



**FRANKEL
CARDIOVASCULAR CENTER**
UNIVERSITY OF MICHIGAN HEALTH

Differentiators

IN CARDIOVASCULAR CARE



2021
2020 DATA

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BY THE NUMBERS



2,977

ADULT OPEN SURGICAL VOLUME



2,114

ARRHYTHMIA CASES



5,067

CARDIAC CATHETERIZATION CASES



75,300

CLINIC VISITS



6,204

INPATIENT DISCHARGES



96.6%

FRANKEL CVC CLINICS OVERALL RATING OF CARE



FRANKEL CVC U.S. NEWS & WORLD REPORT RATINGS

Each year, *U.S. News & World Report* judges hospitals for its Best Hospitals list by rating high-quality patient care, commitment to patient safety, clinical resources, family-centeredness and other measures. For 2021–22, Michigan Medicine ranked No. 20 in the nation for Cardiology and Heart Surgery. The Frankel CVC’s scores include “High Performing” ratings in six conditions/procedures: Heart Failure, Abdominal Aortic Aneurysm Repair, Aortic Valve Surgery, Heart Bypass Surgery, TAVR and Heart Attack.

Michigan Medicine’s combined ranking is No. 11, putting it on the Honor Roll, and No. 1 in Michigan. Thanks to the teamwork, innovation and excellence of our employees, this is the 29th consecutive year that Michigan Medicine has been nationally recognized for strong across-the-board performance.



MAGNET AWARD OF EXCELLENCE

University of Michigan Health was honored with the Magnet Award, presented by the American Nurses Credentialing Center. Only six percent of U.S. hospitals earn this honor, given to organizations that meet rigorous standards for quality patient care, nursing excellence and innovations in professional nursing practice.



Follow us on Twitter
[@umichCVC](https://twitter.com/umichCVC)



FROM THE Frankel CVC Leadership

Welcome to the 2021 Samuel and Jean Frankel Cardiovascular Center Differentiators report, which reflects a new look and feel. In response to feedback we've received from many of our referring physicians, this new design presents information in a format that is easily accessible for you and easily shared with your patients. As you'll see, the infographics and narrative portions showcase many of the strengths that enable us to deliver exceptional patient care.

- **Multidisciplinary team-based care.**
Each and every day, Frankel CVC specialists come together to deliver the highest standards of care. Trained in every heart and vascular specialty area, our multidisciplinary team includes cardiologists, cardiac surgeons, vascular surgeons, vascular medicine specialists, advanced practice nurses and physician assistants — all committed to collaborative, compassionate cardiovascular care for a seamless patient experience.
- **Innovative programs.**
A commitment to excellence through collaboration and innovation enables our team to offer the most advanced programs addressing the entire spectrum of cardiovascular disease. Our specialized programs are designed to guide patients through diagnosis, treatment and rehabilitation for conditions ranging from simple to the most complex, incorporating novel techniques and customized treatment strategies.

- **Leading research initiatives.**
Advances in diagnosis and treatment of cardiovascular disease depend on research and discovery. Our specialists are recognized as national leaders in the latest therapies and non-invasive procedures for the entire spectrum of cardiovascular disease. This emphasis on research is an important differentiator that gives patients access to the latest cardiovascular clinical trials and therapies. Our faculty, staff and technologists maximize our research facilities to bring advanced imaging techniques, ensuring the most effective diagnosis, analysis and treatment.
- **Focus on diversity, equity and inclusion.**
Together, we celebrate diversity and strive to inspire an equitable and inclusive environment that welcomes and respects each and every individual. With diversity at the heart of our values, we can successfully improve patient outcomes, enhance our work culture and optimize health care.

The Frankel CVC is proud to be a leader in shaping the future of cardiovascular care. Through our partnership with you, our referring physicians, we will continue to provide the most advanced care to patients throughout Michigan and beyond. As always, we welcome your feedback.

Yvonne A. Eagle *[Signature]* *Thomas W. Wolk*
Stephanie L. Peters *[Signature]*



COMPREHENSIVE Aortic Program

The Frankel CVC Comprehensive Aortic Program, established more than 25 years ago, is one of the largest practices in North America, with specialists providing unparalleled expertise in advanced open and endovascular procedures to treat aortic disease. Our multidisciplinary team includes experts from cardiac surgery, vascular surgery, interventional cardiology, interventional radiology and diagnostic radiology.

READ ABOUT how a “monster” aneurysm called for an unprecedented emergency procedure:

michmed.org/G2BKY

HEAR THE STORY of Mojo in the Morning as the disc jockey describes his treatment for an aortic aneurysm:

michmed.org/wObk2

Our recently launched **MI-AORTA initiative** reflects a \$20 million gift that will position us as the premier aortic program in the country. MI-AORTA supports the growth of our current aortic disease clinical practice, training and research with the goal of transforming our highly regarded aortic program into a world-renowned entity. This initiative facilitates collaboration within our current systems, creates value for the patients, families and communities we serve, and allows us to continue to pioneer advanced therapies for aortic disease.

From **medical management to minimally invasive endovascular and open surgical procedures**, our specialists treat the entire spectrum of aortic disease. Our faculty include some of the world’s leading experts in bicuspid aortic valve disease and aortic root disease.

Our vascular surgery section is pursuing novel methods to extend the treatment of **complex aortic aneurysms** via 3D printing, physician-modified endografts, and ongoing enrollment in clinical trials of thoracoabdominal aneurysm stent grafts. These efforts allow us to offer treatment to patients who otherwise have no viable options.



ABDOMINAL AORTIC ANEURYSM REPAIR

HIGH PERFORMANCE RECOGNITION FOR ABDOMINAL AORTIC ANEURYSM REPAIR



TYPE A AORTIC DISSECTION OPERATIVE MORTALITY* SIGNIFICANTLY LOWER THAN NATIONAL BENCHMARK

9.1% vs. 14.8%

*R3Y – 2018, 2019, 2020

Our experience as a high-volume center for complex aortic aneurysm repair, including open repair, fenestrated aneurysm repair and iliac branch endografts, allows us to deliver **mortality rates among the lowest in the country.**

We offer **genetic counseling** to help patients and their families understand their risk for aortic disease. We routinely participate in national consortiums and institutional studies focused on identifying genetic mutations that affect aortic disease.

Our **world-renowned researchers** are advancing the science of aortic disease evolution and progression. Participation in clinical trials — **including seven current minimally invasive aortic-related trials** — gives patients access to care for which they would not otherwise be eligible.



For information about our many active clinical trials, visit [UMHealthResearch.org](https://www.umhealthresearch.org).



EVAR AND ABDOMINAL AORTIC ANEURYSM MORTALITY OUTCOMES ARE **SIGNIFICANTLY BETTER** THAN PUBLISHED GUIDELINES



PEDIATRIC VASCULAR DISEASE SPECIALISTS CARED FOR YOUNG PATIENTS FROM

14 STATES AND 5 COUNTRIES

IN CY2020



COMPREHENSIVE Valve Program

The multidisciplinary team at the Frankel CVC is a national leader in the treatment of cardiac valve disease. Our extensive minimally invasive program was built upon our long-standing reputation for excellence in surgical valve therapies. We offer patients the latest transcatheter and percutaneous options for all valve conditions.

