



2019-2020

**FROEDTERT HOSPITAL**  
HEART AND VASCULAR  
**OUTCOMES**

# WELCOME TO THE 2019-2020 HEART AND VASCULAR OUTCOMES BOOK

Measuring and understanding outcomes of medical treatments promotes quality improvement. Created by Froedtert & the Medical College of Wisconsin Froedtert Hospital and Cleveland Clinic, this Outcomes Book is designed for the physician audience and contains a summary of surgical and medical treatments, with data on patient volumes and outcomes and a review of new technologies and innovations.



# CLEVELAND CLINIC'S SYDELL AND ARNOLD MILLER FAMILY HEART, VASCULAR & THORACIC INSTITUTE CHAIRMAN'S LETTER

We are proud to present the 2019-2020 outcomes from the heart and vascular programs at Froedtert & the Medical College of Wisconsin Froedtert Hospital, which has an ongoing collaborative relationship with Cleveland Clinic's Miller Family Heart, Vascular & Thoracic Institute to promote best practices and optimal quality in cardiovascular caregiving.

This overview of outcomes, volumes and quality metrics reflects some of the fruits of that collaboration, which involves members of the Froedtert & MCW Heart and Vascular team and ranges from physicians and other health care providers to administrative personnel. It refers to national benchmarks established by the American College of Cardiology and Society of Thoracic Surgeons and stems from our shared commitment to give every patient the best possible outcome and experience. We believe that transparency around clinical outcomes is essential to improving quality and efficiency as we all continue to move toward ever more value-based care delivery.

Cleveland Clinic's Heart, Vascular & Thoracic Institute is gratified by the success of our collaborations with our affiliate and alliance members like Froedtert Hospital. Our goal is to develop relationships with providers nationwide to enhance the quality and value of cardiovascular care in our communities. We welcome your comments and feedback, and we thank you for your interest.

Sincerely,



**Lars G. Svensson, MD, PhD**  
Chairman, Sydell and Arnold Miller Family  
Heart, Vascular & Thoracic Institute  
Cleveland Clinic



# FROEDTERT & THE MEDICAL COLLEGE OF WISCONSIN HEART AND VASCULAR SERVICES DIRECTOR LETTER

With pleasure and pride, we present the 2019-2020 Froedtert & the Medical College of Wisconsin Froedtert Hospital *Heart and Vascular Outcomes Book*. This third edition details clinical performance at Froedtert Hospital in 2019-2020 and emphasizes our ongoing commitment to using data analytics to provide transparent clinical quality metrics.

The expertise of our physician teams and the strength of our cardiovascular programs define the quality of care we provide to patients. This expertise, combined with access to innovative technology, allows us to offer the most current treatments for all cardiovascular conditions, including heart failure, aortic disease, arrhythmia and heart valve disease. Our treatment offerings encompass the latest in mechanical circulatory devices, endovascular approaches for complex aortic aneurysms, minimally invasive ablation procedures and expertise in complex minimally invasive aortic and mitral valve repairs. Treatments available continue to increase, and access to our services is expanding as our team attracts new experts, including some of the nation's most distinguished physicians and researchers.

The impact of the coronavirus pandemic on our health care network and health care providers throughout the world cannot be overstated. COVID-19 has brought unprecedented demands on all aspects of health care and quickly ushered in changes in the safest ways to treat patients. We pivoted to virtual visits whenever possible and took precautions throughout our facilities to enhance patient safety and reduce risk, exposure and stress when in-person care is needed. For people with severe respiratory distress due to COVID-19, treatment through our ECMO Program provides support for their heart and lungs, allowing their bodies more time to fight the coronavirus. Our ECMO Program is designated as a Center on Path to Excellence in Life Support by the Extracorporeal Life Support Organization.

We value our relationships with referring physicians and partner with them for long-term follow-up care. Our goal is to deliver the best in cardiovascular care so patients can continue their care locally with their referring physician.

This *Outcomes Book* is created in collaboration with the Cleveland Clinic Heart, Vascular & Thoracic Institute, with whom we began a relationship in April 2016. Our partnership with Cleveland Clinic leads to best practice development and program implementation, resulting in better outcomes for patients. Together, we are dedicated to delivering world-class clinical and surgical heart and vascular care for each patient.



A handwritten signature in black ink that reads "J Saucedo".

**Jorge Saucedo, MD, MBA, FACC, FAHA, FSCAI**

Professor; Chief, Cardiovascular Medicine; and Director, Heart and Vascular Services with the Froedtert & the Medical College of Wisconsin health network

# WHAT'S INSIDE

---

About the Froedtert & the Medical College of Wisconsin health network.....	4
Froedtert & the Medical College of Wisconsin Heart and Vascular Program Highlights.....	6
Complex Cardiac Patients Benefit From Multidisciplinary Care.....	10
How ECMO Can Effectively Treat COVID-19 Patients .....	12
Clinical Outcomes: Vascular and Endovascular Surgery.....	14
Kathy's House Provides Home Away From Home.....	17
Clinical Outcomes: Cardiovascular Surgery .....	18
Clinical Outcomes: Isolated Coronary Artery Bypass Graft .....	20
Clinical Outcomes: Structural Heart.....	21
Patient Experience .....	24
Clinical Outcomes: Extracorporeal Membrane Oxygenation .....	29
Clinical Outcomes: Interventional Cardiology .....	30
Clinical Outcomes: Electrophysiology.....	32
Clinical Research .....	34
Physician Listing.....	36
Contact Information .....	41

# ABOUT THE FROEDTERT & THE MEDICAL COLLEGE OF WISCONSIN HEALTH NETWORK

The Froedtert & the Medical College of Wisconsin regional health network is a partnership between Froedtert Health and the Medical College of Wisconsin supporting a shared mission of patient care, innovation, medical research and education. Our health network operates eastern Wisconsin's only academic medical center and adult Level I Trauma Center at Froedtert Hospital, Milwaukee, an internationally recognized training and research center engaged in thousands of clinical trials and studies. The Froedtert & MCW health network, which includes five hospitals, a Community Hospital with two locations, nearly 2,000 physicians and more than 40 health centers and clinics, draws patients from throughout the Midwest and the nation. In our most recent fiscal year, outpatient visits exceeded 1.2 million, inpatient admissions to our hospitals were 52,807 and visits to our network physicians totaled 947,136.

## About Froedtert Hospital

Froedtert Hospital, the primary adult teaching affiliate for the Medical College of Wisconsin, is a 719-bed (as of October 2020) academic medical center that delivers advanced medical care. Froedtert Hospital is nationally recognized for exceptional physicians and nurses, research leadership, specialty expertise and state-of-the-art treatments and technology. It serves as a referral center for advanced medical practice care in 37 specialties and is a major training facility with more than 1,000 medical, nursing and health technical students. In partnership with the Medical College of Wisconsin, it is also a respected research facility with more than 2,000 research studies, including clinical trials, conducted every year.

## About Heart and Vascular Services

Our team of nationally and internationally recognized cardiovascular specialists offers the full spectrum of specialized treatments for all forms of heart and vascular disease, from the common to the complex. Our team approach is central to the care we deliver, helping us thoroughly provide optimal diagnostic and treatment approaches for each patient. We regularly participate in clinical research aimed at providing the best value to patients by delivering the right care at the right time in the right place. Our highly trained physicians and researchers are at the leading edge of cardiovascular care. With the comprehensive resources of eastern Wisconsin's only academic medical center behind them, they are advancing the level of cardiovascular care available to patients in eastern Wisconsin and beyond.





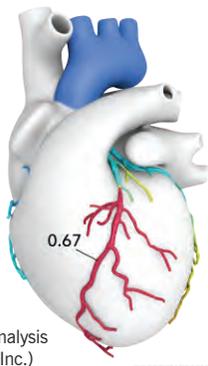
Opened in 2015, the Froedtert & the Medical College of Wisconsin Heart and Vascular Center, located within the Center for Advanced Care, provides patients an enhanced care experience where all their cardiovascular needs can be met under one roof.

# FROEDTERT & THE MEDICAL COLLEGE OF WISCONSIN

## HEART AND VASCULAR PROGRAM HIGHLIGHTS

**Adult Congenital Heart Disease** — Our Adult Congenital Heart Disease Program is one of the busiest in the nation. Our team of board-certified physicians provides a range of care options for patients with congenital heart disease, from testing and diagnosis to treatments including medication management, minimally invasive procedures, interventional procedures, surgery and follow-up care.

**Advanced Cardiac Imaging** — A multidisciplinary team of cardiologists, cardiac electrophysiologists and radiologists uses the latest diagnostic technology, including cardiac PET, cardiac MRI, CT, 3D echocardiograms and HeartFlow® FFR<sub>CT</sub> Analysis, which often eliminates the need for invasive diagnostic procedures. Froedtert & MCW Froedtert Hospital is among an elite group of hospitals that can safely perform MRIs on adult patients with pacemakers or defibrillators. The health network's commitment to quality is evidenced by the fact that all echocardiography laboratories in the health network are accredited by the Intersocietal Accreditation Commission.



Artistic interpretation of the HeartFlow Analysis 3D model (image courtesy of HeartFlow Inc.)

**Aortic Disease** — Our Aortic Disease Program includes cardiac and vascular specialists with expertise in treating aortic defects, often from within the artery using minimally invasive remote access. Our specialized hybrid operating room combines surgical and interventional services with state-of-the-art, robotically controlled X-ray imaging.

**Cardio-Oncology** — The Cardio-Oncology Program brings together a multidisciplinary group of specialists from the cardiovascular and cancer teams. The team provides patients who are at an increased risk for cardiovascular disease due to cancer treatment a comprehensive resource for prevention strategies and early-stage management. Working with patients, caregivers develop personalized care plans prior to cancer treatment that manage cardiovascular risk without diminishing the effectiveness of the patient's cancer treatment regimen.

**Cardiovascular Wellness** — The health network emphasizes not only treating cardiac disease, but also preventing it and helping patients maintain long-term cardiovascular health. Our Cardiovascular Wellness Program focuses on managing patients at risk for cardiac disease through lifestyle modifications, patient education and, when a heart event occurs, cardiac rehabilitation. Our team is currently the only one in Wisconsin to offer an Intensive Cardiac Rehabilitation (ICR) Program. ICR builds on traditional cardiac rehabilitation by offering more education and nutritional workshops, in addition to heart-healthy exercise.

**Dysrhythmia** — The Froedtert & MCW team of experienced cardiac surgeons and electrophysiologists is armed with the latest in diagnostic and treatment options for highly individualized dysrhythmia treatment. As part of an academic health network, the team of providers continues to be on the leading edge of advanced treatment options, including cryoballoon ablation and WATCHMAN™ device implantation, which can eliminate the need for long-term anticoagulant use in patients with nonvalvular atrial fibrillation. The team also has expertise in complex device management and lead extraction, providing a long-term resource for patients with implanted devices.



WATCHMAN left atrial appendage closure device (image courtesy of Boston Scientific). ©2018 Boston Scientific Corp. or its affiliates. All rights reserved.

**Heart Disease in Pregnancy** — The Heart Disease in Pregnancy Program offers specialized care before, during and after pregnancy for women at high risk for heart disease or those with a preexisting cardiovascular condition. Care provided through the program may include preconception counseling and risk stratification, antenatal care including development of an individualized labor plan, access to fetal echocardiography, multidisciplinary care during labor and delivery and coordinated postpartum care and counseling.

