Cardiovascular and Surgical Outcomes | 2016

BayCare

BayCareHeart.org

Clinical Review Committee

Augustine E. Agocha, MD, PhD
St. Joseph's Hospital

Mahesh Amin, MD
Morton Plant Hospital

Rodrigo Bolaños, MD
Winter Haven Hospital

George Dagher, MD
Morton Plant North Bay Hospital

David Evans, MD
Winter Haven Hospital

David W. Kohl, MD
St. Anthony's Hospital

Stephen M. Langley, MD
St. Joseph's Children's Hospital

Kevin Makati, MD
St. Joseph's Hospital

Leslie Miller, MD
Morton Plant Hospital

John Ofenloch, MD
Morton Plant Hospital

Jeremy Ringewald, MD
St. Joseph's Children's Hospital

Joshua Rovin, MD
Morton Plant Hospital

Andrew Sherman, MD
St. Joseph's Hospital

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Dear Colleague,

We're pleased to provide this summary of key 2016 cardiovascular program highlights. BayCare's cardiovascular programs are dedicated to providing the highest quality care and services throughout Florida and beyond. Our advanced facilities permit us to care for complex cardiac disease with programs specializing in coronary artery disease, heart failure, structural heart and valve disease, peripheral vascular disease, arrhythmia, pediatric and congenital heart disease and diseases of the aorta.

BayCare offers comprehensive forums for physicians, staff and administrators to share clinical expertise, outcomes data, research and translation of best practices. Clinical outcomes management, using national benchmarking along with patient-centered care, assures the best treatment for each patient. In addition to our volume and outcomes data, we're excited to highlight some of our world-class programs including our fast-growing arrhythmia, structural heart and percutaneous coronary intervention programs. As a system of community hospitals within West Central Florida, we're committed to being a leader in providing superior heart care.

We hope you can utilize the information in this outcomes book to help with patient care and treatment decisions. For more information or to refer a patient to any of our programs, call (844) 344-1990.

Augustine E. Agocha, MD, PhD
Clinical Leader, Heart Failure
Clinical Leader, General Cardiology
BayCare Cardiovascular Services

Medical Director, Cardiac Rehabilitation and Preventive Cardiology
St. Joseph's Hospital

Mahesh Amin, MD
Medical Director
BayCare Cardiovascular Services

Medical Director
Morton Plant Mease Cardiovascular Services

David W. Kohl, MD
Clinical Leader, Percutaneous Coronary Intervention
BayCare Cardiovascular Services

Interventional Cardiologist
St. Anthony's Hospital

Kevin Makati, MD
Clinical Leader, Arrhythmia Management
BayCare Cardiovascular Services

Co-Director, Department of Electrophysiology
St. Joseph's Hospital

John C. Ofenloch, MD
Clinical Leader, Open-Heart Surgery
Clinical Leader, Structural Heart and Valve
BayCare Cardiovascular Services

Chief, Cardiothoracic Surgery and Medical Director, Morgan CVICU/OR
Morton Plant Hospital

Andrew Sherman, MD
Clinical Leader, Open-Heart Surgery
Clinical Leader, Structural Heart and Valve
BayCare Cardiovascular Services

Chief, Department of Cardiothoracic Surgery
St. Joseph's Hospital

New in 2016

Bartow Joins BayCare

Joining BayCare in 2016, Bartow Regional Medical Center is an acute care hospital serving South Lakeland, Bartow, Fort Meade, Mulberry, rural south Polk County and northern Hardee County. The interventional laboratory at Bartow Regional Medical Center operates as a hybrid laboratory, performing both coronary catheterizations and interventional radiology procedures. Our specialists offer state-of-the-art cardiovascular care from diagnosis to emergency intervention to the latest treatments and preventive education, including diagnostic cardiac catheterizations, defibrillator/pacemaker implant and generator change, digital loop/event recorder implantation, cardioversion, transesophageal echocardiogram (TEE) and other noninvasive cardiac diagnostic services including stress testing and echocardiogram.

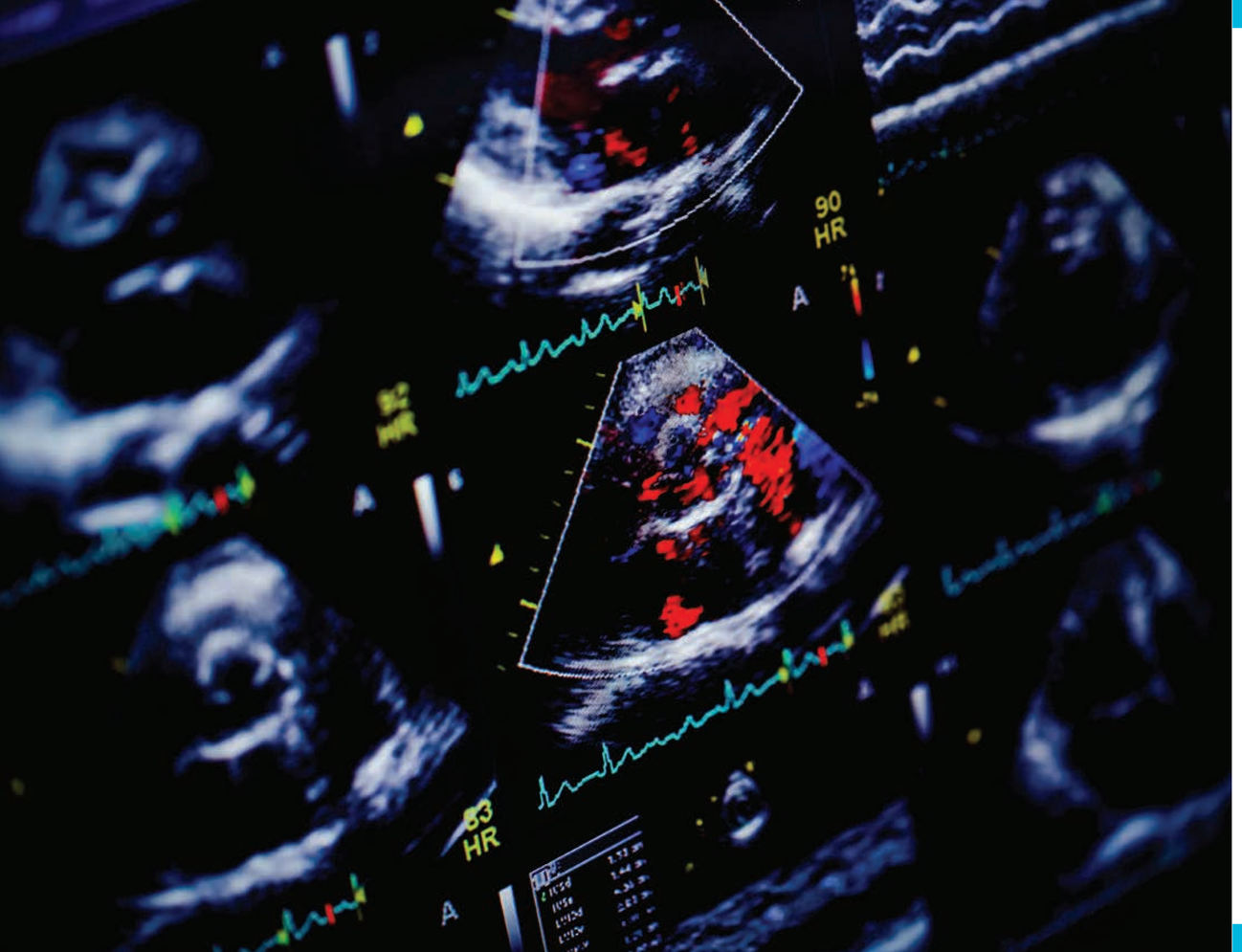
BayCare Earns Three-Star STS Rating

BayCare has earned a distinguished three-star rating from the Society of Thoracic Surgeons (STS). The three-star rating, which denotes the highest category of quality, places BayCare among the elite in the United States and Canada. In addition to BayCare receiving the three-star rating as a system, each of our three flagship cardiovascular facilities—Morton Plant Hospital, St. Joseph's Hospital and Winter Haven Hospital—received three-star ratings. Achieving the highest rating (three stars) from STS places us in the top 10-15 percent of all cardiac surgery programs nationwide.

BayCare submits data to the STS National Database with the goal of improving patient outcomes and patient safety. These open-heart surgery programs have also elected to share their results publically since that reporting structure became available in 2010.

"With the collective experience of over 1,000 open-heart surgeries each year and the cohesive interaction of sharing best practices between cardiovascular surgeons across the BayCare network, we've been able to provide a world-class experience with superior outcomes for our patients and their families," according to Dr. David Evans, director of cardiothoracic surgery at the Bostick Heart Center at Winter Haven Hospital.

STS National Database™
Participant 2017



Why Choose Us?

At BayCare, *quality* is serving the needs of our customers. Leaders and team members are responsible for creating an environment that allows quality to flourish. Our quality model, shown here, highlights the philosophy, process and culture we promote to support quality throughout our system.

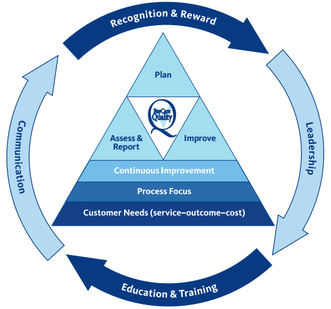
Our quality philosophy efforts are aimed at the customer experience and improving customer satisfaction with the services we deliver. The customer experience is enhanced by improving processes and reducing process variations.

Awarded the highest three-star STS rating as a system, BayCare is the largest not-for-profit health care system in the area. From our three flagship cardiovascular institution leaders in complex arrhythmias, advanced structural heart and valve and open-heart surgery, to the clinically integrated network of hospitals, outpatient centers, surgery centers and outpatient imaging facilities, BayCare physicians and patients have access to experts across the spectrum. In addition, through our expansive network footprint, patients are able to move easily within the system to get the care and clinical expertise they need, regardless of their location.