For more than 25 years, the University of Michigan has been at the forefront of **surgical aortic valve replacement**. Today, using state-of-the-art **transcatheter aortic valve replacement (TAVR) techniques**, we offer minimally invasive treatment options for an expanding portfolio of aortic clinical disease domains. We are the only site in the region to offer a percutaneous solution to patients with high-risk aortic regurgitation with the JenaValve as part of the pivotal **ALIGN-AR clinical trial**. A new technique was recently developed at the Frankel CVC to enlarge the aortic annulus and allow placement of larger surgical valves in certain patients.

The Frankel CVC was one of the first five medical centers in the country to be recognized for best practices in **mitral valve repair** with the Mitral Valve Repair Reference Center Award. We are among the largest and longest-standing mitral valve centers in the country, with more than 30 years of experience, thousands of mitral valve surgeries performed, and a highly skilled multidisciplinary team.

By offering both **minimally invasive and conventional tricuspid valve surgery**, we provide our patients with a wide variety of tricuspid valve treatment options and exceptional clinical expertise. To date, we have performed more surgical and percutaneous tricuspid valve



THE MOST NOVEL
TECHNOLOGIES IN MICHIGAN
FOR TREATMENT OF ALL VALVE DISEASES



CURRENTLY PARTICIPATING IN
16 VALVE TRIALS
TAVR: 4 MITRAL: 8 TRICUSPID: 4

procedures than any other site in the state. We are one of a limited number of centers nationally that participate in a broad spectrum of percutaneous repair and replacement device trials for the treatment of tricuspid valve disease.

Our robust **clinical trials** program allows us to offer a wide variety of alternative options for patients who are not candidates for commercially approved transcatheter and/or surgical therapies. The **APOLLO Trial** offers the only truly transcatheter mitral valve replacement via a trans-septal approach. The **Summit Tendyne Trial**, nationally co-led by Frankel CVC faculty, is a game-changing mitral valve replacement option for patients with moderate to severe mitral regurgitation and severe mitral annulus calcification (michmed.org/8RNR2).

The Frankel CVC's multidisciplinary team has a single common goal to provide safe and efficient patient care. To this end, our **ACTIVATE initiative** has resulted in a reduction in post-operative length of stay, less frequent discharge to an extended care facility, and lower 30-day readmissions.

READ ABOUT how one octogenarian found hope with the MitraClip procedure: michmed.org/dLYPb



For information about our many active clinical trials, visit UMHealthResearch.org.



RECOGNIZED FOR
**BEST PRACTICES IN
MITRAL VALVE REPAIR**



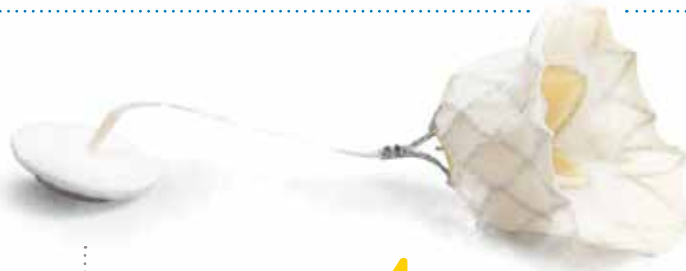
**ONE OF THE LARGEST
MITRAL VALVE
PRACTICES**
IN THE COUNTRY
TRANSCATHETER AND SURGICAL



94.5%
REPAIR RATE
FOR DEGENERATIVE
MITRAL VALVE DISEASE*
*R3Y – 2018, 2019, 2020



U-M TAVR TICKER
2,112 AORTIC VALVES
REPLACED AND COUNTING



**FEWER PATIENTS
NEED PACEMAKERS
POST-TAVR**



TRANSCATHETER AORTIC
VALVE REPLACEMENT
**HIGH PERFORMANCE
RECOGNITION FOR
TAVR**



TOP 10%
FOR RISK-ADJUSTED
SURVIVAL FOR TAVR



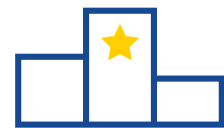
1 DAY
TO RETURN HOME
POST-TAVR PROCEDURE
FOR MOST PATIENTS



AORTIC VALVE
SURGERY
**HIGH PERFORMANCE
RECOGNITION FOR
AORTIC VALVE
SURGERY**



**HIGHEST RATING FOR
AORTIC VALVE
REPLACEMENT
AND AORTIC VALVE
REPLACEMENT+CABG**



TOP 2%
FOR RISK-ADJUSTED
SURVIVAL FOR
OPEN AORTIC
VALVE SURGERY

Heart Failure

CONTINUUM OF CARE

The Frankel CVC Heart Failure Program provides expert medical management, access to advanced surgical care and comprehensive rehabilitation programs. We are also a leader in mechanical circulatory support and heart transplantation.

Our inpatient team of nurse practitioners and physician assistants provides safe, coordinated care while helping patients outside the hospital navigate the complexities of heart failure with tele-management services.

A unique **University of Michigan Health Inpatient Heart Failure Service** at St. Joseph Mercy Chelsea Hospital gives patients access to Frankel CVC heart failure specialists, including transplant and VAD specialists, closer to home. The program provides intensive education and support to patients and family members during their stay and after discharge. Pharmacists provide one-on-one medication counseling and management to ensure patients are successful at home and to help avoid readmission.

Our renowned specialists provide **advanced treatment for cardiac sarcoidosis and transthyretin amyloidosis**. These rare, difficult-to-diagnose conditions require unique expertise and state-of-the-art imaging. Early referral and diagnosis leads to optimal patient outcomes.

As **leaders in the treatment of heart failure with preserved ejection fraction, or HFpEF**, grant-funding allows us to offer personalized treatment plans for this

challenging population. We are the only site in Michigan participating in the REBALANCE and Corvia REDUCE LAP-HF clinical trials. These studies offer breakthrough device-based care options for patients with HFpEF.

The **Center for Circulatory Support** houses our **VAD program**. The team is led by internationally recognized experts and has been at the forefront of VAD technology since it was first introduced over 25 years ago. It is one of only a few programs worldwide that has participated in nearly every ventricular assist device-related investigational and FDA-approved clinical trial.

As a **leading heart transplantation center**, we are capitalizing on recent changes to the Organ Procurement and Transplantation Network heart allocation policy that allows cross-country donor and recipient matches to reduce transplant waitlist time. Recent advancements in oral antiviral therapy have allowed us to initiate a program to accept organs from Hepatitis C positive donors. We are also the first in the state to create an infrastructure for “donor after cardiac death,” an initiative that will allow hearts to be transplanted from a donor who has suffered an irreversible brain injury, but does not meet formal brain death criteria.



For information about our many active clinical trials, visit UMHealthResearch.org.