**Hereditary Hemorrhagic Telangiectasia** — Our Hereditary Hemorrhagic Telangiectasia (HHT) Program is one of only a few in the country designated as a Center of Excellence. It is the only program of its kind in Wisconsin and part of a short list of clinics in the Midwest dedicated to screening and managing HHT. Our program follows international, evidence-based guidelines for screening and management, offering a full spectrum of coordinated care, treating HHT as a lifelong condition. Our team includes a variety of specialists who offer genetic counseling, diagnostic testing and treatment throughout the continuum of the disease, all while coordinating with the patient's primary care physician.

**Hypertrophic Cardiomyopathy** — The Hypertrophic Cardiomyopathy (HCM) Program offers a comprehensive service for patients diagnosed with or suspected to have HCM. The multidisciplinary team, including board-certified cardiologists with extensive training and experience in the treatment of HCM, collaborates to ensure patients receive confirmation of diagnosis, evaluation for and treatment of symptoms, risk stratification for sudden cardiac death and thorough education about appropriate family screening. Additionally, as part of the only academic health network in eastern Wisconsin, the team actively participates in research, both on-site and through collaborative opportunities with national genetic and cardiovascular centers. This ensures patients have access to best-practice treatment approaches as soon as they become available.

**Peripheral Arterial Disease** — The Froedtert & MCW Peripheral Artery Disease (PAD) Program is led by a multidisciplinary team of board-certified, fellowship-trained vascular medicine specialists, vascular surgeons and vascular and interventional radiologists. Together, they work to ensure each patient's care is individualized for their particular condition. From screening to treatment with PAD rehabilitation, medication management or minimally invasive surgical options, we offer the latest options for your patients no matter where they are in their treatment process.

**Women's Heart Disease** — The Women's Heart Disease Program brings together one of the largest teams of female board-certified cardiologists in Wisconsin. The program's goal is to partner with women to maintain or improve their heart health. Using leading-edge diagnostics, genetic testing and cardiovascular treatments, providers can detect and treat obvious or subtle indicators of heart disease. The program also has the distinct advantage of providing women direct access to physician experts in obstetrics and gynecology, cancer care and other specialties if further care is needed. Working together, caregivers can provide individualized diagnoses and treatments for the best possible outcomes no matter how complicated the situation.

**Venous Disease** — Our nationally recognized vascular experts work with all types of venous disease every day, from mild to life-threatening conditions. Our program provides patients access to the very latest in diagnostic testing and treatment options. Testing options include a noninvasive vascular lab where tests to assess blood flow and locate blockages in blood vessels are completed without the use of needles, catheters, dye or radiation. Treatment options are individualized to each patient, ranging from lifestyle changes to minimally invasive endovascular therapy.

# FROEDTERT & THE MEDICAL COLLEGE OF WISCONSIN HEART AND VASCULAR PROGRAM HIGHLIGHTS

## Comprehensive Heart Failure and Transplant

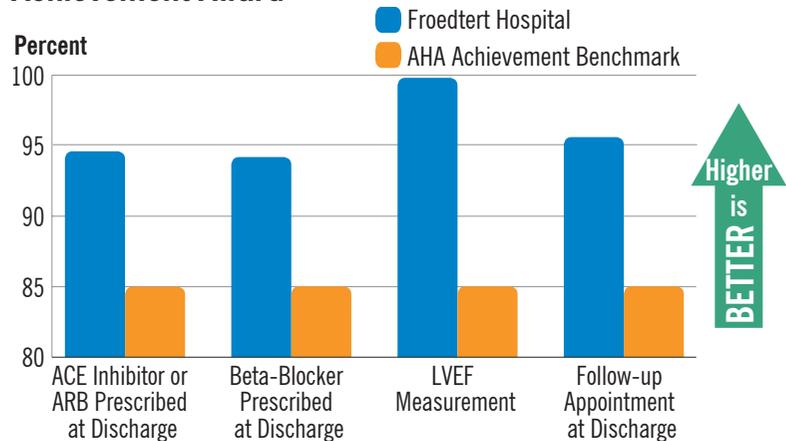
— The Comprehensive Heart Failure and Transplant Program provides patients with access to a highly experienced team of advanced heart failure cardiologists and heart transplant surgeons. Individualized medical therapy is the first treatment approach for heart failure patients and part of the full spectrum of treatment options. These treatment options include managing heart failure patients with the latest technology, such as CardioMEMS™, a remote monitoring system that allows providers to monitor a patient's heart pressure and adjust medications before the patient's health declines. In addition, the program offers patients the latest in available short-, intermediate- and long-term mechanical circulatory support, including total artificial hearts (TAHs) and ventricular assist devices (VADs), such as HeartWare™ and HeartMate 3™. Froedtert Hospital is one of only three providers in Wisconsin certified by The Joint Commission and recognized by the Centers for Medicare & Medicaid Services as a VAD Destination Therapy Program. If patients require transplantation, they will be treated by some of the most experienced transplant surgeons in the country. As part of an academic health network, the team also participates in and conducts substantial research, which enables them to further understand the causes of heart failure and identify innovative treatments, including increasingly sophisticated VADs and TAHs.

HeartMate 3 left ventricular assist device (image courtesy of Abbott)



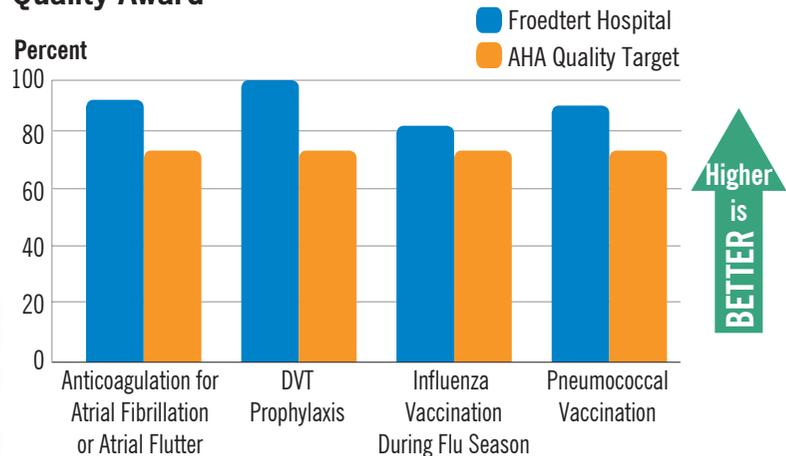
## American Heart Association Get With The Guidelines® – Heart Failure Achievement Measures

### Achievement Award



ACE = angiotensin-converting enzyme, AHA = American Heart Association  
ARB = angiotensin receptor blocker, LVEF = left ventricular ejection fraction  
Source: AHA Get With The Guidelines CY 2019

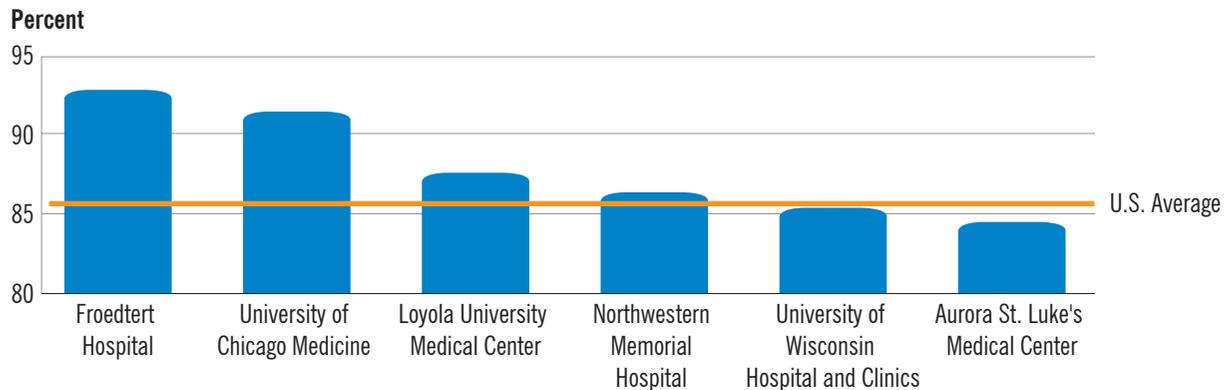
### Quality Award



DVT = deep vein thrombosis  
Source: AHA Get With The Guidelines CY 2019

## Heart Transplant – Three-Year Adult Patient Survival Rate

The following chart illustrates Froedtert Hospital's heart transplant patient three-year survival outcomes compared to the U.S. national average and other centers in our region.



Source: Scientific Registry of Transplant Recipients, *srrt.org*, Aug. 2020

**Valvular Disease** — The Valvular Heart Disease Program provides a dedicated and coordinated approach to diagnosing and treating all types of valve disease. The collaborative, multidisciplinary team uses best-practice techniques, meeting regularly to discuss the care of each patient and develop personalized treatment plans. From medical management to advanced surgical options for valve repair and replacement, the team has the expertise to treat each patient no matter the concern. These options include a robust transcatheter aortic valve replacement (TAVR) clinic, which performs most procedures without general anesthesia, resulting in an average length of stay in the hospital of one day. We are the only hospital in Wisconsin to perform TAVR using the Sentinel™ Cerebral Protection System in every eligible patient. In addition, the team is skilled in performing complex valve repairs and replacements, such as transcatheter paravalvular leak closures, valve-in-valve replacements and MitraClip™ procedures.

# COMPLEX CARDIAC PATIENTS BENEFIT FROM MULTIDISCIPLINARY CARE

At an academic center like Froedtert & the Medical College of Wisconsin Froedtert Hospital, complex heart patients are more the rule than the exception. To give them the advanced care they require, as well as to collaborate with community physicians, Froedtert & MCW specialists have developed a multidisciplinary approach centered on case conferences.



Paul Pearson, MD, PhD, cardiothoracic surgeon and MCW faculty member, defined the characteristics that make heart patients complex.

“One category is patients with a simple cardiac problem along with other medical complications, for example, coronary artery blockages with some level of kidney failure, lung failure or other conditions,” he

said. “The other category is patients with a complex heart problem like valve disease, who have had previous surgery or intervention and now need additional therapies.”

Previously, patients like these might have relied completely on the treatment recommendations of a single provider or, conversely, sought recommendations from multiple specialists not working together, and then attempted to make a decision on their own.

## The Experience of Many for One

“We offer a group of physicians with different areas of expertise in treating the same problem, who work together to review these complex cases and come to a consensus about the best therapy,” Dr. Pearson said. “The patient benefits because the experience of these experts is leveraged to treat their individual condition.”

The team includes specialists from many disciplines, including cardiothoracic surgery, general cardiology, interventional cardiology, echocardiography, heart failure cardiology and electrophysiology. They meet weekly

to discuss complex cases and recommend a course of treatment. They can also meet virtually when patients come in on an emergency basis and can't wait for the weekly case conference.

When necessary, the team will bring in specialists from other areas, such as pulmonology if a patient has severe lung disease, or liver and kidney disease if the patient has had a transplant.

“We have many tools to help us tailor treatment to each patient,” Dr. Pearson said.

## Combining Skills To Innovate

The close working relationship of specialists at Froedtert Hospital often leads to their combining skills to perform an innovative, hybrid procedure. Dr. Pearson cited the example of a patient who previously had surgery to replace the ascending aorta, but the suture line had broken and blood was escaping outside the graft.