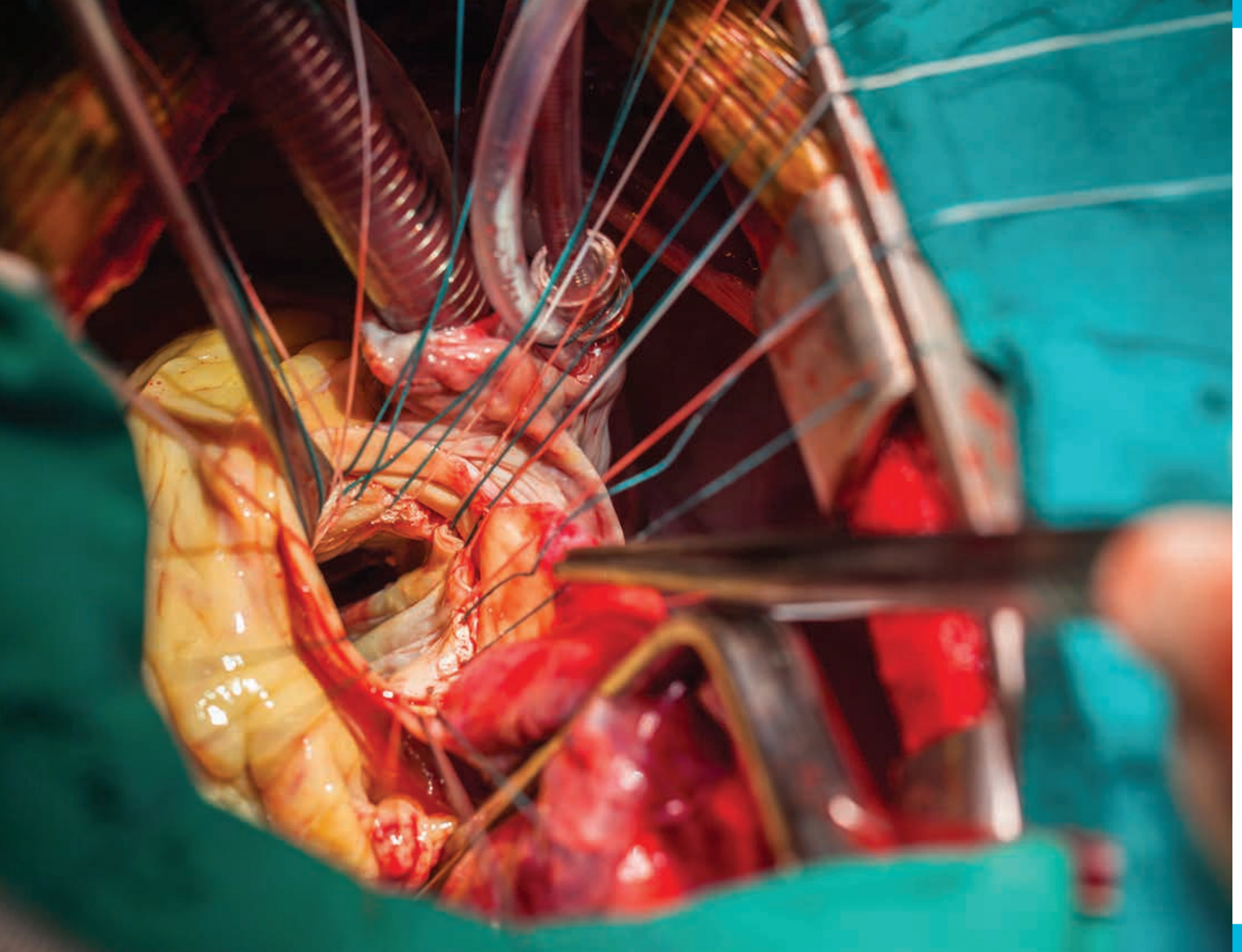
Our quality process provides the framework for innovation and the creation of new services designed to serve the needs of our customers including advanced ablation, transcatheter approaches, cardiac-oncology and congenital heart. The quality process encompasses planning a system-wide strategy to serve the customer needs and achieve the vision of the organization, taking actions to improve the processes used to deliver products and services, and continually measuring and reporting how well we're performing.

BayCare strives to improve clinical safety and outcomes through collaborative and rigorous process review. As a network, BayCare is investing in the community and future of cardiovascular medicine through participation in national and international clinical trials and research. To implement a quality philosophy and process, BayCare has established a culture where quality behaviors and expectations are communicated, encouraged and rewarded.

At BayCare, we offer access to clinically advanced, comprehensive, quality cardiovascular care and treatment for both simple and complex cardiac disorders.



To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990



Cardiovascular Surgery

When it comes to your patients' care, we realize that quality, outcome and cost are of the upmost importance. BayCare's cardiovascular and cardiothoracic surgeons are all members of the Society of Thoracic Surgeons (STS) whose mission is to enhance the ability to provide the highest quality patient care. BayCare participates in the STS National Adult Cardiac Surgery Database that includes over 1,200 participating institutions throughout the country.

Cardiovascular surgery is currently performed at three BayCare facilities: Morton Plant Hospital, St. Joseph's Hospital and Winter Haven Hospital. As a system, we're proud to have been awarded an STS rating of three stars for 2016. Dr. John Ofenloch, chief of cardiothoracic surgery and medical director of Morgan CVICU/OR at Morton Plant Hospital, acknowledges that "Cardiac surgery is one of the most scrutinized and data-driven specialties. The fact that BayCare has again been awarded the STS's highest possible distinction demonstrates our commitment to providing the highest quality, most progressive and transparent level of care to our expanding patient population throughout West Central Florida."

For information on BayCare's management and treatment of pediatric and congenital heart disease, please see the Pediatric and Adult Congenital Heart section of this book on page 27.

BayCare cardiac surgical procedures include:

- Aortic aneurysm repair
- Aortic valve repair and replacement
- Carotid endarterectomy and stenting
- Coronary artery bypass (CABG)
- Endovascular aneurysm repair (EVAR)
- Implantable defibrillator insertion and lead extraction
- Minimally invasive valve replacement/repair
- MitraClip
- Mitral valve repair and replacement
- Redo cardiac surgery
- Transcatheter aortic valve replacement (TAVR)
- Treatment for atrial fibrillation *(Maze, Convergent, AtriClip)*

"Cardiac surgery is one of the most scrutinized and data-driven specialties. The fact that BayCare has again been awarded the STS's highest possible distinction demonstrates our commitment to providing the highest quality, most progressive and transparent level of care to our expanding patient population throughout West Central Florida."

~ Dr. John Ofenloch
Chief of Cardiothoracic Surgery and Medical Director, Morgan CVICU/OR at Morton Plant Hospital

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A Look at Volume

2016 Open-Heart Surgery Breakdown	
	BayCare
Surgical Valve	431
Isolated CABG	727
Other	78
Total Open Heart	**1,236**

Volume data is based on the STS definition for cardiac surgery procedure identification category.

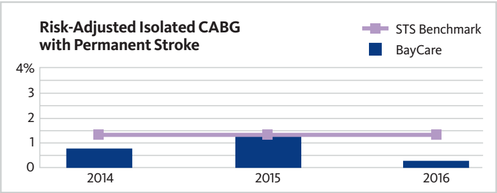
2016 Surgical and Transcatheter Valve Volume	
	BayCare
Mitral Valve	179
Aortic Valve	277
Transcatheter Valve *(aortic and mitral)*	371
Total Valve Volume	**827**

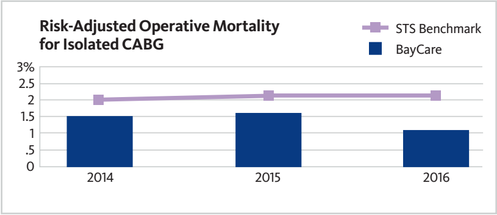
Emphasis on Mitral Valve Repair for Mitral Regurgitation

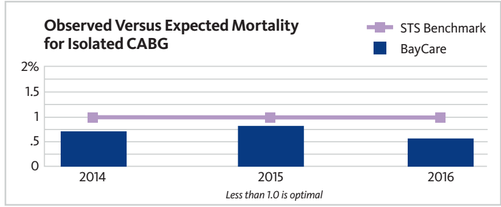
For many patients with severe mitral valve regurgitation, surgically repairing the valve is often the preferred form of treatment over mitral valve replacement. Dr. Andrew Sherman, chief of the department of cardiothoracic surgery at St. Joseph's Hospital, acknowledges BayCare's success and states, "Over the past year, BayCare cardiovascular surgeons have performed more than 179 mitral valve repairs. These repairs can be performed as isolated mitral valve repair, combined mitral valve repair with CABG, multiple valve surgery and in combination with arrhythmia surgery."

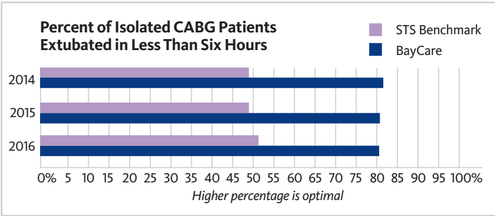
A Look at Quality

The Society of Thoracic Surgeons (STS) has developed a comprehensive rating system for the quality of coronary artery bypass (CABG) surgery among hospitals across the country. In the current analysis of national data covering the period of January 1, 2016, through December 31, 2016, the CABG performance of BayCare was found to lie in the highest quality tier, thereby receiving an STS three-star rating. Approximately 10-15 percent of hospitals received the three-star rating, which denotes the highest category of quality.



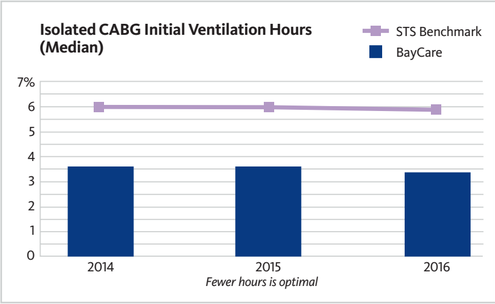


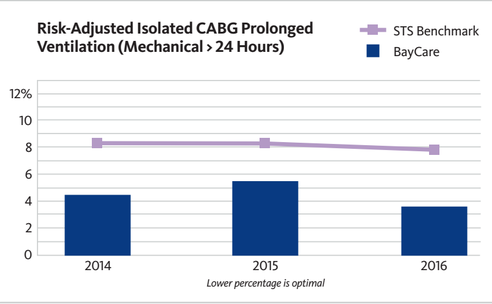




STS Major Cardiac Procedures Mortality				
	Number of Procedures	**Operative Mortality**	**O:E**	**STS O:E**
2014	919	2.3%	0.91	1.0
2015	923	1.7%	0.8	1.0
2016	988	1.7%	0.88	1.0

BayCare's outcomes compare favorably to regional and national outcomes for CABG, valve and valve plus CABG procedures combined. O:E ratios denote observed versus expected outcomes.





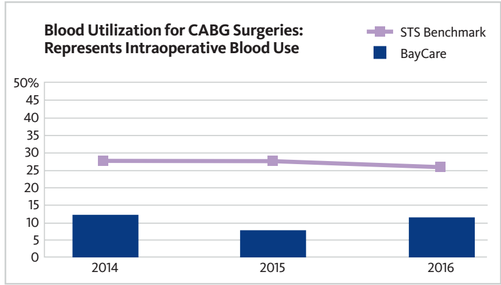
A Closer Look: Importance of Blood Conservation

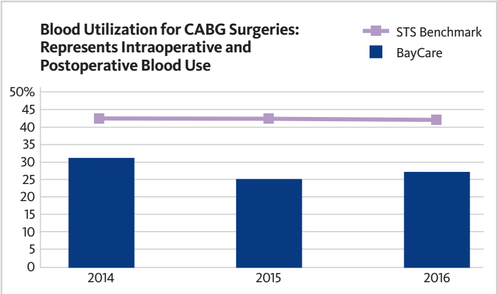
"Blood and blood product transfusion are necessary components of busy cardiovascular surgical programs. Nonetheless, blood transfusion carries risk and strategies to minimize transfusions are essential to maintaining top decile performance and outcomes," states Dr. David Evans, director of cardiac surgery at the Bostick Heart Center at Winter Haven Hospital. "Research indicates that unnecessary transfusions increase complications including infection and may prolong hospital stay."