ONE OF THE FIRST
CENTERS TO BE AWARDED
**DISEASE-SPECIFIC
CARE CERTIFICATION**
FOR VENTRICULAR
ASSIST DEVICES BY
THE JOINT COMMISSION



U-M VAD TICKER
1,109 VADs IMPLANTED
AND COUNTING



**5 YEAR
VAD SURVIVAL
NEARING 70%**
WITH NEWEST TECHNOLOGY



U-M Health has partnered with the International Consortium of Circulatory Assist Clinicians to create **VAD-C™**, a certification program focused on the care of Ventricular Assist Device patients.

READ THE STORY of how two heart failure patients found hope and friendship: michmed.org/o4JBz



CURRENTLY CARING FOR
187
VAD PATIENTS



HIGH PERFORMING HOSPITALS
US News
A WORLD REPORT
2021-22
HEART FAILURE
HIGH PERFORMANCE
RECOGNITION FOR
HEART FAILURE



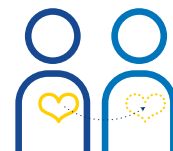
OVERSEEING MORE THAN
40,000
TELE-MANAGEMENT
CALLS EACH YEAR



14 YEARS
LIVING WITH A VAD
A FRANKEL CVC PATIENT
HOLDS THE RECORD



CURRENTLY MANAGING
THE CARE OF NEARLY
4,500
HEART FAILURE
PATIENTS



ACTIVELY CARING
FOR MORE THAN
550
HEART TRANSPLANT
PATIENTS



COMPLEX Coronary Disease

Frankel CVC complex coronary disease specialists are experts in a wide variety of innovative and advanced treatments, ranging from open surgical and percutaneous revascularization to specialized medical management. We care for a large volume of complex and high-risk patients with limited treatment options.

A dedicated **heart team** of cardiac surgeons and interventional cardiologists collaborates in multidisciplinary conferences to develop individualized, evidence-based patient care planning strategies to optimize outcomes for patients with multi-vessel disease.

A high percentage of our team's **percutaneous coronary intervention (PCI)** patients have one or more high-risk coronary lesion features; including:

- Left main coronary artery location
- Chronic total occlusion (CTO)
- Significant calcification
- In-stent restenosis
- Long lesion length
- Multi-vessel disease

As one of only a few teams in the state with expertise in the catheter-based treatment of **chronic total occlusions (CTO)**, we are committed to offering safe



Left anterior descending artery chronic total occlusion before and after recanalization

and effective minimally invasive solutions to improve quality of life for patients suffering from chronic angina or cardiac dysfunction.

Older patients with coronary disease are more likely to have significant calcification not amenable to conventional angioplasty balloons and stent placement. We offer treatment options that remove obstructive calcium to obtain an optimal result, including atherectomy and intravascular lithotripsy.

We also offer stent modification and optimization techniques for in-stent restenosis or stent failure, including laser atherectomy and brachytherapy. Our

coronary brachytherapy program is one of the most experienced in the region. By providing radiation therapy inside the affected vessel, our interventional cardiologists can prevent recurrent stent failure.

Our **surgical complex coronary intervention** team performs bilateral internal mammary artery grafting procedures three times more often than the national average, leading to superior life expectancy. Despite our high-risk patient population with complex disease and a high rate of comorbidities, patients undergoing coronary artery bypass graft surgery at the Frankel CVC:

- Require significantly fewer blood product transfusions
- Are liberated from the ventilator within the first 6 hours post-surgery significantly more often
- Are less likely to suffer a stroke or death post-operatively

For patients with prior heart attacks or weakened heart muscle, the team partners with imaging experts to perform state-of-the-art **nuclear positron emission tomography (PET) scans**. PET scans map coronary blood flow patterns and identify hibernating cardiac muscle more likely to recover with revascularization.

Our preventative cardiology specialists focus on **primary and secondary preventive measures**, including early detection, risk stratification and evidence-based treatment to prevent coronary and other vascular diseases. After a coronary procedure or cardiac event, our cardiac surgery and interventional cardiology teams collaborate with preventative cardiology to ensure medical optimization and minimize the risk of disease progression or recurrent cardiac events.

Our **Comprehensive Hypertension Center**, designated as such by the American Society of Hypertension, is expert at controlling both common and rare forms of hypertension, including resistant and refractory hypertension.

Our **lipid management** service includes certified lipidologists who specialize in lipid and lipoprotein metabolism as well as their associated disorders and treatment. For very severe lipid disorders, we are one of only a few centers in the country to offer lipid apheresis, an FDA-approved treatment to lower LDL cholesterol.

A multidisciplinary team of **metabolic fitness** specialists helps patients manage and reverse components of metabolic syndrome, including pre-diabetes, hypertension, central obesity, elevated triglycerides and low HDL cholesterol. Through lifestyle changes implemented in our structured MetFit Program, patients are able to reduce the risk of cardiovascular disease.

M-LINE: 800-962-3555



HIGH PERFORMANCE
RECOGNITION FOR
HEART BYPASS
SURGERY



65%
OF CORONARY LESIONS
TREATED WITH PCI ARE
HIGHLY COMPLEX



POST-OPERATIVE STROKE AND
MORTALITY RATES ARE
**LOWER THAN THE
NATIONAL AVERAGE**



PATIENTS ARE LIBERATED FROM
A VENTILATOR WITHIN THE
**FIRST 6 HOURS
POST-SURGERY**
MORE OFTEN THAN THE
NATIONAL AVERAGE:
81% vs. 60%



BILATERAL INTERNAL MAMMARY
ARTERY GRAFTING PROCEDURES
ARE PERFORMED
3X MORE OFTEN
THAN THE NATIONAL AVERAGE:
16% vs. 6%

READ HOW one man's catheter-based CTO treatment restored 100% of his blood flow: michmed.org/wnnQB



For information about our many active clinical trials,
visit UMHealthResearch.org.

COMPREHENSIVE Arrhythmia Program

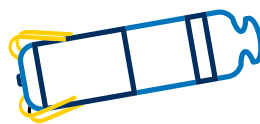
The Comprehensive Arrhythmia Program at the Frankel CVC is a high-volume tertiary referral center for the management of the most complex cardiac arrhythmias, including failed percutaneous arrhythmia therapies, complemented by a robust clinical research program.

- **Non-valvular atrial fibrillation:** Our team partners with neurology to provide a multidisciplinary patient evaluation and management plan for patients who would benefit from left atrial appendage occluders. Our robust percutaneous and surgical Afib program features experts in the Watchman FLX and AtriClip devices. These devices reduce the risk of clots forming in the left atrial appendage and eliminate the need for long-term anticoagulation. Our Watchman implant procedure volume grew exponentially in 2021.
- **Arrhythmia ablation:** The U-M Center for Arrhythmia Research is involved in groundbreaking clinical trials. Our renowned experts have helped to perfect the tools used in ablation and played a key role in developing new treatment strategies. Many of our physicians are involved in decisions that shape the standard of arrhythmia care.

