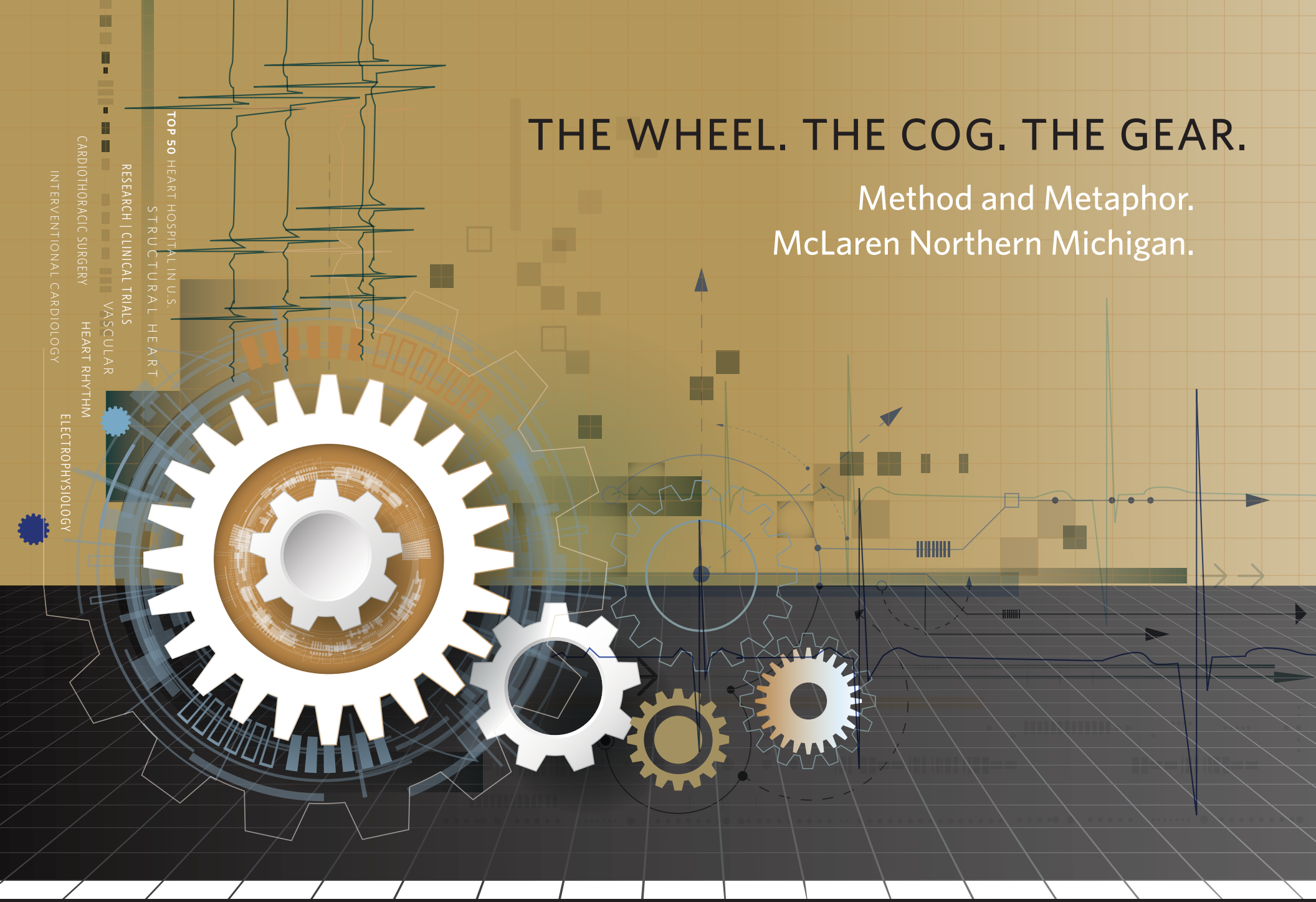


McLaren Northern Michigan

HEART and VASCULAR ANNUAL REPORT

2017

PRECISION:
in HEART and VASCULAR CARE

Throughout modern history, an organization was often compared to a machine, one in which every part moved together in pursuit of a common goal. The image persists, but in a new and important way: a highly functional organization must work smoothly and seamlessly, generating motion and energy to fulfill its shared goals. One movement, one intention, leads to the next, with both symmetry and precision, the same qualities that exemplify the heart and vascular program of McLaren Northern Michigan.

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.

INSIDE

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.

One movement, one intention, leads to the next, with both symmetry and precision, the same qualities that exemplify the heart and vascular program of McLaren Northern Michigan.

TO THE MEDICAL COMMUNITY

DEAR COLLEAGUES AND FRIENDS:

When I reflect on the past year, I am reminded of our ongoing goal and our commitment to fashioning a program of excellence within an organization that has supported us. This collaborative effort of like-minded colleagues with a cause has led to the continued recognition of McLaren Northern Michigan as a lauded heart and vascular program, nationally recognized for both quality and outcomes, with the data and accolades to prove it.

We have secured a position at the leading edge of emerging techniques and technology in heart and vascular care. We followed the trends in procedures and treatments; we kept up with best practices and adapted the best of them to our needs. We assimilated a team of top candidates in the field, with the skills and the intellect to make our program a resource for the region and a model for other hospitals to emulate. We pursued opportunities in clinical trials and research, participating with other leading research centers, always for the betterment of our patients and the practice of medicine overall. In the process, we surpassed even our lofty original expectations, and now through careful and diligent stewardship, we carry on, today and into the future.

Significantly in 2017, we were named a Top 50 cardiovascular hospital of 2018 by IBM Watson Health. Our reputation, for example, garnered opportunities that continue to be unusual for a regional facility. We were one of only a few Michigan facilities awarded FDA approval to perform transcatheter aortic valve replacement (TAVR), and now, five years later, as TAVR has evolved, we find ourselves as a leader in the field. This year, McLaren Northern Michigan was invited to utilize the new Impella RP® System, and we were among the few Michigan facilities selected to use the Watchman™ occluder allowing patients with atrial fibrillation to avoid blood thinners. These accomplishments and awards, presented in this report, define our continued patient-centered focus and validate our success.

Beyond the heart and vascular services we provide in-hospital, our full continuum of care monitors patients every step along the way. Our patients benefit from individually designed rehabilitation and wellness programs, and our outreach services connect our region all the way to the Eastern Upper Peninsula. We remain committed to making positive change, saving lives, enhancing well-being, and fostering positive growth, both within our heart and vascular program and within the organization as a whole.

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

A CULTURE OF EXCELLENCE

Reflections on One of the Highest Performing Cardiovascular Service Lines in the Nation

TOP 50 AWARD: A Proud Achievement

Recognized in 2017, McLaren Northern Michigan ranked among the top 50 cardiovascular hospitals in the nation for 2018 — one of only three in Michigan. The IBM Watson Health award is based on publicly available Medicare data measuring four key performance areas: bypass surgery, angioplasty, acute heart attacks, and congestive heart failure.

"We are fortunate to have a team of exceptionally well-trained physicians with inquiring minds and intellectual drive," says Interventional Cardiologist Harry Colfer, MD, President, Michigan Heart & Vascular Specialists. "We are unique for a smaller hospital and our scope is broad, so we want to recruit physicians who will be comfortable in that culture." This has worked well, as evidenced by the choice of McLaren Northern Michigan as a top cardiovascular hospital. The award puts McLaren Northern Michigan in good company, as only 50 facilities were chosen from a field of 1,016 hospitals nationwide, based on objective public data.

Dr. Colfer explains that their success is a result of thinking beyond the possibilities, especially for a smaller facility, and by a proactive approach to research, new technology, and best practices. "Being a bit isolated, in terms of our northern Michigan geographic location, we've had to be more self-sufficient. For example, we have always moved toward introducing new technology, such as TAVR and MitraClip, earlier rather than later, making us leaders in the field," he explains. "And," he adds, "our participation in quality initiatives allows us to measure our efforts against national benchmarks."

Colfer stated that a focused, team approach to quality improvement informs every aspect of cardiovascular care. "It is encouraging that McLaren Northern Michigan is putting resources behind the cardiovascular service line with the hospital expansion project," he says. "It is good for the system, it is good for heart and vascular care, and it is good for the community."

McLaren Northern Michigan cardiologists, cardiothoracic surgeons, and electrophysiologists pictured from left to right: J.D. Talbott, DO, Thomas Earl, MD, Gerald Gadowski, DO, Daniel Buerkel, MD, Dalton Miranda, MD, Jason Ricci, MD, Naomi Overton, MD, Duane Schuil, MD, PhD, Chris Akins, MD, Louis Cannon, MD, Linda Gossett, MD, David Corteville, MD, Harry Colfer, MD.

McLAREN NORTHERN MICHIGAN
STRUCTURAL HEART TEAM MEMBERS (FROM LEFT TO RIGHT):
CARDIOTHORACIC SURGEON **CHRIS AKINS**, MD
STRUCTURAL HEART CLINIC REGISTERED NURSE **JANE FISCHER**, RN
STRUCTURAL HEART CLINIC ASSISTANT **MELEA BULKLEY**
INTERVENTIONAL CARDIOLOGIST **LOUIS CANNON**, MD
INTERVENTIONAL CARDIOLOGIST **THOMAS EARL**, MD
STRUCTURAL HEART CLINIC COORDINATOR **ALICIA BEEBE**, BSN, RN
STRUCTURAL HEART PROGRAM DIRECTOR **JASON RICCI**, MD
CARDIOTHORACIC SURGEON **J.D. TALBOTT**, DO
ELECTROPHYSIOLOGIST **DANIEL BUERKEL**, MD

structural heart

THE PROGRESSIVE EDGE

Americans are living longer, and a longer life means an increased risk of advanced or complex structural heart conditions. The heart and vascular team at McLaren Northern Michigan positively impacts health for an aging population, and for those with preexisting or congenital conditions.

