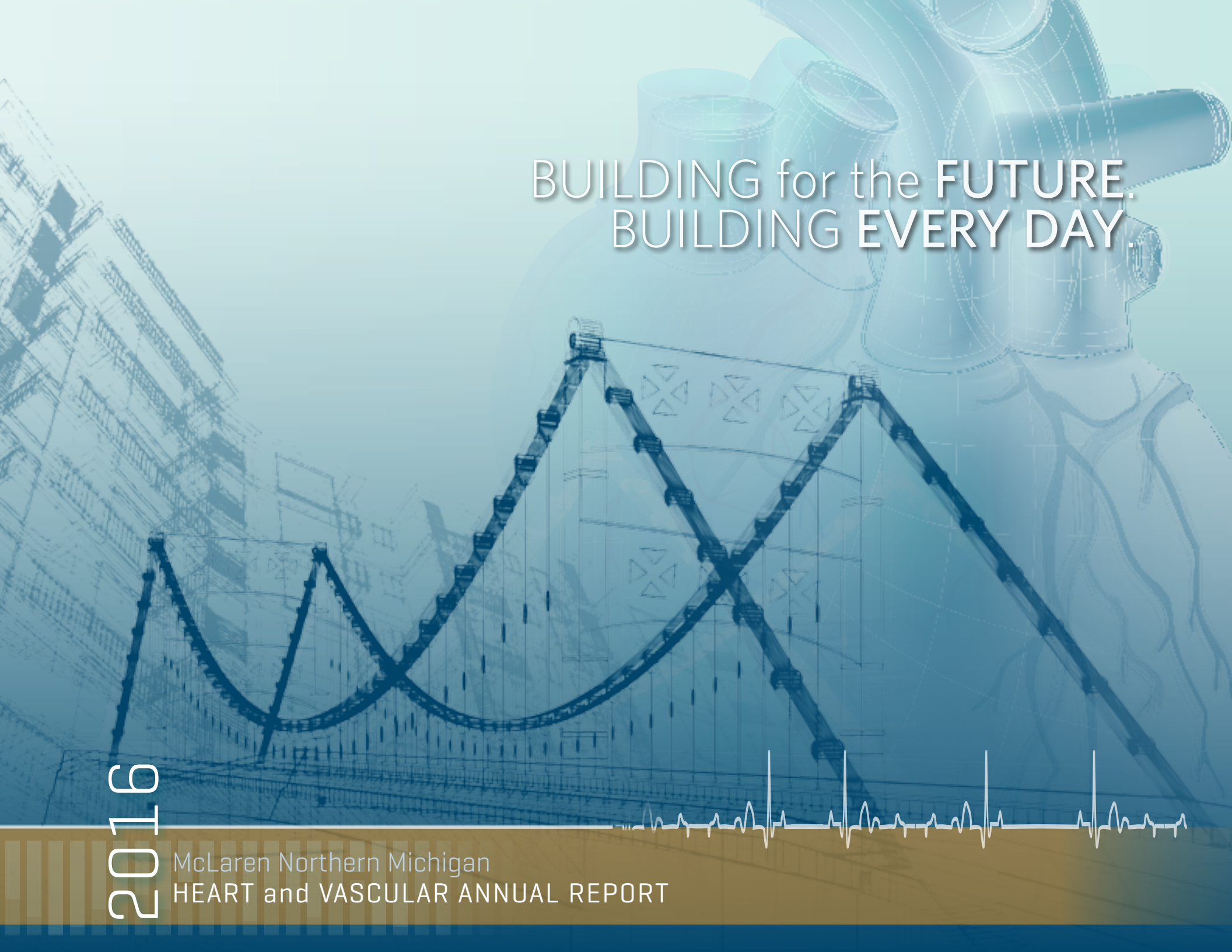


BUILDING for the **FUTURE**.
BUILDING **EVERY DAY**.

2016

McLaren Northern Michigan

HEART and VASCULAR ANNUAL REPORT

BUILDING MOMENTUM:

SYNCHRONIZING HEART & VASCULAR CARE

Movement creates momentum,
and momentum builds a quality program.
We move the parts of the whole to
create a synchronized effect.
EVERY DAY...

We build upon our foundation.

We build bridges to take health care across the region.

We build strong, lasting relationships with our patients.

We build a center of security for those who need our services, and for those who love them.

We build reputations, for continued excellence, for patient outcomes, and for advanced treatments.

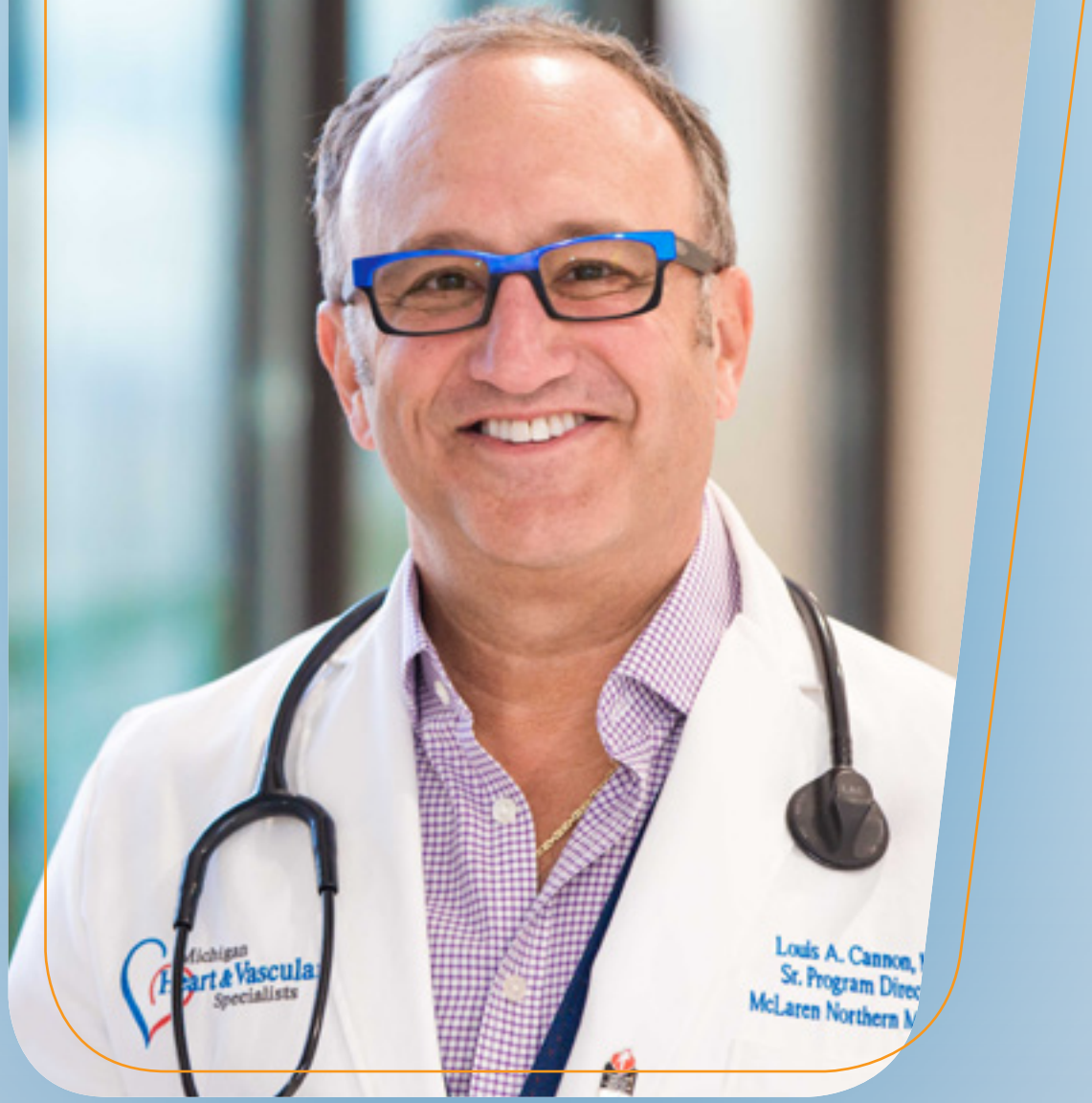
We build upon our past to pave a way for the future.

MOMENTUM | SYNCHRONIZATION | MOVEMENT | FOR THE FUTURE

INSIDE

UNDERSTANDING THE CONNECTION:

Michigan Heart & Vascular Specialists (MHVS) is a cohort of highly skilled cardiologists, cardiovascular surgeons, electrophysiologists, and specialists functioning as a team within the McLaren Northern Michigan network. The individual and collective skills of its members make MHVS a key element in regional and national cardiovascular care.



Louis Cannon, MD, FSCAI, FACA, FCCP, FACC, FACP, has been repeatedly honored as a leading interventional cardiologist. Author of over 200 medical publications and two United States medical device patents, Dr. Cannon serves on strategic advisory boards for several Fortune 500 companies, as well as many medical technology companies. McLaren Northern Michigan proudly recognizes Dr. Cannon for his significant contributions to heart and vascular health.

An acclaimed program does not appear, fully formed.

It is constructed with care.

It is empowered by a vision.

It starts with a concept and builds upon itself, one advancement at a time.

It builds with each idea, each patient, and each procedure.

TO THE MEDICAL COMMUNITY

DEAR COLLEAGUES AND FRIENDS:

An effective heart program is both specialized and functional, just like the heart itself; its chambers must all function separately to work effectively as a whole. This concept was, and continues to be, our vision as we build the most efficient heart and vascular center in the region and one of the most respected centers in the state.