- **Leadless pacemaker:** U-M was the 3rd hospital in the world and the 1st in Michigan to implant the Medtronic Micra Transcatheter Pacing System, the world's smallest pacemaker. Our experts are also driving the next generation of pacemakers — an adjunct to the Micra that is even smaller in size. Now in clinical trials, the system targets the heart's left ventricle in patients who require biventricular pacing.
- **Cardiac resynchronization therapy:** Patients with a diagnosis of heart failure with a reduced ejection fraction can get improved circulation through the use of cardiac resynchronization therapy in which a pacing device is positioned in the heart to help coordinate the function of the left and right ventricles.
- **Cardiac implantable electronic device (CIED) lead extraction:** The Frankel CVC leads the state in performing laser lead extractions, a high-risk, complex procedure to remove broken, malfunctioning or infected pacemaker or defibrillator wires that run through veins in the chest and attach to the heart.



>1,000
CATHETER ABLATIONS
PER YEAR



#1
IMPLANTER OF
LEADLESS PACEMAKERS
(MEDTRONIC MICRA)
IN MICHIGAN (2020)



OUR DEVICE TEAM MANAGES
6,000
PATIENTS WITH
ICDs AND PPMs



>400
CARDIAC DEVICE
IMPLANTS
PER YEAR



#1
IN LASER LEAD
EXTRACTIONS
IN MICHIGAN



SETTING THE STANDARD FOR
TREATING ARRHYTHMIAS
FOR THE LAST
30 YEARS

COMPREHENSIVE Stroke Center

Acute stroke care is one of the fastest-evolving fields in medicine, with revolutionized diagnostic and therapeutic technologies improving the lives of stroke patients in ways that would have been unimaginable a decade ago.

The University of Michigan Health Comprehensive Stroke Center provides access to timely, evidence-based and effective acute stroke management 24/7 as well as secondary stroke prevention and recovery. The team includes specially trained, multidisciplinary experts in emergency medicine, neurology, neurosurgery, neuro-interventional radiology, neurocritical care, vascular surgery, cardiology, anesthesiology, internal medicine, and physical medicine and rehabilitation. Our board-certified neurologists utilize state-of-the-art imaging and cutting-edge interventional treatment to reduce the long-term effects of acute stroke.

- **Joint Commission Disease**

Specific Certification: The Comprehensive Stroke Center is a Joint Commission Certified Comprehensive Stroke Center. We initially received our Comprehensive Stroke Center Certification in 2014.

- **National Stroke Guideline**

Development: Comprehensive Stroke Center physicians are active in the development of national guidelines for the treatment of stroke.

- **Carotid disease:** Carotid arterial disease is very highly associated with stroke. Our specialists use advanced imaging and the full complement of treatment options, including carotid endarterectomy and carotid artery stenting, to reduce the burden of carotid atherosclerosis and prevent stroke. We were one of the first centers in the state to offer transcatheter carotid artery revascularization (TCAR), a clinically proven, minimally

invasive procedure developed by a former Frankel CVC faculty member.

- **Associated conditions:** Atrial fibrillation, patent foramen ovale and endocarditis all increase risk of stroke. We offer multidisciplinary evaluation and comprehensive treatment for patients with these and other conditions, including options for surgery or device implantation.

- **Clinical trials:** Frankel CVC faculty are involved in a full complement of stroke primary and secondary prevention research. We lead research across race, ethnic, social and gender health disparities in stroke care, and we participate in clinical trials that seek to optimize acute stroke intervention and secondary stroke prevention. The University of Michigan serves as a **Regional Coordinating Center for NIH StrokeNet** — a nationwide hospital network that conducts leading stroke clinical trials.



**American Heart Association
American Stroke Association
CERTIFICATION**
Meets standards for
Comprehensive Stroke Center



REGIONAL COORDINATING
CENTER FOR
NIH StrokeNet



70
**THROMBECTOMY
PROCEDURES
PERFORMED**
EACH YEAR



HIGH PERFORMANCE
RECOGNITION
FOR
STROKE

Venous Health

PROGRAM

The Venous Health Program is a multidisciplinary, high-volume clinic that offers care for the entire spectrum of venous disease provided by vascular surgeons, interventional radiologists and vascular medicine specialists — and anchored by our expert advanced practice providers and nurse clinicians.

- **Personalized therapies:**

Our team consists of highly trained experts with years of experience treating patients with conditions ranging from superficial venous disease to the most complex conditions. We offer patients a personalized solution encompassing lifestyle changes, compression, medications and massage therapies as well as interventional therapies that include:

- Liquid and Varithena foam sclerotherapy
- Endovenous superficial vein treatments including radiofrequency ablation, laser ablation and non-tumescent ablation
- Phlebectomies including powered (Trivex) and stab technique
- Pharmacomechanical thrombolysis
- Recanalization of central vein occlusions
- Large vein transpositions

- **Venous diagnostics:** Our diagnostic vascular laboratory provides the most up-to-date, noninvasive venous diagnostic studies. We work closely with the wound clinic at Domino's Farms to identify and treat patients with venous ulceration.

- **Expanded services:** Our expanded virtual services include virtual consultations for patients and educational programs for our referring physicians. These services help improve the care of patients with venous disease locally whenever possible, and are particularly valuable to patients and referring physicians located a significant distance from Ann Arbor. In the coming year we are expanding our pelvic and deep venous imaging pathways to provide minimally invasive diagnostic imaging. We are also expanding our virtual services to a broader population of our patients with deep venous thrombosis.

CONDITIONS WE TREAT

- Renal vein compression
- Pelvic congestion syndrome
- Non-occlusive iliac vein compressive lesions
- Inferior vena cava occlusion
- Deep vein thrombosis
- Post-pulmonary embolism follow-up
- Post-thrombotic syndrome
- Venous ulcers
- Congenital venous atresia
- Venous aneurysms
- Symptomatic varicose veins
- Klippel-Trenaunay syndrome
- Leg swelling from a venous or lymphatic cause



22.8%
PROGRAM GROWTH
SINCE 2019
COMMITTED TO ONGOING
GROWTH STRATEGIES



**MULTIDISCIPLINARY
TEAM OF PROVIDERS**
ENSURES THE LATEST DIAGNOSTIC
AND TREATMENT RECOMMENDATIONS

CARDIOVASCULAR Imaging

State-of-the-art cardiovascular imaging services available at the Frankel CVC support our wide spectrum of heart and vascular programs. Our team of board-certified imaging specialists uses advanced techniques to provide unparalleled levels of detail, including imaging of the most complex diseases. Close collaboration with specialists throughout U-M Health ensures effective diagnosis, analysis and treatment for our patients.

Cardiovascular images can be transferred electronically to promote patient-provider communication with Frankel CVC clinical cardiologists.

