# Table of Contents

Welcome .............................................................................................................5

## Services

Heart ......................................................................................................................6
- Coronary Artery Disease .............................................................................6
- Cardiothoracic Critical Care .................................................................11
- Shock ........................................................................................................11
- ECMO .....................................................................................................12
- Structural Heart ....................................................................................14
- Hypertrophic Cardiomyopathy .........................................................17
- Valve Disease .........................................................................................18
- Heart Failure .........................................................................................19
- Ventricular Assist Devices .................................................................20
- Heart Transplantation ...........................................................................22
- Atrial Fibrillation ...................................................................................24
- Cardiac Rhythm Management ..........................................................27
- Adult Congenital Heart ........................................................................29
- Cardiovascular Imaging .........................................................................32
- Preventive Cardiology and Rehab. .......................................................34

Lung .......................................................................................................................36
- Advanced Lung Disease .........................................................................36
- Lung Transplantation ...............................................................................38

Vascular ...........................................................................................................40
- Aortic Disease ........................................................................................40
- Vascular Disease .....................................................................................42
- Venous Disease .........................................................................................46
- Wound Care, Limb Care and Hyperbaric Therapy .........................48

## Research and Innovation

- ...........................................50

## Fellowships and Education

- ...........................................53

## Community Engagement

- ...........................................54

## Outreach

- ...........................................54

## Patient and Family Advisory Council

- ...........................................55

## Philanthropy

- ...........................................56

## Heart, Lung and Vascular Leadership

- ...........................................58

## Contact Us

- ...........................................60

## MedNow

- ...........................................60

## Locations

- ...........................................61
Dear Colleagues,

We are pleased to share our 2018 Spectrum Health Heart, Lung and Vascular Outcomes report. This information is compiled to showcase the clinical outcomes, programmatic accomplishments and innovations of the Frederik Meijer Heart & Vascular Institute. We are excited to highlight our achievements in clinical excellence, high-quality outcomes and volume metrics as well as feature our subspecialty programs. Our strategic vision is to be a national leader in cardiovascular health care by 2022. None of this would be possible without you, our physician partners.

We serve our patients through a multidisciplinary team-based model that is delivered by highly experienced clinicians who collaborate across the cardiovascular service line, with cardiac anesthesia, emergency medicine and primary care specialists. Each patient who is referred to our team receives expert opinions from clinicians who have subspecialized extensively in their field. Our state-of-the-art facilities allow us to provide 24/7 lifesaving care for patients with even the most complex conditions.

We have implemented several new initiatives over the past year. Our new culinary medicine program is part of our wellness and prevention portfolio, and highlights a commitment to preventing, rather than just treating, cardiovascular disease. Growth has occurred in niche subspecialties such as hypertrophic cardiomyopathy—which has received national accreditation. Volumes have increased in wound and limb care preservation, minimally invasive and robotic thoracic surgery to meet the need of disease prevalence in our community. Our Jacob and Lois Mol Cardiovascular Simulation Center recently opened and is one of the first of its kind dedicated to cardiovascular medicine in the country. The unique collaboration we have between our cardiothoracic surgery, cardiology and vascular fellows is highly innovative and facilitates team-based thinking at the inception of medical training.

Partnership with primary care and referring physicians is paramount as our patients navigate the complexities of health care. At Spectrum Health, we strive to ensure a unified and personalized multidisciplinary service, allowing world-class programs to be accessible to all, at greater convenience and lower cost for our patients.

We invite you to read this report and provide feedback and ideas for additional collaborations.

Sincerely,

Dr. Penny Wilton, MBBS, FANZCA, FFICM, MBA
Vice President, Department Chief
Cardiovascular Health

Tracey Burke, MBA, MSA, FRCA, RVT, RDMS
Vice President
Cardiovascular Health

John Heiser, MD
Division Chief, Cardiac & Thoracic Surgery

Jason Staikeu, MD, FACS, MBA
Division Chief, Vascular & Endovascular Therapy

David Wohns, MD, MBA, FACC
Division Chief, Cardiovascular Medicine

The Magnet Recognition Program® is the most prestigious distinction a health care organization can receive for nursing excellence and quality patient outcomes. Consumers rely on Magnet designation as the ultimate credential for high-quality nursing. Research over the past 20 years shows Magnet hospital culture is characterized by strong nursing leadership, well-educated and competent nurses, nursing autonomy and robust administrative support for improved patient outcomes. Better outcomes include fewer complications, lower mortality rates, decreased length of stay and higher levels of patient satisfaction.

Spectrum Health Butterworth and Blodgett Hospitals: 2018 Healthgrades Clinical Achievements

- One of Healthgrades America’s 100 Best Hospitals for Cardiac Care™ for 5 Years in a Row (2014-2018)
- One of Healthgrades America’s 100 Best Hospitals for Coronary Intervention™ for 4 Years in a Row (2015-2018)
- Recipient of the Healthgrades Cardiac Care Excellence Award™ for 5 Years in a Row (2014-2018)
- Recipient of the Healthgrades Cardiac Surgery Excellence Award™ for 8 Years in a Row (2011-2018)
- Named Among the Top 10% in the Nation for Coronary Intervention Procedures for 4 Years in a Row (2015-2018)
- Named Among the Top 10% in the Nation for Coronary Interventional Procedures for 4 Years in a Row (2015-2018)
- Named Among the Top 5% in the Nation for Overall Cardiac Services for 5 Years in a Row (2014-2018)
- Named Among the Top 5% in the Nation for Overall Cardiac Services for 5 Years in a Row (2017-2018)
- Five-Star Recipient for Coronary Interventional Procedures for 5 Years in a Row (2014-2018)
- Five-Star Recipient for Treatment of Heart Attack for 4 Years in a Row (2015-2018)
- Named Among the Top 5% in the Nation for Overall Cardiac Services for 4 Years in a Row (2015-2018)
- Named Among the Top 10% in the Nation for Coronary Interventional Procedures for 4 Years in a Row (2015-2018)

Data in this publication reflects calendar year 2017.
HEART: Coronary Artery Disease

Spectrum Health sees a high volume of acute heart attack patients, treating 329 STEMI patients in 2017—more than any other center in Michigan. Through the STEMI Referral Network, 12 hospitals collaborate to provide rapid treatment and transfer of patients, including those with cardiogenic shock and cardiac arrest, to the Fred and Lena Meijer Heart Center, where advanced ventricular support—including Impella, extracorporeal membrane oxygenation and open-heart surgery—is available 24/7.

Collaboration is a key component of our program. We are grateful to be an extension of the care already provided by referring physicians. We value and nurture provider partnerships, seeing this as an advantage for all involved in patient care.

RADIAL ACCESS: Our triple aim:

- Improves quality—fewer bleeding complications
- Reduces cost—shorter length of stay and fewer overall complications
- Improves patient experience—patients can get out of bed almost as soon as the procedure is done, with a higher likelihood of same-day discharge

53.29% of all PCIs were performed radially, higher than the national rate of 39.45%

Source: CathPCI Registry®

ACE™ Accreditation for Cardiovascular Excellence

What this means for your patient:

- Dozens of experts gather in one room to review complex cases.
- The right people pair up with the right technology to treat both routine and life-threatening conditions.
- Patients receiving elective stent procedures have a higher likelihood of going home on the same day.
- Our participation in research continues to expand treatment options.

In 2017, 42% of scheduled, elective PCI patients were discharged on the same day of the procedure.

National trends have shown declining rates of PCI, correlated with a combination of improvements in guideline-based care and appropriate use of procedures.

Diagnostic Catheterization

Percutaneous Coronary Intervention

Coronary Artery Bypass Graft Surgery

Acute Myocardial Infarction

Spectrum Health partners with 12 hospitals in its Regional STEMI Network.

Source: ACTION Registry®

The national goal for STEMI is less than or equal to 90 minutes.

Source: ACTION Registry®

The national goal from arrival at a regional emergency department to definitive treatment in a cath lab is less than or equal to 120 minutes.

Source: ACTION Registry®

More STEMI patients are treated at Fred and Lena Meijer Heart Center than at any other center in Michigan.
HEART, LUNG AND VASCULAR OUTCOMES REPORT

Zero-Gravity™ systems are used in multiple rooms in our cath lab to reduce radiation exposure to the cardiologist. By fall 2018, all rooms will have these systems available. Ryan Madder, MD, interventional cardiologist, also conducts research to help cath lab clinicians avoid radiation exposure through innovative shielding techniques and workflows.

Spectrum Health has the only Grand Rapids hospital with physicians who are approved to perform both surgical and percutaneous revascularization procedures. In addition, our surgeons have more than 10 years of experience with advanced robotic procedures that help eliminate the need for a mediastinal incision.

Fractional Flow Reserve Use for Intermediate Stenosis Lesions

<table>
<thead>
<tr>
<th>Spectrum Health</th>
<th>National Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>49.5%</td>
<td>25.1%</td>
</tr>
</tbody>
</table>

Percentage of patients with intermediate stenosis lesions—40 to 70 percent—with whom FFR was used. Source: CathPCI® Registry

We fully manage the medically complex patients that require left ventricular assist devices.