The Structural Heart Program at McLaren Northern Michigan continues to evolve as new procedures and technology emerge. We have been at the forefront of bringing many firsts to the patients of northern Michigan, like TAVR, MitraClip®, and the Watchman™ device. Our focus is to explore research opportunities that advance the field of medicine and improve quality of life for our patients. We continue to stay current with the latest procedures."

— INTERVENTIONAL CARDIOLOGIST **JASON RICCI**, MD

"Watchman™ provides additional options for physicians to prevent the devastating consequences of stroke in patients with non-valvular atrial fibrillation."

— **NAOMI OVERTON**, MD
ELECTROPHYSIOLOGIST

2017 STRUCTURAL HEART ADVANCES

WATCHMAN: An Alternative to Life-long Blood Thinners

Late in 2016, McLaren Northern Michigan was one of only a few Michigan facilities selected to offer Watchman™ left atrial appendage closure device for stroke prevention in patients with atrial fibrillation (AFib). The collaborative structural heart team at McLaren Northern Michigan began offering the life-altering treatment for patients in 2017. "Watchman is equivalent to warfarin for stroke prevention in patients with non-valvular atrial fibrillation, and eliminates the need for life-long blood thinning medication in most patients," explains Electrophysiologist Naomi Overton, MD. "When analyzing the totality of data from the PREVAIL and PROTECT AF trials, we know this is a safe and effective treatment."

Patients with AFib have 5x greater incidence of stroke as a result of thrombus formation in the atria, most of which occur on the left side. And, while anticoagulant medications such as warfarin and NOAC are appropriate for many patients, as many as half of the patients who need them cannot take the drugs and are left without a viable alternative — until now. The Watchman device prevents the formation of clots within the left atrial appendage where up to 90% of stroke-producing clots occur. This one-time application is appropriate for patients who cannot tolerate blood thinners or whose health, lifestyles, or occupations make them vulnerable to bleeding episodes.

Paravalvular Leak Closure/Repair

An unintended consequence of valve replacement is the incidence of regurgitation through paravalvular leaks (PVL) caused by a space between the patient's natural heart tissue and the prosthesis. These gaps can occur from calcium buildup which prevents a tight application of the device, a breakage of stitches around the sewing ring, overall wear and tear, or structural limitations of a bioprosthetic valve. While PVL usually initially manifests itself as a heart murmur, the condition can lead to heart failure or hemolysis, the rapid destruction of red blood cells leading to anemia. According to the *International Journal of Cardiology*, paravalvular leak has a 5 – 17% prevalence rate.

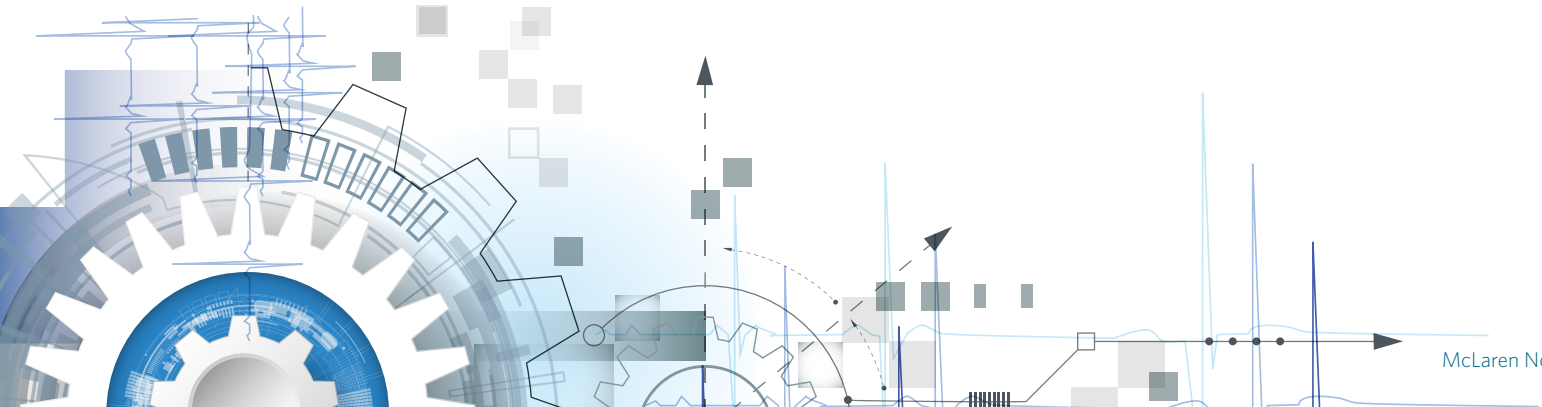
Traditionally, PVL repair required a re-do valve replacement, but the risks can far outweigh the advantages, depending on the overall health of the patient. Now, technological advancements allow for minimally invasive percutaneous repair — mesh-based devices are delivered through catheters to close the defect.

"This can be a very complex and difficult procedure," explains Interventional Cardiologist Jason Ricci, MD, "and it requires a high degree of expertise with imaging." As a result, few facilities perform the procedure. McLaren Northern Michigan, however, provides PVL repair as a component of its structural heart program. "We have had incredible success in treating a variety of mitral and aortic perivalvular leaks, resulting in dramatic differences in the lives of our patients," adds Dr. Ricci.

Data Reflects Need for Transcatheter PVL Repair

- PVL has a prevalence rate as high as 5 – 17% of all mechanical valves.
- Usually manifested as a heart murmur, PVL can lead to heart failure (85%) or hemolysis (13 – 47%).
- Repeat surgery produces mortality rates of 13%, 15%, and 35% for the first re-do, second re-do, or third re-do surgery, respectively. Each repeat operation is less likely to be successful.

SOURCE: Interventional Cardiology Review



"The 22-county McLaren Northern Michigan patient population benefits from our strong structural heart program, from our comprehensive team of specialists to our complete continuum of care. Such advanced technology, procedures, and professionals are not typically found in rural regions of the country — our patients can stay close to home for the best in heart and vascular care."

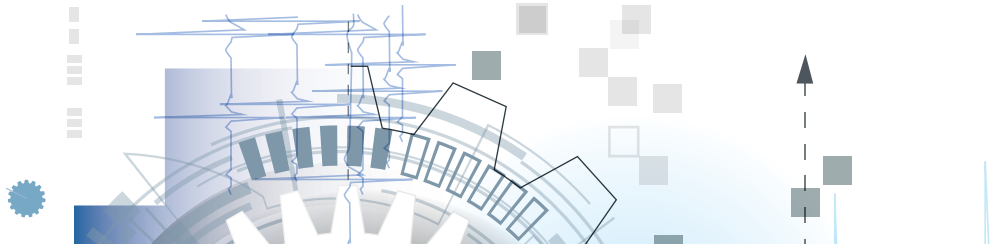
— **J.D. TALBOTT**, DO
CARDIOTHORACIC
SURGEON

Celebrating Five Years of TAVR Advancements: CONTINUING INNOVATION

After five years of use at McLaren Northern Michigan, the TAVR (transcatheter aortic valve replacement) procedure has continued to evolve, both in its approach and in its applications. Initially performed through a femoral artery, the approach limited application for many patients. Now with axillary, transapical, transaortic, subclavian, transcaval, and transcarotid routes, it is rare when patients cannot be offered TAVR if they meet the criteria. "Alternative access sites, like transcarotid, allow us to provide TAVR to most patients," says Interventional Cardiologist Jason Ricci, MD. "We can look at the patient's anatomy and choose the safest approach."

"The ongoing TAVR program is indicative of our commitment to creating and maintaining a position as a top-tier regional heart and vascular center," adds Dr. Ricci. In 2012, when TAVR was introduced, McLaren Northern Michigan was the smallest hospital approved for the procedure and one of only a handful of non-teaching hospitals in the nation to offer a fully implemented TAVR program.

"We continue to evolve and to deliver exceptional outcomes as we gain a better understanding of the advantages and shortcomings of the technology," Dr. Ricci states. "We have been fortunate to stay at the forefront in the field, and we offer the latest advances and techniques earlier than most." As new techniques, biomedical design improvements, and expanded approaches are introduced, McLaren Northern Michigan is ready to embrace them."