“Interventional cardiologists could plug the leak but couldn't get to the spot,” Dr. Pearson said. “Surgeons, however, were able to make a small incision in the chest and deliver a plastic tube into the beating heart for interventional cardiologists to place the plug. By working together, they were able to do that in a minimally invasive way, and the patient went home in a day instead of facing a big heart operation.”

## Supporting Physicians on the Front Lines

Many heart patients come to the Froedtert & MCW health network via referral from other physicians. If patients live far from Froedtert Hospital, physicians can submit their data for review by the team without the patient having to come in.

“The referring physician can call in to the conference and discuss the patient, whether to reaffirm a treatment decision or to consider other treatment options,” Dr. Pearson said.

“In these cases, we help them with their decision-making rather than being actively involved in patient care.”

When referral patients do come to Froedtert Hospital, our team coordinates care with each patient’s physician. “We keep the referring physician in the loop about treatment and return the patient to them,” Dr. Pearson said. “Typically, heart patients need long-term relationships with their cardiologists, and we support that.” The Froedtert & MCW cardiac team understands that community physicians are practicing on the front lines, and if they’re with smaller systems, they may not have deep support in their specialty.

“We provide them with state-of-the-art consultations for their patients,” Dr. Pearson said. “The therapy we recommend will be dependent on what we think is best. Just because a patient comes to a surgeon at Froedtert Hospital doesn’t mean they’ll automatically get an operation. They might get an interventional procedure if we think that’s best. We make recommendations for treatment based on consensus.”

To refer a patient to our team, call **414-805-3666** or visit [froedtert.com/refer](http://froedtert.com/refer). To learn more about our team of physicians and available treatment options, visit [froedtert.com/heart](http://froedtert.com/heart).



Paul Pearson, MD, PhD, cardiothoracic surgeon, and Michael Salinger, MD, interventional cardiologist

# HOW ECMO CAN EFFECTIVELY TREAT COVID-19 PATIENTS

As the world moves forward through this unprecedented pandemic, physicians around the globe are trying to find effective ways to treat and save the lives of COVID-19 patients. One treatment option that has shown promise is the use of extracorporeal membrane oxygenation (ECMO) for COVID-19 patients with severe respiratory distress. By supporting the heart and lungs, the ECMO machine stabilizes patients to allow their body more time to fight the virus. With a program designated as a Center on Path to Excellence in Life Support by the Extracorporeal Life Support Organization (ELSO), the ECMO team at the Froedtert & the Medical College of Wisconsin Froedtert Hospital is uniquely experienced and positioned to help COVID-19 patients.



“We are one of the largest ECMO programs in the Midwest, as we have around-the-clock ECMO-dedicated staff and the capability to treat more than 15 patients simultaneously,” said Lucian “Buck” Durham III, MD, PhD, director of Mechanical Circulatory Support and ECMO with the Froedtert & MCW health network. “ECMO can be a potential game changer

for COVID-19, and it’s already proved to be a lifesaver.”

Originally developed in the 1960s to support newborns and infants with respiratory distress syndrome and cardiac abnormalities, ECMO has only been widely adopted for use in adults over the last five years. With the ECMO machine, physicians insert a plastic tube into a large vein or artery through the neck, chest or groin of the patient. This tube allows the patient’s blood to flow out into an oxygenator, or artificial lung. The oxygenator adds oxygen and removes carbon dioxide from the blood, before a pump sends this blood back into the patient through a separate tube, at the same frequency and force of the heart. Essentially, ECMO helps these patients by acting as their heart and lungs.

The machine is used when all other medical options have been exhausted for patients whose lungs can’t provide enough oxygen to their body or rid themselves of carbon dioxide. It can also be used for patients whose heart can’t pump enough blood to the body and for those waiting to either get a heart or lung transplant.

## How ECMO Can Help COVID-19 Patients

Even though there’s more to learn about how COVID-19 affects the body, physicians know that it primarily affects the lungs. In certain cases, the virus can entirely overwhelm the lungs and, in turn, negatively affect the heart.

“COVID-19 is different from pneumonia or an influenza A or B because it affects all five lobes of the lung — three on the right and two on the left — and it’s patchy and diffused throughout the whole lung,” Dr. Durham said. “That is where the real respiratory issues come from, as it’s damaging all areas of the lung.”

Because all five lobes of the lung are damaged, they can’t properly exchange oxygen and carbon dioxide. As carbon dioxide levels in the body increase, so does the respiratory rate, as the brain tells the body to breathe more to rid itself of this carbon dioxide. However, since the lungs are damaged and are unable to do so, carbon dioxide remains in the blood and turns to acid.

“The body doesn’t work well in an acidic environment,” Dr. Durham said, “particularly, the right side of the heart. The lungs get stiffer and the pressure to push blood through the lungs goes up, which is known as pulmonary hypertension. This puts strain on the right side of the heart and causes it to fail. When the body fails to this degree, ECMO can help.”

When a COVID-19 patient is transferred to Dr. Durham and the ECMO team, whether by medical intensive care unit physicians within the Froedtert & MCW health network or emergency department physicians from external health systems, a right ventricular assist device (RVAD) and an oxygenator within the ECMO machine are used. The RVAD

is placed inside the patient through the tube that goes into the patient's neck, down through the right atrium and right ventricle of the heart and into the pulmonary artery. This allows for blood to be taken out of the right atrium and sent to the ECMO machine. There, it's filtered, temperature modulated and oxygenated, and the carbon dioxide is removed. This blood then enters the body through a tube placed into the pulmonary artery.

"We are putting 100% oxygen into those pulmonary arteries, which is what is going out into the two lungs," Dr. Durham said. "This accomplishes two things: One, it takes the load off the right side of the heart, as we are essentially bypassing it. And two, by increasing the level of oxygen going into the lungs, it decreases pulmonary vascular resistance and reduces the pressure it takes to push blood through the lungs."

This ECMO process supports patients' bodies and allows them extra time to attack and overcome the virus. This extra time is often necessary for patients in such extremes, with the average COVID-19 patient staying on ECMO for 10-12 days. Once off ECMO, they remain isolated while recovering in the cardiovascular intensive care unit.

### **An Added Layer of Safety for COVID-19 Patients on ECMO**

Certain patients with an aggressive form of COVID-19 are susceptible to a "cytokine storm," which can cause a severe inflammatory response and multiple organ failure. This happens when a patient's immune system malfunctions and attacks its own cells. While ECMO alone has been shown to reduce the chances of a cytokine storm, Froedtert Hospital is the first hospital in Wisconsin to utilize CytoSorb®, a device that is used within ECMO to further reduce the cytokines and inflammatory molecules.

Recently approved by the FDA for temporary emergency use in COVID-19 patients, CytoSorb is a sterile, single-use filter that is placed into a patient's ECMO circuit. This filter contains absorbent polymer beads that are designed to

remove cytokines — which signal the immune system to work against itself — as blood passes through. This filter is then replaced routinely for a five-day course of treatment.

### **Advancing COVID-19 Care With ECMOCARD Observational Study**

With one of the largest ECMO programs in the Midwest, Froedtert & MCW Froedtert Hospital is one of 200 health centers worldwide that is participating in the Extracorporeal Membrane Oxygenation for 2019 Novel Coronavirus Acute Respiratory Disease (ECMOCARD) observational study to advance COVID-19 treatment. Each participant is sending data and information to the University of Oxford in England on how their health center is using ECMO for COVID-19 patients. At Oxford, artificial intelligence and neural networking will analyze the data and information in hopes of finding exactly what type of ECMO treatment or combination of ECMO treatments is best for COVID-19 patients.

"This is one of the largest multicenter, multinational observational studies that's ever been done," Dr. Durham said. "Many of the hospitals have different ways of treating these patients. The data on how they're treating them and what their outcomes have been from a pulmonary, cardiac and neurologic standpoint will help shape the way care is delivered in the future using ECMO."

### **The Earlier, the Better for ECMO**

Although ECMO has already shown to be a promising way to save lives, Dr. Durham urges medical professionals to get patients to ECMO teams earlier, as this could save even more. Getting certain patients on ECMO sooner rather than later can avoid organ failure that physicians are seeing with COVID-19. "The patients we get earlier are the ones we have the greatest impact on," Dr. Durham said.

For more information about our ECMO Program, please contact our team at **414-805-4700**.

# CLINICAL OUTCOMES: VASCULAR AND ENDOVASCULAR SURGERY

## Vascular Program Earns Three Stars From VQI

In 2019 the Froedtert & the Medical College of Wisconsin health network received the Society for Vascular Surgery's Vascular Quality Initiative (SVS VQI) three-star recognition, the highest number of stars awarded, for its active participation in the SVS VQI Registry Participation Program. The SVS VQI promotes patient safety and vascular care quality by providing web-based collection, aggregation and analysis of clinical data submitted in registry format for all patients undergoing specific vascular treatments. The VQI operates 14 vascular registries.

The participation awards program was created to encourage and recognize active participation in the registries program. Our health network has received the three-star award for the past two years. This year we were among fewer than 10% of 469 eligible centers to receive the recognition.

## Physician Spotlight:

### Peter J. Rossi, MD, Vascular Surgeon and Chief, Vascular and Endovascular Surgery



Peter Rossi, MD, FACS, associate professor of surgery, is a board-certified, fellowship-trained vascular surgeon who has treated patients with vascular disease for more than 15 years. He has extensive experience in treating all forms of vascular disease and has a special interest in endovascular approaches for patients who traditionally may have been treated with open surgery.

Dr. Rossi and the team of vascular surgeons and interventional radiologists with the Froedtert & the Medical College of Wisconsin health network often partner with referring physicians across the region to offer patients with complex vascular disease treatment options that other health systems may not have access to. This includes patients with complex aortic aneurysms, carotid artery disease, lower extremity arterial disease and venous thromboembolic disease. "Working in multidisciplinary fashion between vascular surgery and interventional

radiology allows for the insights of multiple specialists on these very complex cases," Dr. Rossi said. "With our combined experience in open, hybrid and endovascular approaches, we are often able to find less invasive options for patients, even in complex situations."

Our physicians and staff work closely with referring physicians to coordinate treatment and follow-up care. Our referring physicians are partners in the care of these patients, and as such, our team communicates regularly with the referring office regarding the patient's care while at our hospital. "We welcome the opportunity to work with providers to find the best solutions for patients across the region and look forward to continued collaboration for the long-term care of these patients," Dr. Rossi said.

To learn more about our Vascular Surgery and Vascular and Interventional Radiology teams, visit [froedtert.com/vascular](http://froedtert.com/vascular). For transfers, consultations and physician-to-physician discussions regarding your patient, call **414-805-4700**.