Spectrum Health has the only Grand Rapids hospital with physicians who are approved to perform both surgical and percutaneous revascularization procedures. In addition, our surgeons have more than 10 years of experience with advanced robotic procedures that help eliminate the need for a mediastinal incision.

Chronic Total Occlusion PCI

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cases</td>
<td>43</td>
<td>46</td>
<td>37</td>
<td>24</td>
</tr>
</tbody>
</table>

While CTO treatment is more complex than typical PCI, the procedure is still minimally invasive, and patients often return home the following day with a dramatic reduction of symptoms.

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impella insertions</td>
<td>51</td>
<td>64</td>
<td>64</td>
<td>81</td>
</tr>
</tbody>
</table>

Number of Impella insertions and high-risk, protected PCI procedures over four years.

Our multidisciplinary heart team meets weekly to perform a comprehensive review of patients with complex cardiac problems, collaborate on potential treatment options and provide recommendations. Candid discussion allows for the best and safest plan to unfold, and patients are more secure going into their procedures knowing such a large group of experts is behind the decisions.

Though we perform many high-risk procedures, working as a team has helped our outcomes remain some of the best in the state.

**HEART: Coronary Artery Disease**

When 68-year-old Xuan-Mai Roush struggled with chronic total occlusion, she couldn’t go anywhere, and she couldn’t do much of anything. Now she is standing tall and enjoying life again.

Spectrum Health Medical Group cardiologists Kevin Wolschleger, MD, and David Wohns, MD, are specially trained to treat this condition through a minimally invasive total occlusion procedure in Spectrum Health’s cath lab. Together, they have performed the cutting-edge procedure nearly 250 times since 2013.

The heart team includes cardiologists, cardiothoracic surgeons, cardiovascular anesthesiologists and intensivists.
HEART: Coronary Artery Disease

Isolated CABG

Number of isolated CABG procedures over four years.
Source: The Society of Thoracic Surgeons National Adult Cardiac Surgery Database

Operative Mortality

National Benchmark

Source: The Society of Thoracic Surgeons National Adult Cardiac Surgery Database

Infection Complications

Spectrum Health’s cardiac surgery infection complication rate is lower than the national benchmark.
Source: The Society of Thoracic Surgeons National Adult Cardiac Surgery Database

Initial Ventilation

< 6 Hours for CABG Patients

Patients at Spectrum Health are intubated for a shorter period of time following CABG.
Source: The Society of Thoracic Surgeons National Adult Cardiac Surgery Database

HEART: Cardiothoracic Critical Care—Shock

A shock team alert brings together experts from different specialties to rapidly evaluate patients in cardiogenic shock and determine the best therapies for the individual.

We receive referrals from all over Michigan for patients requiring the advanced shock therapies that we are skilled at providing.

In 2017 the shock team responded to
94 shock calls

The team often responds to evaluate patients brought to Spectrum Health Butterworth Hospital by Aero Med. Aero Med provides scene flight services as well as inter-hospital transport for patients with emergent cardiovascular concerns.

“A when I woke up from the coma … I kind of realized that I was living my worst nightmare. When you have a spouse that already has a cancer diagnosis and you have young kids, I mean, your worst fear is that something might happen to you, too.”

36-year-old Lisa Cardillo was on a mini vacation to Grand Rapids with her husband when she had a heart attack. She presented at Spectrum Health Butterworth Hospital Emergency Department, where it took CPR and two defibrillator shocks to get her heart pumping again. Using an invasive coronary angiogram, Ryan Madder, MD, the on-call interventional cardiologist, pinpointed the cause of Lisa’s heart attack as spontaneous coronary artery dissection.

By the time Lisa made it to the cath lab, the blood flow had resumed on its own. Lisa stayed the night in the ICU in a medically induced coma so her body could rest, but her crisis wasn’t over. During the next 12 hours Lisa developed cardiogenic shock.

Milena Jani, MD, the advanced heart failure specialist who followed Lisa’s situation, called Dr. Madder for a consultation. He recommended inserting an Impella heart pump to keep her heart working temporarily while giving it a chance to regain strength.

To read more about Lisa’s journey to recovery, visit healthbeat.spectrumhealth.org.
HEART: Cardiothoracic Critical Care—ECMO

The cardiothoracic critical care team at Spectrum Health is available to provide guidance to referring providers prior to transfer, and to discuss whether or not transfer is needed. The CTCC team is staffed by experts 24/7, and comprises physicians who are board certified in critical care and cardiac anesthesia, advanced practice providers, nurses and pharmacists that are cardiac focused and trained.

Daily multidisciplinary rounds focus on the care of patients with ventricular assist devices, extracorporeal membrane oxygenation and transplant. The team also provides emergent support to the cath lab for unstable patients, especially those in cardiogenic shock.

ECMO can be placed in:
- Emergency Department
- Cath Lab
- Operating Room
- Cardiothoracic Critical Care

Spectrum Health employs full-time, specially trained staff members who come together when a shock call is paged. Advanced lifesaving options include: ECMO, Impella (2.5, CP, 5.0 and RP) and CentriMag®.

With ECPR, practitioners can maintain end-organ perfusion while determining cause of the arrest and potential for reversing it, with the goal of improving long-term survival and neurological outcomes.

ECMO provides support for patients in shock with a failing heart or lungs.

ECMO Cases
Annual Volumes and Survival Rates: 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>VA and VV Runs</th>
<th>Survival Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>58</td>
<td>46.6%</td>
</tr>
<tr>
<td>2015</td>
<td>102</td>
<td>59.8%</td>
</tr>
<tr>
<td>2016</td>
<td>95</td>
<td>53.7%</td>
</tr>
<tr>
<td>2017</td>
<td>98</td>
<td>58.3%</td>
</tr>
</tbody>
</table>

Types of ECMO Cases
Types and Survival Rates: 2017

<table>
<thead>
<tr>
<th>Type</th>
<th>Runs</th>
<th>Survival Rate vs. ELSO* Reported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venous-Arterial</td>
<td>63</td>
<td>59.3% vs. 41%</td>
</tr>
<tr>
<td>Venous-Venous</td>
<td>25</td>
<td>62.5% vs. 59%</td>
</tr>
<tr>
<td>ECMO Supported Resuscitation</td>
<td>10</td>
<td>44.4% vs. 29%</td>
</tr>
</tbody>
</table>

*Extracorporeal Life Support Organization

What this means for your patient:
- We have processes in place to rapidly assemble the right practitioners at the right time to make lifesaving decisions.
- Our team is highly skilled in performing ECMO and Impella procedures and using the most advanced technologies to serve critically ill patients.

Our survival rates are better than the ELSO Benchmark for all types of ECMO.

What this means for your patient:
- We have processes in place to rapidly assemble the right practitioners at the right time to make lifesaving decisions.
- Our team is highly skilled in performing ECMO and Impella procedures and using the most advanced technologies to serve critically ill patients.

Our survival rates are better than the ELSO Benchmark for all types of ECMO.

We are a high-volume center for venous-arterial ECMO, used to support patients with poor cardiac function. The availability and expertise of our ECMO services expands the number of patients that can be candidates for surgery.

Number of patients treated with ECMO and survival rates from 2014 to 2017.
HEART: Structural Heart

As an early site for transcatheter aortic valve replacement, Spectrum Health is a high-volume referral center and continues to grow. Our program successfully treats even the most extreme-risk patients due in part to our streamlined multidisciplinary approach to patient care.

Spectrum Health’s specialized team uses the latest techniques, including:

- Valve-in-valve procedures, a less invasive treatment option for patients who have had a previous valve surgery
- Use of both commercially available transcatheter aortic valves to meet the unique needs of each patient
- Balloon valvuloplasty, repairing heart valves with a narrowed opening

MitraClip procedure is a less invasive option for those with degenerative mitral regurgitation who are not candidates for open-heart surgery.

What this means for your patient:

- Patients will benefit from thorough and collaborative care, being served by highly experienced specialists.
- Our team-based approach allows for a shorter time from referral to procedure.
- The safest possible care will be provided, in some cases using advances made through physician-initiated translational research.

TAVR Patient Risk Profile Comparison
Annual Volumes: 2017
Spectrum Health (243 patients)

TAVR Sedation Type Comparison
Annual Volumes: 2017
Spectrum Health (242 patients)

We treat more extreme-risk patients.

Nancy Perry, 79, had a near-death experience when her 14-year-old heart valve suddenly tore. Pain shot through her chest. She could barely breathe.

Doctors determined open-heart surgery would be risky because she was in shock. Instead, the team opted for the TAVR procedure—valve replacement without open-heart surgery. Nancy was up and walking the halls the next day.

“The TAVR team affords the patient the best view from all disciplines. It’s a meeting of the minds.”

William Merhi, DO, medical director, structural heart program
HEART: Structural Heart

Our structural heart physicians are experienced in multiple approaches for vascular access, making the procedure available to patients for whom traditional transfemoral access cannot be performed.