- **Cardiac MR:** Our MR scanners are equipped with the latest technology and allow us to skillfully demonstrate cardiovascular anatomy, make extremely accurate measurements of cardiac function, shunt quantification and stress perfusion, assess valvular pathologies and identify areas of cardiac scarring — all critical steps in planning advanced cardiac procedures. We also perform state-of-the-art MR imaging in patients with pacemakers and ICDs.
- **Cardiac and Vascular CT:** The latest CT scanners allow several advancements, including scanning with low radiation doses and imaging of the entire heart in a single heartbeat. Advanced computer processing helps reduce artifacts and improve image quality. We also offer advanced post-processing to enable accurate dimensions prior to planning structural heart interventions as well as creation of 3D printed models.

CARDIOVASCULAR IMAGING VOLUME

	FY20	FY21
Transthoracic Echo	25,016	30,196
Stress Echo	2,314	2,510
Transesophageal Echo	1,836	2,015
PET	1,937	2,260
SPECT	1,826	2,130
CT	8,614	10,763
Cardiac MR	2,947	3,357
Diagnostic Vascular Studies	25,179	28,226



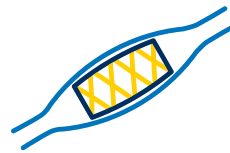
- **Diagnostic Vascular Unit:** Our DVU specialists perform approximately 33,000 studies annually, including a full spectrum of arterial and venous examinations such as air plethysmography, transcranial doppler monitoring and patent foramen ovale diagnosis, transcutaneous oxygen measurement and arterial perforator mapping prior to fibular flap surgery. Accreditation by the Intersocietal Accreditation Commission has been ongoing since 1993.
- **Echocardiography:** A state-of-the-art imaging center offers the most advanced echo imaging modalities available. Our team of board-certified echocardiologists, cardiac sonographers and nurses provides services to over 34,000 patients annually. Services include transthoracic, transesophageal and stress (exercise and pharmacologic) echocardiography, as well as 3D echocardiography and strain analysis.
- **Nuclear Cardiology:** Our nuclear cardiology lab and PET imaging center are equipped with the latest SPECT/CT and PET/CT imaging systems with a new state-of-the-art, fully digital PET/CT system being installed this year. These advanced systems enable specialists to employ novel approaches to detect and quantify abnormalities in blood flow due to coronary artery disease as well as inflammation in the heart muscle due to cardiac sarcoidosis, myocarditis and cardiac infection.



KEY SERVICE

Areas of Excellence

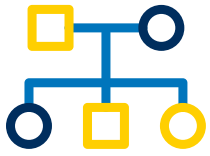
Frankel CVC specialists in all areas of cardiovascular care work collaboratively to provide the most advanced treatment options. Here are just a few of the many innovative services we offer. For these and every one of our programs, our goal is to interact closely with referring physicians as we provide specialty treatment options and services for your patients, with a seamless transition back to your care.



PULMONARY ENDARTERECTOMY AND BALLOON PULMONARY ANGIOPLASTY

The Frankel CVC is the only center in Michigan to offer both pulmonary endarterectomy and balloon pulmonary angioplasty (BPA) for the treatment of pulmonary chronic thromboembolic disease and chronic thromboembolic pulmonary hypertension (CTEPH). Pulmonary endarterectomy is an extremely complex open-heart procedure that allows experts to extract chronic material in the pulmonary arteries. Patients who are not eligible for pulmonary endarterectomy, or have recurrent or persistent pulmonary hypertension, are treated with BPA, a minimally invasive percutaneous treatment.

Patients with a prior history of pulmonary embolism who present with shortness of breath, fatigue or right heart failure should undergo a ventilation perfusion (VQ) scan and echocardiogram to determine if they have pulmonary chronic thromboembolic disease or CTEPH. If positive, they should be seen at a center of excellence with specific expertise in pulmonary endarterectomy and BPA.



INHERITED CARDIOMYOPATHIES

The Inherited Cardiomyopathies Program specializes in the treatment of all inherited heart muscle

conditions. We are the only site in Michigan participating in all currently ongoing clinical trials for both obstructive and nonobstructive hypertrophic cardiomyopathy (the most common form of cardiomyopathy) and have been recognized as a Center of Excellence by the Hypertrophic Cardiomyopathy Association since 2007.

Our multidisciplinary team includes cardiologists and electrophysiologists (both adult and pediatric), genetic counselors, cardiac surgeons, radiologists specializing in cardiac imaging, exercise physiologists and nutritionists. This approach allows seamless transition of care from pediatric to adult stages and allows for efficient, patient-centered communication.

Our specialists encourage timely referral to a center of excellence to identify and monitor inherited heart conditions in early stages. Late stage patients who may have been candidates for advanced therapies (such as heart transplant) if seen earlier, may not qualify due to the severity of their condition.



CARDIO-OBSTETRICS

Our Cardio-Obstetrics Program combines the expertise of cardiologists and high-risk obstetrics specialists to help patients achieve optimal birth outcomes. The team specializes in the full spectrum of cardiovascular

conditions and works with patients to create personal plans for care during pregnancy, labor and birth, as well as during the postpartum period.

A leading referral center, we care for high-risk patients from throughout the state, providing in-person and virtual visits for those living in rural locations. For patients who want to understand the risks associated with becoming pregnant, we offer pre-conception and contraception counseling. We also treat those who develop heart disease during pregnancy, including peripartum cardiomyopathy and preeclampsia.



PERIPHERAL ARTERIAL DISEASE

Our Peripheral Arterial Disease Program brings together a solid team of specialists in interventional cardiology, interventional radiology, cardiovascular medicine, vascular medicine and vascular surgery. Our team meets regularly to discuss individual cases and develop optimal management strategies. From mild to the most complex cases, our emphasis is on improving each patient's quality of life with the most appropriate treatment plan, developed with a long-term, holistic perspective.

Specialists take an evidence-based approach to patient care, with recommendations for medical therapy before considering a surgical procedure whenever possible. To this end, we are actively involved in the Vascular Quality Initiative "My PAD Pilot Study," a forum for patients to report their experience and a resource to help our team assess outcomes.

Patients should be referred if there is any concern about a PAD condition to ensure prompt care.



ADULT CONGENITAL HEART DISEASE

The Adult Congenital Heart Disease Program was the first in the state to be accredited as a Comprehensive Care

Center by the Adult Congenital Heart Association. This distinction recognizes the program as a leader in the field and a provider of the highest quality of care for ACHD patients. Our dedicated team includes three board-certified adult congenital cardiologists specializing in the diagnosis, management and lifelong care of complex congenital heart conditions.

As the only center in the state offering the Harmony Transcatheter Pulmonary Valve System for pulmonary valve replacement, we provide a minimally invasive alternative to open-heart surgery for patients with severe pulmonary regurgitation.

Any patient with a congenital heart condition should be evaluated at an accredited center to identify potential treatment options.

CONTINUED >>>



CARDIO-ONCOLOGY

Our Cardio-Oncology Clinic is one of only a few such clinics in Michigan and was one of the first in the country to provide comprehensive, coordinated care for cancer patients and cancer survivors. A team of cardiologists and oncologists specializes in the full spectrum of heart conditions related to cancer treatment, including the most complex cases such as bone marrow transplant, cardiotoxicity issues and cardiac amyloidosis. Our goal is to improve the quality of life for these patients and eliminate barriers to effective treatment as we support them from diagnosis through survivorship.