### Elective Endovascular Aneurysm Repair Complications

	2018	2019	2020*
Congestive heart failure		0%	0%
Intestinal ischemia		0%	0%
Myocardial infarction	0%	0%	0%
Stroke	0%	0%	0%
Dialysis	0%	0%	0%
Respiratory	0%	0%	0%

\*As of November 2020

### Carotid Endarterectomy Complications

	2018	2019	2020*
Congestive heart failure	0%	0%	0%
Myocardial infarction	0%	0%	0%
New stroke	0%	0%	0%
Wound infection	0%	0%	0%

\*As of November 2020

# CLINICAL OUTCOMES: VASCULAR AND ENDOVASCULAR SURGERY

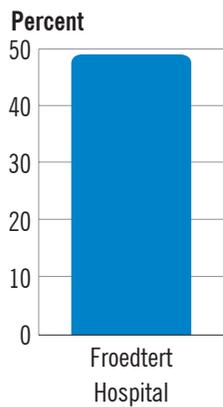
## Vascular and Endovascular Surgery Mortality

	2018	2019	2020*
Carotid endarterectomy	0%	0%	0%
Elective endovascular aneurysm repair (EVAR)	0%	0%	0%
Pulmonary vascular intervention	0%	0%	0%
Infra bypass	0%	0%	0%
Supra bypass	0%	0%	0%
Elective TEVAR/Complex EVAR	0%	0%	0%
Elective carotid artery stent	0%	0%	0%

TEVAR = Thoracic endovascular aortic repair

\*As of November 2020

## Inferior Vena Cava Filter Retrieval or Attempted



Period ending 12/2019

# KATHY'S HOUSE - A HOSPITAL GUEST HOUSE FACILITY OPENING NEAR FROEDTERT HOSPITAL

## New building opening in summer 2021 will double capacity

In response to growing, strong demand, a new, larger Kathy's House is currently under construction in Wauwatosa near the Froedtert & the Medical College of Wisconsin Clinical Cancer Center on the Froedtert Hospital campus. Founded in 2001, Kathy's House is a Hospital Hospitality House (HHH) that provides affordable lodging and caring support in a "home away from home" environment for people who need to travel to Milwaukee for medical care. Open 365 days a year, it is the only such facility in southeastern Wisconsin that serves patients of all ages, their families and caregivers, and accepts referrals from all accredited area hospitals.

Annually, Kathy's House serves about 1,500 guests. More than 70% live in Wisconsin; many come from the Fox Valley and northeastern Wisconsin. To contact Kathy's House on behalf of a patient, call **414-453-8290** or e-mail Kathy Wagner, Director of Operations and Guest Services, at [kathyw@kathys-house.org](mailto:kathyw@kathys-house.org).

In 2017, Froedtert Hospital, a longtime partner of Kathy's House, pledged \$6 million to build the new House, which will double current capacity from 18 rooms to 36 rooms. Features include a separate wing for patients with compromised immune systems, and a patient services room where basic clinical services such as blood draws and video telehealth visits can occur. The House will also have a communal kitchen, dining area, library, family room, fitness room, laundry facilities, courtyard, patio, walking trail and parking, and will be fully compliant with Americans with Disabilities Act requirements.

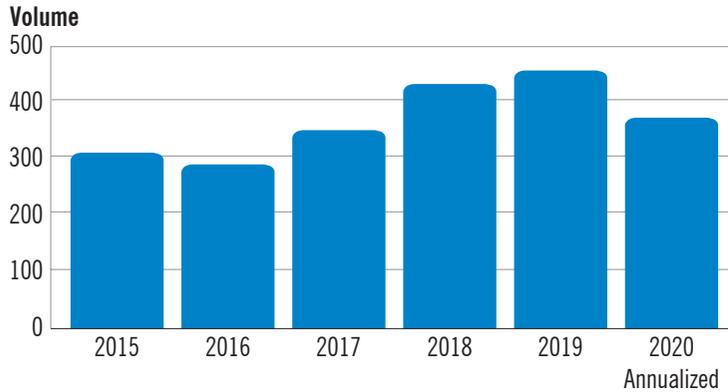
Kathy's House was founded as a not-for-profit 501(c)(3) organization in memory of Kathy Vogel Kuettnner, who died in July 2000 after her battle with an aggressive form of lymphoma. It was Kathy's wish to create an HHH to support those fighting similar battles. Her parents, Dick and Judy Vogel, along with family friends worked tirelessly and opened the doors in July 2001. Kathy's House is dedicated to providing a warm and supportive environment to families who are experiencing one of life's most stressful situations — personal illnesses or the serious illness of a loved one.



Artistic rendering of the new Kathy's House opening in summer 2021, which will double current capacity

# CLINICAL OUTCOMES: CARDIOVASCULAR SURGERY

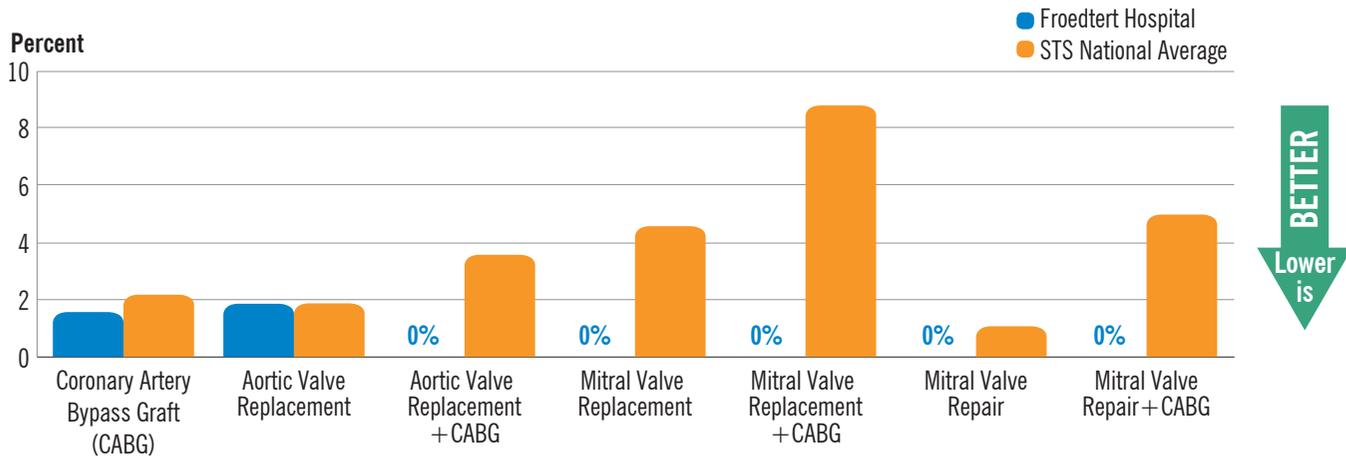
## Society of Thoracic Surgeons (STS) Cardiac Surgery Volume



Source: STS Registry

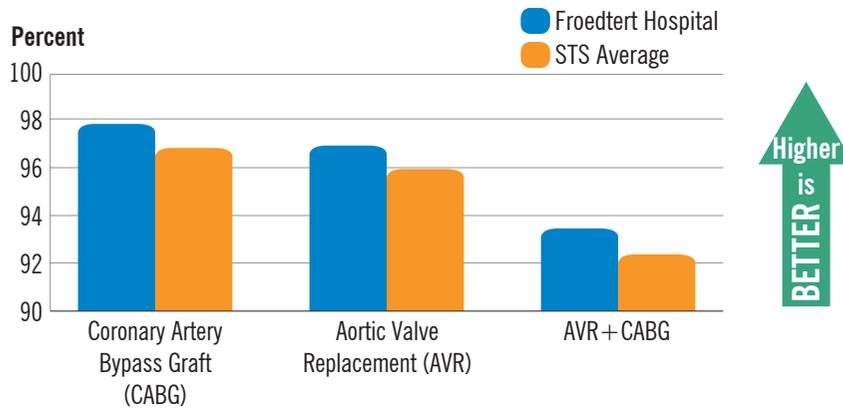
The Froedtert & MCW cardiovascular team has been an early adopter of endovascular techniques. These minimally invasive options have replaced the need for open surgical procedures for many patients.

## Risk-Adjusted Operative Mortality



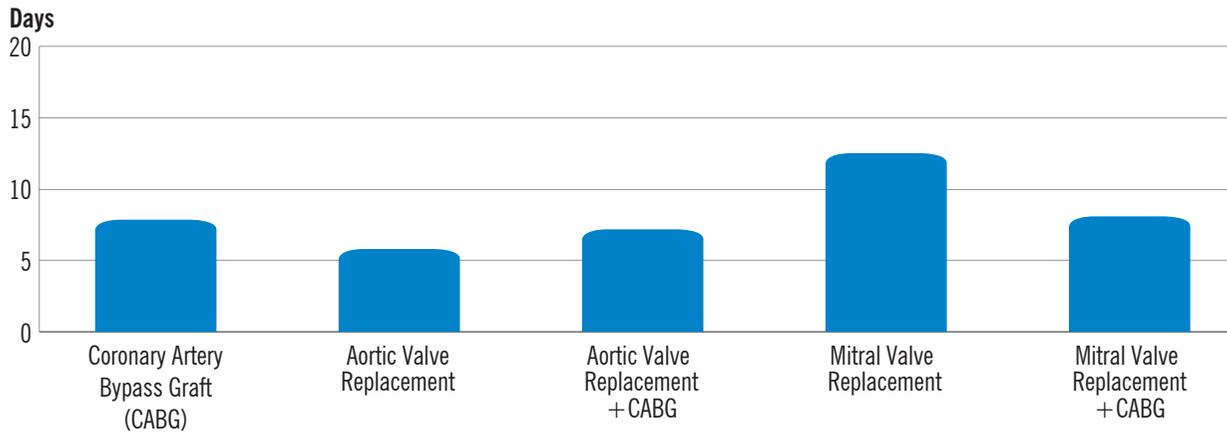
Source: STS Harvest Report, period ending 12/31/2019

## STS Composite Quality Rating



Source: STS Harvest Report, period ending 12/31/2019

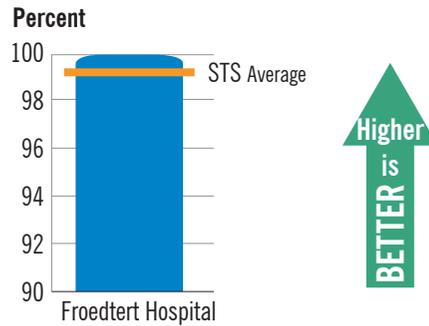
## Median Length of Stay, Cardiovascular Surgeries



Period ending 12/2019

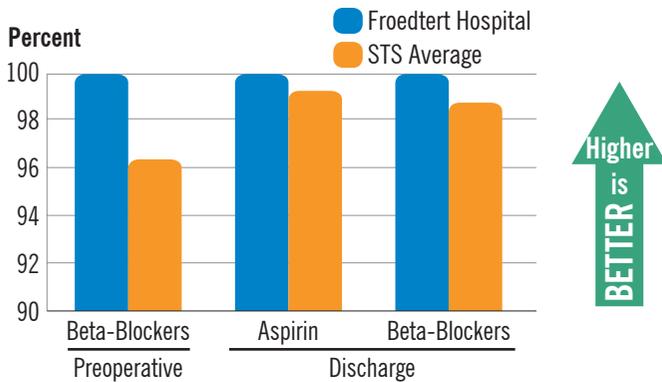
# CLINICAL OUTCOMES: ISOLATED CORONARY ARTERY BYPASS GRAFT

Arterial grafts are known for their excellent long-term patency and are the conduits of choice for coronary revascularization. In 2019, 100% of patients undergoing primary isolated revascularization procedures received at least one arterial graft.