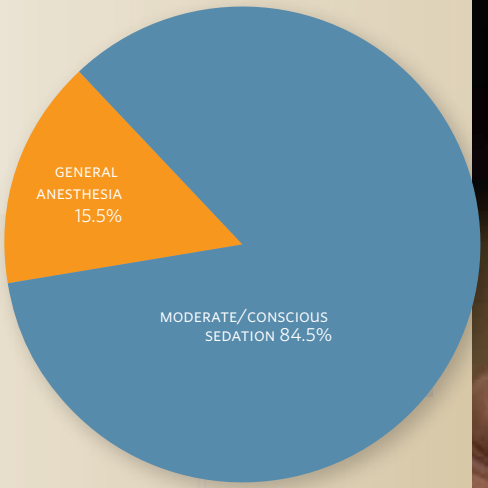
2017 TVT REGISTRY™ DATA

The STS/ACC TVT Registry™, created by a collaboration between the Society for Thoracic Surgeons (STS) and the American College of Cardiology (ACC), monitors patient safety and real-world outcomes related to transcatheter valve replacement and repair procedures — emerging treatments for valve disease patients. Analysis of TVT Registry data allows cardiovascular professionals and the 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 has been approved by the Centers for Medicare and Medicaid Services (CMS) to meet the registry requirements outlined in the national coverage decisions for TAVR and transcatheter mitral valve repair (TMVR). — ncdr.com

84.5%
OF PERCUTANEOUS TAVR PROCEDURES PERFORMED UNDER
MODERATE SEDATION

54.6% **MORE MODERATE/CONSCIOUS SEDATION** Procedures than U.S. Averages



0% MODERATE TO SEVERE ACUTE KIDNEY INJURY FOR TWO CONSECUTIVE YEARS

0% VASCULAR COMPLICATIONS

22% SHORTER LENGTH OF HOSPITAL STAY than National Mean

CARDIOLOGIST
DAVID CORTEVILLE, MD

general cardiology

THE HEART, IN WORKING ORDER

Board certified cardiologists use a comprehensive approach to heart and vascular health through risk assessment, advanced imaging technology, interventional protocols, and state-of-the-art medical procedures. At McLaren Northern Michigan, general cardiology is the first step in heart health maintenance.

"The future of cardiac imaging is exciting to consider. The field has seen incredible advancement, and one can only anticipate the next breakthrough."

— **LINDA GOSSETT**, MD
CARDIOLOGIST

Powering the Future:

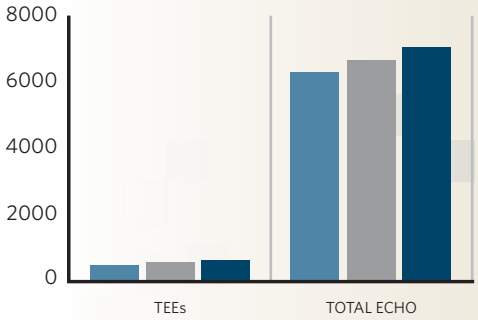
3-D IMAGING IMPROVES HEART DISEASE DIAGNOSIS AND OUTCOMES

Cardiologist David Corteville, MD, indicates that 3-D imaging is already the standard at McLaren Northern Michigan. "This technology is much more accurate than traditional exploratory alternatives."

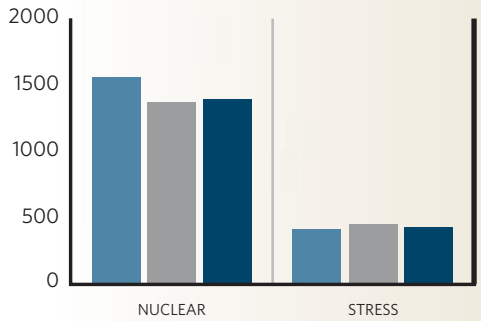
Current 3-D technology at McLaren Northern Michigan is used to evaluate and assess coronary arteries and vascular structures, and to conduct whole-heart evaluations. It yields highly accurate images, faster diagnoses, and is applicable for both adult and pediatric conditions. In the future, 3-D imaging is expected to be even faster, more accurate, portable, and cost efficient.

As part of its continuum of care and quality initiative, McLaren Northern Michigan specialists continue to include the patient in heart health decisions and to foster a team approach to a solution. "Even though we use the latest procedures, devices, and technology available, we don't emphasize one intervention over another," says Dr. Corteville. "We stay ahead of advancements in research, technology, and best practices in order to offer the best for our patients, now and into the future."

2017 IMAGING VOLUMES

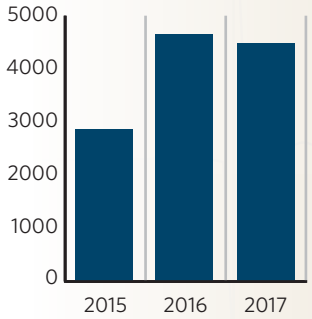


Echocardiogram (Echo) and Transesophageal Echocardiogram (TEEs) Testing Volumes



Nuclear and Stress Test Volumes

Total Vascular Testing



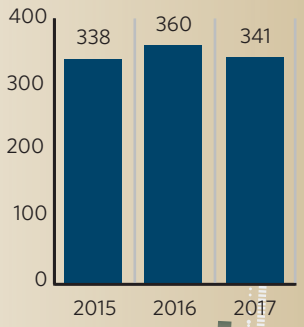
MOBILE DIAGNOSTICS: Advanced Imaging Where Patients Live

The Mobile Diagnostic Unit brings cardiovascular services to select northern Michigan outreach locations. Diagnostic testing and imaging are administered from a comfortable state-of-the-art mobile unit with the experienced staff and equipment found at McLaren Northern Michigan.

2017 MOBILE DIAGNOSTIC STRESS TESTING VOLUMES

2017 Services and Testing Offered in
ST. IGNACE | GAYLORD | ROGERS CITY

15.7%
of STRESS TESTS
in 2017
performed in the
Mobile Diagnostic Unit.



INTERVENTIONAL CARDIOLOGIST
THOMAS EARL, MD

interventional cardiology

THE PROGRESSIVE EDGE

Advanced diagnostics and catheter-based procedures, both the best and the most innovative, drive health care for patients. McLaren Northern Michigan cardiologists are highly-regarded leaders in the field.

"The invitation to incorporate Impella RP® into our repertoire validates the success of our heart and vascular program and our quality initiatives."

— **THOMAS EARL**, MD
INTERVENTIONAL
CARDIOLOGIST

Inner Workings of the Heart:

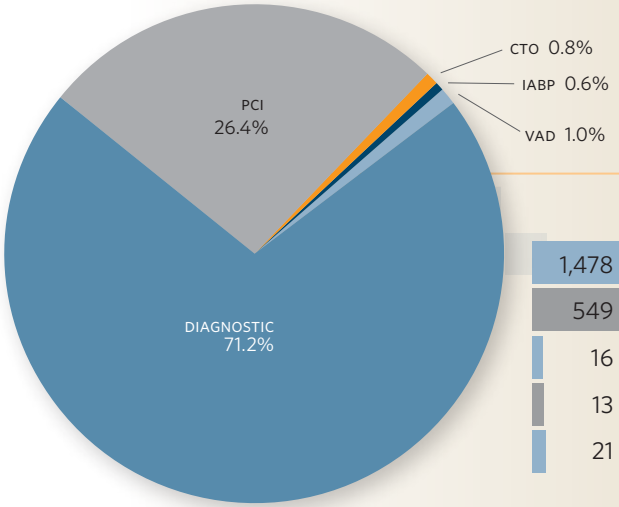
NEW DEVICE EXPANDS LIFE-SAVING PROCEDURES

Today, there are an estimated 46 million Americans over age 65, and an aging population brings health care challenges. "We are seeing patients with increasingly complex coronary artery disease," says Interventional Cardiologist Thomas Earl, MD. "And," he adds, "patients are getting older and sicker and are less robust candidates for surgical therapies." Dr. Earl lists multi-vessel coronary artery disease, chronic total occlusions, co-morbidities, and advanced age as particular challenges for cardiologists and surgeons.

Dr. Earl indicates that mechanical circulatory support catheters have served them well for many years, though, now, an exciting new device derived from Impella® technology will soon be available for cardiac patients. The new Impella RP® System is the first and only percutaneous heart pump approved by the FDA for right ventricle heart support. Impella RP pumps blood from the inferior vena cava to the pulmonary artery, immediately increasing blood flow for patients with right heart failure.

The introduction of this new catheter, slated for 2018, expands the procedures available to heart patients with difficult cases. "Impella RP gives us a larger armamentarium to treat patients with cardiogenic shock," Dr. Earl says. "In the past, we did not have a dedicated option for patients with right ventricular failure; this is an exciting development."

McLaren Northern Michigan was among a small group of facilities with access to this new device. "The Impella RP was only approved for use in centers with expertise and experience with the Impella family of devices," Dr. Earl explains. "The invitation to incorporate Impella RP into our repertoire validates the success of our heart and vascular program and our quality initiatives."

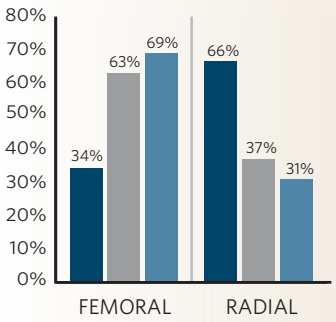


2017 CATHETERIZATION VOLUMES

1,478	DIAGNOSTIC
549	PCI
16	CTO
13	IABP (INTRA-AORTIC BALLOON PUMP)
21	VENTRICULAR ASSIST DEVICE (IMPELLA®/TANDEMHEART®)

Impella® and TandemHeart® technologies 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.

2017 RADIAL:FEMORAL CATHETERIZATION DATA



113% MORE

Radial Procedures than U.S. Averages

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

McLaren Northern Michigan (reporting 2017 Q1 and Q2 data)
BMC2 State Percentage (2015 data)
NCDR® (2015 data)

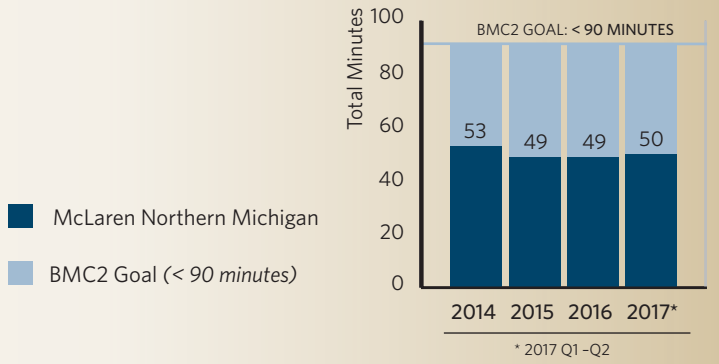
NCDR® is the National Cardiovascular Data Registry.