Our specialists also lead a nationwide U-M Cardiac Tumor Program that brings together multidisciplinary experts from around the country via videoconference to discuss complex cases and a broad research program studying the most effective ways to predict and prevent cardiotoxicity.

Cancer patients suspected of having symptoms related to cardiac issues or those with abnormal cardiac imaging should be seen by an experienced subspecialty team for evaluation.

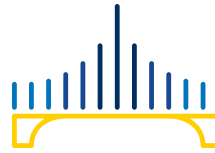


GENETIC COUNSELING AND TESTING

The Genetic Counseling and Testing Program is the only program in the state dedicated to genetic counseling and testing for individuals diagnosed with inherited cardiovascular conditions and their families. The program works hand in hand with a multidisciplinary team of specialists in cardiomyopathy, arrhythmia, aortic disease, heart failure, early-onset coronary artery disease, pulmonary arterial hypertension and other vascular/arterial diseases.

As leaders in clinical research, we are working to translate our findings into useful clinical information for patients and their families. Our board-certified genetic counselors are available to assist clinicians and to prepare individuals with familial cardiovascular disease for genetic testing, including how testing might impact the patient and family.

Any individual with a family history of heart disease — especially early-onset heart disease — is encouraged to meet with a genetic counselor experienced in inherited cardiovascular conditions.



TRANSITIONS OF CARE

Because the most vulnerable time for a patient is often shortly after discharge, we have developed a series of follow-up options generally described as Bridge Clinics to help patients stay healthy and to reduce their risk of being readmitted. Within 14 days of being discharged from the hospital, patients have an appointment at one of our Bridge Clinics. At this appointment, patients meet with an advanced practice provider who conducts a thorough assessment and ensures patients are on correct medications, have the necessary cardiovascular resources, fully understand their role in their own care and have a follow-up appointment scheduled with their cardiologist.

Our data has shown that patients who participate in Bridge Clinics are at less risk for readmission to the hospital or Emergency Department visits (over six months) than those who don't participate.



QUALITY IN PATIENT CARE

The Frankel Cardiovascular Center is committed to achieving superior, highly reliable patient care. Clinicians at the CVC have led the Blue Cross Blue Shield Cardiovascular Consortium (BMC2) Percutaneous Coronary Angioplasty (PCI) Quality Improvement Initiative since its inception in 1997, making it the longest running Value Partnership in Michigan. Our clinicians are also integral leaders for all other BCBS cardiovascular collaborative quality initiatives, including:

- BMC2 Vascular Surgery Intervention Registry
- Michigan Society of Thoracic and Cardiovascular Surgeons (MSTCVS) Quality Collaborative
- Michigan Transcatheter Aortic Valve Replacement (TAVR) Quality Collaborative
- Michigan Anticoagulation Quality Improvement Initiative (MAQI2)

These CQIs are informed by their associated registries and create an environment where data transparency facilitates the development of statewide best practices in safety, appropriateness and clinical care quality.

Procedural Volume

PROCEDURE CATEGORY	DEFINITION	CY2018	CY2019	CY2020
Aortic Disease	Vascular Surgery: Open Abdominal Aortic Aneurysm (OAAA)	38	51	55
	Vascular Surgery: Abdominal Endovascular Aneurysm Repair (EVAR)	86	69	67
	Cardiac Surgery: Thoracic Aortic Aneurysm (TAA)			
	Root / Ascending / Arch	299	340	323
	Descending / Thoracoabdominal	18	12	19
	Cardiac Surgery: Thoracic Endovascular Aneurysm Repair (TEVAR)	61	80	67
Transcatheter Valve Disease	All transcatheter valve procedures	299	366	321
Surgical Cardiac Disease (Coronary & Valve)	Isolated Aortic Valve Replacement	127	116	90
	Isolated Mitral Valve Replacement	74	94	74
	Isolated Mitral Valve Repair	223	176	154
	Isolated CABG	154	183	183
	Isolated AVR + CABG	30	41	32
	Isolated MV Replacement + CABG	10	12	8
	Isolated MV Repair + CABG	25	26	19
Heart Transplant	Heart Transplants	37*	37*	48*
VAD	Implants	55	52	39
	Re-implants	19	17	6
Heart Failure	Right Heart Catheterization (RHC)	1,193	870	670
	Endomyocardial Biopsy	475	466	363
Percutaneous Coronary Heart Disease	Percutaneous Coronary Intervention (PCI)	561	530	709
Arrhythmia Management	Cardiovascular Implantable Electronic Device (CIED) Procedures (PPM, ICD, ILR)	926	1,145	1,089
	Ablation	1,025	1,230	1,011
	Left Atrial Appendage Occlusion (LAAO)	27	23	14
Stroke	Vascular Surgery: Carotid Endarterectomy (CEA) Procedures	74	72	54
	Vascular Surgery & Neurology: Carotid Artery Stent (CAS) and Transcarotid Artery Revascularization (TCAR)	19	44	35
Venous Health	All venous procedures	429	314	279
Chronic Thromboembolic Pulmonary Hypertension (CTEPH)	Cardiac Surgery: Pulmonary Endarterectomy	23	31	28
	Interventional Cardiology: Balloon Pulmonary Angioplasty (BPA)	15	19	45
	Interventional Cardiology: Pulmonary Angiography (PA-Gram)	7	75	57

*Per SRTR released August 2020

Research

The Frankel Cardiovascular Center has a vast research enterprise reliant on sound strategy to maximize efficiencies, quality and research opportunities. The commitment to excellence through teamwork, innovation, caring, inclusion and integrity is the basis for success for the Frankel CVC Research Programs. Our goal is to generate new knowledge and make significant advances in cardiovascular research to lead the fight against cardiovascular disease.

Our commitment to basic science, translational and clinical research keeps us at the forefront of scientific discovery, demonstrates our leadership in the fight against cardiovascular disease and ensures patients have access to the expansive range of clinical research studies that are currently enrolling at the Frankel CVC.

There are currently **459 active research studies** across **39 diverse divisions, departments, schools, and institutions** at the University of Michigan.

RESEARCHERS AND CLINICIANS

The Frankel Cardiovascular Center recruits and retains promising scientists and clinicians who are not only successful in their fields, but who represent the Center's mission, vision and values. Visit our digital timeline (med.umich.edu/cvc/timeline/) to view the contributions of U-M cardiovascular researchers over the past 100+ years.