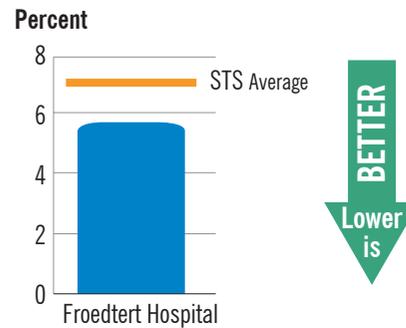
Source: STS Harvest Report, period ending 12/31/2019

## Perioperative Medications



Source: STS Harvest Report, period ending 12/31/2019

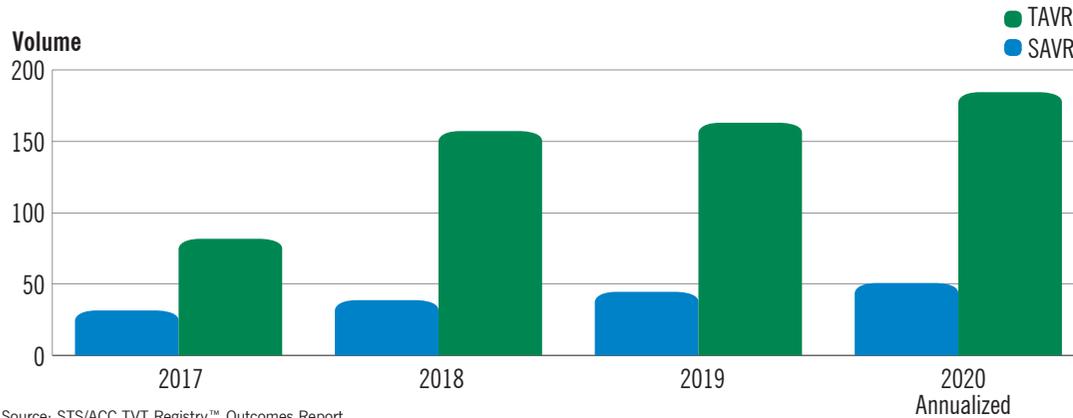
## Risk-Adjusted Prolonged Ventilation



Source: STS Harvest Report, period ending 12/31/2019

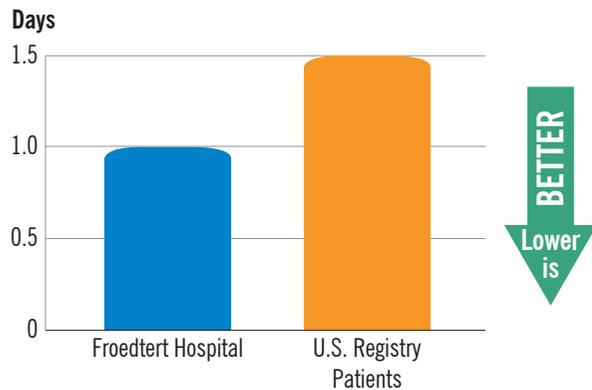
# CLINICAL OUTCOMES: STRUCTURAL HEART

## Aortic Valve Program Growth



Source: STS/ACC TVT Registry™ Outcomes Report

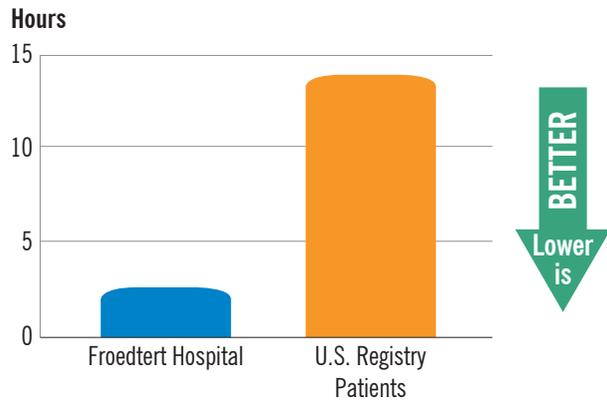
## Transcatheter Aortic Valve Replacement (TAVR) Procedures Length of Stay — Median Post Procedure



Source: National Cardiovascular Data Registry (NCDR) CathPCI™ Outcomes Report Q4 2019

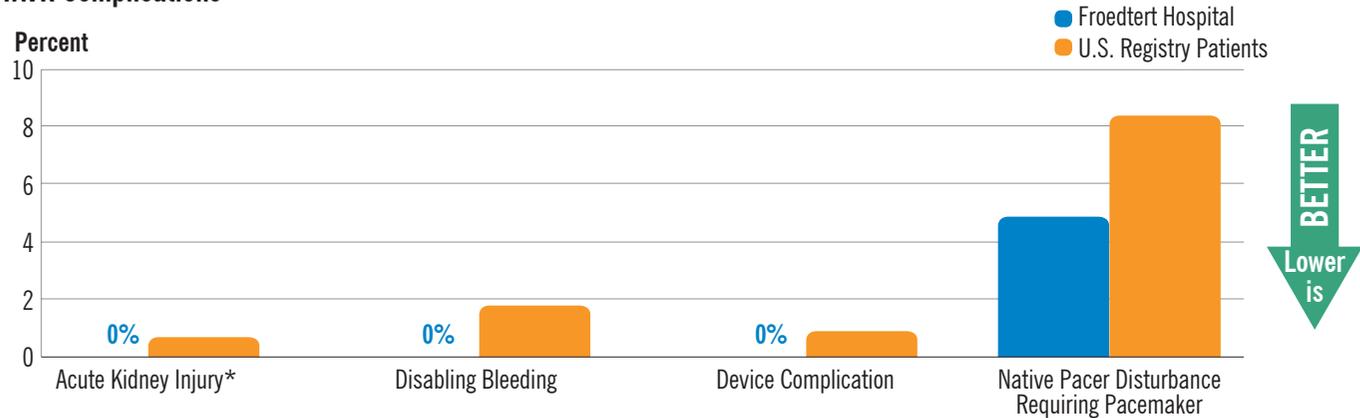
# CLINICAL OUTCOMES: STRUCTURAL HEART

## ICU Median Length of Stay



Source: ACC NCDR CathPCI Registry Outcomes Report Q4 2019

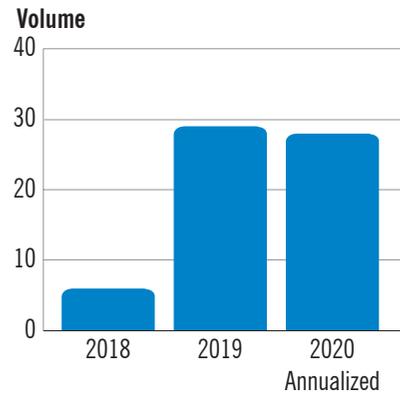
## TAVR Complications



\*Acute Kidney Injury Stage 3

Source: STS/ACC TVT Registry™ Outcomes Report 2019 Q4

## MitraClip Volumes



Source: STS/ACC TVT Registry™ Outcomes Report



Peter Mason, MD, MPH,  
interventional cardiologist



Peter Steinert

### **Lucky Catch: Abdominal Aortic Aneurysm Discovered During Unrelated Testing**

With its positive connotation, serendipity, or finding something unexpected while searching for something else, is generally not a word associated with health care. Finding money in your pocket while hunting for your car keys, yes. But when it comes to health, science rules, not chance. Nonetheless, there are times when a diagnosis is made serendipitously.

Consider abdominal aortic aneurysm, or AAA. A bulge that occurs in the large artery that leads from the heart to the lower body, AAA is often detected through an X-ray or CT scan ordered for an unrelated condition. There are generally no noticeable symptoms with AAA, but if the ballooning area grows too large, it can burst and prove fatal.

In June 2019, Sheboygan dentist Peter Steinert was hospitalized for an *E. coli* blood infection. Among the routine tests administered during his stay was a CT scan, which revealed the presence of AAA, centered in the wall of the iliac artery, which is located in the pelvis. The condition was not immediately life-threatening, and Peter required some time to digest this latest bit of medical news.

“I felt like I needed to recover from the infection before I could wrap my head around figuring out how to deal with the aneurysm,” Peter said. “After meeting with a local doctor, I learned that there could be some post-surgical side effects, including erectile dysfunction, incontinence and muscle weakness. I needed to get all the facts.”

#### **Minimally Invasive AAA Repair**

When he was ready to move forward, Peter went to Froedtert & the Medical College of Wisconsin Froedtert Hospital to consult Peter Rossi, MD, vascular surgeon and MCW faculty member.



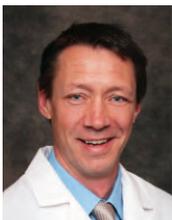
“Dr. Rossi walked me through the treatment options and made it really easy for me to process the information and make a decision,” Peter said. “Before I left his office that day, we scheduled surgery.”

Before minimally invasive treatments were available, the primary option for aneurysms was open repair, which involved a large abdominal incision, a week in the hospital and six weeks to recover. For years, Froedtert & MCW vascular surgery and interventional radiology experts have used endovascular aneurysm repair (EVAR), a minimally invasive procedure in which stent grafts are inserted through the groin and guided by X-ray imaging via a catheter to the location of the aneurysm, where they are released to expand and line the wall of the aorta.

“The difference with the EVAR technique is that we are not removing the aneurysm but simply reinforcing the aorta with a new lining so the aneurysm cannot burst,” Dr. Rossi said.

Dr. Rossi performed Peter’s procedure alongside William Rilling, MD, vascular and interventional radiologist and MCW faculty member.

“Vascular and interventional radiologists specialize in using imaging guidance and minimally invasive approaches for multiple disease states and patient populations,” Dr. Rilling said. “This is a complex procedure, which requires advanced endovascular skills from experts working on both the patient’s left and right side. We do this procedure in a state-of-the-art, hybrid operating room/interventional radiology suite with a specialized robotic imaging system that optimizes our visualization and precision during the procedure.”



“Finding these aneurysms is important because when they rupture, most people die before ever making it to the hospital,” Dr. Rossi said.

Peter doesn’t smoke, keeps active and, at 55, is relatively young to have experienced AAA. Dr. Rossi considers his a “spontaneous aneurysm.”

Following a night in the hospital, Peter was back home. After taking it easy for a week, he was soon back to his regular routine. Initially, while out for a long walk, he experienced fatigue and noticed what felt like a spasm in his backside.

“That was probably the worst of my side effects, and I can still feel that sometimes, but I have to be getting quite a workout,” Peter said.

“So I’m back to running and doing everything that I normally did.”

Abdominal aortic aneurysms require multidisciplinary, complex care. As an academic medical center, Froedtert Hospital has the expertise and resources to handle this life-threatening condition.

To refer a patient to the Aortic Disease Program, call **414-805-3666** or visit [froedtert.com/refer](http://froedtert.com/refer).

# PATIENT EXPERIENCE

## Care Team Rallies Around Young Heart Transplant Patient and His Family

As a mother, Lisa Schumacher, of Neenah, Wisconsin, knows how hard it is to put your child's life in someone else's hands. She recently had no other choice.

On June 6, 2019, her son, Logan, then 19, sent her a text around lunchtime. He was cutting grass at his summer job when he started feeling unusually fatigued. Lisa encouraged him to take a break and drink some water, but he texted back that it wasn't helping. In fact, he was experiencing chest pain, an odd symptom for a physically fit teenager. He wanted to finish his shift, but Lisa convinced him to meet her at home. Once there, she could see Logan was extremely uncomfortable. He suddenly asked his mom to take him to the emergency department at a nearby hospital.

"He said he was so tired he couldn't use his arms, and it hit me that it might be his heart," Lisa said.