Blue Cross Blue Shield of Michigan Cardiovascular Consortium Percutaneous Coronary Intervention Quality Improvement Initiative (BMC2 PCI) is a prospective, multicenter registry that represents a regional collaborative effort to assess and improve care quality and outcomes of patients with coronary disease undergoing PCI. The registry has collected information for approximately 415,000 interventional cases since 1997, from 33 participating PCI hospitals and an additional 15 Primary PCI Hospitals that participate with BMC2 at the request of the State of Michigan Certificate of Need Commission.

DOOR-TO-BALLOON

44% LESS TIME

than BMC2 goal of 90 minutes.
McLaren Northern Michigan
experienced a median of 50 minutes.



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

84.5% of STEMI PATIENTS

receive Immediate PCI

within 90 MINUTES

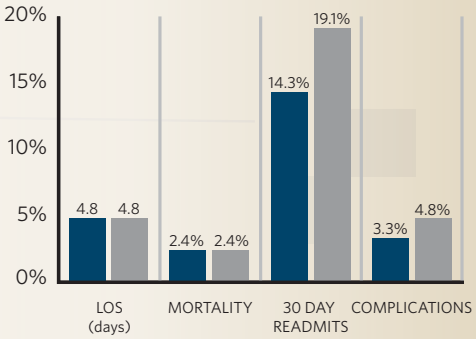
according to NCDR® data

76.24%

of Heart Failure Patients Discharged

TO HOME

vs. Other Facilities



Risk Adjusted Quality Measures Heart Failure Patients

McLaren Northern Michigan
Benchmark

CARDIOTHORACIC SURGEONS
J.D. TALBOTT, DO LEFT
CHRIS AKINS, MD RIGHT

cardiothoracic surgery

THE SYSTEM AT WORK

Board certified, nationally recognized cardiothoracic surgeons drive the successful program at McLaren Northern Michigan. Their efforts make McLaren Northern Michigan a trusted center for leading edge surgical heart procedures.

"Referring providers throughout our region should know that we offer all cardiothoracic surgical options, and by that I mean expertise in all leading edge procedures and technology. Providers do not have to send their patients elsewhere to find the best heart and vascular care."

— **CHRIS AKINS**, MD
CARDIOTHORACIC SURGEON

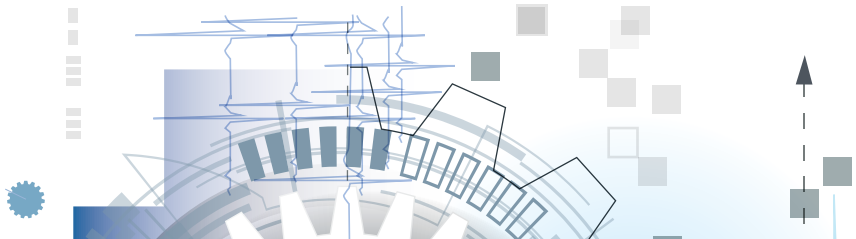
Valve Replacement:

OUTCOMES SUPPORT QUALITY INITIATIVE GOALS

After a full year of use, the INTUITY rapid deployment sutureless valve has proven itself to be a valuable addition to cardiothoracic surgical procedures at McLaren Northern Michigan. "INTUITY's performance is consistent with, and often better than a standard valve, and, perhaps most important, it reduces heart bypass times by at least 60%," explains Cardiothoracic Surgeon Chris Akins, MD. "As a result, we see decreased blood use, shorter ICU stays, fewer infections, and a marked decrease in renal failure. This all positively impacts our patient outcomes."

The INTUITY valve requires only three sutures, instead of the 15 to 18 permanent sutures used in a traditional valve replacement procedure. Patients report a significant reduction in the symptoms of valve disease, including fatigue and shortness of breath.

The INTUITY valve has been used in Europe since 2007 and in Canada since 2011. Stateside, the valve received FDA approval in late 2015. McLaren Northern Michigan became the first Michigan hospital to begin using the new valve and one of only four facilities approved for the procedure statewide. "This important technology has given our patients a valuable option in addressing aortic valve disease," Dr. Akins adds.

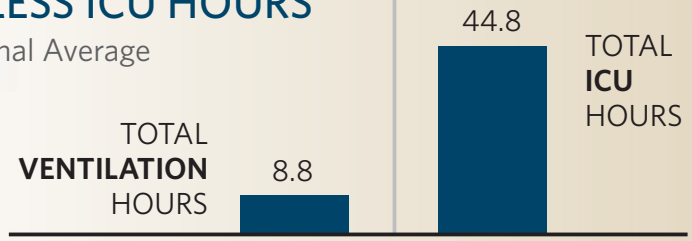


OPERATIVE AND POSTOPERATIVE INFORMATION

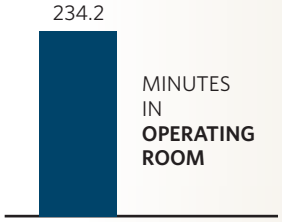
48.2% LESS VENTILATION HOURS

38.4% LESS ICU HOURS

than STS National Average



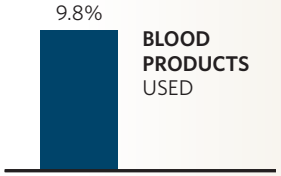
OR DURATION



25.9% LESS TIME

Spent in the Operating Room than STS National Average

PRODUCTS USED



62.4% LESS OPERATIVE BLOOD PRODUCTS

than STS National Average

Founded in 1964, The Society of Thoracic Surgeons (STS) is a not-for-profit organization representing over 7,500 surgeons, researchers, and health care professionals worldwide, dedicated to ensuring the best possible outcomes for surgeries of the heart, lung, esophagus, and other surgical procedures of the chest. The STS mission is to enhance the ability of cardiothoracic surgeons to provide the highest quality patient care through education, research, and advocacy. — sts.org

SURGICAL COMPLICATIONS

following Isolated CABG Procedures

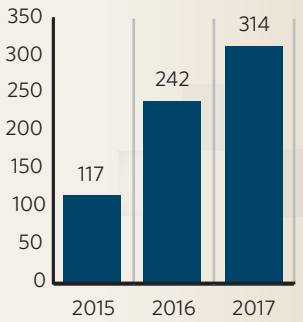
0.7% INFECTION

0.7% PNEUMONIA

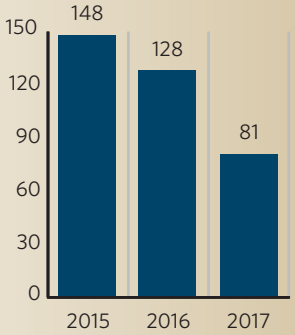
A Collaborative Effort: ADDRESSING LUNG CANCER

Reflective of the complete McLaren Northern Michigan continuum of care, cardiothoracic surgeons partner with Karmanos Cancer Institute to address lung cancer. The Lung Tumor Board collaborates regularly to ensure a seamless path for lung cancer patients. From diagnosis to treatment and follow-up, the board provides a multidisciplinary approach to quality care. Together, medical and radiation oncologists, cardiothoracic surgeons, pulmonologists, radiologists, pathologists, clinical research associates, social worker, clinical nurses, nurse navigator, and other professionals provide comprehensive and expeditious cancer care.

LUNG CANCER SCREENING DATA



LUNG TUMOR BOARD CASES



314 SCREENINGS

- 103 ABNORMAL RESULTS
- 25 ABNORMAL OTHER
- 3 POSITIVE RESULTS
- 183 NEGATIVE RESULTS

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

ELECTROPHYSIOLOGY TEAM (FROM LEFT TO RIGHT):
NURSE PRACTITIONER **CHRISTINA WAUGH**, NP
CARDIAC DEVICE SPECIALIST **BOB URMAN**, RN
ELECTROPHYSIOLOGIST **DANIEL BUERKEL**, MD
ELECTROPHYSIOLOGIST **NAOMI OVERTON**, MD
CARDIAC DEVICE SPECIALIST **KRISTA COOK**, CCT, RMA
CARDIAC DEVICE SPECIALIST **NICK BULLOCK**, CCEP

electrophysiology

KINESIS: ACTION AND REACTION

Highly skilled specialists, using advanced technologies, identify arrhythmias and employ the most advantageous treatment options. Cardiac ablation, pacemaker or defibrillator implantation, and medication therapy are among the individual treatment options for the region's patients.

"The commitment to quality in care and procedures has defined us for many years, and now we have achieved some impressive firsts in the treatment of complex heart rhythms."

— **DANIEL BUERKEL**, MD
ELECTROPHYSIOLOGIST

In Good Working Order:

THE GOAL, THE RESULT

"It's no exaggeration to say that McLaren Northern Michigan has a top-tier heart and vascular program," says Electrophysiologist Daniel Buerkel, MD. "The commitment to quality in care and procedures has defined us for many years, and now we have achieved some impressive firsts in the treatment of complex heart rhythms. There was a time when not many centers performed these procedures, though McLaren Northern Michigan has consistently been a leader in advanced treatments."