Spectrum Health is one of the first hospitals in the area to investigate the Medtronic Intrepid™ transcatheter mitral valve replacement system, a minimally invasive potential alternative to conventional open-heart mitral valve surgery. Through the APOLLO Trial, Spectrum Health will study the Intrepid TMVR system in patients who have severe symptomatic mitral regurgitation, and are either a candidate for, or ineligible for, conventional valve surgery.

Access points for TAVR

Transfemoral
Transapical
Transcaval
Transaxillary
Transsoral

HEART: Hypertrophic Cardiomyopathy

Spectrum Health is one of only two providers in Michigan to be designated a national Center of Excellence by the Hypertrophic Cardiomyopathy Association. Our multidisciplinary team with specialty staff is dedicated to improving the quality of life for HCM patients and families through advanced diagnostics, medical and surgical management, genetics, education and prevention of sudden death. We use progressive strategies to set up individualized care plans.

The HCM program is committed to our community through raising awareness at quarterly patient and family support group events.

The figures below represent examples of HCM. Thickening can occur in different patterns and in a variety of thickness.

**Hypertrophic Cardiomyopathy**

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
</tr>
<tr>
<td>2015</td>
</tr>
<tr>
<td>2016</td>
</tr>
<tr>
<td>2017</td>
</tr>
</tbody>
</table>

Ken Whitcomb, 53, and his family members have likely been suffering with HCM for 25-plus generations dating back to an ancestor in Holland. Ken's mother, Lucille, also has the gene. Her brother died suddenly from the heart condition and so did several cousins.

To treat his condition, Whitcomb tried drug therapy, but after a year his symptoms became more severe, and he found it increasingly difficult to breathe. An evaluation with Spectrum Health cardiologist David Fermin, MD, who is now the medical director of the HCM program, revealed Whitcomb was a candidate for a surgical procedure to correct the obstruction of the heart caused by HCM.

He underwent a septal myectomy, an open-heart procedure. Dr. Fermin continues to follow Whitcomb closely. “Ken has made remarkable progress,” Dr. Fermin said. “He looks and feels better than at any point since I started seeing him nearly five years ago.”

Ryan Rodarmer, Spectrum Health genetic counselor, says Spectrum Health’s clinic can identify the genetic cause of HCM in some families. “This allows us to determine which family members are at increased risk and which are not, via a blood test.” Many of these conditions are unique to just one or two families worldwide.
HEART: Valve Disease

Spectrum Health’s cardiovascular surgeons evaluate each patient’s overall health when determining the surgical procedure that will be most appropriate. This may include traditional open-heart surgery with one large incision or a minimally invasive open-heart surgery using robotic assistance via several smaller incisions. In both procedures, the diseased valve is repaired or replaced to restore normalized function.

Valve repair procedures may include:
- **Commissurotomy**: Freeing up valve leaflet motion
- **Valvuloplasty**: Supporting and strengthening valve leaflets by insertion of a ringlike device around the outside of the valve opening
- **Reshaping**: Removing and resewing a section of a leaflet
- **Decalcification**: Removing calcium buildup from leaflets
- **Mending structural repair**: Repairing the chordae tendineae and papillary muscles
- **Patch ing**: Placing a tissue patch to cover a hole or tear in a leaflet

Our cardiothoracic surgery fellows benefit from an essential array of cases due to our tremendous clinical volumes and innovative research pursuits.

HEART: Heart Failure

Spectrum Health employs seven board-certified advanced heart failure physicians who have together developed a care pathway to define state-of-the-art heart failure care. Through collaboration with other disciplines, our patients experience the power of integrated care that is consistent across our whole health system, from the primary care setting to general cardiology to our heart failure clinic.

Inpatient Care

As one of the busiest advanced heart failure hospitals in Michigan, we have every tool available to care for patients with heart failure. Two highly trained and specialized inpatient rounding teams are dedicated solely to the care of heart failure patients. Our nurses and staff within the heart failure specialty unit are supportive and passionate about caring for this patient population.

Within the AHF ICU, our team provides customized, hemodynamically tailored medical treatment for each patient, allowing the best medicine for the individual.

The cardiothoracic critical care unit uses an intensive multidisciplinary approach for complex patients or for those who require cardiac surgery. Each patient is managed by a specially trained critical care physician, cardiologist and cardiac surgeon, plus a comprehensive team of APPs, nurses, pharmacists and therapists.

**What this means for your patient:**

- We perform a high volume of surgeries for valve disease and serve as a referral center for complex, high-risk patients.
- Surgeons will see all patients, regardless of the complexity of their disease and welcome patients seeking a second opinion.
- Our commitment to teamwork coupled with individual treatment planning leads to safer outcomes.
- The cardiothoracic surgery team continues to grow so that all aspects of care are provided in one place.

Our team of 16 cardiovascular anesthesiologists are all double board certified and diplomats of the National Board of Echocardiography. They participate in heart team discussions and provide perioperative counseling and care as intensivists in the cardiothoracic critical care unit.
When cardiologists refer their complex, high-risk patients to Spectrum Health, they enter into a partnership. Spectrum Health’s heart failure program has cultivated collaborative relationships with cardiologists in a dozen hospitals around the state. Michael Dickinson, MD, medical director of the Spectrum Health Richard DeVos Heart & Lung Transplant Program, is in regular communication with Lakeland Health medical staff member Brett Hoseth, PA-C, Great Lakes Heart and Vascular Institute in St. Joseph. The providers connect regarding recommendations and transfers, and Hoseth has visited Meijer Heart Center to freshen his knowledge of ventricular assist devices.

Patients requiring ventricular assist device surgeries are often some of our sickest patients. We offer truly team-based care for these individuals, with multispecialty providers to handle pre-evaluation to post-LVAD placement care. Advanced heart failure cardiologists, cardiothoracic surgeons, advanced practice providers, registered nurses, pharmacists, social workers, psychologists and financial coordinators surround patients with support to lead them through their care journey.

**Primary VAD Survival**

Survival Rates Over 60 Months

- Spectrum Health
- National Benchmark

Source: Intermacs 2017 Q4 Cumulative Report implant and event dates: June 23, 2006, to December 31, 2017

**Process Improvement:**

- Timely evaluation and decision making are important so that patients in need of ventricular assist devices can get them before they become so ill that they are at high risk for surgery. Focused efforts brought the time from evaluation to decision from several weeks to eight days.

We cared for 121 VAD patients throughout the community in 2017.

**Ventricular Assist Device Surgery**

Annual Volumes by Category: 2014-2017

- **Bridge to Transplant** Patients receive this procedure to maintain health as they wait for a heart transplant.
- **Destination** This procedure improves survival and quality of life for patients who are not transplant candidates.

Mike Hensley has battled 20 years with cardiomyopathy and heart failure. He got his first pacemaker at age 40, and it kept his heart stable for 15 years. But in 2014 he ran out of solutions. An initial evaluation at a major heart transplant program rejected him as a transplant candidate. They told him a secondary medical issue made him ineligible and sent him on his way.

A second opinion from Michael Dickinson, MD, Spectrum Health Medical Group advanced heart failure and transplant cardiologist, and Alfred Albano, MD, Spectrum Health Medical Group electrophysiologist, revealed an issue with Hensley’s pacemaker that could be fixed, and along with medication optimization, could allow him to avoid a transplant.

**What this means for your patient:**

- Experts from multiple disciplines will analyze complex cases.
- Our integrated system allows for a consistent patient experience wherever care is sought, with the ability to complete some follow-up care at shared care sites.
- A full range of treatments is available, from holistic care to advanced technology, including left ventricular assist devices and heart transplantation when heart failure medications no longer help.

Our VAD team participates in research, and gave 13 presentations at the 2018 International Society for Heart & Lung Transplantation annual meeting in Nice, France.

“...But I got all the right people with all the right knowledge. They made my life a whole lot better.”

Mike Hensley, patient
HEART: Heart Transplantation

The surgical team within our Richard DeVos Heart & Lung Transplant Program has performed more than 100 transplants since its 2010 inception. Within our Heart Transplant Specialty Clinic, highly specialized clinicians—who are experts in managing the complexities of transplantation—collaborate for the benefit of each patient. The team includes nurse coordinators, pharmacists, social workers, dietitians, financial counselors, advanced practice providers and physicians.

A Partner for Stage D Evaluations

We work with a broad network of physicians throughout Michigan to help with Stage D patients—those with persistent symptoms and those getting worse over time. Our advanced heart failure physicians perform comprehensive assessments to find answers and solutions that can range from slight changes in treatment recommendations to LVADs and transplant.

In each situation, referring providers, patients and families can be assured that we will do our best to help each individual meet their goals of care, and do so in a timely manner.

Stephanie Hanson, RN; Beth Twyford, pharmacist; and Sangjin Lee, MD, advanced heart failure cardiologist, gather to discuss a patient’s plan of care.

Heart Transplant


<table>
<thead>
<tr>
<th>Year</th>
<th>Spectrum Health</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>2015</td>
<td>13</td>
<td>19</td>
</tr>
<tr>
<td>2016</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>2017</td>
<td>15</td>
<td>20</td>
</tr>
</tbody>
</table>

Survival Rates

Heart Transplant Risk-Adjusted Patient Survival Rates

<table>
<thead>
<tr>
<th>Survival Time</th>
<th>Spectrum Health</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Day</td>
<td>96.06%</td>
<td>96.41%</td>
</tr>
<tr>
<td>1-Year</td>
<td>90.42%</td>
<td>91.35%</td>
</tr>
<tr>
<td>3-Year</td>
<td>84.07%</td>
<td>84.97%</td>
</tr>
</tbody>
</table>

U.S. numbers are unadjusted survival rates.