Multiple strategies are utilized within BayCare cardiovascular surgical programs to limit operative blood loss and patient exposure to blood products.

Techniques to limit bleeding and return shed blood to the patient include:

- Optimization of patient's own clotting mechanism prior to operation
- Cell saver technology
- Cardiotomy suction
- Meticulous surgical technique
- Medication administration during surgery prior to incision to enhance patient's clotting mechanism
- CardioPat closed chest tube drainage systems in the CVICU postoperatively
- Specialized medications utilized to address specific deficiencies in coagulation



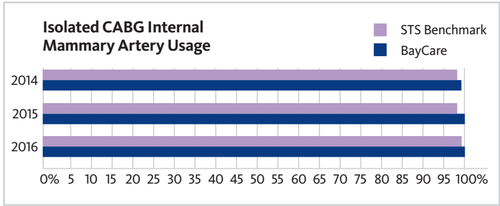


Emphasis on Arterial Grafting for CABG

"Arterial bypass grafts have been proven to provide superior long-term outcomes and, as such, our utilization of multiple arterial grafts in patients undergoing CABG is several times the regional and national averages," according to chief of cardiothoracic surgery and medical director of Morgan CVICU/OR at Morton Plant Hospital, Dr. John Ofenloch. "BayCare cardiovascular surgeons are committed to providing the highest quality surgical care. Not only are in-hospital and 30-day mortality rates important, but also long-term freedom from further cardiovascular events." BayCare cardiovascular surgeons have utilized the internal mammary artery for CABG surgery in 100 percent of appropriate cases over the past several years. Use of a second arterial graft, either an additional internal mammary artery or a radial artery graft, is increasingly employed as a strategy by BayCare cardiovascular surgeons to enhance long-term freedom from repeat intervention and cardiovascular events.

Surgical Treatment for Cardiac Arrhythmias

Surgical treatment for cardiac arrhythmias, typically atrial fibrillation, has become increasingly important within advanced cardiovascular surgery programs. Often these patients are treated in a comprehensive manner incorporating cardiovascular surgeons and cardiac electrophysiologists. Intraoperatively, surgeons have an ideal opportunity to treat atrial fibrillation with a Maze procedure or other type of ablation. Additionally, the left atrial appendage may be closed or occluded at the time of surgery to potentially reduce patient's stroke risk secondary to atrial fibrillation. Arrhythmia surgery is commonly performed in conjunction with mitral valve repair or replacement, but can also be performed concomitantly with other valve surgery or CABG. BayCare's cardiovascular surgeons also perform a unique, hybrid approach to the treatment of atrial fibrillation. BayCare cardiovascular surgeons are encouraged by this type of collaborative approach to complex cardiac problems. According to Dr. John Ofenloch, "The convergent Maze operation incorporates surgical ablation on the external surface of the left atrium as well as electrophysiology ablation on the internal surface of the left atrium, often performed during one procedure. This type of teamwork allows close follow-up and analysis of outcomes." In 2016, BayCare cardiovascular surgeons and the electrophysiology team have performed over 54 convergent and 96 surgical procedures for atrial fibrillation.



Radial Artery Usage		
	STS Benchmark	BayCare
2014	4.1%	14.6%
2015	4.5%	17.%
2016	5.1%	20.9%

Bilateral Internal Mammary Artery Usage		
	STS Benchmark	BayCare
2014	4.5%	10.1%
2015	4.8%	12%
2016	5.5%	7.3%

2016 Surgical Treatment of Arrhythmia	
	BayCare
Maze	75
PVI	21
Convergent	54
Total	**150**

Advanced Structural Heart and Valve

Structural Heart and Valve Disease Treatment

Team-based advanced treatment for structural heart and valve disease is available within BayCare. Several hospital facilities in Pinellas and Hillsborough counties have developed dedicated structural heart teams that specialize in the medical and surgical care of these cardiac problems. BayCare's structural heart and valve teams are comprised of physicians and health care providers from multiple heart and vascular specialties, who have interest and expertise in the treatment of complex cardiac conditions.

"Our program's success has been built upon the commitment of the multidisciplinary heart team. Together, the team assesses each patient using the latest cutting-edge diagnostics, and recommends appropriate treatment solutions including surgical and interventional options, as well as medical therapy, based on what's in the best interest of the patient," according to Dr. Joshua Rovin, medical director of the Center for Advanced Valve and Structural Heart Care at Morton Plant Hospital.

These specialists are from the divisions of cardiovascular surgery, interventional cardiology, cardiac imaging and cardiac anesthesia. These physicians work together to provide innovative heart treatment solutions and the best possible outcomes for patients with structural heart abnormalities. A large number of affiliated health care providers participate on the dedicated team as well, including nurses, physician assistants, advanced nurse practitioners and cardiac sonographers.

Structural heart disease may affect the heart muscle and the valves that regulate blood flow within the heart. Some structural heart abnormalities are congenital and others are the result of acquired heart disease. Many of these abnormalities ultimately result in congestive heart failure (CHF). Some of the most common conditions and their treatments are described in the Medical Terminology and Procedure Review section on page 46.

For information on BayCare's management and treatment of pediatric and congenital heart disease, please see the Pediatric and Adult Congenital Heart section of this book on page 27.

BayCare cardiac transcatheter procedures include:

- Balloon valvuloplasty
- Left atrial appendage closure
- Transcatheter atrial septal defect closure
- Transcatheter aortic valve replacement
- Transcatheter mitral valve repair–MitraClip
- Transcatheter mitral valve replacement
- Transcatheter paravalvular leak closure

To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990

Surgical Innovation

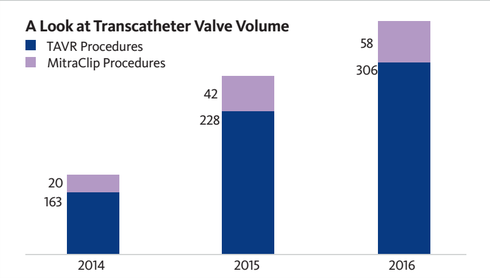
Surgical innovation and advances in cardiovascular surgical care are paramount to the success of the BayCare cardiovascular program. Over the past five years, BayCare hospitals, with the collaboration between cardiovascular surgeons and cardiologists, have implemented many new programs, which have benefited many BayCare patients. Valve surgery, in particular, has been an area of rapid progress and growth. As an example, transcatheter valve surgery avoids a sternal incision and most patients can be discharged home the day after their procedure.

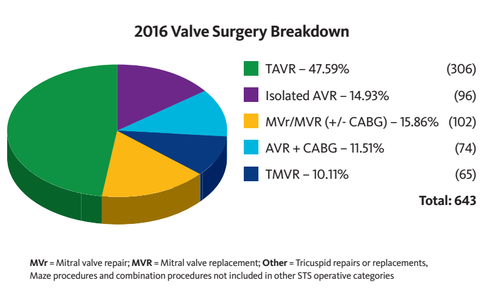
- Fifty-one percent of all BayCare cardiovascular surgical and transcatheter cases involve valve surgery
- Twenty-three percent of all BayCare cardiovascular cases are transcatheter
- Forty-five percent of all BayCare valve procedures are currently performed by transcatheter approach

2016 TAVR 30-Day Outcomes *(In hospital)*

	BayCare
	**N=306 (%)*
All-cause mortality	2.61%
Major disabling stroke	1.63%
Access site vascular complications	0.98%

*Includes research cases





Case Study

A 46-year-old female, who underwent an aortic valve replacement at the age of 23 for bacterial endocarditis, presented with fever, vegetation on the valve leaflet and aortic bioprosthetic valve insufficiency. She was admitted in extremely critical condition with shock, multiple organ failure and imminent death expected. Since it was highly doubtful that the patient would survive another open-heart procedure, the team recommended transcatheter aortic valve replacement, or TAVR. The patient was implanted with a valve and was only the fifth case done by the team. Postoperatively, the patient recovered slowly but was finally discharged from the hospital 10 days later. The patient was recently seen for her five-year follow-up appointment, doing extremely well with no cardiac symptoms and living a full, active life. She expressed her sincere gratitude to the team and technology that saved her from almost certain death.

Arrhythmia

BayCare arrhythmia specialists are internationally recognized for their pioneering work in the field of clinical electrophysiology. For over 25 years, arrhythmia specialists at BayCare helped further the discipline of rhythm disorders by contributing to the body of literature supporting development of procedures, catheter design and ultimately the management of electrical disorders of the heart, and includes one of the only facilities to provide management of arrhythmia for both adults and pediatric patients.

Electrical disorders of the heart encompass a wide range of cardiac diseases. The discipline of electrophysiology involves the diagnosis of arrhythmia using diagnostic equipment which includes tilt table testing, ambulatory monitoring, cardiac imaging using sophisticated equipment including 3-D reformatting of MRI, CT and ultrasound, and invasive testing in the form of catheter-based electrophysiology studies.

Symptoms of arrhythmia can range from the most obvious which include syncope, chest pain, dizziness, symptoms of stroke and palpitations, to the more subtle, such as exertion fatigue and in some cases, no symptoms at all.

"Contemporary management of electrical system heart disease requires forward thinking technology, state-of-the-art facilities, active participation in research, and visionary physicians and staff. With over a thousand ablations and devices performed annually, and the well-established Atrial Fibrillation and Advanced Arrhythmia Center, we're well positioned to be the area's only electrophysiology department with active cooperation with cardiothoracic surgery in providing our patients an exceptional experience," says Dr. Kevin Makati, co-director of the department of electrophysiology at St. Joseph's Hospital. "The Rhythm section at BayCare is committed to providing unparalleled care in the community with a collective procedural experience that is unmatched serving both Florida and southeastern United States."

Common arrhythmia disorders and procedures to manage them are listed in the Medical Terminology and Procedure Review section of this book on page 46.

For volume related to surgical management of arrhythmias, see the Cardiovascular Surgery section of this book on page 7.

"The Rhythm section at BayCare is committed to providing unparalleled care in the community with a collective procedural experience that's unmatched serving both Florida and southeastern United States."

~ Dr. Kevin Makati
Co-Director of the Department of Electrophysiology at St. Joseph's Hospital

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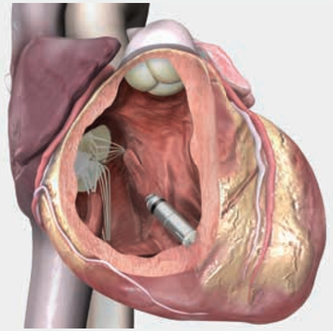
A Closer Look: Micra TPS Pacemaker

BayCare continues to offer advancements in cardiac care with Morton Plant and St. Joseph's hospitals recently becoming the first hospitals in Florida not a part of the clinical trial study to implant the Medtronic Micra Transcatheter Pacing System (TPS). Known as the world's smallest pacemaker, the one inch Micra TPS, which is 93 percent smaller than conventional pacemakers and smaller than a AAA battery, is implanted directly into the patient's right ventricle through a vein in the leg. It's a single-chamber pacing system that paces only the right ventricle of the heart.