Among the significant achievements and milestones for 2017: the first subcutaneous ICD (SICD) performed in northern Michigan; and the hospital's first placement of the Medtronic leadless pacemaker (only the second placement in northern Michigan). And, to provide regular support to Dr. Buerkel, Electrophysiologist Naomi Overton, MD, and the entire electrophysiology team, the department welcomed Nurse Practitioner Christina Waugh, NP.

Perhaps the most significant advancement for 2017 is the adoption of the His Bundle Pacing (HBP), which has revolutionized the pacing of the heart during pacemaker implantation. "Normally, when putting in a pacemaker, the lead is directly attached to the muscle rather than to the electrical conduction system," explains Dr. Buerkel, "but this creates a dyssynchronous contraction." Dr. Buerkel further explains that HBP allows for a normal activation, during which the lead is attached directly to the conduction system. "This synchronizes both chambers of the heart with a more physiologically accurate effect, and feels better for the patient," he explains. "This was the hottest topic at the Heart Rhythm Society (HRS) annual meeting," adds Dr. Buerkel. "It's an exciting, major advancement in the treatment of arrhythmia, and our northern Michigan patients are realizing the benefits."

He's Back: AN AFIB SUCCESS STORY

After suffering with the complications of atrial fibrillation (AFib) — and the increasing doses of medication — for over 9 years, John Smith, 72, had had enough. The retired insurance salesman had recently changed primary care providers and decided to ask his new physician Robert Allum, DO, if there was another option. After a referral to Electrophysiologist Daniel Buerkel, MD, an expeditious plan was put into place. "John was a perfect candidate for ablation," says Dr. Buerkel. Following a late August appointment with Dr. Buerkel, Smith was scheduled for the procedure in October.

Post procedure, Smith's heart rate stabilized from 55 bpm to an age-appropriate 85 – 95 bpm; and, he was free from medication dependence for the first time in years. Most important, he had his energy level back. "I did not know that ablation could be such a life changer." And, his friends noticed, too. Wife Jan recalls an evening out with friends and many "he's back" comments.

Since his procedure, John Smith is golfing, enjoying life, and has joined the McLaren Northern Michigan Patient and Family Advisory Council.

Collecting the Data: ENGAGING THE RESULTS

To increase the amount of useful data, McLaren Northern Michigan began preparing to participate in the NCDR ICD Registry beginning January 1, 2018. Similarly, participation in the National AFib Registry will begin in 2019. "Measuring our practice against national benchmarks shows success as well as growth opportunities," explains Dr. Buerkel. "Better recognizing appropriateness and methodology while collaborating with other national centers is beneficial for us and our patients."

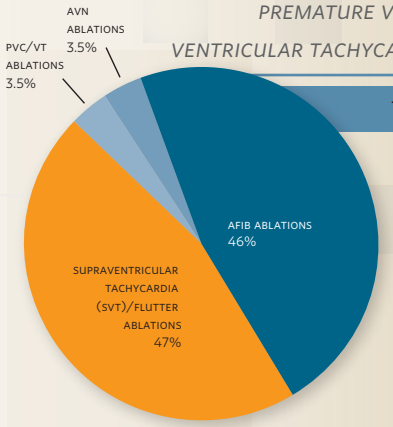
2017 ELECTROPHYSIOLOGY DATA

EP VOLUME

PACEMAKER IMPLANTS (PPM/CRT-P)	268
ICD IMPLANTS	121

ABLATION DETAIL

AFIB ABLATIONS	92
SUPRAVENTRICULAR TACHYCARDIA (SVT) ABLATIONS	94
ATRIOVENTRICULAR NODE (AVN) ABLATIONS	7
PREMATURE VENTRICULAR CONTRACTION VENTRICULAR TACHYCARDIA(PVC/VT) ABLATIONS	7
TOTAL EP ABLATIONS	200



DATA SOURCE:
Michigan Heart & Vascular Specialists

DUANE SCHUIL, MD, PhD
INTERVENTIONAL CARDIOLOGIST

vascular specialties

A MECHANISM FOR QUALITY

Vascular specialists are well-versed in all procedures, from the innovative to the standard, from the complex to the minimally invasive. Their skills are in keeping with the system-wide quality initiative at McLaren Northern Michigan.

"Our pulmonary embolism program is run much like our STEMI program. We have protocols in place to expeditiously treat patients who present in the Emergency Department or who are transferred from other nearby community hospitals."

— **JASON RICCI**, MD
INTERVENTIONAL CARDIOLOGIST AND VASCULAR SPECIALIST

Vascular Interventions:

HEALING THE VESSELS OF THE HEART

Vascular specialists of McLaren Northern Michigan use nationally and internationally accepted research, best practices, and emerging clinical trials to supplement proven treatments directed toward individual patient conditions. Each patient is evaluated for the appropriate intervention — endovascular, open, and hybrid approaches for complex conditions — followed by risk and lifestyle change management.

In 2017, vascular specialists introduced a new catheter-based procedure for sub-massive pulmonary embolism (PE), or blood clots in the lungs. Unlike life-threatening/massive PE that requires tissue plasminogin activator (tPA) in higher doses with greater risk, the Ekosonic Endovascular System (EKOS) provides an alternative option for non-life-threatening/sub-massive PE cases. EKOS is a catheter-directed pharmacomechanical thrombolysis using high-frequency ultrasound for optimal penetration of the thrombolytic into the clot. "With EKOS high-frequency ultrasound, we can dissolve the embolism with lower doses of thrombolytics, making the treatment safer," explains Jason Ricci, MD.

Traditionally, treatment of sub-massive PE included anticoagulants such as Heparin and Coumadin. "For patients with non-life-threatening/sub-massive PE, the EKOS system has increased the likelihood of long-term right heart function, faster resolution of symptoms, and shorter hospital stays," says Dr. Ricci. "This procedure is an improvement in our treatment of pulmonary embolisms."

Vascular surgery data is compiled and approved through the Blue Cross Blue Shield of Michigan Cardiovascular Consortium (BMC2-VIC). The consortium is comprised of 36 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/SEPSIS

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

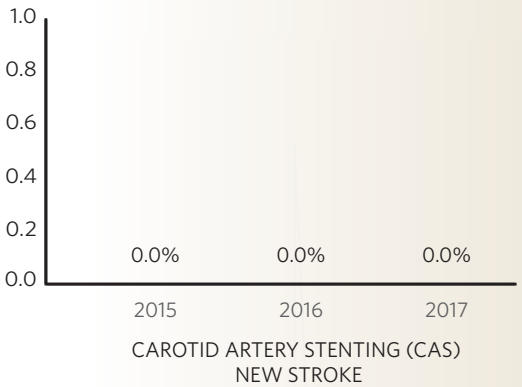
0% TIA/STROKE

prior to discharge

80.5% OF PATIENTS

Discharged to HOME

STROKE



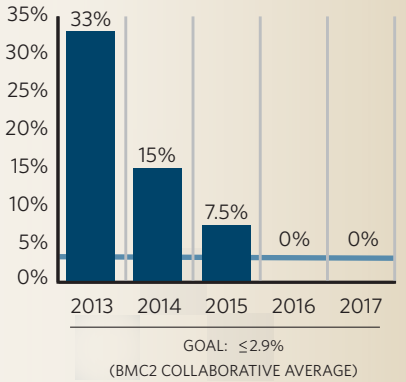
CAROTID ARTERY STENTING (CAS)
NEW STROKE

32.5% LESS

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

BLOOD PRODUCT USAGE

TRANSFUSION WHEN ASYMPTOMATIC WITH Hgb



McLaren Northern Michigan has maintained a

100% REDUCTION

in TRANSFUSION
WHEN ASYMPTOMATIC with Hgb
(≥ 8.0 discharge level)

McLaren Northern Michigan BMC2-VIC Vascular Surgery Goals

CARDIOLOGIST **DALTON MIRANDA**, MD, reviews patient clinical trial progress with **JENNIFER LaLONDE**, BSN, RN, CCRC, DIRECTOR OF RESEARCH at The Cardiac & Vascular Research Center of Northern Michigan, a heart and vascular research division of McLaren Northern Michigan.

Research and Clinical Trials:

PROGRESSING FORWARD, WITH MOMENTUM

A successful health care organization promotes participation in research and clinical trials. Such endeavors enhance patient care, increase the likelihood of optimal outcomes, and attract top-tier physicians. The specialists of McLaren Northern Michigan are both participants and leaders in the pursuit of new knowledge and best practices.

"Through research, we are helping the future of medicine," explains Cardiologist Dalton Miranda, MD. "We do not promise those we are enrolling that their trial will specifically help them, though we can promise that they will be diligently monitored throughout the entire trial process, well beyond traditional oversight, and that they are helping to advance medicine for many years."

