2,200+ patients at any given time



**650+ record high of publications**, abstracts, podium presentations and invited talks at international conferences

11,000+ hours of professional and community education each year reaching 4,000+ attendees Please find the complete 2022 Annual Report online mplsheart.org/2022Report

Thank you for being part of a community that believes in lifesaving heart research!



#### Nolan Family Center for Cardiovascular Health



#### 2023 Prevention Fellow at the Nolan Family Center for Cardiovascular Health

The Minneapolis Heart Institute Foundation is pleased to announce that Dr. Felipe Martignoni has been selected to serve as its cardiovascular prevention fellow for 2023-2024 in the Nolan Family Center for Cardiovascular Health.

Dr. Martignoni completed medical school, a cardiology fellowship and echocardiography fellowship at Hospital Universitario de Santa Maria in Brazil. He then came to the US where he completed an internal medical residency at the Billings Clinic in Billings, Montana where he continues to practice. In August 2023, Dr. Martignoni completed a 10-day Seminar on the Epidemiology and Prevention of Cardiovascular Disease and Stroke offered by the American Heart Association.

As an MHIF cardiovascular prevention research fellow, Dr. Martignoni will focus on conducting prevention research around Lipoprotein (a), preventive medication use in STEMI patients and dietary factors associated with coronary plaque development.

The fellowshiph builds expertise in:

- Optimal methods of cardiovascular risk assessment, including coronary artery calcium scoring
- The importance of nutrition, physical activity, and smoking cessation in cardiovascular prevention as well as optimal counseling methods to implement behavioral change
- The diagnosis and treatment of complex lipid disorders, including familial hypercholesterolemia
- The diagnosis and treatment of cardiometabolic disorders, including type 2 diabetes
- The diagnosis and treatment of hypertension

In addition to Dr. Miedema, faculty for the fellowship include Dr. Courtney Jordan Baechler, MHIF medical director health equity and health promotion; Dr. Thomas Knickelbine, director of lipid research; Susan White, RDN, clinical program lead for cardiovascular health; and Gretchen Benson, RDN, program director for the Nolan Family Center for Cardiovascular Health.

# Dr. Michael Miedema Recognized by Harvard T.H. Chan School of Public Health with 2023 Emerging Public Health Professional Award

The Harvard T.H. Chan School of Public Health announced that Michael Miedema, MD, MPH, is the recipient of the prestigious 2023 Emerging Public Health Professional Award. The award recognizes early-career public health achievements and contributions of Harvard Chan School graduates who received their degree within the past 10 years. This award is one of four 2023 Alumni Awards granted to leading alumni chosen by their peers through a nomination and voting process.

Dr. Miedema is a cardiologist, researcher and director of the Nolan Family Center for Cardiovascular Health at the Minneapolis Heart Institute Foundation® (MHIF) where he focuses his research on determining the optimal individual and population-based approaches for the prevention of cardiovascular disease. He maintains an active clinical practice as director of cardiovascular prevention at Allina Health Minneapolis Heart Institute® where he focuses on cardiovascular prevention, seeing over a thousand patients each year. In 2022, he was named the team cardiologist for the Minnesota Timberwolves.

Dr. Miedema obtained his medical degree and completed a cardiovascular fellowship at the University of Minnesota Medical School and a master's degree in public health from the Harvard T.H. Chan School of Public Health. The Harvard Chan School announced the recipients of the awards during their alumni weekend events September 28–30.



#### **Clinical Research Internship**

The 2023 Clinical Research Internship class was the 21st group of interns for this important program. Eleven interns from around the country contributed to 13 different groundbreaking research projects. Made possible by the generous contributions of individual donors, MHIF offers one of the most outstanding and unique internship opportunities available to undergraduates who are premed or planning a career in medicine.

Since 2002, 235 MHIF research interns have contributed to 235 posters and presentations at international scientific sessions, and 219 publications in peer-reviewed medical journals.



#### **MHIF International Scholar Program**

In 2023, MHIF hosted nine international scholars, accelerating ground-breaking physician-initiated research and spreading the lessons learned across the globe. Since 2017 the program has brought practicing physicians from countries around the world for a one- or two-year period to work directly with Allina Health Minneapolis Heart Institute® physicians and advance MHIF cardiovascular research.

Research scholars bring a wealth of diversity and knowledge to the MHIF team, helping design and conduct clinical studies of all types under the supervision of physician mentors. Research scholars also assist in disseminating important MHIF research findings by publishing articls in peer-reviewed journals and submitting abstracts and challenging cases for presentation at international scientific conferences. To date, the program has welcomed scholars from China, Japan, Brazil, Hungary, Turkey and Greece.

#### Current MHIF Fellows and Scholars Supported by Philanthropic Gifts

Women's Health Equity Fellow – anonymous

**CCAD Scholar** – anonymous funding for PROGRESS Registries

**CCAD Scholar** – anonymous funding for REBIRTH trial

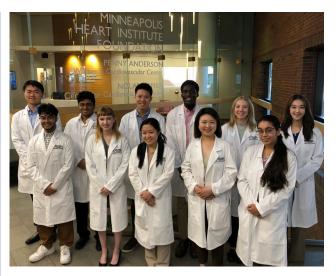
Sens Sr. CCAD Scholar – Drs. Mary Ann and Donald Sens

Frank J. and Eleanor A. Maslowski CCAD CHIP-CTO Fellow

Baker Genetic Arrhythmia Scholar - Mary Ann and Looe Baker

**Raymond Ames and Barbara Thorndike CCAD Scholar** – Raymond Ames and Barbara Thorndike

Pierce Heart Rhythm Scholar - Carolyn and Buzz Pierce



# The 2023 class of research interns and their research projects

**Maya Palmer** Lead Intern/Dubes Family Intern Peripartum Cardiomyopathy Registry

**Tremayne Ansani** Rose Peterson Memorial Intern
Temporal change of mitral stenosis in patients with MAC after successful aortic valve intervention

**Paige Carlson** Heart Rhythm Intern Electrical Dyssynchrony Mapping (EDM) and LV Lead Position in Patients with CRT

**Subhan Khalid** Center for Coronary Artery Disease Intern Frequency and outcomes of brachytherapy use in stent failure percutaneous coronary intervention

**Rina Li** Leonardus Loos and Shelley Holzemer Intern Antithrombotic Therapies for Patients Following Endovenous Recanalization, Meta-analysis

Jeffery Liu Discovery Intern

The Influence of NOACs on Bleeding and Cardiac Complications Following STEMI

**Ishan Nadkarni** Joseph F. Novogratz Heart Rhythm Science Center Intern

Clinical Outcomes of 3830 4Fr Pace/Sense Leads for Septal and Conduction System Pacing

Le Nguyen Richard Kantrud Intern

Impact on 2nd prosthesis choice on early surgical aortic bioprosthetic failure

**Sydney Peng** Cline and Dianne Hickok Intern Impact of Thrombectomy on the Outcomes of Patients with Coronary Thrombus

**Pranathi Pilla** Pete Pierce Intern CardioMEMS registry

**Kayla Wong** Leonardus Loos and Shelley Holzemer Intern Change in mitral valve regurgitation (functional vs degenerative) after TAVR

For more information about how to support the MHIF Clinical Research Internship Program, please contact Nancy Meyer Wilson, <a href="mailto:nmeyerwilson@mhif.org">nmeyerwilson@mhif.org</a> or 763-990-3831.