In the past, single chamber pacemakers were implanted under the skin near the collarbone and had wired leads that ran through a vein directly to the heart's right ventricle, creating a "pocket" under the skin. Unlike these conventional pacemakers, the Micra TPS is self-contained and doesn't have wired leads. It latches directly onto the heart using small hooks and can be repositioned if needed.

"We believe this is the start of a new era in pacemakers," said electrophysiologist Jose Gallastegui, MD, at Morton Plant Hospital. "The absence of leads is one of the main advantages of the pacemaker. The elimination of the wires connecting the device to the heart makes for a less invasive procedure reducing the risk of complications for the patient," he said.



BayCare arrhythmia programs include:

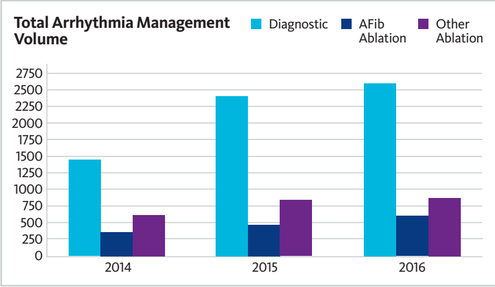
- Management of complex arrhythmia using ultrasensitive 3-D mapping
- AF ablation (pulmonary vein isolation) using radiofrequency and cryoballoon
- Hybrid AF ablation for advanced AF
- VT/VF ablation with hemodynamic assist
- Left atrial occlusion/ligation
- Surgical Maze procedure
- Convergent hybrid Maze

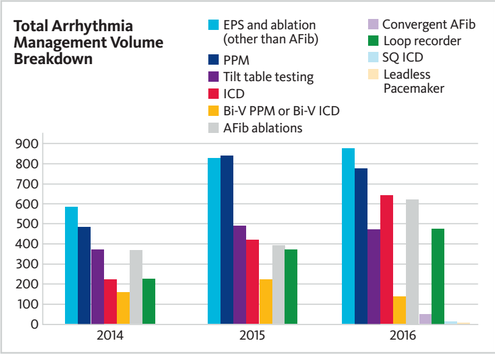
Cardiac rhythm management (CRM) device implants include:

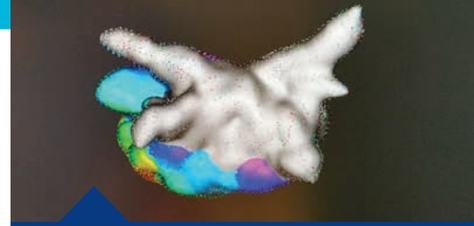
- Diagnostic EP studies
- Transvenous and subcutaneous implantable cardioverter defibrillators (ICD)
- Biventricular and His bundle pacing
- Injectable loop recorders
- Permanent and leadless pacemakers (PPM)
- Tilt table testing
- Lead extraction and venoplasty

Information on BayCare's management and treatment of pediatric and congenital heart disease can be found in the Pediatric and Adult Congenital Heart section of this book on page 27.

A Look at Volume







Case Study

Patient is a 52-year-old white male with a long history of atrial fibrillation (AFib). He was part of the original phase 1 FDA clinical trial for the cryoballoon in 2005. He did well for three years and then developed recurrent AFib. Despite medication, he developed chronic AFib. He presented in January 2016 with a TIA. Despite being on Sotalol, he had a resting heart rate of 128. His ejection fraction was 30 percent and the left atrium was 55mm. He was having fatigue and difficulty doing his job. Because of a previous median sternotomy for cancer on two separate occasions, he wasn't a candidate for surgical convergent procedure to get and maintain sinus rhythm. In April 2016, the patient received a convergent hybrid procedure. The new mapping system allowed us to verify completeness of the lines. The patient went home the day after the procedure off medications. He stayed in sinus rhythm for three weeks and then had an atypical flutter. He was restarted on Sotalol and after one dose was back in sinus rhythm. Over the next six months, the patient remained in sinus rhythm. His ejection fraction improved to 54 percent. His left atrial size decreased to 52mm. He completed 12 minutes on a Bruce protocol treadmill. He is now off Sotalol. He remains in sinus rhythm after being in chronic AFib for six years.

Percutaneous Coronary Intervention

The landscape of coronary disease treatment is changing and evolving rapidly with more complex disease being treated with percutaneous techniques. Examples of innovative procedures and technologies include the use of long drug-eluting stents that provide excellent long-term patency rates, the ability to open arteries that have been occluded chronically, the ability to support the failing heart muscle with different percutaneous devices (i.e. Impella), and the use of absorbable scaffolds that are completely reabsorbed by the body two to three years after being implanted in the coronary arteries. "The cardiology division at BayCare is proud to offer these and many other techniques to our patients with advanced coronary disease," said Dr. Bernardo Stein, medical director of the Cardiac Catheterization Laboratories at Morton Plant Hospital.

Angioplasty, or percutaneous coronary intervention (PCI), is performed at Mease Countryside Hospital, Morton Plant Hospital, Morton Plant North Bay Hospital, St. Anthony's Hospital, St. Joseph's Hospital, St. Joseph's Hospital-North, South Florida Baptist Hospital and Winter Haven Hospital.

In addition, Mease Countryside Hospital, Morton Plant Hospital, Morton Plant North Bay Hospital, St. Anthony's Hospital, St. Joseph's Hospital, St. Joseph's Hospital-North and Winter Haven Hospital are also STEMI receiving centers.

Cardiac catheterization procedures can be done by advancing catheters through the radial artery in the wrist as well as the femoral artery in the peripheral groin area. Radial procedures have been linked to decrease in ambulation, length of stay and bleeding risks. Many of the physicians within these hospitals are able to perform radial procedures when appropriate.

BayCare's PCI procedures include:

- Cardiogenic shock
- Diagnostic coronary angioplasty
- Diagnostic peripheral angioplasty
- Percutaneous coronary intervention (PCI)
- Peripheral vascular intervention (PVI)

To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990

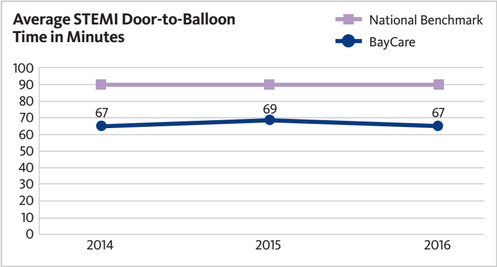
A Closer Look: Impella

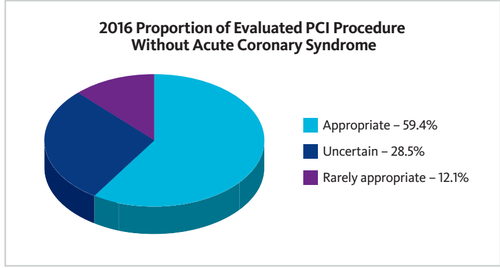
Smaller than the width of a pencil, Impella devices are miniaturized, percutaneously inserted ventricular assist devices (VAD) used in patients with severe heart failure, cardiogenic shock and high-risk percutaneous intervention (PCI). The goal of an Impella device is to improve overall systemic cardiac output by supporting the heart's effort to pump enough blood to the body. Devices can deliver 2.5 to 5 liters of blood flow per minute. This support allows the heart muscle time to rest and potentially recover its natural function.

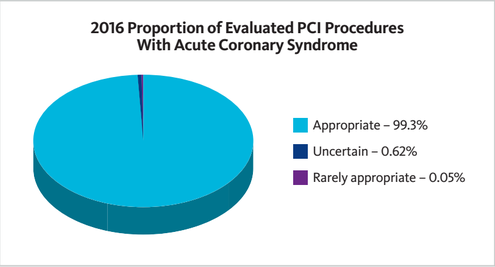
A Look at Volume

PCI Volume			
	2014	2015	2016
PCI volume	4,615	5,060	5,187
Total peripheral vascular intervention volume	1,833	1,793	2,511
Diagnostic cath lab volume	11,810	11,808	12,254

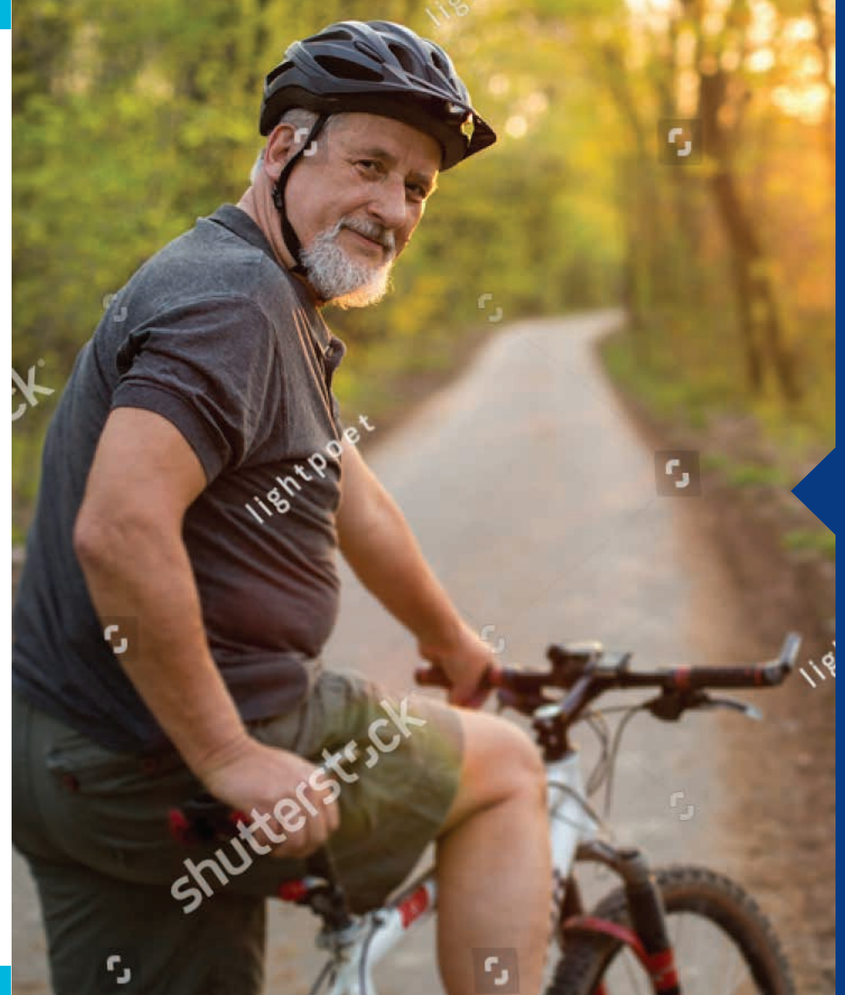
A Look at Quality







Appropriate: Meets ACC/NCDR guidelines for performing PCI
Uncertain: Currently insufficient evidence
Rarely Appropriate: Not generally acceptable



Case Study

A 62-year-old male with a history of one-vessel coronary bypass and mitral valve replacement experienced a VFib arrest at home while engaged in vigorous activity. The wife started CPR. EMS arrived, defibrillated and intubated the patient. He continued to have VFib arrests en route to the hospital. Amiodarone and vasopressors were started. Because the patient was unresponsive, a catheter was placed in the femoral vein for therapeutic hypothermia treatment. The patient was cooled to 33 degrees centigrade. Twenty-four hours later, re-warming started at 0.1 degree/hour. Within 36 hours of presentation, the patient was extubated and alert/oriented to person, place and time. One week later, he was transferred to a regular room, neurologically intact. Four days later, he was discharged to a rehab facility, and is gaining strength to get back to work.