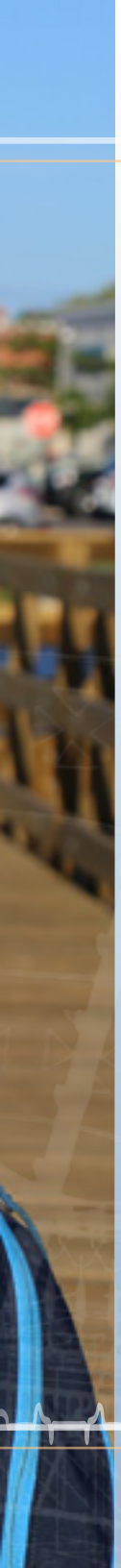
We have accomplished this through a comprehensive approach, one in which all aspects of cardiovascular care are joined with the practical, supportive elements necessary to any sustainable health care program. For example, our Structural Heart program, initiated in 2016, has steadily gained momentum for full implementation in 2017. We achieved this — and all other components of our Heart and Vascular Center at McLaren Northern Michigan — by expanding our team of physicians, surgeons, and specialists to create a collaborative powerhouse. These professionals bring energy and expertise to the workplace through their medical skills and compassion as well as their intellectual property and patents. And, their participation in groundbreaking national research and clinical trials places McLaren Northern Michigan in an enviable position among others in the field. Simply put, we are the preferred center for top-tier heart and vascular care.

The contents of this annual report illustrate the reach and responsibility of our Heart and Vascular Center. The patient stories found in these pages are validation of the effectiveness of our continuum of care. Information about new technology, namely the MitraClip® and Watchman™, supports our drive for technical excellence. And, important statistics and data included within prove that we successfully and regularly exceed national benchmarks. McLaren Northern Michigan knows how to build a program that impacts lives, supports the region, and at the same time advances the science of heart and vascular care.

LOUIS A. CANNON, MD, FSCAI, FACA, FCCP, FACC, FACP, Interventional Cardiovascular Specialist
SENIOR PROGRAM DIRECTOR, HEART AND VASCULAR CENTER
PRESIDENT, THE CARDIAC & VASCULAR RESEARCH CENTER OF NORTHERN MICHIGAN

"I'm glad my son and daughter-in-law sang the praises of the McLaren Northern Michigan heart and vascular program. I think it saved my life."

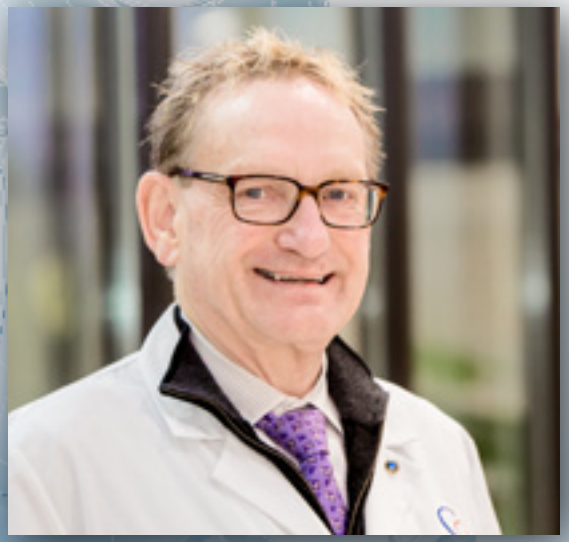
— Quadruple bypass patient **WALTER FRASZ** offers a few fishing tips to his granddaughter Norah on the docks in Boyne City.



THE CARE CONTINUUM:

NOW, WITH FRIENDSHIP

Two men, unknown to each other, had similar cardiac events and found themselves together through the McLaren Northern Michigan care continuum. In the process, they discovered that they had much more in common.



The Care Continuum, as implemented by McLaren Northern Michigan, is a seamless, dynamic set of protocols, able to function singularly and in tandem to follow patients from pre-admission to discharge and beyond. "The Care Continuum really works for us and for our patients," explains Dr. Colfer. "We are conscious of every step along the way, and that allows colleagues at each juncture to communicate and coordinate patient care. This is a system that works to the advantage of all."

— **HARRY COLFER** MD
INTERVENTIONAL
CARDIOLOGIST

IT TAKES A TEAM

WALTER (WALT) FRASZ and his wife Alice were enjoying a northern Michigan vacation, first at the home of their son and daughter-in-law in Boyne City, and then in the Upper Peninsula. But Walt began experiencing unusual health symptoms. He attributed his breathing difficulty and shortness of breath to just a part of aging, and to compensate, he took frequent breaks. But his condition worsened to such a degree that, while checking into their hotel, he couldn't even push the baggage cart. After two days, the Frasz's decided to return to their Cranberry Lake cottage near West Branch.

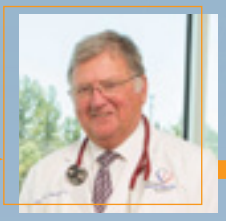
Walt, however, remembered something that his son and daughter-in-law told him about the high quality of heart and vascular care at McLaren Northern Michigan. That was all he needed to detour to the emergency room in Petoskey. It was a smart move. The next day, Walt received a heart catheterization that determined his condition was serious. Two days later, Cardiothoracic Surgeon J.D. Talbott, DO, performed quadruple bypass surgery. "It's lucky that Mr. Frasz did not proceed to their cottage, because he would have had a much more difficult and circuitous route to an appropriate facility," explains Interventional Cardiologist Harry Colfer, MD, who performed the heart catheterization. "A quick and accurate assessment in our Emergency Department (ED) sent Walt on his way to life-saving surgery and into our continuum of care."

The Care Continuum Links Every Aspect of Health Care

- Cardiovascular Care with Gerald Gadowski, DO, Cheboygan — RICH
- EMS to Cheboygan Campus and Transport to Petoskey — RICH
- Petoskey Campus Emergency Department — WALT AND RICH
- Hospital Admission — WALT AND RICH
- Heart Catheterization with Harry Colfer, MD — WALT AND RICH
- Open Heart Surgery with J.D. Talbott, DO — WALT AND RICH
- Cardiovascular Unit Recovery (CVU) — WALT AND RICH
- Outpatient Rehabilitation — RICH IN CHEBOYGAN, WALT AT McLAREN FLINT
- New Friendship

WALTER FRASZ

RICHARD KNIGHT



RICHARD (RICH) KNIGHT, of Afton, had a family history of heart disease and had undergone previous stent procedures. In late November, he began to notice that he started to tire easily. "I was short of breath," he explains, "even going out to get the mail." A follow-up appointment with Cardiologist Gerald Gadowski, MD, at Cheboygan Community Medical Center revealed that a stent procedure was needed and scheduled in Petoskey with Dr. Colfer. But, the night before the scheduled procedure, things began to change, and fast. "I broke out in a sweat, and I knew something wasn't right," Knight says. His wife Jacky called 9-1-1, and after assessment at the McLaren Northern Michigan-Cheboygan Campus ED, he was transported to the Petoskey Campus.

Once in Petoskey, Knight had a heart catheterization procedure by Dr. Colfer and was told that he needed triple bypass surgery and a valve replacement. Dr. Talbott performed the surgery. "As part of McLaren Northern Michigan, our Cheboygan team moves quickly to evaluate and stabilize patients who need more advanced care in Petoskey," states Dr. Colfer. "The parts of the whole work together for favorable outcomes."

Getting to Know You

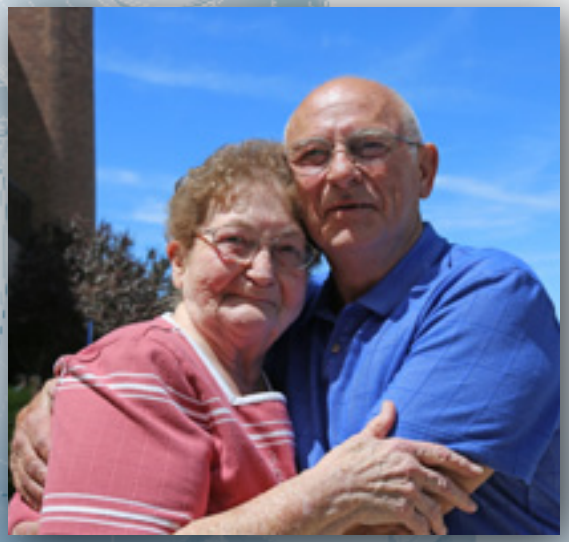
Throughout the evaluation and treatment process in Petoskey, Walt and Rich stayed in a room together. There, they learned that they had more in common than their upcoming bypass surgeries: both were retired tool and die workers; both had four children and multiple grandchildren; both shared a love of tinkering, gardening, and northern Michigan. It wasn't long before they were watching holiday football games together and giving each other culinary recommendations on the hospital menu. "I don't think I ever hit it off with anyone that quickly in my life," says Rich. And, when Walt was offered a bayside room of his own, he opted to stay with his new friend. "I didn't want to move," Walt says. "I liked sharing a room with Rich." After their discharge, both men were headed to 10 weeks of outpatient rehabilitation — Rich to Cheboygan Campus and Walt to McLaren Flint, near his hometown — but the families plan on having a northern Michigan reunion soon.

McLaren Northern Michigan
STRUCTURAL HEART TEAM

STRUCTURAL HEART:

Complex Matters of the Heart

A team of specialists, with years of collective experience and study, individualize patient care for all structural heart conditions. Embracing new knowledge and participating in clinical studies make the McLaren Northern Michigan Structural Heart Program a regional destination for those with heart valve disease.