The emergency room doctors quickly determined Logan was having a massive heart attack caused by a blood clot in his coronary artery, a rare condition for someone his age. They rushed him by ambulance to a larger hospital in Appleton that was better equipped for cardiac emergencies. There, doctors found that both the right and left ventricles of Logan's heart were damaged, leaving the left side unable to pump more than a small amount of blood. The lack of circulation was causing his lungs to fail, and he could no longer breathe on his own.

At that point, the doctors in Appleton made an important call to Froedtert & MCW Froedtert Hospital, activating a special protocol for patients with heart failure. Within minutes, a group of Froedtert & MCW heart specialists gathered on a conference call to discuss Logan's care. They agreed he should be flown by helicopter from Appleton to Froedtert Hospital for urgent treatment.

## Highest Level of Care

When Logan arrived on the helipad at Froedtert Hospital the morning of June 7, he was taken quickly to an operating room, where Lucian "Buck" Durham III, MD, PhD, cardiothoracic surgeon and MCW faculty member, performed surgery to place him on ECMO support. This system pumps and oxygenates blood outside the body temporarily so the heart and lungs can rest. Dr. Durham has been treating patients with this technology for more than two decades, and the ECMO Program at Froedtert Hospital is designated as a Center on Path to Excellence in Life Support by the Extracorporeal Life Support Organization.

With ECMO in place, Logan was moved to the cardiovascular intensive care unit (CVICU), where the medical team could provide the high level of care he needed, work to stabilize him and determine the next phase of treatment.

Because ECMO was circulating blood throughout his body, Logan's lungs began to recover. He no longer needed ECMO to breathe for him, though he still required a device to handle his heart's pumping function. Dr. Durham switched him to a ventricular assist device known as a BiVAD, which included two pumps, one for each side of his heart. Given his extensive heart damage, Logan's physicians began to discuss whether he should have an artificial heart or a heart transplant with a donor organ.

But Logan was still too sick for either option. Mitchell Saltzberg, MD, medical director of the Comprehensive Heart Failure and Transplant Program and MCW faculty member, explained to Logan and his parents that to be considered a good candidate for a heart transplant, Logan would need to get back on his feet, increase his nutrient intake and engage with the team in his healing process. Just standing was a huge task for Logan, who is 6 feet, 4 inches tall.



“I was so weak and so big that they had to have two therapists essentially lift me out of bed,” Logan said. When he began to take steps, he needed as many as seven people around him, including physical therapists, nurses and a perfusionist, who transferred the BIVAD to a wheeled cart so Logan could pull it along,

and then monitored the equipment as he walked. Logan’s mom; his dad, Ryan; and his sister, Morgan, were always nearby as well.

The weeks after Logan’s heart attack included many ups and downs, including bouts of pneumonia, a medication allergy and other complications that challenged his already compromised health. Some days, Logan was so physically and emotionally depleted that he struggled to leave his bed, yet he pushed through.

“He found the heart and strength to get motivated,” Dr. Saltzberg said. “He inspired a lot of people.”

### **A Team To Lean On**

Throughout the summer, the medical team in the CVICU served as a lifeline for Logan and his family. Logan appreciated nurses, physical therapists, perfusionists and doctors who talked sports and video games with him, shared his sarcastic sense of humor and searched the city to find a frozen version of his favorite soft drink.

The family relied on team members, especially Carolyn Pinkerton, MD, an anesthesiologist and MCW faculty member, who regularly cared for Logan in the CVICU and provided pep talks when he or his parents felt overwhelmed. She often appeared in Logan’s room with a coffee for his mom. A parent herself, Dr. Pinkerton said she appreciated Lisa’s strength.

“I thought, ‘This woman is my kindred spirit, and I need to feed her caffeine,’” Dr. Pinkerton said.

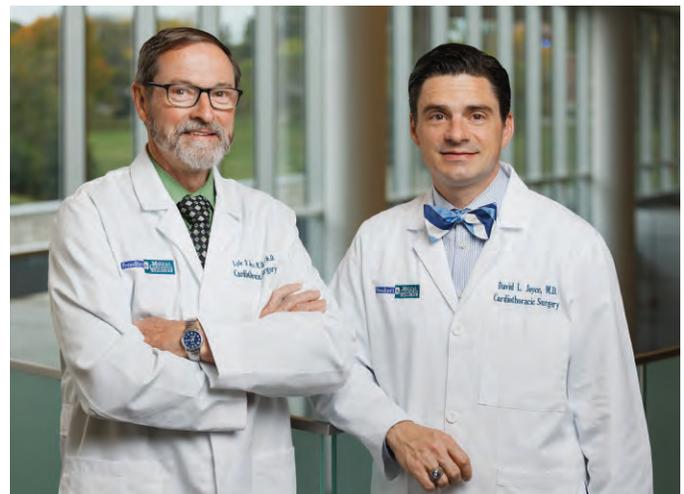
This compassionate care meant the world to Lisa and Ryan, who both struggled to make sense of the fact that their once-healthy teenager was so suddenly, inexplicably sick.

“A lot of those people are like family to us,” Lisa said.

### **Father-Son Transplant Team**

By late September, Logan was strong and stable enough that his case was presented to the Froedtert & MCW transplant selection team.

“I always say it’s the best medical care in the world,” said David Joyce, MD, cardiothoracic surgeon and MCW faculty member. “You have the ultimate crowd wisdom — surgeons, cardiologists, psychologists, nutritionists — an incredible range of disciplines that all sit in a room together to determine the best course of action.” They agreed Logan was a good candidate for a heart transplant.



Cardiothoracic surgeons Lyle Joyce, MD, PhD, and David Joyce, MD

## PATIENT EXPERIENCE



Logan Schumacher

Logan was placed on the national waiting list for a heart on Sept. 22. Within days, an ideal donor heart became available, and on Sept. 26, Dr. Joyce and his father, Lyle Joyce, MD, PhD, cardiothoracic surgeon and MCW faculty member, worked together to perform Logan's heart transplant.

"On that critical day for our son, we felt reassured to have a father-son team performing his surgery," Lisa said. Logan's family felt tremendous relief when Dr. David Joyce appeared to report the transplant was a success.

### Logan's Recovery

With the transplant complete, Logan was monitored closely for signs of organ rejection. In October, he was transferred to rehabilitation at Froedtert Hospital for additional physical therapy and recovery time. On Nov. 18, more than five months after he arrived by helicopter, Logan finally went home.

In between his college classes, Logan and his parents make frequent trips from Neenah to Froedtert Hospital for follow-up appointments, including biopsies to check the health of his new heart. Logan has had extensive genetic testing to look for an inherited component to his unusual heart attack, but the tests did not reveal a genetic link. The heart attack remains a mystery.

In contrast, the Schumachers' feelings are clear.

"If you end up at Froedtert Hospital, you're going to have great people taking care of you — people who really care about you," Logan said.

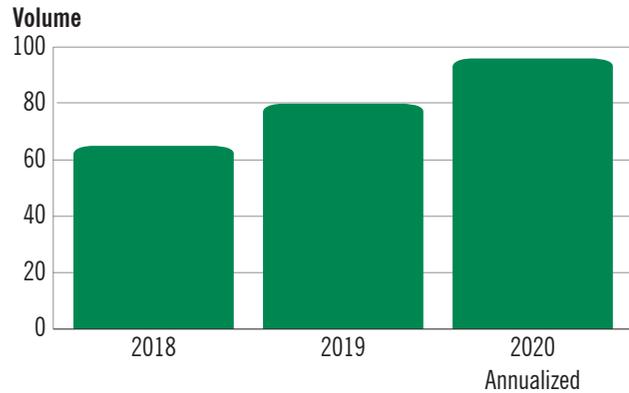
Lisa agreed. She and her family are grateful for the caring expertise of the Froedtert Hospital team. "I thank God we found ourselves with that group of people," she said.

To refer a patient to the Froedtert & MCW Heart Transplant Program, call **414-805-3666** or visit [froedtert.com/refer](http://froedtert.com/refer).

To learn more about our team of physicians and available treatment options, visit [froedtert.com/heart-transplant](http://froedtert.com/heart-transplant).

# CLINICAL OUTCOMES: EXTRACORPOREAL MEMBRANE OXYGENATION (ECMO)

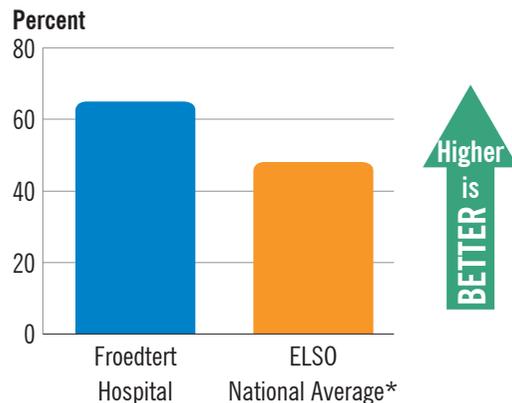
## ECMO Patient Volume



Source: Extracorporeal Life Support Organization (ELSO) Registry

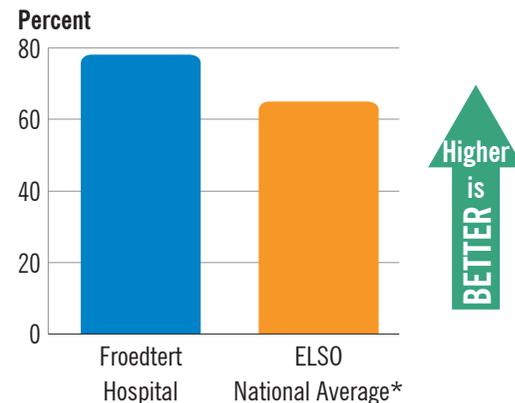
## ECMO Survival to Discharge — 2019

Unadjusted VA ECMO (cardiac)



Source: Extracorporeal Life Support Organization, [elso.org](http://elso.org)  
 \* ELSO Registry Report, July 2020

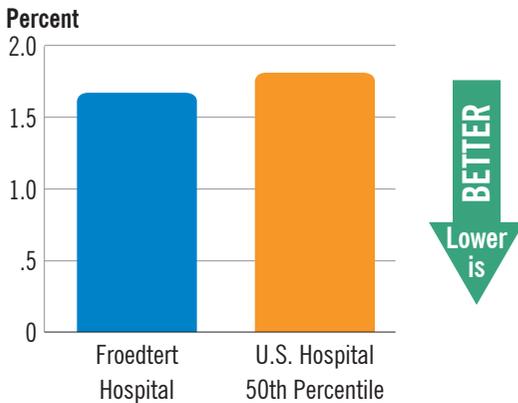
Unadjusted VV ECMO (respiratory)



# CLINICAL OUTCOMES: INTERVENTIONAL CARDIOLOGY

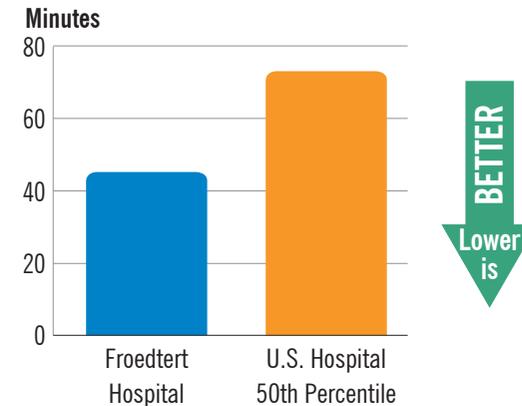
## Percutaneous Coronary Intervention (PCI) Procedures