Heart Failure

BayCare's Heart Function Clinics, for the evaluation and treatment of congestive heart failure (CHF), serve as a resource for primary care physicians and other medical specialists who have high-needs patients who'd benefit from the close and continuous oversight of a dedicated heart function team. "As Americans live longer, the number of people suffering from heart failure has grown tremendously and now numbers nearly six million. Heart failure is the most common reason for hospitalization in people over age 65 and effective treatment often requires the collaboration of a health care team that includes primary care physicians, cardiologists, and the specialized doctors and nurses of BayCare's Heart Function Programs," said Dr. Augustine Agocha, medical director of the Heart Function Clinic at St. Joseph's Hospital.

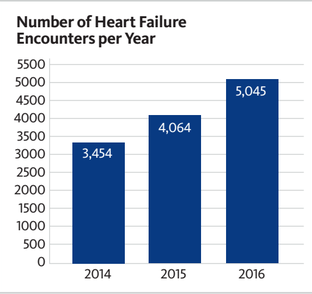
The Heart Function Clinics specialize in the management of heart failure at all stages. The clinics also serve the needs of patients with heart muscle diseases (cardiomyopathy) related to cancer chemotherapy, radiation therapy and other conditions. The Heart Function team is committed to working hand-in-hand with their patients' primary care physicians and cardiologists to best understand each individual patient's needs.

BayCare has Heart Function Clinics located on the campuses of Morton Plant Hospital, St. Joseph's Hospital, St Joseph's Hospital-North, South Florida Baptist Hospital and Winter Haven Hospital.

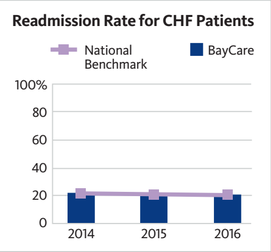
Additional services offered are:

- Emergency room follow-up
- Clinical care and research on athletic heart disease
- Comprehensive evaluation of cardiomyopathy
- Coordination of home heart monitoring
- Home infusion therapy
- Hospital readmission risk management
- Inpatient continuity of care
- Opportunity to participate in clinical trials
- Treatment for hypertensive heart disease

A Look at Volume



A Look at Quality



To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990

Pediatric and Adult Congenital Heart

BayCare is home to the Tampa Bay area's only comprehensive congenital heart disease (CHD) center capable of delivering full spectrum care for the CHD patient from conception to late adulthood. Part of the Heart Institute, this unique program is located on the campus of St. Joseph's Hospital in Tampa.

The CHD center features congenital heart surgeons and cardiologists who have extensive experience in echocardiography, advanced imaging, electrophysiology, interventional techniques, adult congenital cardiology and heart failure management. The echocardiography laboratory was the first accredited center for transthoracic, transesophageal and fetal echocardiography in West Central Florida by the Intersocietal Commission for the Accreditation of Echocardiography Laboratories (ICAEL). Additionally, the center's imaging physicians have experience with fetal echocardiography, 3-D echocardiography, transesophageal echocardiography and advanced diastology. They routinely guide the surgical and interventional physicians to ensure optimal results. The catheterization laboratory is one of the busiest congenital laboratories in Florida, performing over 400 procedures annually, most of which are interventions.

The interventional team has extensive experience with device closure, balloon valvuloplasty and balloon expandable stenting. It's a nationally recognized program for both volume and quality for transcatheter pulmonary valve implantation with Melody® and Sapien valves.

Since the program's inception, the CHD center has implanted the most transcatheter pulmonary valves in Florida. The program is also the highest-volume Melody valve implanting center in Florida, and one of the busiest in the United States. The CHD center is among a small number of facilities in the country to offer this technology at the extremes of age, size and anatomic complexity. The program is also one of the very few programs in Florida that has performed valve-in-valve replacement of the tricuspid valve. While transcatheter valve implantation can't be used in all cases of abnormal pulmonary valve function, it can give doctors an alternative to repeated traditional open-heart procedures, offering children and adults who may not be able to tolerate another open-heart surgery hope for the future. According to pediatric cardiologist Dr. Jeremy Ringewald, "this groundbreaking technology can markedly prolong the time between surgeries for many patients, with the goal of maximizing heart health and minimizing invasiveness. Our team has implanted over 100 valves into patients with rare adverse events. By undergoing this procedure at our facility, these patients have avoided additional cardiac surgery."

Within the CHD center, the electrophysiology program was established over two decades ago and offers radiofrequency ablation and cryoablation utilizing the latest 3-D mapping systems, and many procedures avoid the use of X-ray entirely. The EP physicians manage complex arrhythmias by providing individualized pacemaker and ICD recommendations, insertion and optimization for the best patient outcome.

Developed in collaboration with the Children's Hospital of Pittsburgh, the center's congenital surgical program is a leader in surgical outcomes, patient volume and length of stay. Surgical planning often begins at fetal diagnosis, allaying family anxiety and ensuring parents know what to expect when their child is born. Throughout the CHD center and programs, there's a strong belief in quality, excellence and transparency. The CHD center actively participates in various National Databases for Quality Improvement

and Benchmarking, including Society of Thoracic Surgeons Congenital Heart Surgery Database (STS CHSD), Improving Pediatric and Adult Congenital Treatment (IMPACT), Congenital Cardiovascular Interventional Study Consortium (CCISC) and Extracorporeal Life Support Organization (ELSO).

The physicians at the CHD center specialize in the care of patients with congenital heart disease at all ages including but not limited to the following conditions:

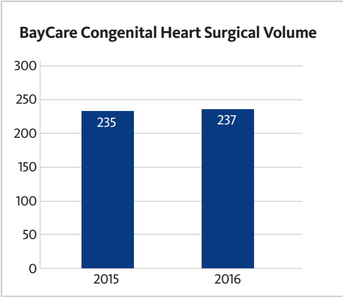
- Aortic stenosis, mitral stenosis
- Atrioventricular septal defect
- Coarctation of the aorta
- Complex single ventricle
- Ebstein's anomaly
- Hypoplastic left heart syndrome
- Pulmonary and tricuspid valve atresia
- Pulmonary stenosis
- Shone's syndrome/complex
- Tetralogy of Fallot
- Transposition/complete transposition

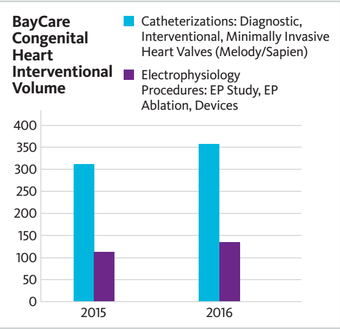
Services and procedures include:

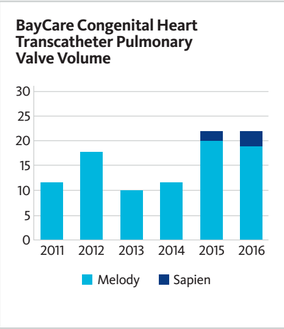
- Specialized pediatric/congenital cardiology services treating a wide range of patients with mild to complex heart conditions
- Cardiac catheterization designed especially for children and adults utilizing a less invasive alternative for some heart conditions. Some procedures include:
  - Angioplasty
  - Atrial septal defect (ASD) device closure
  - Atrial septostomy
  - Balloon valvotomy
  - Coil embolization
  - Electrophysiology studies
  - Implantable cardioverter defibrillators (ICD) and pacemakers
  - Patent ductus arteriosus (PDA) device closure in newborns weighing less than 2kg
  - Pulmonary valve insertion (Melody valve, Sapien valve)
  - Stent implantation
  - Radiofrequency and cryoablation, often without fluoroscopy
  - Ventricular septal defect (VSD) device closure
- Pediatric cardiac imaging including:
  - Echocardiology laboratory
  - Fetal echocardiology
  - 3-D echo
- Pediatric and adult congenital cardiovascular surgery serving children and adult congenital heart patients. Some offered procedures include:
  - Arterial switch
  - Atrioventricular septal defect repair
  - Complex valve repair
  - Fontan procedure and Fontan conversion
  - Hybrid, palliation and repair of hypoplastic left heart syndrome (HLHS) and single ventricle heart disease
  - Tetralogy of Fallot (TOF) and TOF with pulmonary atresia repair
  - Various hybrid procedures
- Pediatric and adult congenital cardiac anesthesiology serving the particular needs of congenital heart patients

The Pediatric and Congenital Cardiac Anesthesia Team manages the extubation of surgical patients, enabling greater than 60 percent to leave the operating room extubated or without a breathing tube. The potential benefits of early extubation combined with adequate postoperative pain control may include more favorable cardiac performance, reduced length of ICU and hospital stay, and a lower rate of ventilator associated respiratory infections.

A Look at Volume







A Look at Quality for 2015–16

Percent of Operative Mortality by Patient Group		
Patient Group	**BayCare**	**STS Benchmark**
STAT 1	0%	0.4%
STAT 2	0.8%	1.6%
STAT 3	2.9%	2.6%
STAT 4	6.7%	6.8%
STAT 5	11.1%	15.6%

Lower percentage is optimal

Length of Stay (LOS) by Patient Group		
Patient Group	**BayCare**	**STS Benchmark**
STAT 1	3	7
STAT 2	4	19
STAT 3	5	14
STAT 4	8	25
STAT 5	20	41

LOS is expressed as a median in days. Fewer days is optimal.

Operative Mortality	
BayCare	**STS Benchmark**
2%	3.1%

Lower percentage is optimal

Percent of Patients Extubated in Operating Room		
Extubated in the OR	**BayCare**	**STS Benchmark**
All Patients	63%	23%
Neonates	13%	3%
Infants	49%	15%

Higher percentage is optimal

Data is subdivided into five different groups depending on the level of risk. STAT Category 1 is associated with the lowest and STAT Category 5 is associated with the highest risk of mortality.