Roland Lynch, a retired army drill sergeant and veteran of two tours in Vietnam, received his MitraClip® in a 2016 procedure performed by Dr. Ricci. A long history of heart issues — a heart attack in 1978 and open heart surgery in 1986 — followed by mitral regurgitation made Lynch a poor candidate for a second open heart surgery, but thankfully, he was the right candidate for the new device. Lynch admits that, prior to his surgery, his condition was getting progressively worse. "Before, I couldn't even walk across the house," he says, but after the procedure he had almost immediate relief. Now, he is "back to cutting trees" near his Lincoln, Michigan, home.

— ROLAND LYNCH
with Jacky, Wife of 54 Years

Structural Heart:
ADVANCED THERAPIES FOR COMPLEX CONDITIONS

The Structural Heart program at McLaren Northern Michigan is tasked with treating difficult and complex diseases of the heart. Skilled interventional cardiologists, cardiovascular surgeons, electrophysiologists, anesthesiologists, and imaging specialists are committed to utilizing the best treatments and protocols available. By embracing new and innovative therapies, the structural heart team is able to offer life-altering treatment in a less invasive way, minimizing operative risk and recovery time.

MitraClip

- ANOTHER FIRST FOR NORTHERN MICHIGAN PATIENTS

  Introduced at McLaren Northern Michigan in 2016, MitraClip® is the world's first percutaneous valve repair therapy designed to relieve the debilitating symptoms of degenerative mitral regurgitation (MR). McLaren Northern Michigan was the first in the region to use MitraClip. Previously, open heart surgery was the only option, but those who were at prohibitive risk for surgery benefit from this new procedure. "Before MitraClip, many patients had limited options and frequently spent their days short of breath and debilitated by the symptoms of congestive heart failure," Interventional Cardiologist Jason Ricci, MD, explains. MitraClip is a catheter-based therapy delivered from the femoral vein. Symptom relief is almost immediate following the 1- to 2-hour procedure, and most patients are discharged the next day.

  "To date, non-surgical based therapies for mitral valve disease are limited. MitraClip is the first FDA approved percutaneous technology, allowing us to treat debilitating mitral regurgitation," explains Interventional Cardiologist Harry Colfer, MD.

Watchman

- A VIABLE ALTERNATE TO BLOOD THINNERS

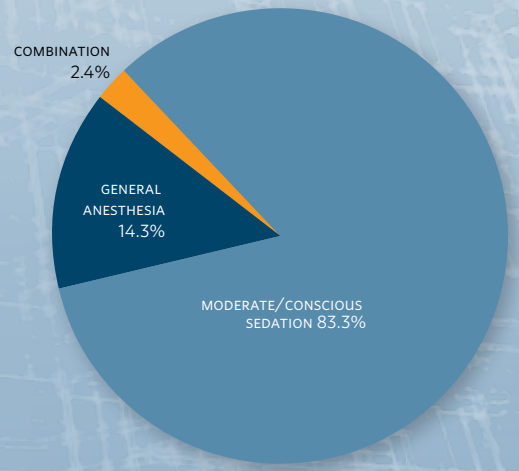
For patients with atrial fibrillation (AFib), the incidence of stroke is 5X higher due to thrombus formation in the atria. It is estimated that 90% of thrombus formation occurs in the left atrial appendage. Although pharmaceutical treatment such as Warfarin or NOAC are effective strategies, up to 50% of patients that should be receiving treatment aren't. Preparations for the Watchman™ left atrial appendage occluder for stroke prevention in patients with AFib began in 2016, for implementation in 2017. The Watchman device has been shown to be as effective as Warfarin in stroke prevention for patients with non-valvular AFib, preventing the formation of clots by permanently blocking the left atrium.

Watchman is appropriate for patients who cannot tolerate blood thinners or who have occupations, conditions, or lifestyles that put them at risk for serious bleeding episodes. It is the only FDA approved device to prevent stroke in patients with AFib not caused by valvular heart disease. McLaren Northern Michigan is only one of a few centers selected in Michigan to offer this life-altering therapy.

The TVT Registry™ monitors patient safety and real-world outcomes related to transcatheter valve replacement (TAVR) and repair procedures — emerging treatments for valve disease patients. Analysis of TVT Registry data allows the cardiovascular profession and medical community to understand how transcatheter heart valve procedures are being deployed throughout the U.S., and what impact they will have on patient outcomes as they become more prevalent. Data from the registry will also assist the medical device industry and the Federal Drug Administration (FDA) in surveillance of the quality, safety, and efficacy of new medical devices.

The TVT Registry was developed in collaboration with the FDA, Centers for Medicare and Medicaid Services (CMS), and with input from the Society for Cardiovascular Angiography and Intervention and the American Association for Thoracic Surgery. — tvtregistry.org

0% MODERATE TO SEVERE ACUTE KIDNEY INJURY



83.3% OF PROCEDURES PERFORMED UNDER MODERATE/ CONSCIOUS SEDATION

142% **MORE** than U.S. Averages

30% SHORTER LENGTH OF STAY than National Median

Electrophysiologist

DANIEL BUERKEL MD

ELECTROPHYSIOLOGY:

A Framework for Excellence

The application of electrophysiology in diagnosing and treating arrhythmias and other related conditions has expanded to include new methods and tools as they become available. McLaren Northern Michigan is at the center of electrophysiological care.

"Advancements in non-invasive and minimally-invasive electrophysiology procedures help us alter the heart rhythm, and improve lives for many of our northern Michigan patients."

— **NAOMI OVERTON** MD
ELECTROPHYSIOLOGIST

Identifying and Treating Heart Rhythm Conditions:

A TEAM APPROACH

Nationally, atrial fibrillation (AFib) affects 6 million people, 85% of whom are age 65 or older, and 35% of that number will have a stroke. Most significant to Electrophysiologist Daniel Buerkel, MD, is that a majority of those diagnosed do not understand the risks.

"Because AFib is a significant health factor in our region, we are developing a streamlined approach, aimed at connecting our team here at McLaren Northern Michigan with regional primary care providers," explains Dr. Buerkel. "Ideally, a primary care provider will refer a patient as quickly as possible so that we can evaluate the condition and begin a treatment plan; this places the referring provider and the patient at the center of our efforts."

"Educating patients about their condition will help them take action, make appropriate decisions in consultation with their primary care providers, and allow us to have early intervention and optimal impact," he states. Dr. Buerkel stresses that because every patient case is different, early intervention by electrophysiologists will speed the process. "Referring providers can lean on us to evaluate and treat their patients, while giving them a care management program to use long-term."

Building a Comprehensive Program

- AFIB PROTOCOLS IN THE EMERGENCY DEPARTMENT
  Improving and standardizing Emergency Department (ED) protocols for patients diagnosed with heart rhythm disorders is aimed to reduce and avoid readmissions. Following ED discharge, patients will be scheduled for Heart Rhythm Clinic evaluation to develop and implement individualized care plans. "Our overall goal is to provide patients with improved standardized care, allowing them to realize optimal outcomes," he adds.

HEART RHYTHM CLINIC

To facilitate treatment of heart rhythm disorders, McLaren Northern Michigan began to lay the foundation in 2016 for a new Heart Rhythm Clinic, a coordinated and comprehensive method to identify patients, design their treatments, and conduct follow-up expeditiously. "We want to see patients as early as possible so that we can initiate treatment with potential cures before the condition becomes chronic or permanent," Dr. Buerkel states. "The Heart Rhythm Clinic will aid our efforts by standardizing care plans and encouraging patient participation in their care." To allow electrophysiologists to focus on treating the condition, the clinic plans to add a new EP nurse practitioner to assist patients and their referring providers with coordinated care management.

EMBRACING THE LATEST TECHNOLOGY

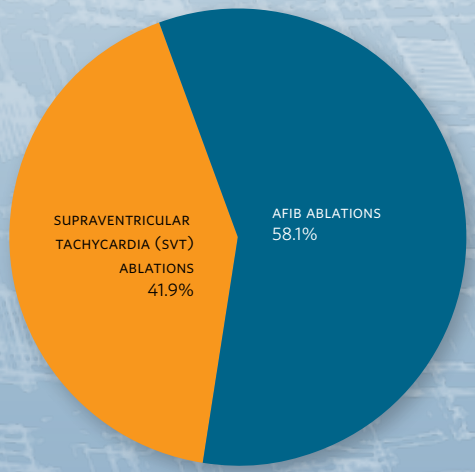
McLaren Northern Michigan strives to provide the latest electrophysiology treatments to improve patient safety and outcomes. The Carto 3 electroanatomical mapping system, for example, is a highly advanced three-dimensional (3D) platform with increased clarity for accurate visualization, rapid mapping, and streamlined workflow for increased efficiency. The system is able to provide both graphical and numerical displays of contact force and 3D force vectors in real time, on one screen, without the need for an additional workstation. "With advanced mapping, combined with integrated radiofrequency catheters, we treat patients more accurately in less time," explains Dr. Buerkel.

EP VOLUME

PACEMAKER IMPLANTS (PPM/CRT-P)	314
ICD IMPLANTS	132

AFIB ABLATIONS	36
SUPRAVENTRICULAR TACHYCARDIA (SVT) ABLATIONS	26
TOTAL EP ABLATIONS	62

ABLATION DETAIL



DATA SOURCE:
Michigan Heart & Vascular Specialists

Interventional Cardiologist

THOMAS EARL MD

INTERVENTIONAL CARDIOLOGY:

Groundbreaking Advancements have Altered the Landscape

Cardiovascular diseases and structural abnormalities are all treated at McLaren Northern Michigan through an enhanced collaborative system. Patients have access to advanced procedures close to home.