359 FACULTY MEMBERS

85 JOINT APPOINTMENTS

35 DIVISIONS, DEPARTMENTS, SCHOOLS, INSTITUTES



COLLABORATIVE PROGRAMS WITH LASER-FOCUSED RESEARCH GOALS

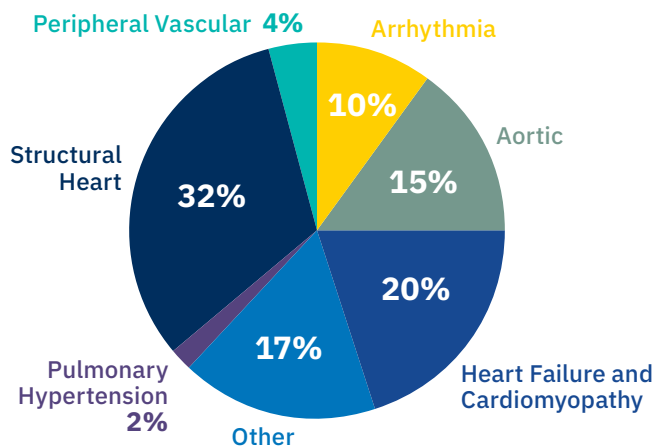
- M-BoCA* – work in understanding cardiovascular aging
- M-BRISC** – examining biological sex differences and their impact on cardiovascular health
- MI-AORTA – conducting aortic disease research in parallel with the clinical and educational aspects of this program
- MI-REACH – collaborative program in cardiovascular imaging

*Michigan Biology of Cardiovascular Aging Program

**Michigan Biological Research Initiative on Sex Differences in Cardiovascular Disease

BROAD OFFERING OF CLINICAL TRIAL OPPORTUNITIES

Clinical Trials Open to Enrollment



RESEARCH EDUCATION OPPORTUNITIES TO DISCUSS AND INSPIRE NEW DISCOVERIES

- Frontiers in Cardiovascular Science – Basic Science content-focused seminar
- Cardiovascular and Cardiovascular Medicine Grand Rounds – Clinical science content-focused seminars
- C3RG* – Research staff education content-focused seminar
- SURF** – Basic science lab experience
- MAP*** – Aortic disease seminar

*Cardiovascular Center Clinical Research Group

**Summer Undergraduate Research Fellowship

***Multidisciplinary Aortic Program

TECHNOLOGY TRANSFER LEADERS

Licensing agreements for CVC Members – 2007–2021



519 FILINGS
57 in FY21

294 ACTIVE
42 in FY21

59 LICENSED
5 in FY21



DEDICATED RESOURCES TO FACILITATE RESEARCH SUCCESS

- CHIP*
- FCVC Cores**
- Regeneration Core Lab
- Shared cutting-edge research equipment inventory available to all CVC faculty
- Internal funding opportunities to launch discovery (nearly \$10M invested since 2013)

*Cardiovascular Health Improvement Project

**Frankel Cardiovascular Center Core Laboratories

FOR MORE INFORMATION

Please call **1-888-286-4420**, email **CVCVolunteer@med.umich.edu** or visit **UMHealthResearch.org** for answers to your questions and additional information about our research programs.

Patients and their families can sign up to be matched with research studies for specific health conditions through **UMHealthResearch.org**, the greater University's research community website.



Education

One of the main pillars of the Frankel CVC mission is education. Expanding our understanding of cardiovascular disease across the lifespan is a collaborative effort among clinicians, scientists, patients and their families. Our focus on the exploration of improved treatments, disease mechanisms, genetics and myriad other factors impacting patient care supports our educational partnerships with our referring physicians to improve outcomes for all.



PATIENT AND FAMILY EDUCATION

The Frankel CVC's Mardigan Wellness Resource Center provides information about cardiovascular health in patient-friendly language. Our goal is to help patients and families understand their health conditions, make informed decisions and become active members of their health care team. Visit umcvc.org/mardigan-wellness-resource-center.



FRANKEL CVC CARDIOVASCULAR CARE GUIDE

Our Cardiovascular Center Care Guide provides a list of programs and services as well as useful patient education materials.

Visit careguides.med.umich.edu/CVC.



FEATURED FRANKEL CVC CARDIAC SURGICAL VIDEOS

View our playlist of videos on YouTube highlighting short segments of cardiac surgical procedures and complex cases.

Visit michmed.org/DmqG8.



GRAND ROUNDS

Our Grand Rounds program features a series of talks presented by Frankel CVC faculty, guest faculty and medical students on the topics of Cardiovascular

Medicine, Cardiac Surgery and Vascular Surgery. For more information or to register to view live Grand Rounds, email Erika Laszlo at physicianliaisons@med.umich.edu. To view a playlist of past Cardiac Surgery Grand Rounds and other webinars, visit michmed.org/DmqG8.



HEALTH LAB BLOG

Blogs posted at MichiganHealthLab.org are geared toward medical professionals, researchers and thought leaders and feature informative articles about

cutting-edge research, medical breakthroughs and related patient profiles.



ONGOING COMMUNICATION

Subscribe to our quarterly e-newsletter for news on research, procedures, services and CME courses available at the Frankel CVC. Contact Physician

Liaison Erika Laszlo at M-LINE **800-962-3555** or email physicianliaisons@med.umich.edu to subscribe.



CONTINUING EDUCATION

Throughout the year, the U-M Frankel CVC offers physicians, mid-level and advanced practice providers a variety of continuing medical education courses

and seminars taught by our faculty. For information on upcoming courses, visit med.umich.edu/intmed/cme/calendar.htm.



COMMUNITY HEALTH OUTREACH

The Frankel CVC is committed to providing education and services to improve the health and well-being

of our surrounding community. Our priority in FY20 was to place more focus on underserved ethnic and racial groups. To expand our reach to these diverse populations, we partnered with the University of Michigan Community Health Services department. The program also assisted groups across the Frankel CVC in their community outreach efforts by providing written materials, recommending subject matter experts to assist with events, providing counsel regarding plain language/health literacy/developmental appropriateness of content, and reporting event details to the U-M Department of Community Benefit. For more information call **734-232-4120**.

Your Resources



PHYSICIAN LIAISON PROGRAM

Communication with our referring physicians is essential to coordinating patient care. To this end, our Physician Liaison Program offers personalized service to community-based physicians throughout the region.

Erika Laszlo, our Frankel CVC Outreach Manager, provides information about new cardiovascular services, treatment options and clinical trials; assesses your needs and determines how we can best meet them; and shares outreach opportunities from our clinical faculty.

For additional information, call M-LINE at **800-962-3555** or email physicianliaisons@med.umich.edu.



M-LINE: 800-962-3555

M-LINE is a 24-hour, toll-free number for our referring physicians and staff seeking access to clinical services and faculty at U-M Health. The M-LINE staff works closely with personnel across U-M Health to provide efficient and personalized service.

To make a referral or speak with one of our specialists, contact M-LINE: **800-962-3555**. For additional referral information, visit the U-M Health Provider website: med.umich.edu/umhs/health-providers.



ADMITTING OFFICER OF THE DAY

The Admitting Officer of the Day (AOD) program gives referring physicians the opportunity to speak directly with a select group of attending physicians who have the authority to make quick decisions about accepting transfer patients from outside U-M Health. The process enables multiple providers to conference with a referring physician to ensure the patient is transferred to the appropriate service and level of care upon arrival. The Frankel CVC accepted 441 outside hospital transfers in calendar year 2020.