Source: Most recent SRTR report (released January 2018), Table C11D, C12D, & C13D

“"I’m a warrior.”

Two decades after suffering cardiac arrest, 30-year-old Fabiola Garnett’s heart was failing. Her only detour from death? Finding a new heart.

After her doctor on the east side of the state hesitated to put her on the transplant list, Garnett took her health into her own hands and called the director of the Hypertrophic Cardiomyopathy Association in New Jersey. She then got a referral to see David Fermin, MD, a Spectrum Health Medical Group cardiologist specializing in advanced heart failure.

Dr. Fermin concluded that Garnett would need a transplant and admitted her for four days of transplant workup. Within two months, she had her new heart.

Garnett now reaches out to young people battling heart issues. She started a small business called “Heart Warrior,” which features branded apparel and plush lions for kids that read, “I’m a Warrior.”
Spectrum Health is one of 30 sites participating in the STOP AF First Trial, studying the safety and effectiveness of cryoablation in patients before treating them with antiarrhythmic medications.

Through collaboration with the emergency department, protocols have been developed to rapidly treat patients with new onset of Afib. Use of these interdisciplinary pathways reduces the need for hospitalization, decreases the cost of care and improves overall outcomes. An atrial fibrillation clinic is essential to the success of the new protocols, allowing for expedited follow-up without the need for hospitalization. At Spectrum Health, only 25 percent of Afib patients seen in the Spectrum Health Butterworth Hospital ED are admitted for treatment versus 70 percent of patients nationwide.

Our Afib protocols have received national attention as a best practice, and have been presented throughout the U.S. to allow success to spread.

What this means for your patient:
- Our team is highly specialized in treating arrhythmias.
- Pathway-driven care speeds diagnosis, reduces the need for hospitalization and expedites follow-up care.
- Partnerships with other specialists allow for the most comprehensive care and advanced surgical techniques.

Immediate Procedural Success—Device Margin Residual Leak < 5mm

Source: LAAD Registry™

We are active participants in the ASAP-TOO study for use of Watchman implants in those who are contraindicated to oral anticoagulation.
“We were both diagnosed in different cities by different doctors at relatively the same time.”

Both chose to have their procedure at Spectrum Health.

Tom Pantlind was referred by his Spectrum Health Medical Group family practice physician, Brian Phillips, MD, to see a specialist for concerning elevations in heart rate during activity. He quickly saw Andre Gauri, MD, Spectrum Health Medical Group cardiologist and electrophysiologist.

“There was no doubt in his mind that I should have the (ablation) done,” Tom said. “He said it’s a progressive disease, and it would continue to get worse as I get older. He said, ‘We’re going to treat it now while you’re young.’”

Tom’s twin brother, John, was in Chicago struggling with the same medical condition. His cardiologist from Northwestern recommended he seek care for his Afib from the Spectrum Health team. John moved to Michigan to be near family and his brother. The twins both had ablation procedures at Spectrum Health in early 2017 and are doing great.

Spectrum Health has one of the busiest electrophysiology labs in the nation, employing eight board-certified electrophysiologists who together performed more than 2,700 procedures in 2017 at Fred and Lena Meijer Heart Center. Our teams are able to treat and manage heart rhythm disorders throughout all of Spectrum Health’s entities on an inpatient and outpatient basis.

Core Program Providers and Staff

- 8 electrophysiology physicians
- 9 cardiothoracic surgeons (perform arrhythmia surgery)
- 4 electrophysiology advanced practice providers
- 1 registered nurse practice manager
- 1 registered nurse atrial fibrillation program coordinator
- 11 highly skilled procedural nurses and cardiovascular technicians
- 21 electrophysiology registered nurse coordinators

**HEART: Cardiac Rhythm Management**
HEART: Cardiac Rhythm Management

Our electrophysiologists—in conjunction with the radiology division—developed a program that allows patients with pacemakers and defibrillators that are not labeled for MRI to receive a scan if clinically indicated. Research indicates there is a 50 to 75 percent probability that cardiac device patients will need an MRI over the lifetime of their device.

Spectrum Health’s Cardiac Device Clinic provides ongoing care for patients who receive an implanted device, such as an ICD, pacemaker or loop recorder, to monitor heart function and rhythm.

8,479 outpatient cardiac rhythm monitors were placed in 2017.

Improved event monitors such as the Zio system are used to detect and diagnose irregular heart rhythms.

HEART: Adult Congenital Heart

Spectrum Health Helen DeVos Children’s Hospital’s Congenital Heart Center offers comprehensive care to patients from childhood to adulthood. The adult and pediatric teams function as a single unit to provide age-appropriate care, diagnosing and treating all congenital heart conditions, regardless of age.

For continuity of care, we also work closely with other providers that care for our patients and keep discussions open with referring physicians. Outside of Grand Rapids, we employ clinicians at outreach locations throughout Michigan to help with monitoring this patient population.

We are one of only 11 centers in the U.S. to achieve a Three Star rating from The Society of Thoracic Surgeons for congenital heart surgery based on the overall observed-to-expected ratio for operative mortality.

Spectrum Health Helen DeVos Children’s Hospital’s Congenital Heart Center offers comprehensive care to patients from childhood to adulthood. The adult and pediatric teams function as a single unit to provide age-appropriate care, diagnosing and treating all congenital heart conditions, regardless of age.

For continuity of care, we also work closely with other providers that care for our patients and keep discussions open with referring physicians. Outside of Grand Rapids, we employ clinicians at outreach locations throughout Michigan to help with monitoring this patient population.

We are one of only 11 centers in the U.S. to achieve a Three Star rating from The Society of Thoracic Surgeons for congenital heart surgery based on the overall observed-to-expected ratio for operative mortality.

---

**Ablations**


<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Atrial Fibrillation</th>
<th>VT/PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>1,388</td>
<td>75</td>
<td>368</td>
</tr>
<tr>
<td>2015</td>
<td>1,336</td>
<td>74</td>
<td>360</td>
</tr>
<tr>
<td>2016</td>
<td>1,194</td>
<td>71</td>
<td>368</td>
</tr>
<tr>
<td>2017</td>
<td>1,394</td>
<td>69</td>
<td>501</td>
</tr>
</tbody>
</table>

**Remote Monitoring and Device Clinic**


<table>
<thead>
<tr>
<th>Year</th>
<th>Remote Monitoring</th>
<th>Device Clinic</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>9,777</td>
<td>21,227</td>
</tr>
<tr>
<td>2015</td>
<td>9,420</td>
<td>18,203</td>
</tr>
<tr>
<td>2016</td>
<td>10,038</td>
<td>16,152</td>
</tr>
<tr>
<td>2017</td>
<td>10,246</td>
<td>21,227</td>
</tr>
</tbody>
</table>

**Adult Congenital Outpatient Visits**


<table>
<thead>
<tr>
<th>Year</th>
<th>Total</th>
<th>Atrial Fibrillation</th>
<th>VT/PVC</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>2928</td>
<td>25</td>
<td>482</td>
</tr>
<tr>
<td>2015</td>
<td>928</td>
<td>35</td>
<td>925</td>
</tr>
<tr>
<td>2016</td>
<td>1,702</td>
<td>31</td>
<td>67</td>
</tr>
<tr>
<td>2017</td>
<td>68</td>
<td>31</td>
<td>67</td>
</tr>
</tbody>
</table>

---

**Outreach Locations**

- Traverse City
- Holland
- Muskegon
- St. Joseph
- Lansing
- Cadillac
We partner with our women's health program to provide collaborative monitoring of congenital heart disease patients who are pregnant or seeking to become pregnant.

Our team creates 3-D heart models using combined imaging scans to aid in preparation for the complex nature of adult congenital heart surgeries.

What this means for your patient:
• From infancy through adulthood, care is given in the same center, by a team ready to handle the most complex procedures.
• We will collaborate with other providers to help make daily living easier for our patients.
• Referral to an adult congenital disease center such as ours reduces mortality. (Mylotte et al. Circulation. 2014; 129:1804-12).

From birth, Julie Palma's heart lacked the valve that controls blood flow from the heart's upper right chamber to the lower right chamber. The condition, tricuspid atresia, prevents blood from flowing to the lungs to be oxygenated.

After surgery as a child, Palma was living an active life with some restrictions. During her senior year of college, she found herself getting tired again and noticed bluing on the bottom of her legs. Her heart was enlarging. In 2003 she underwent surgery to get a pig valve implanted.

Follow-up care became easier when the Congenital Heart Center formed at Helen DeVos Children's Hospital in 2012, led by Marcus Haw, MBBS, and Joseph Vettukattil, MD, MBBS, both internationally known congenital heart specialists who came from England.

Dr. Haw replaced Palma's artificial valve with a bovine valve in 2013, and she has since had several ablation procedures at Spectrum Health to correct heart rhythm problems.