"With the nation's finest heart and vascular specialists coupled with the most advanced technology and devices, patients need not travel far from home for excellent care. Primary care providers can feel confident in sending their patients to McLaren Northern Michigan for cardiovascular care."

— **DUANE SCHUIL** MD, PhD
INTERVENTIONAL
CARDIOLOGIST

Interventional Cardiology:

IMPROVING QUALITY OF LIFE

Interventional cardiologists at McLaren Northern Michigan have adopted various strategies and protocols to help deliver optimal patient care in complex and high-risk cases.

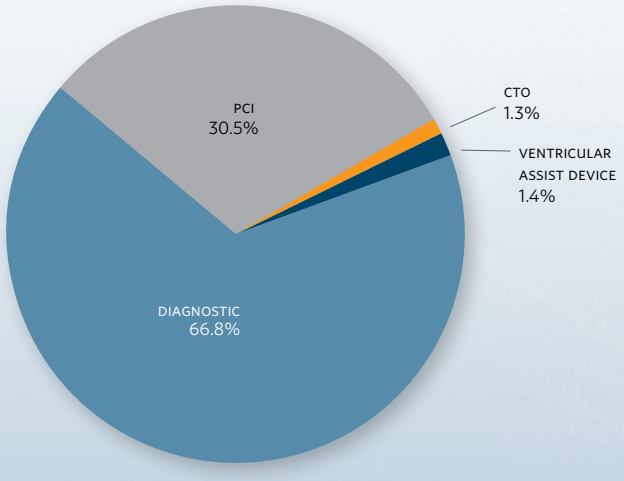
Interventional Cardiologist Thomas Earl, MD, states that with the increasing use of ventricular assist devices, for example, high-risk patients with complex conditions can find relief. Treating patients with advanced coronary artery disease with percutaneous options as opposed to open heart surgery will typically shorten hospital stays. Procedures are performed in the catheterization laboratory with conscious sedation as opposed to the operating room with general anesthesia.

"This approach allows us to take care of the sickest patients who may not have any other options," explains Dr. Earl. "Often these patients have been treated medically, but remain symptomatic; once the arteries are open, they have a new lease on life," he adds. "We see the greatest impact on patients with coronary artery chronic total occlusions (CTO)."

A Shift from Inpatient to Outpatient

Implementation of more outpatient-driven treatments, thereby decreasing inpatient stays, has shown momentum. This is achieved through the use of the radial approach to catheterization. Unlike the femoral artery, the traditional path for catheterization, the radial approach uses one of the main arteries in the forearm. The advantages are many; shorter hospital stays, faster recovery time, and a reduced risk of complications such as internal bleeding. "Our patients can safely go home 1 – 2 hours after a radial procedure and potentially avoid the attendant risks of the femoral approach, such as bleeding in the groin, which can be quite serious," Dr. Earl adds. McLaren Northern Michigan exceeds national benchmarks for radial:femoral approach procedures, performing 60% more radial procedures than U.S. averages.

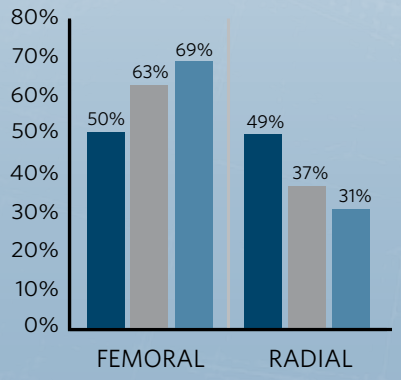
2016 CATHETERIZATION VOLUME



1,438	DIAGNOSTIC
656	PCI
27	CTO
30	VENTRICULAR ASSIST DEVICE (IMPELLA®/TANDEMHEART®)

Impella® and TandemHeart® technology are used in high acuity patients undergoing percutaneous coronary intervention (PCI), as well as in those treated for acute myocardial infarction, decompensated heart failure, or cardiogenic shock. These temporary ventricular assist devices can be used as short-term solutions, allowing for more definite therapies such as heart surgery, stenting, placement of a permanent cardiac assist device, or heart transplantation.

2016 RADIAL:FEMORAL CATHETERIZATION DATA



60% MORE

Radial Procedures than U.S. Averages

Decreasing bleeding complications and shortening recovery time, with shorter hospital stays.

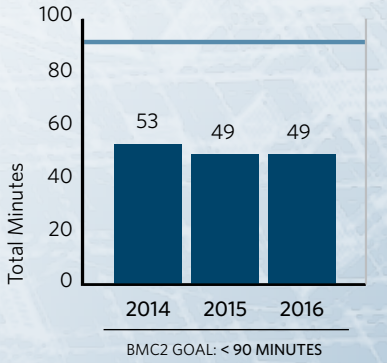
- McLaren Northern Michigan (reporting 2016 data)
- BMC2 State Percentage (2015 data)
- NCDR® (2015 data)

2016 STEMI DATA

DOOR-TO-BALLOON

45.5% LESS TIME

than BMC2 goal of 90 minutes. McLaren Northern Michigan experienced a median of 49 minutes.*



- McLaren Northern Michigan
- BMC2 Goal *(< 90 minutes)*

84.21% OF STEMI

patients receive immediate PCI

WITHIN 90 MINUTES

according to NCDR® data

** BMC2 (Blue Cross Blue Shield of Michigan Cardiovascular Consortium) Data*

Cardiothoracic Surgeons
J.D. TALBOTT DO, and
CHRIS AKINS MD

CARDIOTHORACIC SURGERY:

The Foundation of Heart and Lung Treatment

McLaren Northern Michigan leads the way in cardiothoracic care. Board-certified surgeons and specialists perform traditional and minimally invasive procedures reflective of the latest advancements in the field.

"Creating a seamless treatment plan for patients is improved through strong communication and collaboration. Northern Michigan patients benefit from such well-rounded care close to home."

— **J.D. TALBOTT** DO
CARDIOTHORACIC SURGEON

PICTURED ABOVE (LEFT TO RIGHT):
- JEANNE MELTON, RN, OCN
  ONCOLOGY NURSE NAVIGATOR
- J.D. TALBOTT, DO
  CARDIOTHORACIC SURGEON
- THOMAS BOIKE, MD
  RADIATION ONCOLOGIST
- ANDREA CHERRY, LMSW
  ONCOLOGY SOCIAL WORKER

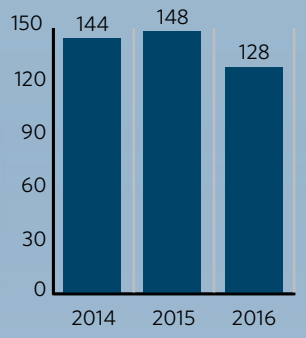
Lending Skills for Lung Cancer Patients:
A COLLECTIVE INITIATIVE

In addition to specialty heart and vascular surgery, McLaren Northern Michigan cardiothoracic surgeons are key components in the care of lung cancer patients. Participation in the Lung Tumor Board, a collaboration with Karmanos Cancer Institute, tasks specialists with providing a seamless treatment path for lung cancer patients. The board includes colleagues throughout the continuum of care — from radiation oncologists and clinical research associates to cardiothoracic surgeons and social workers — who figure in the diagnosis, treatment, and follow-up of cancer patients. "This multidisciplinary collaboration improves our quality and efficiency," says Cardiothoracic Surgeon Chris Akins, MD. "We all benefit from the open lines of communication."

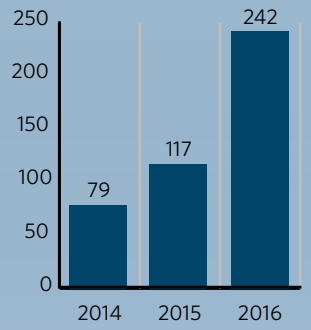
The panel is lead by Oncologist Elena Coppola, DO. "Working as a team, the Lung Tumor Board allows us to hear a patient's story, discuss their pathology and imaging, and individualize a treatment plan in an efficient manner," Dr. Coppola explains.

While the Tumor Board addresses all types of cancer, the incidence of lung cancer is increasing nationwide and its impact is felt in the region as well. "Our cardiothoracic surgeons are top-notch," adds Dr. Coppola. "We are grateful to have such a strong surgical team to provide quality care for our patients."

TUMOR BOARD CASES



LUNG CANCER SCREENING DATA



242 SCREENINGS

92 ABNORMAL RESULTS
148 NEGATIVE RESULTS
13 ABNORMAL OTHER
2 POSITIVE RESULTS

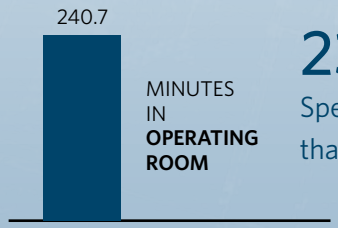
Including adenopathy, granuloma, parenchymal scarring and changes, AAA, COPD, emphysema, spiculated mass, bronchiectasis, bronchitis, thyroid nodules, and nodules of various sizes.