In March 2020 a single point of entry system was created for all external transfers into U-M Health. This was accomplished by bringing together the transfer centers into one Unified Transfer Center (UTC). This change was made in an effort to provide more centralized control of all inpatient and emergency department transfers in response to the COVID-19 pandemic and unprecedented pressures on hospital resources.

The UTC can be reached at **734-615-0930** or **734-936-6666** (ED-to-ED transfers only).





PATIENT AND FAMILY CENTERED CARE (PFCC)

At the heart of the U-M Cardiovascular Center is the belief that providing the ideal care experience stems from a partnership between patients, their families, physicians and staff. CVC has created a Patient and Family Centered Care program as a forum for patients and families to share their personal experiences and partner with the CVC faculty and staff to improve care.

U-M has also established numerous Patient and Family Advisory Councils (PFACs) throughout hospital departments, which are an integral part of our PFCC initiative.

For more information, call **734-232-4617**, email **cvc-pfcc-program@med.umich.edu** or visit **umcvc.org/patient-and-family-centered-care-program**.



PROVIDER PORTAL

The Provider Portal is a secure, web-based application that enables referring physicians and their staff to access patient medical information, including:

- Appointment notifications
- Admission notifications
- Emergency Department notes
- Laboratory and radiological test results
- Physician/clinic letters
- OR notes
- Progress notes
- Medication lists
- Problem list
- Allergies

Visit **uofmhealth.org/providerportal** to download a User and Site Agreement form or call M-LINE at **800-962-3555**.



DIRECT MESSAGING

EHR-to-EHR Communication

Direct messaging is a secure, standardized way that health care organizations can exchange patient health information and referrals directly between electronic health record (EHR) systems. This functionality allows practices to connect with U-M Health without having to use fax machines or mail services.

Direct messaging can be used to securely send:

- Outpatient referrals
- Physician-to-physician messages
- Continuity of Care documents
- Automatic discharge notices
- Summary of Care documents
- Other patient records and results

For more information, visit **uofmhealth.org/provider/direct-messaging** or call M-LINE at **800-962-3555**.



SECURE IMAGE TRANSFERS

Secure, electronic patient image transfers can be made from any facility to U-M Health. A one-time upload feature allows hospitals and sites not currently connected to U-M Health to transfer images via LifeIMAGE, a third-party HIPAA-compliant image exchange network. Any site connected to the Internet can send DICOM images to U-M Health.

Visit **uofmhealth.org/outsideimages** for additional information.

Locations

1 Frankel Cardiovascular Center

1500 E. Medical Center Drive
Ann Arbor, MI 48109

2 Domino's Farms

4000 Ave Maria Drive
Lobby A, Suite 1300
Ann Arbor, MI 48106

3 Briarwood Health Associates

325 Briarwood Circle, Building 5
Ann Arbor, MI 48108

4 Brighton Center for Specialty Care

7500 Challis Road
Brighton, MI 48116

5 Brighton Health Center

8001 Challis Road
Brighton, MI 48116

6 Canton Health Center

1051 N. Canton Center Road
Canton, MI 48187

7 Chelsea Health Center

14700 E. Old US 12
Chelsea, MI 48118

8 East Ann Arbor Surgery and Medical Procedures Center

4270 Plymouth Road
Ann Arbor, MI 48109

9 Northville Health Center

39901 Traditions Drive
Northville, MI 48168

10 West Ann Arbor Health Center

380 Parkland Plaza
Ann Arbor, MI 48103

11 MidMichigan Health Advanced Heart Failure Clinic

4011 Orchard Drive, Suite 1002
Midland, MI 48640

CARDIOVASCULAR NETWORK OF WEST MICHIGAN

The Cardiovascular Network of West Michigan was formed to meet the growing need for expanded heart and vascular services in Grand Rapids, Michigan. As part of a joint operative agreement between University of Michigan Health-West, Mercy Saint Mary's and Mercy Health Muskegon, the Network benefits patients seeking treatment for coronary and vascular disease.

1 GRAND RAPIDS

Mercy Health Physician Partners
Electrophysiology Clinic
Cardiothoracic Surgery
310 Lafayette SE, Suite 310
Grand Rapids, MI 49503

2 MUSKEGON

Mercy Health Physician Partners
Electrophysiology Clinic
1212 E. Sherman Blvd., Suite 2
Muskegon, MI 49444

Cardiothoracic Surgery

1560 E. Sherman Blvd., Suite 309
Muskegon, MI 49444

3 WYOMING

University of Michigan
Health-West Heart & Vascular
Professional Building
2122 Health Drive, SW, Suite 133
Wyoming, MI 4951

STATEWIDE CLINIC LOCATIONS FOR ADULT CONGENITAL HEART DISEASE

- | | |
|-------------|-----------------|
| 1 Ann Arbor | 4 Marquette |
| 2 Kalamazoo | 5 Petoskey |
| 3 Lansing | 6 Traverse City |

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Mark J. Bernstein
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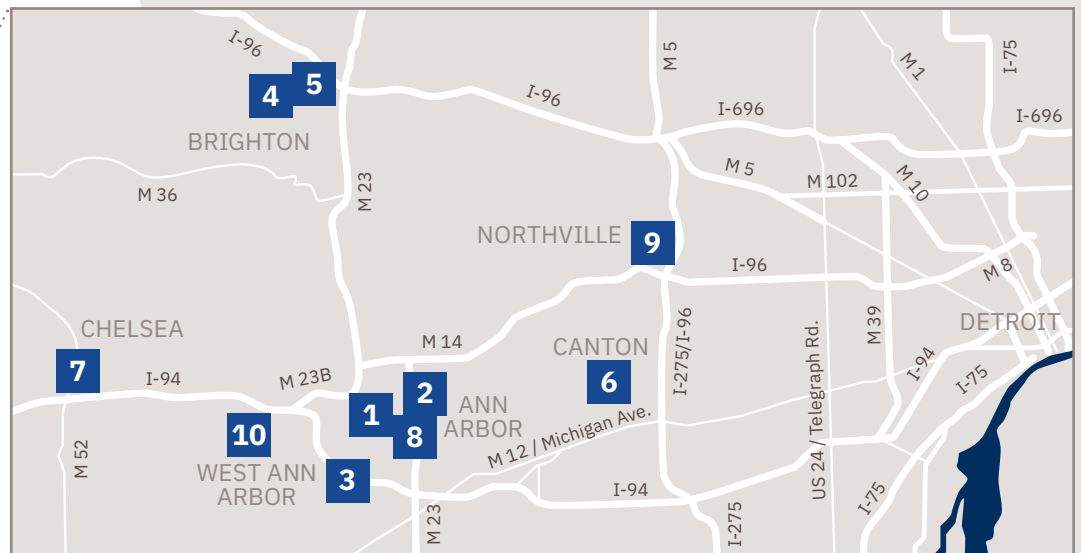
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