"Obviously, I wouldn't wish this on anyone," Palma said. "But I'm grateful for the journey. You don't take life for granted. Every day is a gift, for sure."

We offer a unique, formalized transition program to educate patients as they change over to adult care in the same clinic space.
**HEART: Cardiovascular Imaging**

Spectrum Health is the only provider in West Michigan to offer a full range of advanced imaging technology. Our board-certified cardiologists and radiologists collaborate to provide early and accurate diagnosis of cardiovascular diseases.

Cardiologists trained in advanced imaging have the advantage of being able to adeptly integrate advances in multiple cardiovascular imaging modalities with clinical care to provide more efficient and effective care to the patient.

Advanced Imaging

The DeVos Cardiovascular Imaging Lab at Spectrum Health uses advanced imaging to improve diagnostic and predictive factors for all kinds of heart disease. The goal is to improve doctors’ ability to noninvasively determine the structure and function of the heart in complex forms of heart disease.

**Cardio-Oncology**

Spectrum Health’s cardio-oncology multispecialty team monitors and treats patients at risk for developing heart conditions due to certain types of cancer treatment. This allows patients to receive their full course of treatment while minimizing the consequence of cardiac side effects.

Within the Cardio-Oncology Clinic, cardiologists and nurses from Meijer Heart Center work closely with the cancer specialists at the Spectrum Health Cancer Center to treat patients at all stages of cancer treatment. Cancer patients who may benefit from our clinic evaluation include those with:

- Abnormal electrocardiogram
- Abnormal echocardiogram
- Poorly controlled cardiac risk factors
- A strong family or personal history of heart disease
- Cardiac symptoms such as chest pain, shortness of breath and lower extremity swelling due to heart failure

Clinicians and scientists work together to better understand and improve how noninvasive techniques are used, so that declines in cardiac function can be detected—and managed—as early as possible.

---

**Cardiovascular Imaging**


<table>
<thead>
<tr>
<th>Year</th>
<th>CMR</th>
<th>ECHO—Transesophageal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>757</td>
<td>34,814</td>
</tr>
<tr>
<td>2015</td>
<td>742</td>
<td>3,118</td>
</tr>
<tr>
<td>2016</td>
<td>1,046</td>
<td>6,571</td>
</tr>
<tr>
<td>2017</td>
<td>1,254</td>
<td>7,575</td>
</tr>
</tbody>
</table>

In 2017, the average amount of time from study completion to physician interpretation was 7.78 hours, with 87 percent of all imaging studies reviewed by the physician within 24 hours.

**Time From Study Completion to Physician Interpretation**

In 2017, the average amount of time from study completion to physician interpretation was 7.78 hours, with 87 percent of all imaging studies reviewed by the physician within 24 hours.

---

**What this means for your patient:**

- Images of the highest quality are easy to obtain, to access and to share with other providers.
- Tests will be faster and less invasive.
- Results will be interpreted accurately and quickly, allowing for better outcomes.

**With 14 Spectrum Health imaging labs, access to our facilities is easier for first-time visits and second opinions.**

---

**Nuclear imaging systems allow for a less confining and more comfortable space, and complete scans in half the time.**

---

"We get all the benefit of nuclear stress testing with very little risk, because radiation exposure is now dropped so dramatically."

David Langholz, MD, FACC
Spectrum Health Medical Group cardiologist
What this means for your patient:
• Multiple disciplines come together to create customized plans for each patient.  
• Clinical and nonclinical prevention and rehab measures are explored for a better quality of life.
• We offer fresh education programs to create lasting, healthier lifestyles.

Spectrum Health’s preventive cardiology and rehab program sees the highest volume of patients in West Michigan, with the goals of preventing, halting and reversing coronary artery disease through primary (preventive) and secondary (cardiac rehab) efforts.

Our team comprises specialists from many areas, working together to motivate change that will lead to a healthier life. Team members include a medical director, clinical health psychologist, registered nurses, clinical exercise physiologists, respiratory therapists and nutritionists.

About 610,000 people die of heart disease in the U.S. each year—or about 1 in 4 deaths, according to the Centers for Disease Control and Prevention. Our program is recommended for people suffering from chronic conditions such as diabetes, high cholesterol or high blood pressure. Thomas Boyden, MD, medical director, preventive cardiology and rehabilitation, says he sees patients with “a constellation of risk factors,” sometimes including family history of heart disease.

“Our goal in preventive care is not to have a patient end up in the cath lab with a heart attack,” he said. “My goal, and my hope, is to stop people from getting there in the first place.”

Cardiac Rehabilitation
Annual Volumes and Visits: 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>Patients in program</th>
<th>Patient visits</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>587</td>
<td>8,471</td>
</tr>
<tr>
<td>2015</td>
<td>772</td>
<td>10,780</td>
</tr>
<tr>
<td>2016</td>
<td>706</td>
<td>9,953</td>
</tr>
<tr>
<td>2017</td>
<td>714</td>
<td>8,587</td>
</tr>
</tbody>
</table>

Number of patients and patient visits over four years.

Culinary Medicine
Our new culinary medicine program is co-led by a physician, chef and registered dietitian to teach practical skills in the kitchen and promote sustainable dietary change. Evidence-based nutritional science is translated into actionable steps to help prevent, treat and reverse diet-related chronic disease.

Partnership with the GRCC Secchia Institute for Culinary Education and Tulane University’s Health Meets Food allows us to offer the best-in-class culinary, nutritional and medical education.

Kristi Artz, MD, medical director, lifestyle medicine, is a certified culinary medicine specialist.

Metabolic Stress Testing

<table>
<thead>
<tr>
<th>Year</th>
<th>Volumes</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>741</td>
</tr>
<tr>
<td>2015</td>
<td>748</td>
</tr>
<tr>
<td>2016</td>
<td>667</td>
</tr>
<tr>
<td>2017</td>
<td>677</td>
</tr>
</tbody>
</table>

Metabolic stress testing is available for a more comprehensive exercise prescription, providing functional capacity and ventilation threshold measurements. Testing under physical stress helps to develop the safest and most effective exercise prescription.

Metabolic Wellness Patients

<table>
<thead>
<tr>
<th>Year</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>597</td>
</tr>
<tr>
<td>2015</td>
<td>772</td>
</tr>
<tr>
<td>2016</td>
<td>706</td>
</tr>
<tr>
<td>2017</td>
<td>714</td>
</tr>
</tbody>
</table>

Number of patients and patient visits over four years.
**LUNG: Advanced Lung Disease**

### Medical Management
Clinics specializing in interstitial lung disease, pulmonary hypertension, chronic obstructive pulmonary disease and cystic fibrosis work closely with referring physicians to provide expert management of the most complicated advanced lung diseases. Education, lifestyle modification, in-clinic therapies and our rehabilitation program help improve quality of life for patients with debilitating pulmonary diseases.

### Surgical Treatment
Our cardiothoracic surgeons are very experienced in minimally invasive thoracic surgery, including video- and robotic-assisted techniques. Robotic procedures are performed with a da Vinci Xi robot, which is specifically dedicated to the cardiothoracic program. We continuously monitor our outcomes through participation in the Society of Thoracic Surgeons Database and the Michigan cardiothoracic program. We continuously monitor our outcomes through participation in the Society of Thoracic Surgeons Database and the Michigan Society of Thoracic and Cardiovascular Surgery’s Quality Collaborative.

“As long as I have been doing this, no case is the same as any other case. There’s no textbook in the world that could include the extensive variety and depth of what we see, so that’s why the team is so valuable.”

Marc McClelland, MD, Spectrum Health Medical Group pulmonologist, commenting on the work of the multidisciplinary clinic.

Pulmonary reperfusion therapy is provided in conjunction with interventional radiology for rapid treatment of pulmonary embolism. Rapid treatment prevents development of chronic pulmonary hypertension and ventricular dysfunction.

### Robotic Pulmonary Resections

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resections</td>
<td>121</td>
<td>165</td>
<td>179</td>
</tr>
</tbody>
</table>

Number of pulmonary resections over three years. Source: The Society of Thoracic Surgeons General Thoracic Surgery Database.

### General Thoracic Surgery

<table>
<thead>
<tr>
<th>Year</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery</td>
<td>200</td>
<td>371</td>
<td>372</td>
</tr>
</tbody>
</table>

Number of general thoracic surgeries over three years.

### Pulmonary Rehabilitation

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy</td>
<td>98</td>
<td>132</td>
<td>156</td>
<td>190</td>
</tr>
</tbody>
</table>

Patient volumes for pulmonary rehabilitation have consistently grown over four years.

### 6-Minute Walk Test

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>120</td>
<td>140</td>
<td>150</td>
<td>160</td>
</tr>
</tbody>
</table>

A pulmonary fibrosis support group meets monthly to bring patients and families together to create community and raise awareness of the debilitating disease.

### What this means for your patient:
- Multidisciplinary team meetings help speed patient-centered treatment recommendations.
- We work in teams to surround patients with the knowledge and ability of world-class providers.
- A full spectrum of care options is considered for every patient.