OPERATIVE AND POSTOPERATIVE INFORMATION

52.2% LESS VENTILATION HOURS AND 39.8% LESS ICU HOURS

than STS National Average

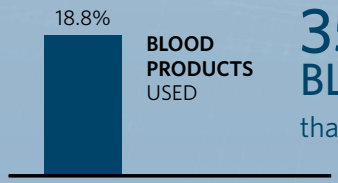
OR DURATION



23.2% LESS TIME

Spent in the Operating Room
than STS National Average

PRODUCTS USED



35.4% LESS BLOOD PRODUCTS

than STS National Average

Founded in 1964, The Society of Thoracic Surgeons (STS) is a not-for-profit organization representing over 6,800 surgeons, researchers, and health care professionals worldwide, dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, and esophagus, as well as other surgical procedures within the chest. The Society's mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy. — sts.org

2016 SURGICAL COMPLICATIONS FOLLOWING ISOLATED CABG PROCEDURES

1.4% INFECTION

0.7% PNEUMONIA

Sutureless Valve: The First in Michigan

Following 2016 FDA approval, McLaren Northern Michigan was the first hospital in Michigan approved to use the INTUITY sutureless valve in the treatment of aortic valve disease.

"The sutureless valve is especially useful for higher-risk patients, because it decreases heart bypass time by 65 – 70%, thus resulting in decreased blood use, ICU time, infections, and renal failure," explains Cardiothoracic Surgeon Chris Akins, MD.

Vascular Surgeon

ANDRIS KAZMERS MD

Integrative Cardiovascular Health and Wellness

VASCULAR CARE:

Assembling the Components of a Successful Program

Vascular specialists use a multidisciplinary, individualized approach to treatment and care. Patients benefit from medications, surgeries, and minimally invasive procedures.

"The good news is that we don't need to wait for a Star Trek era to address the fundamental causes of vascular disease. The solutions are present, here and now, available to all."

— **ANTON SHARAPOV** MD, RPVI
BOARD-CERTIFIED
VASCULAR SURGEON ,
PETOSKEY SURGEONS

Vascular Health:

ADDRESSING COMPLEX DISEASE BEFORE IT DEVELOPS

The heart and vascular program at McLaren Northern Michigan has developed over the years to embrace procedures and protocols for the benefit of vascular patients and to exceed expectations regarding patient outcomes. This complex condition requires complex applications. Though, a fresh and wider understanding of the condition has led scientists and clinicians to investigate underlying causality as well as surgical treatments.

"I have come to realize that the key to the cure and successful management is not found simply in the availability of open, minimally invasive, and hybrid interventions. Granted, these are important rescue tactics," explains Vascular Surgeon Anton Sharapov, MD, RPVI. "But without addressing complex genetic, behavioral, and biochemical reasons for the disease, our purely mechanistic approach could lead to suboptimal, short-term oriented, and sometimes tragic outcomes."

Indeed, the vision of McLaren Northern Michigan has for several years included the whole patient approach, one of early interventions, education, and focus on overall long-term health and wellness. Dr. Sharapov continues, "As our understanding of the disease grows, I am emboldened and encouraged that, while we can successfully mechanistically intervene on a variety of complex vascular lesions in an open, minimally invasive or hybrid fashion, it is in behavioral, biochemical, and targeted dietary interventions that will be the key to the cure for vascular disease. The enthusiasm, expertise, and passion of the physicians, specialists, and surgeons, nurses, and medical support staff will continue to make it possible."

Vascular surgery data is compiled and approved through the Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2-VIC). The consortium is comprised of 43 participating Michigan hospitals to standardize practices and to monitor and improve the quality and safety of vascular procedures. The consortium measures quality improvement indicators specific to vascular surgical procedures. McLaren Northern Michigan consistently exceeds goals as recognized by BMC2-VIC.

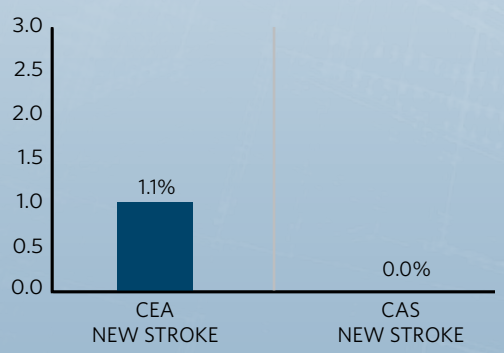
0% INFECTION

0% Central Line/IV
0% Blood
0% Graft Infection
0% UTI
0% Wound/Site

69% LESS

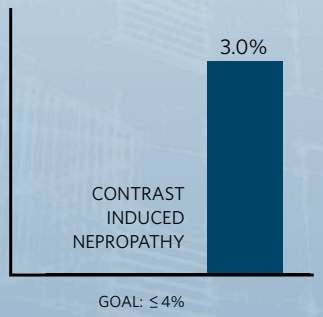
READMISSIONS FOR SSI
(surgical site infection)
at 30 days than
BMC2 Collaborative Data.

STROKE



CAROTID ENDARTERECTOMY (CEA)
CAROTID ARTERY STENTING (CAS)

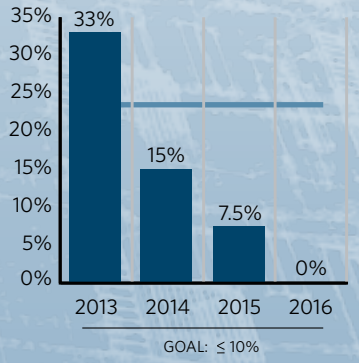
CIN



25% BETTER THAN GOAL in CIN

BLOOD PRODUCT USAGE

TRANSFUSION WHEN ASYMPTOMATIC WITH Hgb



Over a three-year period,
McLaren Northern Michigan Initiatives Show

100% REDUCTION
in TRANSFUSION
WHEN ASYMPTOMATIC with Hgb

McLaren Northern Michigan BMC2-VIC Vascular Surgery Goals

JENNIFER LaLONDE RN, BSN, CCRC,
Director of Research at Cardiac & Vascular Research Center of Northern Michigan, a heart and vascular research division of McLaren Northern Michigan, meets with clinical trial patient Keiko Omans during a scheduled follow-up visit.

Research and Clinical Trials:

THE BENEFITS OF STUDY AND APPLICATION

Research drives virtually all of the positive changes in care and procedures. Without it, vital advancements would remain unavailable to those who would most benefit.

"In many ways, impactful health care is greatly influenced by new knowledge," explains Jennifer LaLonde, RN, BSN, CCRC. "The only way to advance research in the U.S. is through clinical trials," she adds. "And we, at McLaren Northern Michigan, benefit from our position as both a leader and a participant in top-tier research and clinical trials."

- 4 NEW CARDIOLOGY TRIALS IN 2016 WITH 73 NEW PATIENTS ENROLLED | 17 ONGOING TRIALS WITH 321 TOTAL PATIENTS
- 1 NEW CARDIOTHORACIC TRIAL IN 2016 WITH 55 PATIENTS ENROLLED | 2 ONGOING TRIALS WITH 103 TOTAL PATIENTS
- 3 NEW VASCULAR TRIALS WITH 15 PATIENTS ENROLLED | 5 ONGOING TRIALS WITH 64 TOTAL PATIENTS
- 8 TOTAL NEW TRIALS WITH 143 NEW PATIENTS ENROLLED IN 2016

In addition to trial data above, Nisus Research at McLaren Northern Michigan conducts cardiovascular clinical trials and many trials in other therapeutic areas. Since 1984, Nisus has conducted hundreds of Phase II, III, and IV trials with thousands of volunteer participants. Access to new therapies provides a unique complement to the high level of care offered to McLaren Northern Michigan patients.

"It was nice to be a part of the trial, so I can help others, and it might help me in the future if I ever need to have surgery again."

"Being in the hospital was almost like a vacation — no cooking, no cleaning. McLaren Northern Michigan is just a great hospital."

— **PATRICIA KREINER**
QUARK TRIAL PATIENT

PICTURED WITH HER GRANDDAUGHTERS, ELIZABETH AND ISSABEL

Drug Trials at Work:

A PATIENT EXPERIENCE

A strong family history of heart disease, decades of hard work, and a growing list of health problems culminated in open heart surgery for Patricia Kreiner of Wolverine. Her issues included high blood pressure, Type 2 diabetes, depression, and sleep apnea. Twenty years in the fast food industry had led to two carpel tunnel surgeries and an upcoming shoulder replacement surgery. But, it was a follow-up appointment for sleep apnea that alerted Trudy Day, NP, of McLaren Northern Michigan Sleep Center in Gaylord to a more serious condition: Kreiner had a heart murmur, and a subsequent echocardiogram revealed aortic valve disease.

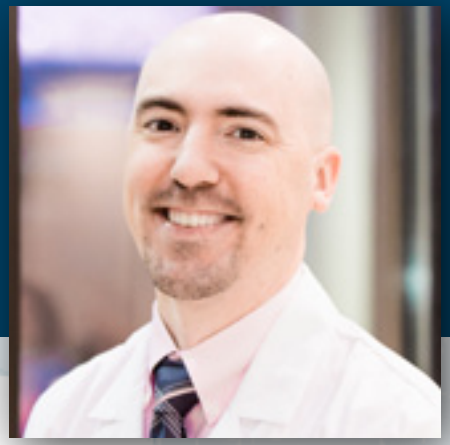
Interventional Cardiologist Louis Cannon, MD, completed a heart catheterization, then explained to Pat her condition and her recommended treatment. The diagnosis might not have come as a surprise, as Kreiner's condition had deteriorated over the preceding year. "I could hardly breathe," she admits. "After just walking through the house, I would need to go outside to get some air." So, instead of having her shoulder replacement, Kreiner was scheduled for open heart surgery. Kreiner was also invited to participate in a clinical trial involving Quark, a new class of investigational drugs used to prevent acute kidney injury. (See accompanying trial details on the facing page.)

"Pat was a good candidate for participation in this study," explains Cardiologist David Corteville, MD. "For someone with her health history, open heart surgery can be particularly risky, so protecting her kidneys during surgery was a prudent thing to do." Kreiner's decision was partly altruistic. "It was nice to be a part of the trial so I could help others, and it might help me in the future if I ever need to have surgery again."