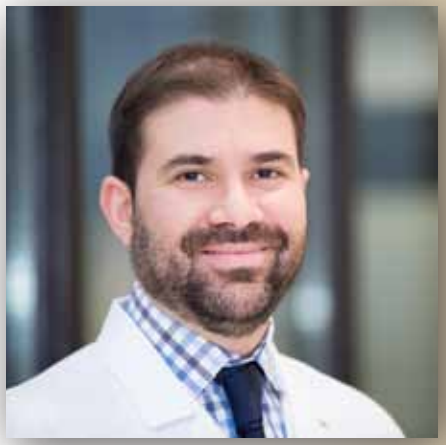
4 NEW CARDIOLOGY TRIALS IN 2017 WITH 39 NEW PATIENTS ENROLLED | 13 ONGOING TRIALS WITH 185 TOTAL PATIENTS

1 NEW CARDIOTHORACIC TRIAL IN 2017 WITH 29 PATIENTS ENROLLED | 3 ONGOING TRIALS WITH 84 TOTAL PATIENTS

1 NEW VASCULAR TRIAL WITH 13 PATIENTS ENROLLED | 5 ONGOING TRIALS WITH 61 TOTAL PATIENTS

6 TOTAL NEW TRIALS WITH 81 NEW PATIENTS ENROLLED IN 2017

In addition to trial data above, the Center for Research and Innovation (formerly Nisus Research) at McLaren Northern Michigan conducts cardiovascular clinical trials and many trials in other therapeutic areas. Since 1984, hundreds Phase 2, 3, and 4 trials with thousands of volunteer participants have been conducted. Access to new therapies provides a unique complement to the high level of care offered to McLaren Northern Michigan patients. Read more about Center for Research and Innovation trials on pages 41.



"We began participating in the CSL112 trial at its inception with Phase 1. As the trial progressed into subsequent phases, we were one of only four U.S. and three German centers invited to participate in the Phase 2 PKPD portion of the trial, focused on timed and measured blood work and EKG results, as well as other detailed analysis. An invitation to participate in such phases is significant and validates the quality of our research program."

DALTON MIRANDA, MD
CARDIOLOGIST | CSL112-2001 LEAD INVESTIGATOR

TRIAL NAME
CSL112-2001

LEAD INVESTIGATOR
DALTON MIRANDA, MD

START DATE
APRIL 2016

SCHEDULED END DATE
JUNE 2018

ENROLLED PATIENTS
19

SPONSOR
CSL BEHRING

CONDITION
ACUTE MYOCARDIAL INFARCTION AND MODERATE RENAL IMPAIRMENT

GENERAL 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.

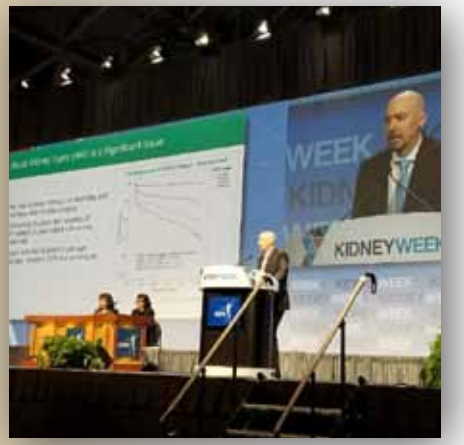
OBJECTIVE: This study investigates the renal safety and tolerability of multiple dose intravenous (IV) administration of CSL112 compared with placebo in subjects with moderate renal impairment (RI) and acute myocardial infarction (AMI).

DESCRIPTION: Increased HDL concentrations increase the uptake of LDL from plaque, resulting in plaque regression. CSL112 drug was developed to resemble HDL and reduce the risk of future plaque rupture for patients experiencing acute coronary syndrome. The primary outcome will measure the safety of CSL112 infusions for patients experiencing an AMI with a history of RI for a reduction in recurrent coronary events.

McLaren Northern Michigan participated in each trial phase including a final Phase 2 invitation to evaluate a sub-population of high-risk patients who exhibited kidney dysfunction following a coronary event, for use during the acute phase, ultimately aimed at decreasing the recurrence of cardiac events. Phase 2 trial results and Phase 3 implementation are both anticipated in 2018. "We are excited to see this trial throughout each phase and even more pleased that results will positively impact patient lives," concludes Dr. Miranda.

"Quark is the first trial ever to show a reduction in kidney failure." McLaren Northern Michigan was the top enroller in the world. As a result, Dr. Corteville was invited to speak to an audience of 3,000 about the success of the Quark trial at the American Society of Nephrology 2017 national conference.

DAVID CORTEVILLE, MD
CARDIOLOGIST | QUARK LEAD INVESTIGATOR



GENERAL 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: The Quark trial evaluates the efficacy and safety of QPI-1002 for the prevention of acute kidney injury in high-risk subjects following cardiac surgery.

DESCRIPTION: Without intervention, up to 40% of patients will have acute kidney injury following open heart surgery which increases length of stay, mortality, morbidity, and risk of chronic kidney disease after leaving the hospital, and also influences long-term mortality. 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 shuts off the cell death pathway of the kidney cells, allowing the body to repair injured cells.

Following trial closing in 2016, Quark Pharmaceuticals announced in July 2017 the successful completion of the trial. The finding: QPI-1002 treatment reduces the incidence of AKI. "Our patients have access to drugs that are currently not on the market," explains Dr. Corteville. "Quark is just one example of this significant opportunity for our patients."

TRIAL NAME
QUARK

LEAD INVESTIGATOR
DAVID CORTEVILLE, MD

START DATE
DECEMBER 2015

END DATE
DECEMBER 2016

TRIAL RESULTS ANNOUNCED
JULY 2017

TOTAL ENROLLMENT
55

SPONSOR
QUARK PHARMACEUTICALS

CONDITION
CARDIAC SURGERY

"Research is vital to medicine. At McLaren Northern Michigan, we carefully choose our clinical trials to best serve our patient population and to impact the long-term advances in patient outcomes."

CHRIS AKINS, MD
CARDIOTHORACIC SURGEON | GUARD CO-INVESTIGATOR

TRIAL NAME
GUARD

LEAD INVESTIGATOR
DAVID CORTEVILLE, MD

CO-INVESTIGATORS
J.D. TALBOTT, DO
CHRIS AKINS, MD

START DATE
DECEMBER 2016

ESTIMATED END DATE
MARCH 2018

ENROLLED PATIENTS (as of publish date)
29

SPONSOR
ANGION BIOMEDICA CORP.

CONDITION
ACUTE KIDNEY INJURY

CARDIOTHORACIC RESEARCH TRIAL:
GUARD

A multicenter, prospective, parallel-group, double-blind, randomized, placebo-controlled, Phase 2 study of BB3 to assess the safety and efficacy of BB3 in patients developing acute kidney injury (AKI) after cardiac surgery.

OBJECTIVE: The objective of the Guard study is to assess the safety and efficacy of BB3 in preventing AKI compared to placebo when administered to patients at risk for developing AKI following cardiac surgical procedures involving cardiopulmonary bypass.

DESCRIPTION: Acute kidney failure is one of the most frequent complications associated with cardiac surgery. Increased mortality, extended length of hospital stay, chronic kidney disease requiring dialysis, and increased infection risk are all resultant complications of AKI. The Guard trial utilizes BB3, an investigational growth factor-like drug that affects cell function and growth. Administered intervenously, BB3 can improve organ functionality when given shortly after the injury occurs. Participation in the randomized trial (BB3 or placebo) is approximately 90 days. "Careful analysis and documentation of patient progress following cardiac surgery incorporates bloods counts to measure liver and kidney function, and heart electrical activity, among other evaluations," explains Cardiologist and Guard Lead Investigator David Corteville, MD. "Currently, there is no FDA-approved drug therapy on the market with an indication to prevent or treat AKI. Results from this trial could improve the lives of cardiopulmonary bypass patients worldwide for years to come."

"When patients are not candidates for surgical valve replacement, TAVR may be the only alternative. To continue making advancements in the field, it is important for us to evaluate and compare the efficacy of emerging technology, like the Lotus Valve."

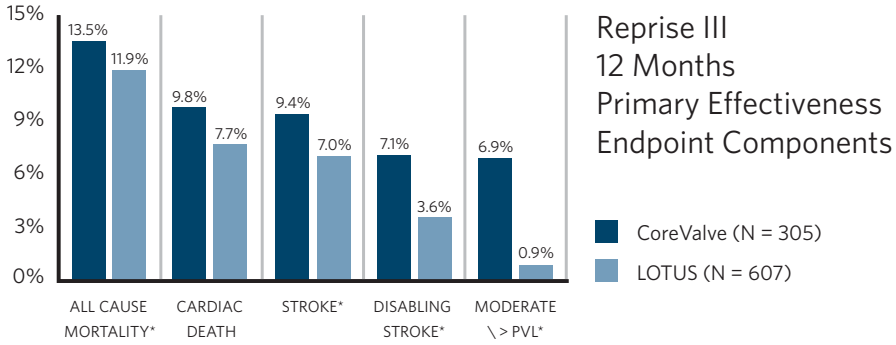
LOUIS CANNON, MD
INTERVENTIONAL CARDIOLOGIST | REPRISE III LEAD INVESTIGATOR

STRUCTURAL HEART RESEARCH TRIAL:
REPRISE III

Repositionable percutaneous replacement of stenotic aortic valve through implantation of Lotus™ Valve System — randomized clinical evaluation.

OBJECTIVE: The objective of Reprise III is to evaluate the safety and effectiveness of the Lotus™ Valve System and Lotus Edge™ Valve System for transcatheter aortic valve replacement (TAVR) in symptomatic subjects with calcific, severe native aortic stenosis who are considered at extreme or high risk for surgical valve replacement.

DESCRIPTION: REPRISE III is the first Head to Head Pivotal Trial of two TAVR devices: Lotus Valve and CoreValve.
The trial, which concluded year one data in 2017, evaluates the safety and effectiveness of both devices in high risk patients. Year-one results from this randomized trial are presented here.