### PCI In-Hospital Risk-Adjusted Mortality (All Patients)



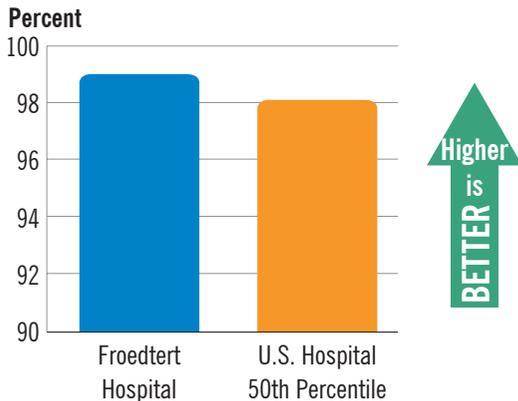
Source: ACC NCDR CathPCI Registry Outcomes Report, Q4 2019

### Median Transfer Time From Door to Door (Patients With STEMI)



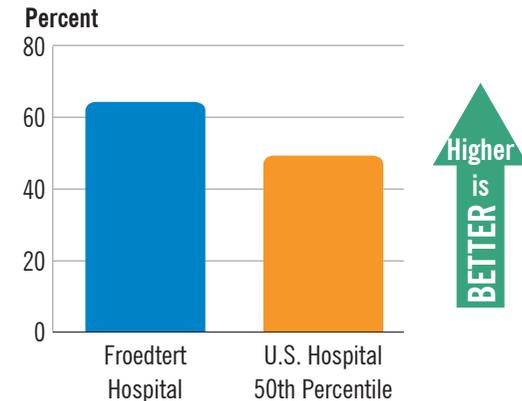
STEMI = ST-elevation myocardial infarction  
Source: ACC NCDR CathPCI Registry Outcomes Report, Q4 2019

### Composite: Guideline Medications Prescribed at Discharge



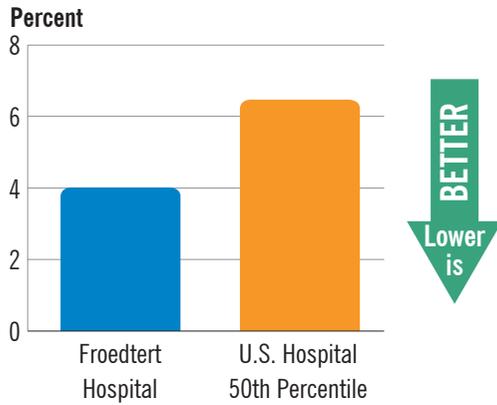
Source: ACC NCDR CathPCI Registry eReport, Q4 2019

### Radial Artery Use



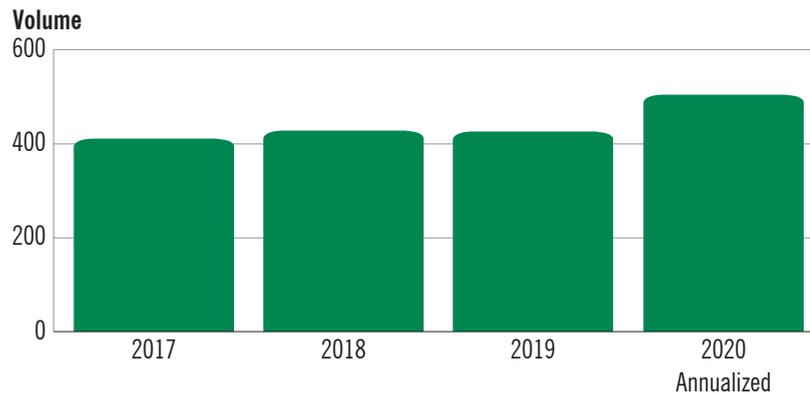
Source: Armus Database  
ACC NCDR CathPCI Registry Outcomes Report, Q4 2019

## PCI In-Hospital Complication Acute Kidney Injury — Risk-Adjusted



Source: ACC NCDR CathPCI Registry Outcomes Report, Q4 2019

## PCI Volumes

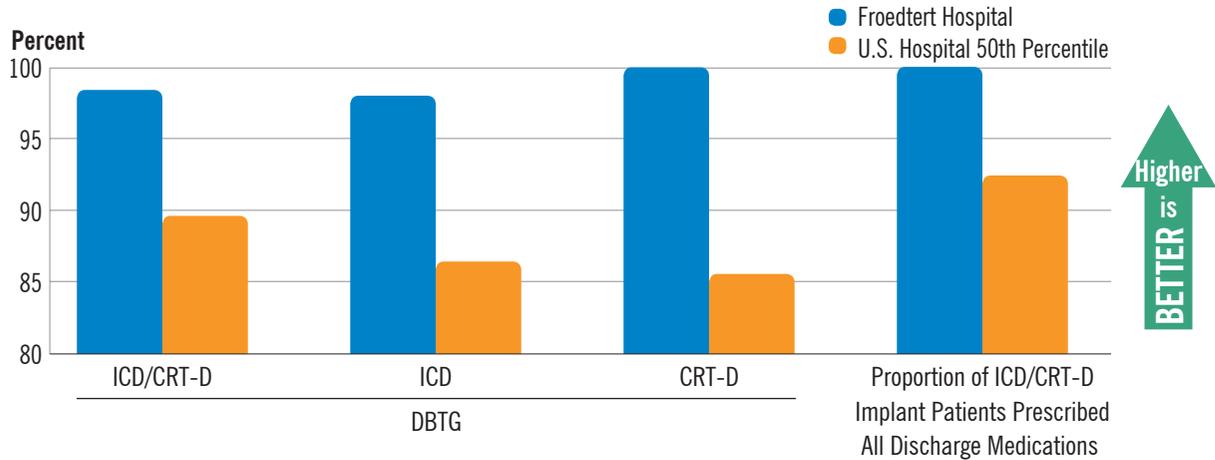


Source: ACC NCDR CathPCI Registry Outcomes Report

# CLINICAL OUTCOMES: ELECTROPHYSIOLOGY

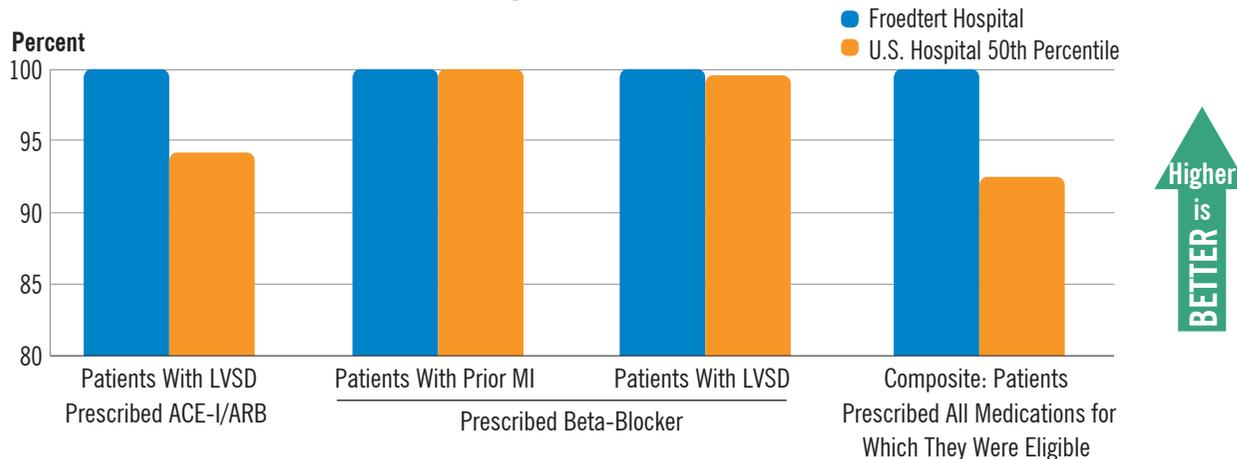
## Implantable Cardioverter Defibrillators (ICDs)

### Device-Based Therapy Guidelines (DBTG)



CRT-D = cardiac resynchronization therapy – defibrillator  
 Source: ACC NCDR ICD Registry Outcomes Report, Q4 2019

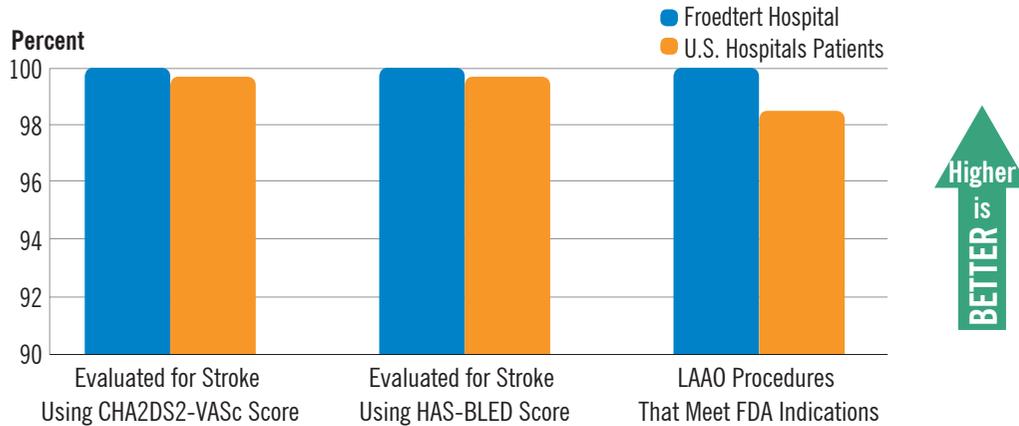
### Guideline Medications Prescribed at Discharge



ACE-I = angiotensin-converting enzyme inhibitor, ARB = angiotensin receptor blocker  
 LVSD = left ventricular systolic dysfunction, MI = myocardial infarction  
 Source: ACC NCDR ICD Registry Outcomes Report, Q4 2019

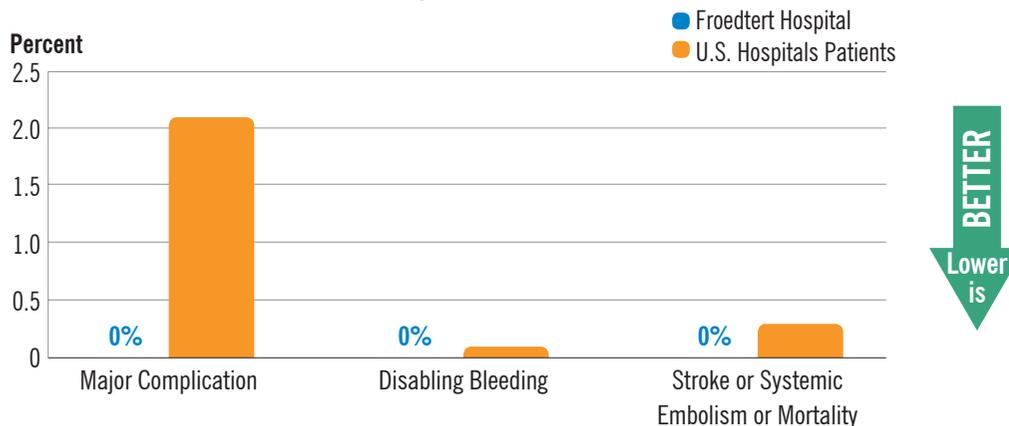
## Left Atrial Appendage Occlusion (LAAO) Procedures

### LAAO Process Measures



Source: ACC NCDR LAAO Registry Outcomes Report, Q4 2019

### LAAO Intra- and Post-Procedure Complications



Source: ACC NCDR LAAO Registry Outcomes Report, Q4 2019

## CLINICAL RESEARCH

The cardiology, cardiothoracic surgery, interventional radiology and vascular surgery teams combine specialty expertise, leading-edge technology and consistent research leadership to provide the most up-to-date treatment options, including clinical trials. Leading facilitation of cardiovascular clinical research within the Froedtert & MCW health network is Nicole Lohr, MD, PhD, medical director of cardiovascular clinical trials and MCW faculty member. “Our team is continuously expanding cardiovascular research within our health network and currently boasts more available cardiovascular trials than ever before,” Dr. Lohr said. “We are proud to be a leader in researching new and more effective ways to treat patients with cardiovascular disease.” Below are some of the active trials in which the team is currently participating.