Cardiothoracic Surgeon Chris Akins, MD, performed the surgery, followed by participation in the Quark drug trial. Though participation was based upon a randomized double-blind, placebo-controlled trial, Kreiner's kidney function remained stable. She states that after surgery, she was breathing easier and that her time in the hospital was "almost like a vacation...McLaren Northern Michigan is just a great hospital."

"Open heart surgery is an insult to the kidneys, and the use of QPI-1002 may save damaged kidney cells that might otherwise die. We must find useful ways to prevent kidney damage and the resulting kidney failure. Dialysis is not an attractive alternative."

DAVID CORTEVILLE MD
NON-INVASIVE CARDIOLOGIST | QUARK TRIAL LEAD INVESTIGATOR



CARDIOLOGY RESEARCH TRIAL:

QUARK

A Randomized, Double-blind, Placebo-controlled, Phase 2 Study to Evaluate the Efficacy and Safety of QPI-1002 for the Prevention of Acute Kidney Injury (AKI) in Subjects at High Risk for AKI Following Cardiac Surgery

OBJECTIVE: To evaluate the efficacy and safety of QPI-1002 for the prevention of acute kidney injury in high-risk subjects following cardiac surgery.

DESCRIPTION: During heart surgery, a decrease of oxygen-rich blood injures cells in the kidneys. QPI-1002 is a siRNA, or small interfering ribonucleic acid, a new class of investigational drugs using a pathway of "RNA interference." This compound prevents cell death, allowing the body to repair injured cells.

LOOKING AHEAD — TRIAL RECEIVES APPROVAL:
Following trial closing in 2016, Quark Pharmaceuticals announced in July 2017 the successful completion of the trial. The primary endpoint for the study was achieved, with QPI-1002 treatment significantly reducing the incidence of AKI.

TRIAL NAME
QUARK

LEAD INVESTIGATOR
DAVID CORTEVILLE, MD

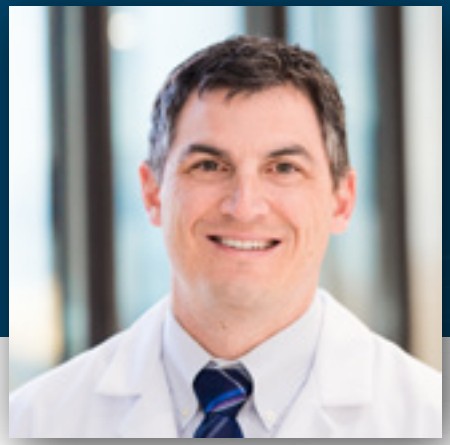
START DATE
DECEMBER 2015

END DATE
DECEMBER 2016

ENROLLED PATIENTS (as of publish date)
55

SPONSOR
QUARK PHARMACEUTICALS

CONDITION
ACUTE KIDNEY INJURY



"Drug-eluting stents are becoming first-line therapy for many PAD patients, but it is important that we continue to study the efficacy of these products. This research helps us determine the most effective way to minimize restenosis in patients with obstructive PAD."

JASON RICCI MD
INTERVENTIONAL CARDIOLOGIST | IMPERIAL TRIAL LEAD INVESTIGATOR

TRIAL NAME
IMPERIAL

LEAD INVESTIGATOR
JASON RICCI, MD

START DATE
AUGUST 2016

END DATE
DECEMBER 2016

ENROLLED PATIENTS (as of publish date)
5

SPONSOR
BOSTON SCIENTIFIC

CONDITION
PERIPHERAL ARTERY DISEASE

VASCULAR RESEARCH TRIAL:
IMPERIAL

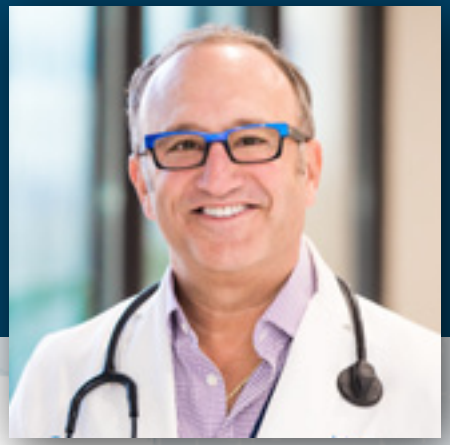
A Randomized Trial Comparing the ELUVIA™ Drug-eluting Stent Versus Zilver® PTX® Stent for Treatment of Superficial Femoral and/or Proximal Popliteal Arteries

OBJECTIVE: To evaluate the safety and effectiveness of the Boston Scientific Corporation (BSC) ELUVIA Drug-Eluting Vascular Stent System (ELUVIA Stent) for treating Superficial Femoral Artery (SFA) and/or Proximal Popliteal Artery (PPA) lesions up to 140 mm in length.

DESCRIPTION: Typically, femoropopliteal lesions have been difficult to successfully treat with endovascular therapy, because the disease is often diffuse and located in an area of the body subject to significant mobility stresses such as extension, contraction, compression, elongation, flexion, and torsion. The Imperial trial addresses these concerns through a prospective, multicenter, 2:1 randomized (ELUVIA vs Zilver PTX), controlled, single-blind, non-inferiority trial (RCT), a concurrent, non-blinded, non-randomized, single-arm, pharmacokinetic (PK) substudy and a concurrent, non-blinded, non-randomized, Long Lesion substudy.

"This system is totally repositionable, which is a great advantage for our high-risk patients. We have continual access to the valve and that gives us greater flexibility — and greater patient safety — if another surgical procedure becomes necessary."

LOUIS CANNON MD
INTERVENTIONAL CARDIOLOGIST | REPRISE III TRIAL LEAD INVESTIGATOR



STRUCTURAL HEART RESEARCH TRIAL:

REPRISE III CONTINUED ACCESS

Repositionable Percutaneous Replacement of Stenotic Aortic Valve Through Implantation of Lotus™ Valve System with the Next Generation Delivery System

OBJECTIVE: To confirm the acute performance and safety of the Lotus™ Valve with the Next Generation Delivery System for transcatheter aortic valve replacement (TAVR) in symptomatic patients with severe calcific aortic stenosis who are considered high risk for surgical valve replacement.

DESCRIPTION: This clinical study is a prospective single-arm study for symptomatic patients who have severe calcific aortic valve stenosis and who are at high risk for surgical aortic valve replacement (SAVR). Reprise III is designed to demonstrate that the acute performance and safety of the LOTUS Edge™ Valve System, when used with the iSleeve Introducer Set or current Lotus Introducer Set, are consistent with the results of the Lotus™ Valve System used in the REPRISE II study when delivered and deployed.

TRIAL NAME
REPRISE III

LEAD INVESTIGATOR
LOUIS CANNON, MD

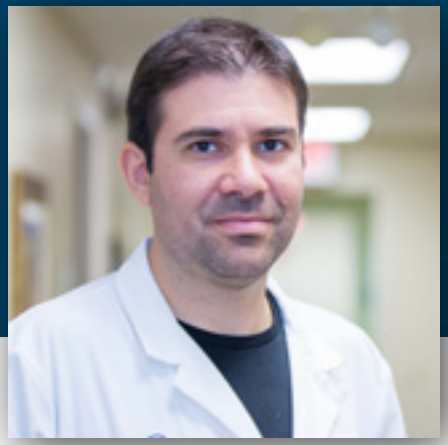
START DATE
APRIL 2016

END DATE
OCTOBER 2016

ENROLLED PATIENTS (as of publish date)
8

SPONSOR
BOSTON SCIENTIFIC

CONDITION
SYMPTOMATIC CALCIFIC AORTIC VALVE STENOSIS



"CSL112 may prove to be a potent weapon against recurrent cardiovascular events in the days or weeks following a heart attack. This study will measure its efficacy in protecting the heart, post heart attack, and its effects on the renal system."

DALTON MIRANDA MD
CARDIOLOGIST | CSL112_2001 TRIAL LEAD INVESTIGATOR

TRIAL NAME
CSL112_2001

LEAD INVESTIGATOR
DALTON MIRANDA, MD

START DATE
OCTOBER 2016

END DATE
DECEMBER 2016

ENROLLED PATIENTS (as of publish date)
3

SPONSOR
CSL BEHRING LLC

CONDITION
ACUTE MYOCARDIAL INFARCTION

CARDIOLOGY RESEARCH TRIAL:

CSL112_2001

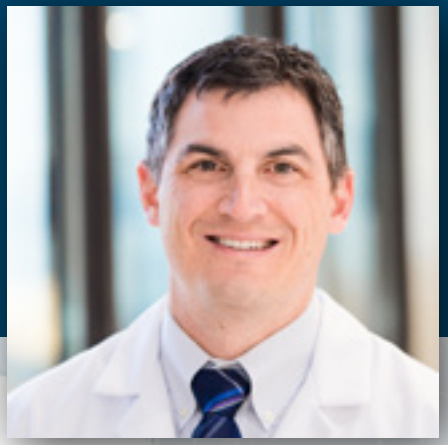
A Phase 2, Multicenter, Double-blind, Randomized, Placebo-controlled, Parallel-group, Study to Investigate the Safety and Tolerability of Multiple Dose Administration of CSL112 in Subjects With Moderate Renal Impairment and Acute Myocardial Infarction

OBJECTIVE: This study is a phase 2, multicenter, double-blind, randomized, placebo-controlled, parallel-group study to investigate the renal safety and tolerability of multiple dose intravenous (IV) administration of CSL112 compared with placebo in subjects with moderate renal impairment (RI) and acute myocardial infarction (AMI).