Cardiac Rehabilitation

Cardiac rehabilitation programs are comprehensive inpatient and outpatient services involving supervised exercise, cardiac risk factor modification, nutritional planning, education and counseling. The goal is to limit the physiological and psychological effects of coronary artery disease, reduce the risk of sudden death and stabilize or reverse the atherosclerotic process. Each patient is assessed and an individual treatment plan is developed to help the patients reach their goals.

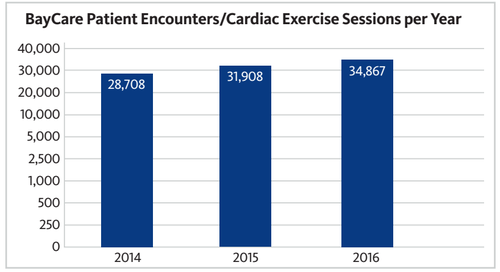
Cardiac rehabilitation is a Class 1 recommendation from the AHA and ACC for patients that have experienced a cardiac event. It's recognized as an integral component of the continuum of care for patients with cardiovascular disease.

Diagnosis indicated for enrollment include:

- Myocardial infarction (MI)
- Percutaneous coronary intervention (PCI)
- Coronary artery bypass grafting (CABG)
- Valve repair/replacement
- Stable angina
- Heart transplant
- Heart failure

BayCare's cardiac rehabilitation programs are some of the largest in the country, offering seven locations covering a four-county area. Our programs are nationally certified by the American Association of Cardiovascular Pulmonary Rehab (AACVPR) and the staff is certified cardiac rehab professionals (CCRP). The staff have experience working with the patients who have internal cardiac defibrillator (ICD), LifeVest, sudden death syndrome (SDS), postural orthostatic syndrome (POTS) and heart failure (HF).

A Look at Volume



Includes some volumes from programs currently working toward certification

"A crucial component to the long-term successful outcome of the cardiovascular patient is participation in cardiac rehab. BayCare's cardiac rehab programs have a well-established track record in improving both physical and psychosocial status in our patients."

~ Dr. Vanessa Lucarella
Medical Director, Cardiac Rehabilitation
Morton Plant Hospital

Research and Clinical Trials: Currently Enrolling

Clinical research makes the latest scientific discoveries available to the BayCare community long before they become available to the general public. Kris Hoce, senior vice president, market leader for North Pinellas and West Pasco counties, acknowledges that "BayCare's involvement in clinical trials supports a collaborative learning environment that raises the level of cardiovascular knowledge across our clinical community, broadening the ability to positively impact the lives of our patients."

"Without research, all of the important advances in medicine that we now depend on would be just observations in a laboratory. Participating in research studies is easy to do, and will accelerate making new advances in treating common diseases available not only to those who are in the trials today, but their children as well," according to Dr. Leslie Miller, medical director of the Heart Function Clinic at Morton Plant Hospital. "We want to make BayCare a center for research, invite the community to learn about the research now going on, and express their support for this important way to enhance the well-being of all those in the communities we serve."

BayCare facilities currently participate in a multitude of clinical research for cardiovascular care. Below are the open trials and the current participating facilities:

Advanced Structural Heart and Valve

Medtronic Transcatheter Aortic Valve Replacement in Low-Risk Patients
Participating facility: Morton Plant Hospital

The study objective is to demonstrate that the safety and effectiveness of the Medtronic TAVR system as measured by rates of all-cause mortality or disabling stroke at two years is noninferior to SAVR in the treatment of severe aortic stenosis in subjects who have a low predicted risk of operative mortality for SAVR.

PORTICO IDE/Portico Re-Sheathable Transcatheter Aortic Valve System US IDE Trial
Participating facility: Morton Plant Hospital

The PORTICO clinical trial is a prospective, multicenter, randomized, controlled clinical study, designed to evaluate the safety and effectiveness of the SJM Portico Transcatheter Heart Valve and Delivery Systems (Portico) via transfemoral and alternative delivery methods.

For more information on our cardiovascular research and clinical trials: (844) 344-1990

TENDYNE Transcatheter Mitral Valve Replacement
Participating facility: Morton Plant Hospital

The purpose of this study is to generate initial insights into the safety and performance of the Tendyne Mitral Valve System. The study includes adult patients with symptomatic mitral regurgitation who are not suitable candidates for conventional mitral valve repair or replacement.

Arrhythmia

AdaptResponse
Participating facilities: Mease Countryside Hospital and Morton Plant Hospital

This study is a prospective, randomized, controlled, interventional, single-blinded, multi-center, post-market, global Cardiac Resynchronization Therapy (CRT) in heart failure (HF) clinical study. The purpose of this clinical study is to test the hypothesis that market released CRT devices which contain the AdaptivCRT® (aCRT) algorithm have a superior outcome compared to standard CRT devices in CRT indicated patients with normal AV conduction and left bundle branch block (LBBB).

Augustus: An Open-label, 2 x 2 Factorial, Randomized Controlled, Clinical Trial to Evaluate the Safety of Apixaban vs. Vitamin K Antagonist and Aspirin vs. Aspirin Placebo in Patients with Atrial Fibrillation and Acute Coronary Syndrome or Percutaneous Coronary Intervention
Participating facility: BayCare Medical Group Cardiology

The purpose of this study is to determine if apixaban is noninferior to Coumadin (INR target range of 2.0-3.0) on the combined endpoint of major and relevant non-major bleeding in patients with non-valvular AF who develop acute coronary syndrome and/or require PCI with planned concomitant P2Y12 inhibitor therapy and to determine if anticoagulant plus single antiplatelet therapy with a P2Y12 inhibitor is superior to anticoagulant plus dual antiplatelet therapy with a P2Y12 inhibitor and aspirin on the combined outcome of ISTH major bleeding and clinically relevant non-major bleeding in patients with non-valvular AF who develop ACS and/or undergo PCI with concomitant anticoagulant.

Product Surveillance Registry
Participating facility: St. Joseph's Hospital

The purpose of this study is to provide continuing evaluation and periodic reporting of the safety and effectiveness of Medtronic market-released products. The Registry data is intended to benefit and support the interests of patients, hospitals, clinicians, regulatory bodies, payers and industry by streamlining the clinical surveillance process and facilitating leading-edge performance assessment via the least burdensome approach.

Percutaneous Coronary Intervention

A Long-Term Outcomes Study to Assess STatin Residual Risk Reduction with EpaNova in HiGh Cardiovascular Risk PatienTs with Hypertriglyceridemia (STRENGTH)
Participating facility: BayCare Medical Group Cardiology (North Bay)

The study is a randomized, double-blind, placebo-controlled (corn oil), parallel group design that will enroll approximately 13,000 patients with hypertriglyceridemia and low HDL and high risk for CVD to be randomized 1:1 to either corn oil + statin or Epanova + statin, once daily, for approximately three to five years as determined when the number of MACE outcomes is reached.

ABLATE/Atherectomy By Laser Ablation with Turbo-Elite
Participating facility: Winter Haven Hospital

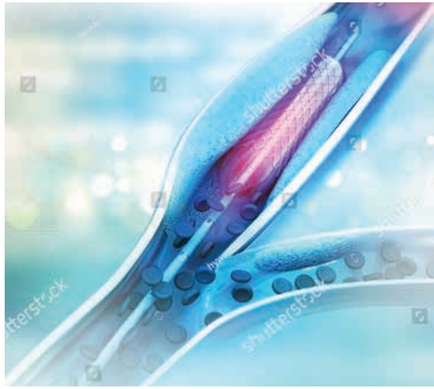
The primary objective for this study is to prove the safety and effectiveness of the Spectranetics Turbo-Elite catheter in atherectomy treatment for infrainguinal arteries with catheter to vessel sizing of at least 50 percent.

ABSORB IV/Absorb IV Randomized Controlled Trial
Participating facility: Morton Plant Hospital

ABSORB IV is a prospective, randomized (1:1, Absorb BVS to XIENCE), single-blind, multicenter study, registering approximately 3,000 subjects at approximately 140 sites. ABSORB IV is a continuation of ABSORB III (NCT01751906) trial which are maintained under one protocol because both trial designs are related. The data from ABSORB III and ABSORB IV will be pooled to support the ABSORB IV primary endpoint. Both the trials will evaluate the safety and effectiveness of Absorb BVS.

ARTEMIS/Affordability and Real-World Antiplatelet Treatment Effectiveness After Myocardial Infarction Study
Participating facilities: Morton Plant Hospital, Winter Haven Hospital and St. Joseph's Hospital

The ARTEMIS trial is a practical, multicenter, cluster-randomized clinical trial that will assess the impact of copayment reduction by equalizing the copayment of clopidogrel and ticagrelor. ARTEMIS will assess prescribing patterns, patient medication adherence and clinical outcomes up to one year. We hypothesize that reducing out-of-pocket cost for P2Y12 receptor inhibitor will lead to improved adherence. Additionally, copayment reduction of both



generic and brand antiplatelet agents may lead to a reduction in MACE risk. This is in part due to greater adherence to an evidence-based secondary prevention medication. Additionally, the reduction in MACE may reflect greater selection of a more potent antiplatelet agent that has been shown to reduce MACE in randomized clinical trials, as provider choice of antiplatelet therapy will be primarily driven by risk-benefit assessment rather than the cost burden to the patient.

Athersys NSTEMI
Participating facilities: Morton Plant Hospital and St. Joseph's Hospital

A phase 2 trial of AMI Multistem® therapy in subjects with non-ST elevation acute myocardial infarction (MI-MSTEMI). This is a double-blind, sham-controlled clinical study to evaluate the safety and feasibility of AMI MultiStem therapy in subjects who have had a heart attack (non-ST elevation MI).

RE-DUAL PCI
Participating facility: Winter Haven Hospital

The main objective of this study is to compare a dual antithrombotic therapy (DAT) regimen of 110mg dabigatran etexilate b.i.d. plus clopidogrel or ticagrelor (110mg dabigatran etexilate dual antithrombotic therapy (DE-DAT)) and 150mg dabigatran etexilate b.i.d. plus clopidogrel or ticagrelor (150mg DE-DAT) with a triple antithrombotic therapy (TAT) combination of warfarin plus clopidogrel or ticagrelor plus ASA <= 100mg q.d. (warfarin-TAT) in patients with atrial fibrillation that undergo a PCI with stenting [elective or due to an acute coronary syndrome (ACS)]. The study aims to show noninferiority of both doses of DE-DAT when compared to warfarin-TAT in efficacy and safety. Efficacy will be determined by comparing a composite death and thrombotic event rate of death, myocardial infarction, stroke and systemic embolism. In addition, comparisons will be made of the rates of clinically relevant bleeding, assessed using the modified International Society of Thrombosis and Haemostasis (ISTH) major classification.

BTK Trial
Participating facilities: Morton Plant Hospital and Mease Countryside Hospital

A prospective, multicenter, single-blind, randomized, controlled trial comparing the Lutonix drug-coated balloon versus standard balloon angioplasty for treatment of below-the-knee (BTK) arteries (Lutonix BTK Trial). The purpose of this Phase 2 study is to assess the safety and efficacy of the Lutonix drug-coated balloon (DCB) for treatment of stenosis or occlusion of native below-the-knee arteries.