### **Anlylam-TTR02-012: Observational Study**

A Phase 4 Multicenter Observational Study to Evaluate the Effectiveness of Patisiran in Patients with Polyneuropathy of Hereditary Transthyretin-Mediated (hATTR) Amyloidosis with a V122I or T60A Mutation.

The purpose of this study is to evaluate the effectiveness of patisiran in patients with ATTRv amyloidosis with polyneuropathy who have a V122I or T60A mutation.

### **Bard Peripheral Vascular, Inc., BPV-001: A Prospective, Multi-Center, Single-Arm, Real World Study Assessing the Clinical Use of the Caterpillar™ Arterial Embolization Device for Arterial Embolization in the Peripheral Vasculature (MONARCH)**

The purpose of this study is to assess the clinical use and outcomes of the study device in patients requiring arterial embolization. We want to see how well the study device blocks blood flow to a specific artery. The study device has

a new design compared to previous expandable embolization plugs. We are trying to determine how well the device performs for its intended use.

### **C-TRACT Trial (Chronic Venous Thrombosis: Relief With Adjunctive Catheter-Directed Therapy)**

Determine if the use of imaging-guided endovascular therapy is an effective strategy with which to reduce post-thrombotic disease severity and improve quality of life in patients with established disabling iliac-obstructive post-thrombotic syndrome.

### **DIAMOND: Patiromer for the Management of Hyperkalemia in Subjects Receiving RAASi Medications for the Treatment of Heart Failure**

The purpose of this study is to determine if patiromer treatment of subjects who developed hyperkalemia while receiving RAASi medications will result in continued use of RAASi medications in accordance with heart failure (HF) treatment guidelines and thereby decrease the occurrence of the combined endpoint of cardiovascular (CV) death and CV hospitalization events compared with placebo treatment.

### **Evaluation of Hemodynamic Parameters Following Transjugular Intrahepatic Portosystemic Shunt (TIPS)**

This study is being done to determine the impact of the TIPS procedure on cardiac (heart) function by collecting data (heart pressures) during the IPS procedure. Immediately after TIPS and at standard follow-up time points, labs and transthoracic echocardiograms (TTE or echo) will also be collected.

### **ExtraCorporeal Membrane Oxygenation for 2019 Novel Coronavirus Acute Respiratory Disease (ECMOCARD)**

The purpose of this study is to describe clinical features; severity of pulmonary dysfunction; incidence of ICU admission and use of mechanical ventilation and ECMO; ECMO technical characteristics; duration of ECMO; complications; and survival of patients with COVID-19.

### **IPC Claudication**

The purpose of this study is to improve walking distance in patients with intermittent claudication by using ischemic preconditioning.

### **Pomalidomide for the Treatment of Bleeding in Hereditary Hemorrhagic Telangiectasia (PATH-HHT)**

The purpose of this study is to determine efficacy of pomalidomide compared to placebo for the reduction in severity of epistaxis after 24 weeks of treatment.

### **Study of the RelayPro® Thoracic Stent-Graft in Subjects with Acute, Complicated Type B Aortic Dissections**

The objective of this study is to demonstrate the safety and effectiveness of the RelayPro Thoracic Stent-Graft in subjects with acute, complicated Type B aortic dissections.

### **Study of the Relay Pro® Thoracic Stent-Graft in Subjects With Traumatic Injury of the Descending Thoracic Aorta**

The purpose of this study is to investigate the safety and effectiveness of the RelayPro Thoracic Stent-Graft in subjects with traumatic injury of the descending thoracic aorta.

### **SynCardia 50cc Temporary Total Artificial Heart (TAH-t) as a Bridge to Transplant (BTT)**

The purpose of this study is to evaluate whether the 50cc TAH-t can support patients who are at imminent risk of death from biventricular heart failure, are eligible for heart transplantation, and for whom the 70cc TAH-t is not appropriate due to size of the chest cavity.

### **SynCardia 70cc TAH-t for Destination Therapy (DT) (RA-540)**

The purpose of this research study is to evaluate whether the TAH-t can support patients with life-threatening irreversible biventricular heart failure who are not eligible for transplantation.

To discuss a trial listed with one of our physicians, call **414-805-3666**. To view the latest list of available clinical trials, visit [froedtert.com/heart-vascular](https://froedtert.com/heart-vascular).

### **Cardiovascular Academic Initiative Advancing Clinical Care**

The Cardiovascular Academic Initiative (CAI) at the Medical College of Wisconsin launched in 2020, bringing resources together to advance cardiovascular clinical care. The CAI aims to create collaborative spaces for innovation in cardiovascular research and clinical care; facilitate the translation of cardiovascular research between basic sciences, early human studies and clinical practice; and train the next generation of leaders in cardiovascular research and education. The goal of this work is to help clinicians solve clinical problems, including helping bring new interventions to the bedside, developing best-practice care models and introducing new clinical tools to the care team.

# PHYSICIAN LISTING

## Froedtert & the Medical College of Wisconsin Heart and Vascular Teams

The Froedtert & MCW health network's multidisciplinary team of heart and vascular physicians and staff are respected specialists in diagnosing and treating all forms of cardiovascular disease using the latest techniques and technologies.

### CARDIOLOGY TEAM

#### Advanced Heart Failure and Transplant Cardiologists



Nunzio Gaglianello, MD



David Ishizawar, MD



Renee Kursel, MD



Eugenia Raichlin, MD



Mitchell T. Saltzberg, MD

#### Cardiologists



Alexei Agapitov, MD



Subh Agarwal, MD



Peter Bartz, MD



Supreeti Behuria, MD



Ivor J. Benjamin, MD



Sherry-Ann Brown, MD



Matthew Buelow, MD



Mercy Chandrasekaran, MD



Scott Cohen, MD



Kevin Cohoon, DO



Russell C. Dabrowski, MD



Stacey Gardiner, MD



Noelle Garster, MD



Jennifer Gerardin, MD



Salil Ginde, MD



Michael J. Gitter, MD



David Groden, MD



David Gutterman, MD



Sara Hariman, MD



James F. Kleczka, MD



Jacquelyn P. Kulinski, MD



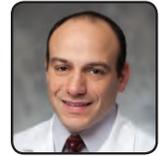
Nicole Lohr, MD, PhD



Pedro Lozano, MD



James Macioch, DO



Joshua A. Meskin, MD



Staci Milosavljevic, MD



Christopher Mueller, MD



Steven L. Peterson, MD



Mohammad Rana, MD



Andrew M. Rosenblum, MD



Linda Scaffidi, MD



Abhinav Sharma, MD



Sarah E. Thorsen, MD



Michael E. Widlansky, MD

# PHYSICIAN LISTING

## Electrophysiologists



Graham Adsit, MD



Marcie G. Berger, MD



Evgueni Fayn, MD



Jalaj Garg, MD



James A. Oujiri, MD



James A. Roth, MD



Jason C. Rubenstein, MD



Dalip Singh, MD

## Interventional Cardiologists



Salman Allana, MD



Michael P. Cinquegrani, MD



Panayotis Fasseas, MD



Kiran Kashyap, MD



David S. Marks, MD



Jesse Martin, MD



Peter Mason, MD



Michael Salinger, MD



Jorge Saucedo, MD



Salim Shammo, MD



John C. Wynsen, MD

## CARDIOTHORACIC SURGERY TEAM

### Cardiothoracic Surgeons



G. Hossein Almassi, MD



Lucian Durham III, MD, PhD



Viktor Hraska, MD, PhD



David L. Joyce, MD



Lyle D. Joyce, MD, PhD



Takushi Kohmoto, MD, PhD



R. Eric Lilly, MD



Michael Mitchell, MD



Paul J. Pearson, MD, PhD



Ronald Woods, MD, PhD

## ENDOVASCULAR AND VASCULAR SURGERY TEAM

### Vascular and Interventional Radiologists



Robert A. Beres, MD



Robert A. Hieb, MD



Eric J. Hohenwarter, MD



Brandon M. Key, MD



Parag J. Patel, MD



William S. Rilling, MD



Matthew J. Scheidt, MD



Amanda R.  
Smolock, MD, PhD



Sean M. Tutton, MD



Stephanie A. Vincent-  
Sheldon, MD



Sarah B. White, MD

# PHYSICIAN LISTING

---

## Vascular Medicine Specialist



James B. Gosset, MD

## Vascular Surgeons



Shahriar Alizadegan, MD



Kellie R. Brown, MD



Joseph Hart, MD



Brian Lewis, MD



Mona Li, MD



Michael Malinowski, MD



Neel Mansukhani, MD



Peter Rossi, MD



Abby Rothstein, MD



Gary Seabrook, MD

# CONTACT INFORMATION

---

## The Froedtert & MCW Heart and Vascular Center on the Froedtert Hospital Campus

8900 W. Doyne Ave. | Milwaukee, WI 53226

To refer a patient to our cardiovascular team, please call **414-805-3666** or visit [froedtert.com/refer](https://www.froedtert.com/refer). For a physician-to-physician phone consultation or patient transfer, call **414-805-4700**.

To learn more about our programs and team of providers, visit [froedtert.com/heart-vascular](https://www.froedtert.com/heart-vascular).

## LEGAL NOTICE/DISCLAIMER

All research and clinical material in this Outcomes Book is for information only. This publication does not provide medical advice and does not substitute for your health care provider's own clinical judgment. Do not disregard professional medical advice or delay seeking it because of something you have read in this publication. Please consult your own physician regarding your symptoms or medical conditions. The procedures or treatments mentioned in this publication may or may not be considered covered benefits by your insurance. Contact your insurance representative as part of your decision-making process before having any medical procedure.

Froedtert Health complies with applicable federal civil rights laws and does not discriminate on the basis of race, color, national origin, age, disability or sex.

Attention: If you speak another language, assistance services, free of charge, are available to you. Call: 414-805-3000 (TTY: 1-800-947-3529)

Español (Spanish): ATENCIÓN: si habla español, tiene a su disposición servicios gratuitos de asistencia lingüística. Llame al: 414-805-3000 (TTY: 1-800-947-3529)

Hmoob (Hmong): LUS CEEV: Yog tias koj hais lus Hmoob, cov kev pab txog lus, muaj kev pab dawb rau koj. Hu rau: 414-805-3000 (TTY: 1-800-947-3529)



**Cleveland Clinic**

**Sydell and Arnold Miller Family  
Heart, Vascular and Thoracic Institute**

*[froedtert.com/heart-vascular](https://froedtert.com/heart-vascular)*

© Copyright 2021 The Cleveland Clinic Foundation. All rights reserved.