DESCRIPTION: CSL112 has been developed as a treatment for acute coronary syndrome (ACS) to reduce the risk of future cardiovascular events. Patients participating in the study have a history of moderate renal impairment and have experienced an acute myocardial infarction. The primary outcome measures incidence of treatment-emergent renal serious adverse event (SAE) through scheduled CSL112 infusions, from the start of the first infusion to the end of the subject's participation in the study (up to approximately nine weeks). CSL112 resembles high-density lipoprotein (HDL) or "good cholesterol."

"CREST-2 is one of the most important ongoing trials in cardiovascular medicine. It is attempting to answer the hotly debated question: "Is revascularization, whether by stenting or endarterectomy, superior to contemporary medical therapy for stroke reduction with high-grade asymptomatic carotid stenosis?"

JASON RICCI MD
INTERVENTIONAL CARDIOLOGIST | CREST-2 TRIAL LEAD INVESTIGATOR



VASCULAR MEDICINE RESEARCH TRIAL:

CREST-2

Carotid Revascularization and Medical Management for Asymptomatic Carotid Stenosis Trial

OBJECTIVE: To determine most effective treatment option for high-grade, asymptomatic carotid stenosis by comparing two separate revascularization strategies versus intensive medical therapy.

DESCRIPTION: CREST-2 participants exhibit asymptomatic high-grade carotid stenosis. Carotid revascularization for primary prevention of stroke (CREST-2) is composed of two independent multicenter, randomized controlled trials of carotid revascularization plus intensive medical management versus medical management alone. One arm randomizes patients in a 1:1 ratio to endarterectomy versus no endarterectomy. Another arm randomizes patients in a 1:1 ratio to carotid stenting with embolic protection versus no stenting. Medical management is uniform and centrally directed for all randomized treatment groups.

TRIAL NAME
CREST-2

LEAD INVESTIGATOR
JASON RICCI, MD

SUB-INVESTIGATOR
ANDRIS KAZMERS, MD

START DATE
JANUARY 2016

END DATE
ONGOING

ENROLLED PATIENTS (as of publish date)
10

SPONSOR
THE NATIONAL INSTITUTE OF NEUROLOGICAL DISORDERS AND STROKE

CONDITION
ASYMPTOMATIC CAROTID ARTERY DISEASE

"Many northern Michigan patients experience geographic barriers to health care. Our outreach locations allow patients to see medical professionals and specialists close to home. And with cardiovascular rehabilitation services available in both Petoskey and Cheboygan, patients are more likely to continue recovery when geography is not a limiting factor."

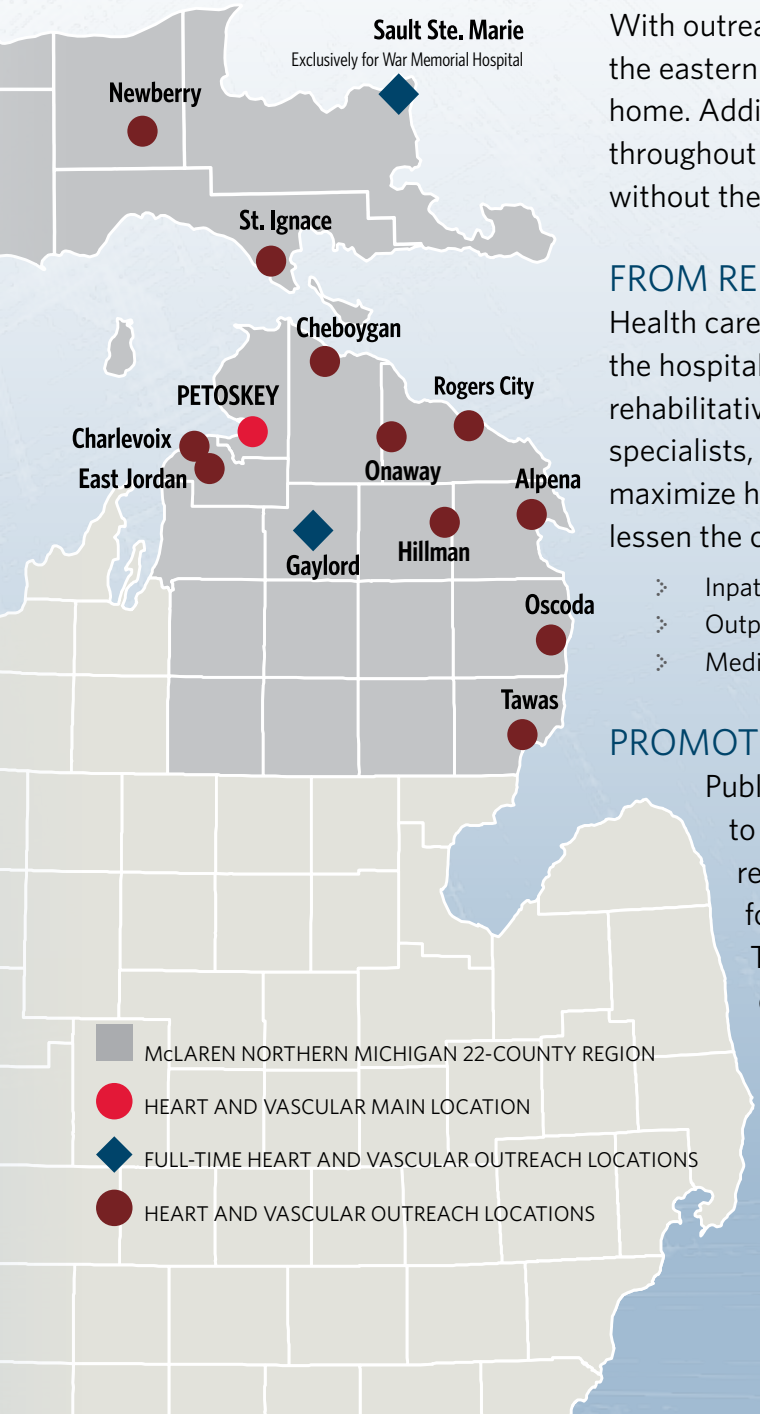
GERALD GADOWSKI DO
CARDIOLOGIST | CARDIOVASCULAR REHABILITATION DIRECTOR

A 22-COUNTY REGION:
A VARIED DEMOGRAPHIC

Within the McLaren Northern Michigan 22-county region, both disparities and commonalities are indicative of the need for proactive outreach efforts. McLaren Northern Michigan stresses health and wellness education, appropriate interventions for targeted populations, and affordable medical and clinical access for all.

SPECIALTY CLINICS: FROM DIAGNOSIS TO TREATMENT AND BEYOND

Comprehensive care plans, derived specifically for the individual patient, bring a seamless application of treatments and aftercare, thanks to the cooperative efforts of heart and vascular specialists, board-certified surgeons, and licensed support staff. Specialty clinics focus on every aspect of the patient's condition through shared knowledge and skills to produce optimal outcomes. McLaren Northern Michigan Heart Clinics are dedicated to the treatment of individual conditions to streamline the process — all focused on delivering advanced patient care.



BUILDING BRIDGES ACROSS THE REGION

Exceptional health care functions best as a seamless construct based upon a common goal: serving the patient. With outreach locations throughout northern Michigan and the eastern Upper Peninsula, patients see specialists close to home. Additionally, the Mobile Diagnostics Unit visits patients throughout northern Michigan, so testing can be performed without the need for travel.

FROM REHABILITATION TO MEDICAL FITNESS

Health care does not end when a patient is discharged from the hospital or goes home. On the contrary, a structured rehabilitative program may be in order. Physicians, exercise specialists, and nurses create individualized strategies to maximize health benefits and progress of each patient to lessen the chances of recurring episodes.

- Inpatient Rehabilitation — PETOSKEY
- Outpatient Rehabilitation — PETOSKEY AND CHEBOYGAN
- Medical Fitness Program — PETOSKEY AND CHEBOYGAN

PROMOTING HEALTH AND WELLNESS

Public health is reflective of a community's access to quality care. Careful study of data at the local, regional, and state level gives coordinators a template for educational programs and prevention services. Targeting a population's needs before a health crisis occurs enhances quality of life, reduces health emergencies, and saves lives.

- Physician Lectures and Community Organization Meetings
- Heart Month Education and Events
- Heart and Healing Arts Programs
- Health Fairs
- Support Groups
- FitKids360

"Through our satellite clinics, we are making commitments to the communities in which we serve. Our Gaylord location, for example, offers a broad spectrum of services from stress testing to echocardiography, from vascular studies to sleep evaluation."

LINDA GOSSETT MD
CARDIOLOGIST

TEAMWORK: WE BUILD EXEMPLARY PROGRAMS

McLaren Northern Michigan enjoys a reputation for excellence in heart care, through nationally ranked treatments, innovations, and patient outcomes. The McLaren Northern Michigan team brings with it the rigorous training, patents and licensure, advanced study, and research experience one would expect from the nation's top-tier facilities.