Reprise III
12 Months
Primary Effectiveness
Endpoint Components

TRIAL NAME
REPRISE III

LEAD INVESTIGATOR
LOUIS CANNON, MD

START DATE
AUGUST 2015

END DATE
OCTOBER 2021
Five-year Follow-up

ENROLLED PATIENTS
18

SPONSOR
BOSTON SCIENTIFIC CORPORATION

CONDITION
AORTIC STENOSIS

DATA SOURCE
BOSTONSCIENTIFIC.COM

Presented by T. Feldman, MD at EuroPCR 2017.
**Component of Primary Effectiveness Endpoint.*

"Contrast induced nephropathy is a common concern during cath lab procedures. RenalGuard precisely measures urine output and matches hydration to keep up with losses and maintain kidney hydration."

THOMAS EARL, MD
INTERVENTIONAL CARDIOLOGIST | RENAL GUARD LEAD INVESTIGATOR

TRIAL NAME
RENALGUARD

LEAD INVESTIGATOR
THOMAS EARL, MD

START DATE
JANUARY 2017

ESTIMATED END DATE
AUGUST 2017

ENROLLED PATIENTS
7

SPONSOR
PLC MEDICAL SYSTEMS, INC.

CONDITION
INCIDENCE OF CONTRAST INDUCED NEPHROPATHY

INTERVENTIONAL CARDIOLOGY RESEARCH TRIAL:

RENALGUARD

A study to evaluate RenalGuard® system safety and efficacy when compared with standard care in the prevention of contrast induced nephropathy in a catheterization laboratory setting.

OBJECTIVE: During cardiac catheterization, iodinated contrast media must be used to visualize the coronary arteries. Contrast-Induced Nephropathy (CIN) can occur when patients with pre-existing kidney problems undergo procedures requiring contrast. RenalGuard Therapy was developed to enable the patient to clear kidney contrast before it causes significant damage. This study aims to enroll patients with increased risk of developing CIN who are scheduled for a cardiovascular catheterization. Patients will be randomized to either RenalGuard therapy or standard therapy.

DESCRIPTION: It is well documented that CIN occurs when the kidneys cannot properly remove contrast from the body. Giving intervenous (IV) and/or oral fluid to patients during a catheterization procedure has been the traditional treatment used for the prevention of CIN to help dilute and flush kidneys by increasing urine output. The purpose of this study is to determine if a new treatment, induced diuresis with matched hydration, is a safe and potentially effective way to protect kidneys.

"Clinical trials improve the quality of care for our patients. Through various research opportunities, we are able to provide evidence-based therapies that otherwise may not be available to patients."

DENISE ANTONISHEN, BSN, RN, CCRC
CLINICAL RESEARCH COORDINATOR, McLAREN CENTER FOR RESEARCH AND INNOVATION

CENTER FOR RESEARCH AND INNOVATION:
EMPEROR–PRESERVED

A Phase 3, randomized, double-blind trial to evaluate efficacy and safety of once daily Empagliflozin 10 mg compared to placebo in patients with chronic Heart Failure with preserved Ejection Fraction (HFpEF).

OBJECTIVE: The aim of the Emperor–Preserved study is to evaluate efficacy and safety of Empagliflozin versus placebo on top of guideline-directed medical therapy in patients with Heart Failure with Preserved Ejection Fraction.

DESCRIPTION: Originally aimed at diabetic patients, the Empagliflozin drug has proven to cause glycosuria or urinating excess sugar and acts as a sodium-glucose co-transporter-2 (SGLT2) inhibitor. Commercially known as Jardiance, Empagliflozin is administered through the Emperor-Preserved trial, enrolling congestive heart failure patients with preserved Ejection Fraction (HFpEF) to evaluate efficacy and safety of Empagliflozin versus placebo on top of guideline-directed medical therapy. "This is a very promising study," explains Cardiologist Dalton Miranda, MD, "because we currently do not have anything that works for patients with preserved ejection fraction. Our goal is to ultimately decrease mortality and morbidity in this patient population."

TRIAL NAME
EMPEROR

LEAD INVESTIGATOR
DALTON MIRANDA, MD

START DATE
MARCH 2017

END DATE
JUNE 2020

ENROLLED PATIENTS (end of 2017)
3

SPONSOR
BOEHRINGER INGELHEIM

COLLABORATOR
ELI LILLY AND COMPANY

CONDITION
CONGESTIVE HEART FAILURE

A code training exercise supervised by Clinical Nurse Manager Intensive Care Unit **MICHELLE RUSHING**, BSN, RN, and **ROSS WITHERBEE**, MSN, RN, Clinical Nurse Manager Cardiovascular Unit

Fine Tuning:

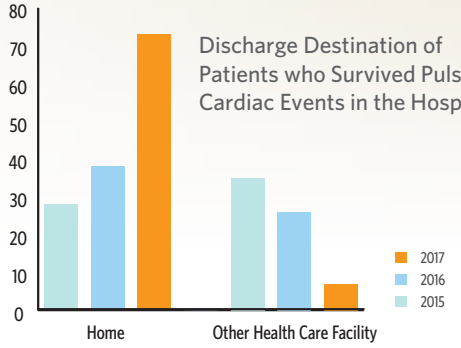
NURSING SKILLS ENHANCE CARDIOVASCULAR CARE

Health care never stops; it is an around-the-clock endeavor supported by hospital staff of every type. McLaren Northern Michigan has an especially strong team of nurse colleagues to carry out the needs of the heart and vascular program, every hour of every day. "Our nurses are exceptionally skilled," explains Cardiologist Dalton Miranda, MD. "Both individually and collectively, they pursue advanced degrees and training, they understand and use best practices, and they adhere to an ongoing improvement campaign that makes them a solid presence in cardiovascular care."

In fact, nursing care impacts the entire heart and vascular program, from Emergency Department to Intensive Care Unit, from the Cardiovascular Unit to Rehabilitation, and from surgery to floor duties. "Our nurses played a strong supporting role in the Top 50 award given to McLaren Northern Michigan and its cardiovascular specialists, for example," adds Dr. Miranda.

Coding Practice: SAVES LIVES AND IMPROVES OUTCOMES

The Resuscitation Committee, that began in 2017, implemented quarterly mock code events to ensure that colleagues have necessary skill sets in accordance with American Heart Association guidelines. The committee is a multidisciplinary team of unit managers, physician leaders, and hospital staff tasked with scheduling mock codes, evaluating results, and updating Cardiopulmonary Code Blue policy in compliance with national standards. "First and foremost, our goal is resuscitation, though beyond that, we strive to discharge patients to their homes rather than to acute care facilities," says Michelle Rushing, BSN, RN, Code Training Committee Chair. "Fine-tuning our resuscitation skills during these practice codes improves patient outcomes during an actual Code Blue event, and our recorded data for 2017 is showing our success."



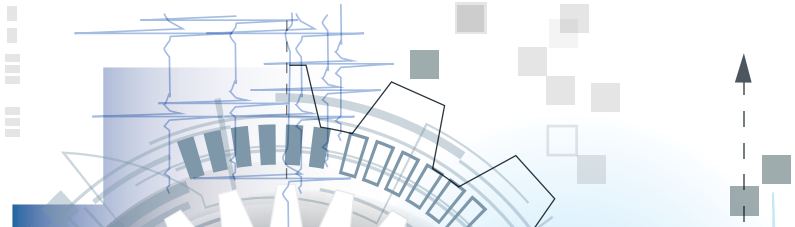
CARDIOLOGIST **GERALD GADOWSKI**, DO
CARDIOVASCULAR REHABILITATION DIRECTOR

Cardiovascular and Pulmonary Rehabilitation:

THE MECHANICS OF GETTING BACK TO FORM

Cardiovascular care might begin in the primary provider's office, or in the Emergency Department, but at McLaren Northern Michigan it is always comprehensive. The continuum of care addresses every aspect of the patient's individual situation, including cardiovascular inpatient and outpatient rehabilitation. "The treatment for cardiovascular disease, especially after a heart attack, intervention, or surgical procedure, almost always includes rehabilitation, and we have vigorously pursued the expansion of rehabilitation services as part of our care continuum," says Gerald Gadowski, DO, Cardiovascular Rehabilitation Director.

Inpatient acute rehabilitation is provided for those in need at the hospital. While outpatient rehabilitation services are conveniently housed at the John and Marnie Demmer Wellness Pavilion and Dialysis Center in Petoskey and at McLaren Northern Michigan – Cheboygan Campus. "Our Wellness Pavilion in Petoskey is state-of-the-art and rivals anything one might find at a much larger population center," explains Dr. Gadowski. "And our clinical colleagues work together to create individualized treatment plans based on new research, evidence-based best practices, and advanced technology.



A Long-term Wellness Plan

Following cardiovascular rehabilitation, patients can choose the Adult Medical Fitness Program, an optional health and wellness-based, supervised exercise and lifestyle regimen. "Our goal, overall, is to facilitate appropriate lifestyle change, improve quality of life, and decrease readmissions," continues Dr. Gadowski. "Our low readmission rates are currently among the best in the nation."

88.3%
of Percutaneous Coronary Intervention (PCI) STEMI Patients

RECEIVE **CARDIOVASCULAR REHABILITATION REFERRALS**

BMC2 PCI Collaborative Data

PEDIATRIC CARDIOLOGIST
CATHERINE WEBB, MD

Pediatric Care:

THE YOUNGEST OF HEARTS

Northern Michigan parents and referring providers have the security in knowing that pediatric patients have access to the best heart and vascular care close to home. A relationship between McLaren Northern Michigan and the University of Michigan benefits infants, children, and teens with congenital or acquired pediatric heart conditions. (The Congenital Heart Center at C.S. Mott Children's Hospital, an affiliate of the university, is one of the highest-volume, high-quality centers in the world.) From diagnostics to consultation, from medical condition management to follow-up care, patients are seen by experienced pediatric cardiologists in Petoskey.