Thanks to his dedication to pulmonary rehab, Larry Haas is breathing better and enjoying life again.

69-year-old Haas suffers from chronic bronchitis and COPD. “I was in the doctor’s office every other week,” Haas said. “Sometimes antibiotics and steroids weren’t working anymore.”

Instead of another pill, his doctor prescribed a visit to Diego Conci, MD, Spectrum Health Medical Group pulmonology specialist. In addition to working in Grand Rapids, Dr. Conci holds office hours at Spectrum Health United Hospital in Greenville several times a week. He said, “I want you to get off antibiotics and steroids. I need for you to go to rehab for a while.”

Haas didn’t want to exercise. He had pretty much resolved himself to a likely fate—his mom died of breathing difficulties in 2001. Through rehabilitation at the Pulmonary Rehabilitation Center in United Hospital he was able to start a new life course.

**Intensive Care Unit**

At Spectrum Health, our ICU patients with respiratory diseases are rounded upon daily by a team that includes board-certified pulmonary critical care physicians, allowing:
- Expedited, accurate diagnosis
- Comprehensive treatment plans using the latest advancements
- The least amount of time on a ventilator
- Higher-quality care with a shorter length of stay

**Multidisciplinary Clinic**

Patients with suspicion of lung cancer are seen in our multidisciplinary clinic, where they complete testing and meet with a clinician on the same day. Our team of pulmonologists, thoracic surgeons, oncologists, radiologists and researchers gather to discuss what has been discovered and propose a patient-centered treatment plan.

**Medical Management**

**Surgical Treatment**

**What this means for your patient:**
- Multidisciplinary team meetings help speed patient-centered treatment recommendations.
- We work in teams to surround patients with the knowledge and ability of world-class providers.
- A full spectrum of care options is considered for every patient.

**6-Minute Walk Test**

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>120</td>
<td>140</td>
<td>150</td>
<td>160</td>
</tr>
</tbody>
</table>

A pulmonary fibrosis support group meets monthly to bring patients and families together to create community and raise awareness of the debilitating disease.

**What this means for your patient:**
- Multidisciplinary team meetings help speed patient-centered treatment recommendations.
- We work in teams to surround patients with the knowledge and ability of world-class providers.
- A full spectrum of care options is considered for every patient.

Thanks to his dedication to pulmonary rehab, Larry Haas is breathing better and enjoying life again.

69-year-old Haas suffers from chronic bronchitis and COPD. “I was in the doctor’s office every other week,” Haas said. “Sometimes antibiotics and steroids weren’t working anymore.”

Instead of another pill, his doctor prescribed a visit to Diego Conci, MD, Spectrum Health Medical Group pulmonology specialist. In addition to working in Grand Rapids, Dr. Conci holds office hours at Spectrum Health United Hospital in Greenville several times a week. He said, “I want you to get off antibiotics and steroids. I need for you to go to rehab for a while.”

Haas didn’t want to exercise. He had pretty much resolved himself to a likely fate—his mom died of breathing difficulties in 2001. Through rehabilitation at the Pulmonary Rehabilitation Center in United Hospital he was able to start a new life course.
LUNG: Lung Transplantation

The Richard DeVos Heart & Lung Transplant Program became designated as a Blue Distinction® program by Blue Cross Blue Shield of Michigan in 2017. This recognition defines us as having the highest-quality facilities and physicians, while meeting or exceeding quality and cost-efficiency standards.

Based on national data, our transplant rate is significantly better than expected, and is one of the highest in the region. According to the Scientific Registry of Transplant Recipients, our median time to transplant in 2017 was two months, compared with 7.7 months for the state of Michigan, and 3.6 months nationwide.

Many of our lung transplant recipients have comorbidities, including:
• Advanced age
• Previous thoracic surgery
• Pulmonary hypertension
• Diabetes
• Resistant microorganisms
• Allo-immunization

Specialized pretreatment allows successful transplantation for these patients who are often turned away by other institutions. Despite an often-riskier patient population, our outcomes are among the best in the country, with one- and three-year survival rates that far exceed the national average.

Our success is based on an integrated and collaborative multidisciplinary approach to candidate evaluation, selection, surgery, perioperative management and long-term care. Patients are guided through each step of the process with stringent attention to detail. And, we continuously work to improve quality, while tailoring care to the unique needs of each patient.

We stay connected with our referring physicians to ensure high-quality continuity of care.

Edward Murphy, MD, cardiothoracic surgeon

Time to Transplant 2017
<table>
<thead>
<tr>
<th>Spectrum Health</th>
<th>2 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>State of Michigan</td>
<td>7.7 months</td>
</tr>
<tr>
<td>U.S.</td>
<td>3.6 months</td>
</tr>
</tbody>
</table>

Median time to transplant compared with state and national metrics.

Survival Rates
Lung Transplant Survival Rates Through January 2018

<table>
<thead>
<tr>
<th>Spectrum Health</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-Day</td>
<td>100%</td>
</tr>
<tr>
<td>1-Year</td>
<td>100%</td>
</tr>
<tr>
<td>3-Year</td>
<td>87.50%</td>
</tr>
</tbody>
</table>

Source: Most recent SRTR report (released January 2018), Tables B9, C11D, C12D & C13D

100th Lung Transplants From 2013 to 2017

Ascenda Denton was diagnosed with cystic fibrosis at 4½ years old. After 38 years of illness, Denton now is free of chronic infections and can breathe easily.

“It is very humbling to know on Christmas Eve, a family struggling with such a terrible tragedy would find it in their hearts to donate the organs of their loved one, so others can have a chance at life.”

Edward Murphy, MD, program director, lung transplant, thoracic and robotic surgery

“The 100th-transplant milestone shows how far the transplant program has come since it was founded,” Dr. Murphy said. Surgeons completed the first lung transplant in February 2013.
VASCULAR: Aortic Disease

Spectrum Health’s vascular division is a high-volume center for aortic disease. We provide medical and surgical expertise from endovascular repair to open surgical approach, and closely monitor patients in an aortic clinic to identify if and when minimally invasive or open surgical repair is needed.

Acute Type A Aortic Dissection

A recent study of patients with acute Type A aortic dissection (2011 to 2017) in the STS Database described high-volume centers as those treating more than 10 cases per year. Spectrum Health cardiothoracic surgeons treated 33 patients with Type A aortic dissection in 2017 with a mortality rate of 12 percent. This is notably lower than the 17 percent mortality rate identified in the study.

Abdominal Aortic Aneurysm

Endovascular Repair


Abdominal Aortic Aneurysm Open Repair


Abdominal aortic aneurysms are the most common type of aneurysm. Men are nearly five times more likely to develop them than women.

Norma Cool, her son Ron, right, and three other sons have been confirmed to have abdominal aortic aneurysms. “I was walking across the living room and I felt a terrible pain,” Norma said.

Robert Cuff, MD, who operated on Ron, says, “Patients with family members who have abdominal aortic aneurysms tend to develop them at a younger age than those without a family history.” He encourages everyone to get a screening ultrasound if there is an aneurysm in the family.
What this means for your patient:
• Our specialized providers collaborate to offer individualized care.
• We handle the most complex of cases at high volumes, using leading technologies.
• Education and research are cornerstones of our program, allowing us to provide the latest and safest treatment options.

Our team steadily works to improve patient outcomes through team-based training and a collaborative approach to diagnosis and treatment. In the fall of 2017, the vascular group successfully implemented a new procedure to open a blocked carotid artery called TCAR, for transcarotid artery revascularization.

The surgical team prepared for the procedure in the Spectrum Health Jacob and Lois Mal Cardiovascular Simulation Center. A lesion was blocking at least 90 percent of Lester Cramer’s blood vessel, leaving him at risk for a stroke.

To open up the artery and reduce his stroke risk, Cramer became the first patient at Spectrum Health to undergo the innovative TCAR procedure. Blood from the artery flows into a tube, runs through a filter to remove debris, and then is fed back into the body through a vein in the groin.

The approach “is really a significant step forward,” said Jason Slaikeu, MD, division chief of vascular and endovascular therapy. “It definitely is a novel, progressive technique.”

Dr. Slaikeu is one of only 100 surgeons in the country trained in the new procedure.

1,172 free peripheral arterial disease screenings and 2,411 free carotid and aorta screenings were performed in 2017.

Vascular conditions found:

- 33 abdominal aortic aneurysms
- 41 cases of carotid stenosis > 50%
- 27 cases of moderate and severe peripheral arterial disease

A lesion was blocking at least 90 percent of Lester Cramer’s blood vessel, leaving him at risk for a stroke.

To open up the artery and reduce his stroke risk, Cramer became the first patient at Spectrum Health to undergo the innovative TCAR procedure. Blood from the artery flows into a tube, runs through a filter to remove debris, and then is fed back into the body through a vein in the groin.

The approach “is really a significant step forward,” said Jason Slaikeu, MD, division chief of vascular and endovascular therapy. “It definitely is a novel, progressive technique.”