PROSPER/Patient-centered Research into Outcomes Stroke Patients Prefer and Effectiveness Research
Participating facility: Winter Haven Hospital

A three-year research project to create a national, sustainable model to improve decision-making and patient-centered stroke outcomes through comparative effectiveness research. Sponsored by the NIH.

STOP-PAD
Participating facilities: Morton Plant Hospital and St. Joseph's Hospital

A Phase 2B randomized, double-blind placebo-controlled study to evaluate the safety and efficacy of JVS-100 administered by direct intramuscular injection as adjunct to revascularization of infrapopliteal lesions in subjects with advanced peripheral artery disease and tissue loss. The purpose of this study is to investigate the efficacy of the administration of JVS-100 delivered via direct intramuscular injections on a three-month and six-month composite endpoint of wound progression, healing and limb loss in patients with severe peripheral arterial disease with nonhealing chronic wounds who undergo an open bypass grafting or endovascular procedure for treatment of infrapopliteal disease and are dosed within two days and three months following the procedure.

Heart Failure

PIONEER-HF
Participating facility: Winter Haven Hospital

The purpose of this study is to assess the effect of in-hospital initiation of sacubitril/valsartan (LCZ696) versus enalapril on time-averaged proportional change in NT-proBNP in patients who have been stabilized following hospitalization for acute decompensated heart failure (ADHF) and reduced ejection fraction (left ventricular ejection fraction (LVEF) ≤ 40%).

DREAM-HF/TEVA C41750/3100 Study
Participating facility: Morton Plant Hospital

A double-blind, randomized, sham-procedure-controlled, parallel-group efficacy and safety study of allogenic mesenchymal precursor cells (CEP-41750) in patients with chronic heart failure due to left ventricular systolic dysfunction of either ischemic or nonischemic etiology. The primary objective of this study is to determine whether transendocardial delivery of allogeneic human bone marrow-derived MPCs (CEP-41750) is effective in the treatment of chronic heart failure due to LV systolic dysfunction.

BayCare's cardiovascular and thoracic programs offer:

260+
Cardiovascular specialists

9
Cardiovascular operating suites

9
Electrophysiology labs

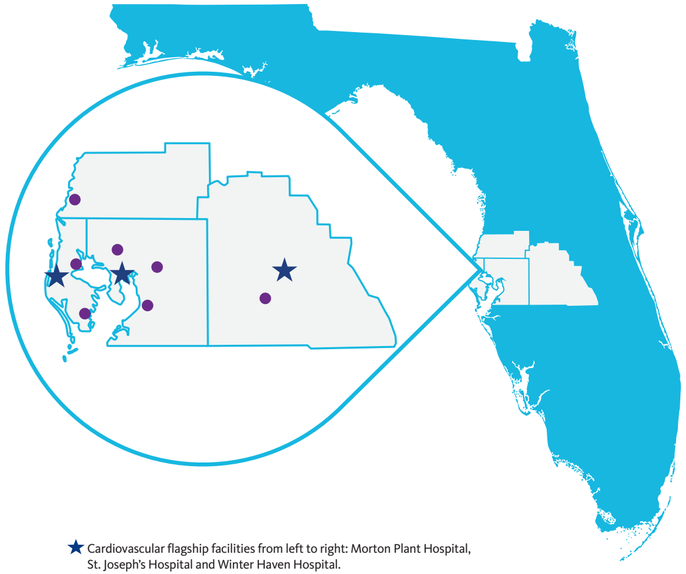
2
Hybrid operating suites

Our Facilities

At BayCare, we take care of more hearts than anyone else in Tampa Bay. In the last year alone, we helped heal more than 30,000 hearts—that's a lot of lives. BayCare provides a multitude of cardiac services at 10 facilities located across Tampa Bay. On the following pages, you'll find a brief description of our different facilities by county.

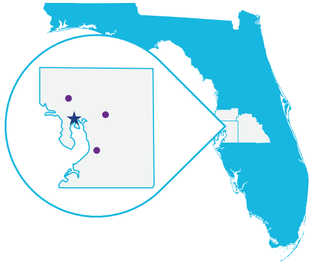
"All of our facilities are dedicated to patient-centric care," according to Dr. Andrew Sherman, chief of the department of cardiothoracic surgery at St. Joseph's Hospital. "A multitude of specialists throughout our system work collaboratively to improve our patients' overall experience, care plan and outcomes."

To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990



★ Cardiovascular flagship facilities from left to right: Morton Plant Hospital, St. Joseph's Hospital and Winter Haven Hospital.

● Clockwise from top: Morton Plant North Bay Hospital, St. Joseph's Hospital-North, South Florida Baptist Hospital, Bartow Regional Medical Center, St. Joseph's Hospital-South, St. Anthony's Hospital and Mease Coutryside Hospital.



Hillsborough County

Steve and Krista Howard Heart and Vascular Center at South Florida Baptist Hospital

South Florida Baptist Hospital
301 N. Alexander St.
Plant City, FL 33563

When the Heart and Vascular Center opened on campus at South Florida Baptist Hospital, the community of Plant City gained greater access to advanced heart care. The Heart and Vascular Center is the first of its kind in the area, offering state-of-the-art diagnostic services, including diagnostic heart catheterization and interventional heart and vascular procedures including being a STEMI receiving facility. Staffed by expert physicians and highly trained technologists, the Heart and Vascular Center is specifically built for the cardiac patient, with specialized recovery rooms, top-notch cardiovascular technology and dedicated waiting areas for the patients' loved ones. The Center also provides an array of diagnostic and therapeutic services for the treatment of vascular disease, such as peripheral artery disease.

St. Joseph's Hospital Heart Institute

St. Joseph's Hospital
3001 W. Dr. Martin Luther King Jr. Blvd.
Tampa, FL 33607

One of the most technologically advanced centers in Florida, St. Joseph's Hospital's Heart Institute provides a multitude of specialized heart services in adult, adult congenital and pediatric cardiovascular medicine. In 2014, the hospital opened the state-of-the-art $20 million facility, featuring a combination of nine traditional and hybrid operating suites, cardiac catheterization labs, and electrophysiology laboratories with dedicated specialized cardiac equipment. As one of the largest providers of heart attack and stroke care in West Central Florida, the Heart Institute was purposely designed to be located directly above one of the region's busiest emergency rooms, providing quick access for patient procedures.

St. Joseph's Hospital's Heart Institute offers the latest technologies for advanced and minimally invasive procedures including complex valve and coronary bypass surgery, TAVR, TMVr (MitraClip®), extracorporeal membrane oxygenation, targeted hypothermia ablation of advanced atrial fibrillation (AF) and complex arrhythmia, and a complete suite of offerings to manage implantable cardiac devices. In addition to participating in multicenter clinical trials in arrhythmia, the institute has recently been identified as the leading cryoballoon AF ablation center in the world and has been designated a leading teaching facility for the convergent hybrid AF ablation procedure, minimally invasive AF surgery, as well as advanced 3-D cardiac mapping, hosting visitors internationally. The Heart Institute has a premier pediatric and adult congenital center, serving as a regional referral center for fetal, pediatric and adult congenital cardiology. It is also the only center in the area to offer congenital interventional and congenital heart surgery alongside an adult cardiac program. With an active heart valve program, the Heart Institute is a national leader in transcatheter pulmonary valve insertion with both the Melody® and Sapien valves. Recognizing the need for specialization within the discipline of cardiology, the Heart Institute is also a leader in programs for advanced heart failure, cardio-oncology, women's heart disease, and cardiac and pulmonary rehabilitation.

St. Joseph's Hospital-North

St. Joseph's Hospital-North
4211 Van Dyke Road
Lutz, FL 33558

Committed to providing advanced cardiac care, St. Joseph's Hospital-North features a highly trained and experienced team dedicated to ensuring the best possible outcomes for those in surrounding communities of North Tampa. The team performs many advanced heart procedures for both diagnostic and treatment purposes, including diagnostic cardiac catheterizations, percutaneous coronary intervention (PCI) which includes percutaneous transluminal coronary angioplasty (PTCA) and coronary stenting, electrophysiologic (EP) studies and ablation procedures. Defibrillator/pacemaker implant and generator change, digital loop/event recorder implant, cardioversion and other noninvasive cardiac diagnostic services such as stress testing, echocardiogram and tilt table study are also performed on campus. The cardiac catheterization lab at St. Joseph's Hospital-North was one of the first in the BayCare to operate as a dual lab, performing both cardiac catheterization procedures as well as interventional radiology procedures and is a STEMI receiving facility.

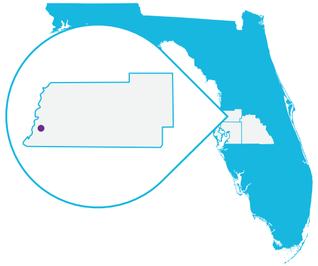
St. Joseph's Hospital-South

St. Joseph's Hospital-South
6901 Simmons Loop
Riverview, FL 33578

Opened in 2015, St. Joseph's Hospital-South provides advanced cardiac care to patients in Riverview, Sun City, Apollo Beach and the surrounding Southshore areas of southeast Hillsborough County. A team of expert physicians and highly trained cardiovascular technologists and nurses perform advanced heart procedures in two hybrid cardiac catheterization and interventional radiology suites, including diagnostic cardiac catheterizations, fractional flow reserve (FFR), intravascular ultrasound (IVUS), defibrillator/pacemaker implant and generator changes, digital loop/event recorder implant, and cardioversion and transesophageal echocardiogram (TEE).

Noninvasive cardiac diagnostic services include stress testing, nuclear cardiac imaging studies, echocardiogram, tilt table studies and coronary CT angiography.

Pasco County



Morton Plant North Bay Hospital
6600 Madison St.
New Port Richey, FL 34652

Morton Plant North Bay Hospital opened a new cardiac catheterization laboratory in October 2011, providing access to more advanced cardiac diagnostic and treatment procedures to the New Port Richey area and surrounding communities in Pasco County. The lab includes two specialized imaging rooms and a nine-bed pre/post procedure area. Services offered include coronary angiography, percutaneous coronary intervention, peripheral angiography and intervention, cardioversions, pacemaker insertion, implantable cardiac defibrillators and loop recorder implants. Morton Plant North Bay Hospital is a nonsurgical Level I Percutaneous Coronary Intervention Center. In 2016, Morton Plant North Bay Hospital opened a cardiopulmonary rehabilitation program designed to help people recover and thrive after a heart event or procedure.