"Northern Michigan families have access to the full scope of care for pediatric heart disease," explains Pediatric Cardiologist Catherine Webb, MD. "I think parents are really grateful to have care for their children close to home with back-up from a big university when deemed necessary." Dr. Webb says that while most patients can be treated in Petoskey, cases needing specific interventions and additional care can receive treatment in Ann Arbor, with follow-up care in Petoskey. "Families travel from across the country — and all around the world — to the University of Michigan C.S. Mott Children's Hospital," she adds. "Our families in northern Michigan don't have to leave the state to access this world class care."

Referring providers can rely on McLaren Northern Michigan for a number of services including auscultation and clinical evaluation; electrocardiography and echocardiography; Holter monitor reading; treadmill stress testing when needed; newborn screening tests; and 24/7 access to telemedicine. "Having access to these services expands our ability to help families navigate the challenges of pediatric cardiac care regardless of the complexity," says Dr. Webb.

"Congenital heart defects are the most common birth defects, appearing in nearly 1 out of every 100 births, though most respond positively to treatment. With the advances and innovations in pediatric cardiovascular care, we are able to serve the unique needs of this patient population, and these children are routinely growing into adulthood."

— **CATHERINE WEBB**, MD
PEDIATRIC CARDIOLOGIST

ONE
OUT OF EVERY
100
CHILDREN

ARE BORN WITH
CONGENITAL HEART DEFECTS

PRESIDENT AND CEO
DAVID JAHN
WAR MEMORIAL HOSPITAL
SAULT STE. MARIE

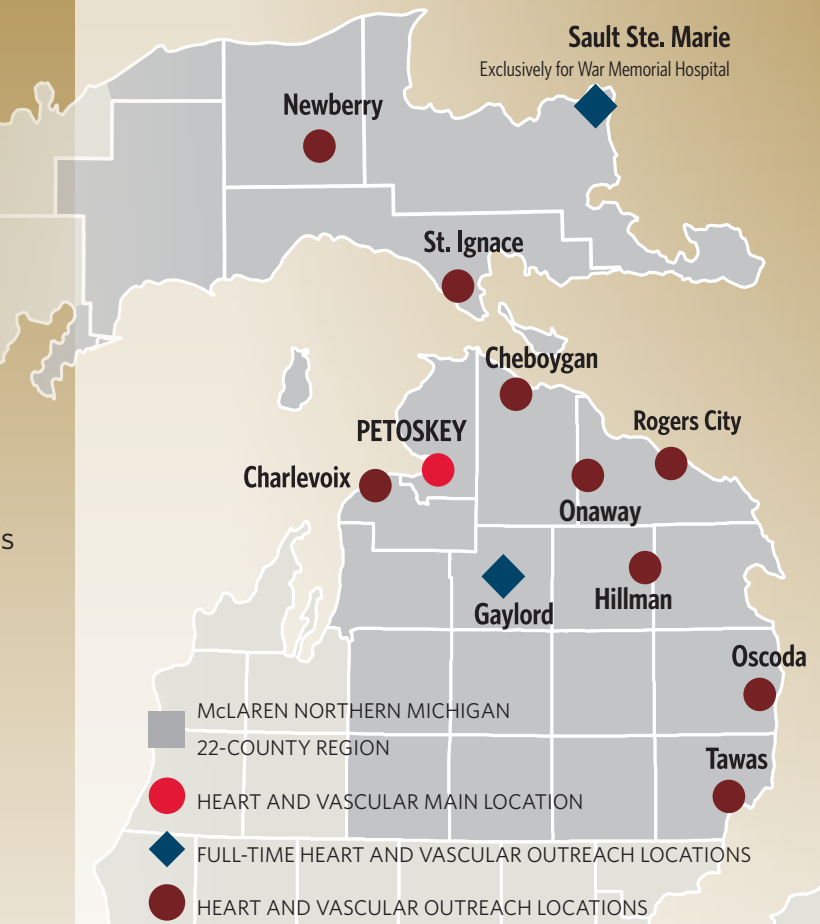
Outreach Services:

THROUGHOUT NORTHERN MICHIGAN

In a region of wide-spread communities and rural populations, heart and vascular services become even more important, and, in some cases, crucial. Sault Ste. Marie's War Memorial Hospital campus, one of 12 heart and vascular outreach locations affiliated with McLaren Northern Michigan, monitors and treats eastern Upper Peninsula residents. "Our patients see cardiologists, electrophysiologists, and other specialists right here in Sault Ste. Marie," says David Jahn, President and CEO of War Memorial Hospital. Cardiovascular specialists hold patient appointments, provide surgical clearance, and offer consultation for inpatient care. "This is how we envisioned the partnership for our patients." When more intensive care is needed, patients travel to Petoskey for treatment, and then return home for follow-up care."

The affiliation strengthens other levels of care as well. "Cardiologists are available when the Emergency Department needs them," continues David Jahn. "In the event of a STEMI, for example, transfer protocols expedite patient transport to Petoskey and ensure that a cardiovascular team is ready prior to patient arrival. Overall, being responsive is by far the most important aspect of any relationship, and McLaren Northern Michigan does that very well."

Strong communication between War Memorial Hospital and McLaren Northern Michigan includes quarterly meetings to facilitate regular evaluation and continuous improvement. "McLaren Northern Michigan is very responsive about the overall program and about individual patients," Jahn compliments. "This is a good partnership, and we are happy to provide the best care for our eastern Upper Peninsula patients."



"We have enjoyed working with McLaren Northern Michigan for many years. Our patients benefit most by seeing heart and vascular specialists both in our hospital and in Petoskey for more advanced care, where their records are continuous. They provide excellent service for our patients, and following, patients return back to us for long-term care."

— **TIMOTHY TETZLAFF**, DO
PRIMARY CARE PHYSICIAN
RIVERSIDE MEDICAL, SAULT STE. MARIE

WORKING TOGETHER: The Power of One, the Power of the Whole

McLaren Northern Michigan operates with serious intention at all levels, including its recruitment of top tier physicians and specialists. Such carefully chosen colleagues bring professional energy and drive to the system, both individually and collectively.

Cardiologists
Electrophysiologists
Cardiothoracic Surgeons

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

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

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

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

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

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

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

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

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

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

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

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

Jason Ricci, MD
Structural Heart 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

CATHETERIZATION LABORATORY TEAM
with Catheterization Laboratory Clinical Manager
GRETCHEN LAMARCHE, BSN, RN, BA

AWARDS & ACCREDITATIONS

TOP 50 HEART HOSPITAL

Significantly for 2017, McLaren Northern Michigan ranked among the top 50 cardiovascular hospitals in the nation — and one of only three in Michigan. The IBM Watson Health award is based on publicly available Medicare data focused on four key performance areas: bypass surgery, angioplasty, acute heart attacks, and congestive heart failure.

CENTERS FOR MEDICARE AND MEDICAID SERVICES (CMS) — HIGHEST NATIONAL RATING

McLaren Northern Michigan received a 5-Star Rating for quality and safety by CMS. A 5-Star rating puts McLaren Northern Michigan in the top 6% of hospitals in the country, and the only one in northern Michigan to receive the highest rating.

GET WITH THE GUIDELINES — GOLD PLUS | QUALITY ACHIEVEMENT AWARD WITH TARGET: STROKE HONOR ROLL

The American Heart Association/American Stroke Association's Get With The Guidelines®-Stroke Gold Plus Quality Achievement Award with Target: Stroke℠ Honor Roll award recognizes the commitment of McLaren Northern Michigan to provide the most appropriate stroke treatment according to nationally recognized, research-based guidelines, centered on the latest scientific evidence. Hospitals must achieve 85% or higher adherence to all Get With The Guidelines-Stroke achievement indicators for two or more consecutive 12-month periods and achieve 75% or higher compliance with five of eight Get With The Guidelines-Stroke Quality measures to receive the Gold Plus Quality Achievement Award.

GET WITH THE GUIDELINES® — RESUSCITATION SILVER AWARD

McLaren Northern Michigan received the Get With The Guidelines® — Resuscitation Silver Award for implementing specific quality improvement measures outlined by the American Heart Association for the treatment of patients who suffer cardiac arrests in the hospital.

AACVPR CERTIFIED PROGRAM — CARDIOVASCULAR REHABILITATION PROGRAM CERTIFIED BY INDUSTRY LEADER

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

ANCC MAGNET RECOGNITION®

Initial American Nurses Credentialing Center (ANCC) Magnet® recognition in 2011 and again in 2015 for another six-year period, places McLaren Northern Michigan among only 6.6% of hospitals throughout the country and among only 14 in Michigan to receive recognition for nursing excellence.

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 nine specific adult procedures/conditions. McLaren Northern Michigan was rated as High Performing in seven including: Abdominal Aortic Aneurysm Repair, Chronic Obstructive Pulmonary Disease (COPD), Colon Cancer Surgery, Heart Bypass Surgery, Heart Failure, Hip Replacement, and Knee Replacement.

BEACON AWARD FOR EXCELLENCE – CARDIOVASCULAR

Association of Critical Care Nurses, recognizes medical units that demonstrate exemplary levels of patient care, patient outcomes, and overall satisfaction.

McLaren

NORTHERN MICHIGAN

(800) 248-6777

mclaren.org/northernheart