Dr. Slaikeu is one of only 100 surgeons in the country trained in the new procedure.
**VASCULAR: Vascular Disease**

### In-Hospital Transient Ischemic Attack Following CEA

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of TIA over four years</td>
<td>3.1%</td>
<td>4.7%</td>
<td>2.2%</td>
<td>2.3%</td>
</tr>
</tbody>
</table>

### Mortality for Vascular Surgery Procedures

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rate of mortality over four years</td>
<td>2.8%</td>
<td>4.0%</td>
<td>1.9%</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

**Procedures include:**
- Endovascular aortic aneurysm repair
- Fenestrated endovascular aortic aneurysm repair
- Open abdominal aortic aneurysm repair
- Upper and lower extremity bypass grafting

### Carotid Stenting

#### Annual Volumes: 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients who received a carotid stent over four years</td>
<td>35</td>
<td>23</td>
<td>25</td>
<td>22</td>
</tr>
</tbody>
</table>

### Carotid Endarterectomy

#### Annual Volumes: 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients who received a carotid endarterectomy over four years</td>
<td>163</td>
<td>150</td>
<td>134</td>
<td>175</td>
</tr>
</tbody>
</table>

### Vascular Surgeries

#### Total Volumes: 2014-2017

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of patients who received vascular surgery over four years</td>
<td>1,808</td>
<td>2,023</td>
<td>2,009</td>
<td>2,055</td>
</tr>
</tbody>
</table>
What this means for your patient:
• Our vast array of treatment options will help improve quality of life, allowing patients to feel comfortable and confident.

Some of our surgical solutions include:

Radiofrequency ablation—use of high-frequency radio waves to create intense local heat in the problem vein. The heat seals off the vein and the procedure yields little pain and a quicker recovery.

Chemical ablation—injection of Varithena® medication into problem veins to cause collapse and a blood flow shift to healthier veins.

Ultrasound-guided sclerotherapy—injection of a material that “dissolves” the damaged veins, allowing other veins in the network of blood vessels to take over the function of the damaged veins.

Phlebectomy—minimally invasive surgery to remove bulging varicose veins.

Deep venous stenting—placement of a stent or woven polyester tube into deep veins to help keep the vein open.

Embolization of pelvic varices—small coils inserted into the femoral vein via catheter to clot the blood and close faulty veins in the pelvic area.

Conditions Treated
• Varicose veins
• Spider veins
• Pelvic congestion syndrome
• May-Thurner syndrome
• Chronic deep vein thrombosis

In 2017, 407 cosmetic procedures were performed:

330 sclerotherapy injections
77 laser treatments

313 individuals were found to have moderate to severe venous disease through our 2017 free screening program.
What this means for your patient:

• We employ more people full time than other hospitals to care for patients with debilitating wounds.
• Level I hyperbaric medicine is available for limb preservation and treatment of other illness.
• A robust education program supports patients at risk for chronic wounds.

**Wound Care**

Spectrum Health employs a full-time team dedicated to wound and hyperbaric medicine, along with the subspecialties needed for wound healing, all in one location. Our wound healing clinic focuses on treating chronic wounds through a collaborative team approach. Wounds may include arterial, venous and pressure ulcers; non-healing surgical wounds; and traumatic wounds. When helpful, other disciplines are brought in for joint consultations to offer optimal coordination of care.

Advanced healing options may include:

- CelluTome™ Epidermal Harvesting—a system using heat and slight vacuum pressure to harvest skin
- EpiFix®—human amniotic membrane that contains powerful agents to help the body produce signals to cells to travel to the wound and regenerate damaged tissue
- Wound VAC—negative pressure therapy

We actively use the MedNow system to extend specialized care throughout the region, allowing patients to be treated close to home.

**Limb Care**

Our limb care and preservation clinic offers a single point of access to comprehensive care for leg and lower-extremity wounds. The team is composed of several specialties, including:

- Vascular surgery
- Hyperbaric medicine
- Podiatry
- Wound care

Same-day diagnostic testing is available for X-ray, ultrasound testing and orthotics, along with on-the-spot nutrition and diabetes education and information on tobacco cessation.

**Hyperbaric Oxygen Therapy**

Spectrum Health is a Level 1 accredited hyperbaric oxygen therapy center, one of only three accredited facilities through the Undersea and Hyperbaric Medical Society in the state of Michigan. This means we meet the highest standards of care and patient safety through rigorous evaluation of our facility, equipment, staff and training.

Unique to our program is the ability to provide 24-hour emergency coverage.

Hyperbaric treatments are used for an array of acute and chronic conditions:

- Carbon monoxide poisoning
- Necrotizing fasciitis and gas gangrene
- Delayed radiation injury
- Decompression injury and arterial gas embolism
- Non-healing diabetic foot wounds and chronic osteomyelitis
- Central retinal artery occlusion
- Idiopathic sudden sensorineural hearing loss
- Acute peripheral ischemia
- Skin grafts and flaps
- Severe anemia

**Once blind, her eye can now see**

Lisa Taylor suddenly lost sight in her right eye. “When I took my hand and covered my left eye, everything was just dark,” she said. A stroke temporarily halted blood flow in Lisa’s retinal artery.

The high levels of oxygen provided by the hyperbaric oxygen chamber at Spectrum Health Butterworth Hospital kept her retina alive until the artery cleared.

“Quick action by Taylor, her family and medical team set the stage for her recovery,” said Drue Orwig, DO, Spectrum Health emergency medicine physician and hyperbaric medicine specialist. Dr. Orwig completed a fellowship in 2017 in undersea and hyperbaric medicine and now oversees treatments for a wide range of illnesses.
Spectrum Health is a high-enrolling center in pivotal research studying transcatheter valve replacement.

121 publications in 2017
27 industry-sponsored studies
39 investigator-initiated studies

**Types of studies conducted at Frederik Meijer Heart & Vascular Institute**

- **Clinical research:** Testing new devices, medications or procedures
- **Research registries:** Gathering information to compare patient care with national guidelines
- **DeVos Cardiovascular Research Program**
  - The DeVos Cardiovascular Research Program is a collaborative effort among Spectrum Health, Van Andel Research Institute and the Cardiovascular Institute in Stanford, California. Using an interdisciplinary and translational approach, we investigate regenerative medicine for the heart. Twenty projects are currently supported through the program.
  - The program began establishing research registries in 2017. The ECMO registry, which comprises more than 500 cases and nearly 5 million data points, is now one of the largest ECMO registries in the world.
  - International collaboration increased in 2017. Our physician-scientists gave six preclinical presentations at the 2018 International Society for Heart & Lung Transplantation annual meeting in Nice, France. Spectrum Health, in conjunction with VARI, was the only non-academic center to give oral presentations.

**DeVos Cardiovascular Research Program**

- Spectrum Health’s heart, lung and vascular teams participate in research to provide innovative new treatments and medical devices that will directly impact the patients of Frederik Meijer Heart & Vascular Institute. Knowing that teamwork improves and speeds discovery, our researchers collaborate with fellow scientists locally and nationally to make advances in the field.

**Clinical research**

- **Databases:** Collecting information related to specific diagnoses or treatments that can be used to answer future research questions
- **Biorepositories:** Collecting blood and tissue samples for current and future research
- **Investigator-initiated:** Research studies developed by our physicians or clinical staff to answer questions about medical treatments

**Spectrum Health’s vice president of research, Chris Chambers, MD, PhD, FACS, is a practicing board-certified vascular surgeon. In addition to his surgical role, he oversees all aspects of research throughout Spectrum Health. His goal is to support the organization’s mission to improve the health of the communities we serve and the vision to be a national leader for health through patient-focused clinical research and fostering scientific discovery through collaboration and partnership. Dr. Chambers recognizes that exceptional patient care includes access to the latest clinical research trials, to provide hope for a better future.**

**Stefan Jovinge, MD, PhD, Spectrum Health’s medical director of cardiovascular research, is an internationally recognized critical care cardiologist and scientist. Originally from Sweden, he moved to Grand Rapids in 2014 to establish a joint program, conducting basic research at Van Andel Research Institute and clinical research at Spectrum Health. He also holds an adjunct professorship at Stanford University School of Medicine.**

Together with his colleagues in the robust translational research programs at Spectrum Health, VARI and Stanford, Dr. Jovinge’s team works to develop the cardiac treatments of the future through efforts to regenerate tissue and stimulate the heart to repair itself.
Research and Innovation

Rare Disease Work

The cost of developing a drug is not feasible for patients with rare diseases, specifically in our case for patients with familial heart muscle diseases. Over the past year, we have established a database that encompasses nearly all Food and Drug Administration-approved drugs and their impact on a wide range of genes. In total, more than 1.3 billion data points are now available to help identify already-approved drugs that can specifically improve the function of heart muscle cells for our patients.

We have already had success for patients with Lamin A/C deficient heart muscle disease. The database is sure to be proven helpful for other patients with rare diseases in the future.

1.3 billion data points encompassing nearly all FDA-approved drugs

Fellowships and Education

Through our strong collaboration with Michigan State University College of Human Medicine and Van Andel Research Institute, Spectrum Health offers fellowships in the fields of cardiology, cardiothoracic surgery and vascular surgery. Our fellows receive educational opportunities that few other health systems can provide, from world-renowned physicians in state-of-the-art facilities. Our academic environment includes medical students along with a wide range of residency programs, including an integrated vascular surgery residency/fellowship.