Cardiologists
Electrophysiologists
Cardiothoracic Surgeons

David Corteville, MD
- ECHOCARDIOGRAPHY
- NUCLEAR IMAGING
- VALVE DISEASE
- CLINICAL RESEARCH
- TAVR

Dalton Miranda, MD
- CARDIOVASCULAR DISEASES
- NUCLEAR IMAGING
- ECHOCARDIOGRAPHY
- HEART FAILURE
- CLINICAL RESEARCH

Chris Akins, MD
- CARDIOVASCULAR AND THORACIC SURGERY
- MINIMALLY INVASIVE TECHNIQUES
- CORONARY BYPASS SURGERY AND GRAFTING
- HEART VALVE SURGERY AND REPLACEMENT
- TAVR

Waleed Doghmi, MD
- CARDIOVASCULAR DISEASES
- ECHOCARDIOGRAPHY
- CT ANGIOGRAPHY
- HEART RHYTHM MANAGEMENT

Naomi Overton, MD
- EVALUATION AND TREATMENT OF RHYTHM DISORDERS, INCLUDING ABLATION
- DEVICE IMPLANTATION
- COMPLEX ABLATION
- VTACH ABLATION

Daniel Buerkel, MD
- EVALUATION AND TREATMENT OF RHYTHM DISORDERS, INCLUDING ABLATION
- DEVICE IMPLANTATION
- COMPLEX ABLATION
- VTACH ABLATION

Thomas Earl, MD
- CORONARY INTERVENTION
- NUCLEAR IMAGING
- CLINICAL RESEARCH
- TAVR

Jason Ricci, MD
- CORONARY AND VASCULAR INTERVENTION
- ABDOMINAL AORTIC ANEURYSM REPAIR
- PFO CLOSURE
- CAROTID STENTING
- CLINICAL RESEARCH
- TAVR

Louis Cannon, MD
- CORONARY AND VASCULAR INTERVENTION
- CAROTID STENTING
- CLINICAL RESEARCH
- TAVR

Gerald Gadowski, DO
- CARDIOVASCULAR DISEASES
- ECHOCARDIOGRAPHY
- NUCLEAR IMAGING
- CARDIAC CTA

Duane Schuil, MD, PhD
- CORONARY AND VASCULAR INTERVENTION
- CAROTID STENTING
- LVAD/RVAD

Harry Colfer, MD
- CORONARY INTERVENTION
- LVAD/RVAD
- DEVICE IMPLANTATION
- CLINICAL RESEARCH

Linda Gossett, MD
- CARDIOVASCULAR DISEASES
- ECHOCARDIOGRAPHY
- NUCLEAR IMAGING
- HEART FAILURE

J.D. Talbott, DO
- CARDIOVASCULAR AND THORACIC SURGERY
- MINIMALLY INVASIVE TECHNIQUES
- CORONARY BYPASS SURGERY AND GRAFTING
- HEART VALVE SURGERY AND REPLACEMENT
- TAVR

Vascular Specialists

Michael Angileri, MD
- INTERVENTIONAL RADIOLOGY

Andris Kazmers, MD
- VASCULAR SURGERY

Jeffrey Beaudoin, MD
- VASCULAR SURGERY

Jason Ricci, MD
- CORONARY AND VASCULAR INTERVENTION
- ABDOMINAL AORTIC ANEURYSM REPAIR
- PFO CLOSURE
- CAROTID STENTING
- CLINICAL RESEARCH
- TAVR

Louis Cannon, MD
- CORONARY AND VASCULAR INTERVENTION
- CAROTID STENTING
- CLINICAL RESEARCH
- TAVR

Duane Schuil, MD, PhD
- CORONARY AND VASCULAR INTERVENTION
- CAROTID STENTING
- LVAD/RVAD

Mark Heilala, MD
- INTERVENTIONAL RADIOLOGY

Anton Sharapov, MD
- VASCULAR SURGERY

Pediatric Specialists

Cathy Webb, MD
- PEDIATRIC CARDIOLOGY (PICTURED)

Robert Beekman, MD
- PEDIATRIC CARDIOLOGY

David Bradley, MD
- PEDIATRIC CARDIOVASCULAR

Macdonald Dick, MD
- PEDIATRIC CARDIOLOGY

Mark Norris, MD
- PEDIATRIC CARDIOVASCULAR

Leadership

Louis Cannon, MD
Senior Program Director
Heart and Vascular Center

Marla Clark, DNP, RN
Senior Director
Heart and Vascular Center

Harry Colfer, MD
President Michigan Heart &
Vascular Specialists

David Corteville, MD
Diagnostic Imaging Director

Thomas Earl, MD
Cardiac Cath Lab Director

Gerald Gadowski, DO
Cardiovascular
Rehabilitation Director

Dalton Miranda, MD
Heart Failure Program Director

Advanced Practice Providers

Sarah Adams, PA-C
Jeffrey Fox, PA-C
Marti Linn, PA-C
Jennifer Middaugh, PA-C
Rochelle Mitas, ACNP-BC

AWARDS & ACCREDITATIONS

AACVPR CERTIFIED PROGRAM — CARDIOVASCULAR REHABILITATION PROGRAM CERTIFIED BY INDUSTRY LEADER

Three-year certification by the American Association of Cardiovascular and Pulmonary Rehabilitation, signifying our organization as a leader in the field of cardiovascular and pulmonary rehabilitation, offering the most advanced practices available.

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS)

RATED NATIONALLY FOR LOWEST 30-DAY HEART ATTACK READMISSION RATE

The only northern Michigan hospital in the top 10, and ranked among the top 7 U.S. hospitals for the lowest 30-day readmission rate following a heart attack by CMS.

RANKED 2nd IN THE NATION FOR LOWEST READMISSION FOLLOWING HEART FAILURE

Ranked second in the nation with the lowest 30-day heart failure readmission rates by CMS. National average is 21.9%. McLaren Northern Michigan performed at 16.5%.

HIGHEST NATIONAL RATING BY CENTERS FOR MEDICARE AND MEDICAID SERVICES

McLaren Northern Michigan received a 5-Star Rating for quality and safety by the CMS. A 5-Star rating puts McLaren Northern Michigan in the top 2.2% of hospitals in the country, and the only one in northern Michigan to receive the highest rating.

SOCIETY OF THORACIC SURGEONS (STS) HIGHEST RATING FOR HEART BYPASS SURGERY

Consistently since 2012, McLaren Northern Michigan has earned the highest quality rating for heart bypass surgery as determined by the STS. Of the more than 700 U.S. hospitals that were part of the study, McLaren Northern Michigan performed significantly higher than the mean score, placing it among the top 15% nationwide. STS analyzes data on heart programs nationwide including quality, complications, pre-and post-operative medication administration, and outcomes.

GET WITH THE GUIDELINES® — GOLD PLUS AND STROKE HONOR ROLL ELITE PLUS AWARD

McLaren Northern Michigan received the American Heart Association and American Stroke Association Get With the Guidelines – Stroke Gold Plus Quality Achievement Award with Target Stroke Honor Roll Elite Plus recognition, the highest rating a facility can receive. The award demonstrates commitment to quality care and best treatment for stroke patients based on nationally recognized and research-based guidelines.

U.S. NEWS & WORLD REPORT BEST HOSPITALS AWARDS

Ranked among the top 10 of 171 regional hospitals in Michigan. Nearly 5,000 hospitals are evaluated nationwide, then grouped into regions. Ranking is based on careful analysis of patient outcomes and care-related factors, such as safety and nurse staffing. U.S. News & World Report evaluated five adult procedures/conditions including: Heart Bypass Surgery, Chronic Obstructive Pulmonary Disease (COPD), Heart Failure, Hip Replacement, and Knee Replacement.

NUCLEAR CARDIOLOGY ACCREDITATION BY THE IAC

Michigan Heart & Vascular Specialists (MHVS) of McLaren Northern Michigan was granted a three-year term of accreditation in Nuclear Cardiology by the Intersocietal Accreditation Commission (IAC) for Petoskey, Gaylord, and Rogers City clinics. Accreditation includes a review of operational and technical components by an IAC panel of experts. MHVS has been accredited since 2003.

ANCC MAGNET RECOGNITION®

Initial Magnet® recognition in 2011 and again in 2015 for another six-year period, placing McLaren Northern Michigan among only 6.6% of hospitals throughout the country and among only 14 in Michigan to receive recognition for nursing excellence.

Publications

LOUIS CANNON, MD

Perdoncin E, Seth M, Dixon S, Cannon L, Khandelwal A, Riba A, David S, Wohns D, Gurm H. The comparative efficacy of bivalirudin is markedly attenuated by use of radial access: insights from Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2). www.ncbi.nlm.nih.gov/pubmed/26377400. Eur Heart J. 2016 Jun 21;37(24):1902-9. doi: 10.1093/eurheartj/ehv434

Gurm HS, Seth M, Mehran R, Cannon L, Grines CL, LaLonde T, Briguori C; Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2). Impact of Contrast Dose Reduction on Incidence of Acute Kidney Injury (AKI) Among Patients Undergoing PCI: A Modeling Study. www.ncbi.nlm.nih.gov/pubmed/26773238. J Invasive Cardiol. 2016 Apr;28(4):142-6

PRESENTATIONS AND CONFERENCES

Transcatheter Cardiovascular Therapeutics (TCT) Conference 2016: Interventional Innovation Corner: Shark Tank Innovation Competition, 2016 October. Co-Program Director. Discussion moderator for the discussion assessing the top ten new innovations in the treatment of cardiovascular diseases for 2016 in the world's largest Trans Catheter CardioVascular Conference in Washington, DC.

Cardiovascular Research Technologies (CRT) Conference 2016: DES Bio-absorbable and DCB Technologies. Discussion leader regarding bioabsorbable stent technologies and the efficacy of drug coated balloons to inhibit tissue regrowth that causes vascular disease of the legs.

Michigan ACC 2016: Now You See It and Now You Don't: Role for BioResorbable Scaffold in the Coronaries, 2016, October. Faculty presenter and moderator. Bioabsorbable stent placement, teaching of cardiologists around the state the dos and donts.

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