The newly constructed Jacob and Lois Mol Cardiovascular Simulation Center allows hands-on education utilizing innovative simulation and applied experiential learning. By providing education in a supportive, controlled environment, clinicians are able to master key competencies and skills with zero risk to patients.

“My team and I have benefitted greatly from the Jacob and Lois Mol Cardiovascular Simulation Center. We have begun an endovascular curriculum that was otherwise unavailable to us, and have space to teach and learn together. The facility has a suite filled with resources that allow me to better myself as a surgeon and physician. It has really changed the way we train and I think it will have real results.”

Peter Beaulieu, DO, MPH, Vascular Surgery Resident

To prepare for Spectrum Health’s first transcarotid artery revascularization procedure, a team assembled at the Jacob and Lois Mol Cardiovascular Simulation Center to perfect the technique and allow the team to feel confident in the procedural steps.

We partner with Spectrum Health Innovations to bring innovative ideas into action. In 2017, Paige Rowland, practice manager, vascular surgery, and former regional supervisor, echo/vascular diagnostic testing, helped to develop a new design for an ultrasound probe holder to prevent sonographer injuries.
Community Engagement

Outreach

In honor of American Heart Month, Spectrum Health’s heart and vascular team invited the community to participate in an evening of complimentary dinner and information on the program’s expertise. More than 200 attendees learned about the areas of heart failure, valve disease, heart rhythm disorders and advances in noninvasive surgical techniques. A behind-the-scenes demonstration of the DaVinci Robot was offered prior to the presentations. The event was streamed live on Facebook for those unable to attend in person.

“Our goal with these seminars is to share the comprehensive and collaborative nature of our heart and vascular program. We want the community to know we are here for individuals who are early in their cardiovascular care, and patients who are very ill and searching for advanced treatments.”

Tracey Burke, Vice President, Cardiovascular Health

Patient and Family Advisory Council

Patient and Family Advisory Councils unite patients and families with health care professionals to improve the patient care experience. The personal experiences and insights brought by PFAC members ensure Spectrum Health continues to improve, innovate and reimagine how care is provided to those we serve.

The Cardiovascular Health Council was formed in 2007 with the goal to bring “heart” to the forefront in the health care we provide. In 2017, some key council activities included:

• Bringing the patient and family perspective to the cardiovascular community engagement strategy
• Providing the patient viewpoint for new bedside technology in the intensive care unit
• Participating in interdisciplinary rounds to improve communication between the care team and family—specifically in regard to keeping informed about treatments in the ICU

Physicians and staff members from the Spectrum Health Richard DeVos Heart & Lung Transplant Program also gathered to celebrate Donate Life Month. The celebration allowed donor families, donor recipients, transplant patients and patients with ventricular assist devices to share stories, show support and simply celebrate life.

“Visiting outpatient offices to share patient perspective with leaders
• Serving as mystery shoppers to observe effectiveness of teamwork at various sites throughout the system

To learn more about Spectrum Health’s Patient and Family Advisory Councils, visit spectrumhealth.org/pfac.

Cardiovascular Health Council

“Very humbling and an immense privilege to be part of PFAC. Hearing the stories from our patients, seeing our hospital and our units through their eyes ... gives us a unique perspective. We strive to improve and perfect our processes to ensure the patient experience is seamless.”

Penny Wilton, MBBS, Department Chief, Cardiovascular Health

Darryl Elmouchi, MD, electrophysiologist and president, Spectrum Health Medical Group, stays in touch with patients and families, in part through participation in Patient and Family Advisory Councils.
Philanthropy

Frederik Meijer Heart & Vascular Institute has broadened its impact across the region thanks to generous support from our donors. We are gratified to be able to further develop programs that are vital to the community, such as the Richard DeVos Heart & Lung Transplant Program, the Richard McNamara Cardiovascular Fellowship, transcatheter aortic valve replacement program and ventricular assist device program, among others.

In 2017, because of philanthropy, the hypertrophic cardiomyopathy team has been able to expand services that lead to reduction in sudden cardiac death, including enhanced imaging techniques, monitoring, education, treatment and genetic testing. The increase in resources will help treat the estimated 4,000 individuals within our region who may test positive for the Hypertrophic Cardiomyopathy gene.

Philanthropy also supports cardiovascular research projects. Recent efforts include groundbreaking work on cholesterol plaques that are known to cause heart attack, isolating pacemaker cells to develop a biological pacemaker and designing new pharmaceuticals for rare heart disease.

The Jacob and Lois Mol Cardiovascular Simulation Center was funded completely through philanthropy and has proven to be a valuable asset in building the skills of our clinicians. The state-of-the-art training space allows for innovative simulation, applied experimental learning and hands-on technology.

For more information on philanthropy supporting the work of heart, lung and vascular programs, visit give.spectrumhealth.org/donate/GratefulHearts.

Committed to Safety 24/7/365
Spectrum Health has a strong safety program that includes sharing medical errors and serious safety events. Less severe, preventable harm events also are shared utilizing organizationwide scorecards.

Protecting our employees from harm is just as important as protecting our patients. Our goal is “zero harm” for both patients and employees.

Spectrum Health Foundation is a 2017 high-performing philanthropic organization according to the Association for Healthcare Philanthropy.

New, enlarged bedside monitors help clinicians within the ICU.
CONTACT US

To refer a patient: 855.7MYHEART spectrumhealth.org/fmhvi

Physician Liaisons
Spectrum Health’s physician relations team is specially trained to support relationships with our referring physicians through providing connectivity, resources, education, support and advocacy. Contact us if you would like help navigating our system. We are available to provide you information on our cardiovascular health services, and address your questions and needs with face-to-face visits.

Kari Rawles, Senior Provider Program Specialist, Cardiovascular Health
616.486.6672
physician.relations@spectrumhealth.org

MedNow
Spectrum Health’s MedNow℠ heart and vascular video visits allow patients to consult with a Grand Rapids-based cardiovascular specialist from remote Spectrum Health specialty clinics and hospitals. More than 1,000 heart and vascular care encounters have been completed through participating locations since the program’s inception in 2014.

In addition to specialty services, direct-to-consumer care is available to anyone in Michigan for low-acuity conditions. This service is used by several West Michigan employers, and is available 24/7 for patients 3 years and older. Patients may download the MedNow app on their smart phone device or call 844.322.7374 to be connected to Spectrum Health’s MedNow providers.

More than 1,000 heart, lung and vascular encounters
Over the past three years, the Spectrum Health Wound Healing Program accounted for 639 visits, providing inpatient and outpatient telemedicine services at five Spectrum Health regional hospitals and a rehab and nursing center.

51,000+ total patients served
11,677+ emergency and urgent care visits avoided
959,943+ miles of travel saved

Cardiovascular Care Locations

1. Spectrum Health Ludington Hospital
   One Atkinson Drive
   Ludington, MI 49431

2. Spectrum Health Reed City Hospital
   300 N. Patterson Road
   Reed City, MI 49677

3. Spectrum Health Big Rapids Hospital
   605 Oak Street
   Big Rapids, MI 49307

4. Spectrum Health Gerber Memorial
   212 S. Sullivan Avenue
   Fremont, MI 49412

5. Spectrum Health Integrated Care Campus – North Muskegon
   2009 Holton Road
   Muskegon, MI 49445

6. Spectrum Health United Hospital
   Heart & Vascular Center
   615 S. Bower Street
   Greenville, MI 48838

7. Spectrum Health Zeeland Community Hospital
   4333 Fch Street
   Zeeland, MI 49464

8. Spectrum Health West Pavilion
   6105 Wilson Avenue SW
   Wyoming, MI 49418

9. Spectrum Health Pennock
   1009 W. Green Street
   Hastings, MI 49058

10. Spectrum Health Pulmonary Hypertension Clinic
    4060 Lake Drive SE
    Grand Rapids, MI 49546

11. Spectrum Health Fred and Lena Meijer Heart Center
    Heart & Vascular Center
    Heart & Lung Specialized Care Clinic
    TAVR Clinic
    100 Michigan Street NE
    Grand Rapids, MI 49503

12. Spectrum Health 2900 Bradford
    Heart & Vascular Center
    Preventive Cardiology and Rehabilitation
    Advanced Heart Failure Clinic
    Anti-Coagulation Clinic
    2900 Bradford Street NE
    Grand Rapids, MI 49525

13. Spectrum Health Heart & Vascular Center at Holland Hospital
    602 Michigan Avenue
    Holland, MI 49423

14. Spectrum Health Professional Building
    705 S. Greenville West Drive
    Greenville, MI 48838

15. Spectrum Health Integrated Care Campus – Holland
    588 E. Lakewood Boulevard
    Holland, MI 49424

16. Health Pointe
    15100 Whitaker Way
    Grand Haven, MI 49417

Spectrum Health provides contracted services to Health Pointe, a joint venture between Spectrum Health and Holland Hospital.
CONTACT US
To refer a patient: 855.7MYHEART

For more information about Spectrum Health or to download this report, visit spectrumhealth.org/fmhvi.