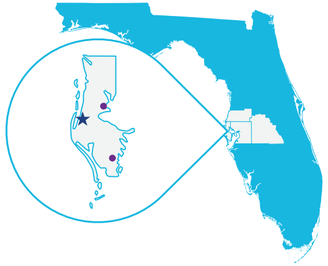
Pinellas County

Mease Countryside Hospital

Mease Countryside Hospital
3231 McMullen Booth Road
Safety Harbor, FL 34695

Thanks to its centralized location, Mease Countryside Hospital serves multiple communities in Pinellas, Pasco and Hillsborough counties, and is one of the busiest STEMI locations in the area. Today, the cardiac catheterization laboratory consists of two imaging rooms that provide a multitude of services including coronary angiography, percutaneous coronary intervention, peripheral angiography and intervention, cardioversions, pacemaker insertion, implantable cardiac defibrillators and loop recorder implants. Mease Countryside Hospital is a nonsurgical Level I Percutaneous Coronary Intervention Center.

Morgan Heart Hospital at Morton Plant



Morton Plant Hospital
300 Pinellas St.
Clearwater, FL 33756

As a leading heart hospital in the Tampa Bay community, Morgan Heart Hospital at Morton Plant has one of the most advanced heart care facilities in Pinellas County. The hospital is also the only hospital in the United States to have been awarded the Truven Top 50 Cardiovascular Hospital designation a record 15 times.

The facility has three cardiac catheterization labs that perform a variety of procedures including coronary angiography, percutaneous coronary intervention, peripheral angiography, peripheral intervention, carotid angiography and stenting with Impella support for high-risk patients, balloon valvuloplasty, chronic total occlusion and laser therapy. Additionally, Morgan Heart Hospital at Morton Plant has three electrophysiology laboratories that offer diagnostic EP studies, ablations and tilt table testing, as well as pacemaker, defibrillator and loop recorder implantation. An 18-bed nursing unit provides pre/post-procedural nursing care.

Morgan Heart Hospital maintains five cardiovascular surgical operating rooms including a state-of-the-art cardiac hybrid operating suite. Surgeons perform

a variety of procedures including complex aortic surgery, endovascular abdominal (EVAR) and thoracic aneurysm (TEVAR) repair, CABG, minimally invasive and open surgical valve repair and replacement, transcatheter aortic valve replacement (TAVR), transcatheter mitral valve repair (TMVr) or MitraClip, extracorporeal membrane oxygenation (ECMO), targeted hypothermia ablation of atrial fibrillation and complex arrhythmias, and comprehensive management of implantable cardiac devices. Morton Plant Hospital performed the first TAVR procedure in Tampa Bay in February 2012, and has been a national leader for valve procedures and outcomes. The physician team has now performed more than 670 TAVR procedures. The heart team physicians performed the first MitraClip treatment for mitral valve repair in 2014 and have subsequently treated more than 100 patients with this advanced therapy. The inpatient area contains 21 private patient rooms, allowing patients to recover in one location. Postoperatively, patients are cared for by a multidisciplinary team, which includes cardiovascular surgeons and advanced care providers, critical care physicians, nursing, and ancillary staff such as social services and pharmacy.

St. Anthony's Hospital

St. Anthony's Hospital
1200 Seventh Ave. N.
St. Petersburg, FL 33705

St. Anthony's Hospital has long been a cardiovascular services leader in south Pinellas County, providing state-of-the-art diagnostic and treatment procedures that achieve consistent superior outcomes and patient satisfaction. As part of the hospital's commitment to providing high-quality cardiac care and growing the cardiovascular services offered to the surrounding community, St. Anthony's Hospital and the team of surgical specialists from Morton Plant Hospital have partnered to bring you and your patients access to advanced cardiovascular and thoracic surgical services.

Current services at St. Anthony's Hospital include three digital cardiac catheterization labs for diagnostic and potentially life-saving interventional procedures, electrocardiogram and echocardiogram (EKG/ECHO) equipment to test for heart abnormalities, cardiac stress testing lab with nuclear medicine testing, cardiac rehabilitation, and education and support groups.

Polk County

Bartow Regional Medical Center

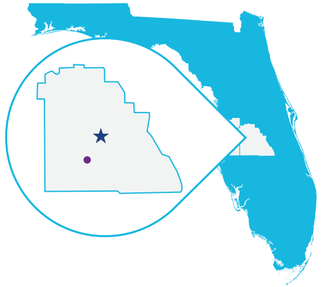
Bartow Regional Medical Center
2200 Osprey Blvd.
Bartow, FL 33830

Bartow Regional Medical Center is an acute care hospital serving South Lakeland, Bartow, Fort Meade, Mulberry, rural south Polk County and northern Hardee County. The interventional laboratory at Bartow Regional Medical Center operates as a hybrid laboratory, performing both coronary catheterizations and interventional radiology procedures. Our specialists offer state-of-the-art cardiovascular care from diagnosis to emergency intervention to the latest treatments and preventive education including diagnostic cardiac catheterizations, defibrillator/pacemaker implant and generator change, digital loop/event recorder implantation, cardioversion, transesophageal echocardiogram (TEE) and other noninvasive cardiac diagnostic services including stress testing and echocardiogram.

The Bostick Heart Center at Winter Haven Hospital

Winter Haven Hospital
200 Ave. F N.E.
Winter Haven, FL 33881

The Bostick Heart Center at Winter Haven Hospital is a comprehensive cardiovascular service line designed to treat all aspects of adult cardiovascular disease from diagnosis to treatment to recovery. This comprehensive heart program provides a variety of specialized heart services including open-heart surgery, elective or emergency coronary intervention including treatment of STEMIs, electrophysiology studies and a range of ablation procedures, heart failure care, and recovery care in the form of cardiac rehab.



The Bostick Heart Center has an eight-bed, state-of-the-art Cardiovascular Intensive Care Unit (CVICU) for care after heart and vascular surgeries, a 12-bed Cardiac Intensive Care Unit (CICU) to care for patients after complex cardiac procedures as well as patients with other serious heart problems, a 32-bed Cardiovascular Unit (CVU), designed for those patients with complex cardiac needs that do not require ICU level attention, and a 16-bed Cardiac Observation Unit (COU), designed for those patients with suspected heart problems.

Medical Terminology and Procedure Review

This section includes a review of some important medical terminology and procedures related to several sections in this book.

Structural Heart and Valve Terminology and Procedures

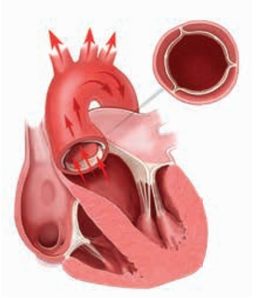
Structural heart disease may affect the heart muscle and the valves that regulate blood flow within the heart. Some structural heart abnormalities are congenital and others are the result of acquired heart disease. Many of these abnormalities ultimately result in congestive heart failure (CHF). Some of the most common conditions and their treatments are described on the following pages.

Congestive heart failure may be an acute (sudden) or chronic (long-term) problem as a result of a weakened heart muscle. CHF can be a result of multiple causes including but not limited to inadequate blood flow to the heart muscle, valve abnormalities or high blood pressure. Symptoms of CHF include:

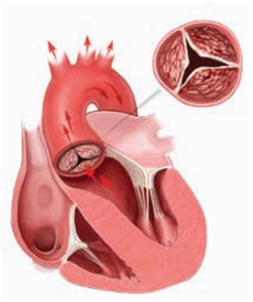
- Chest pain or pressure
- Fatigue
- Persistent cough
- Rapid or irregular heart beat
- Reduced exercise tolerance
- Shortness of breath
- Swelling (edema)
- Weight gain

Physicians categorize heart failure into four classes based on a patient's physical symptoms using the New York Heart Association (NYHA) Functional Classification system:

Class	Patient Symptoms
I	No limitation of physical activity. Ordinary physical activity does not cause undue fatigue, palpitation, dyspnea (shortness of breath).
II	Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, dyspnea.
III	Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes fatigue, palpitation, dyspnea.
IV	Unable to carry on any physical activity without discomfort. Symptoms of heart failure at rest. If any physical activity is undertaken, discomfort increases.



Aortic Valve *opens widely*



Aortic Stenosis *opening restricted*

Aortic regurgitation or insufficiency: Aortic regurgitation or insufficiency is a condition in which the aortic valve allows blood to leak backward into the heart. Aortic regurgitation may also lead to symptoms similar to heart failure.

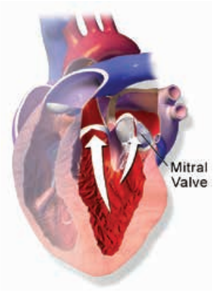
Aortic stenosis: Aortic stenosis is a buildup of calcium deposits on the aortic valve. The aortic valve is the main valve between the heart and the body. Aortic stenosis is a condition in which the aortic valve is so heavily calcified that it is unable to open or close completely. This limits the blood flow from the heart to the brain and body. The heart must then work harder to push blood through the body, which can cause fatigue, shortness of breath and worsening heart function. Declining heart function and the associated symptoms are termed congestive heart failure.

Balloon valvuloplasty: Many patients with degenerative valve disease are ineligible for surgery because of their high-risk status (e.g. advanced age, multiple comorbidities or end-stage disease). For these patients with valves that are too tight or restrictive, balloon valvuloplasty may be a viable alternative to TAVR or open-heart surgery to reduce symptoms. In balloon valvuloplasty, a catheter with a small, deflated balloon attached to the tip is threaded through a blood vessel. Once the catheter reaches the damaged valve, the balloon is inflated to stretch the valve opening and allow more blood to flow. The balloon is then deflated and guided out through the vessel and removed. The patient is generally awake during this procedure, and the recovery time is considerably shorter than with traditional surgery. However, balloon valvuloplasty is not a permanent solution and often has to be repeated at a later date. Balloon valvuloplasty can be used to treat aortic and mitral stenosis.

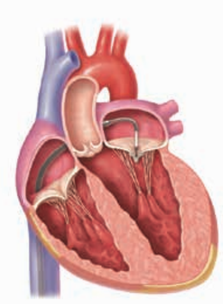
Left atrial appendage closure: The left atrial appendage (LAA) is a small pouch in the left atrium. Patients with atrial fibrillation (abnormal heart rhythm) have a high risk of blood clots forming in the LAA. These clots can dislodge and block blood flow to crucial parts of the body, including the brain (stroke). Oral anticoagulation medications may be used to reduce the risk of clots, but these medications are not safe or appropriate for some patients. In such cases, LAA occlusion is a viable treatment option. In LAA occlusion, a catheter is used to deliver a closure device to the left atrium. The device is inserted into the LAA and expanded like an umbrella to seal off the entrance to the pouch. Management of the left atrial appendage to reduce the risk of stroke has been performed using novel occluder devices as well as epicardial ligation devices.

"Over the past year, BayCare cardiovascular surgeons have performed more than 179 mitral valve repairs. These repairs can be performed as isolated mitral valve repair, combined mitral valve repair with CABG, multiple valve surgery, and in combination with arrhythmia surgery."

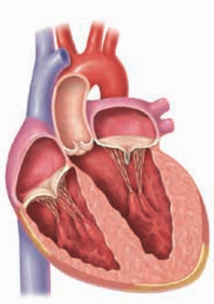
~ Dr. Andrew Sherman
Chief, Department of Cardiothoracic Surgery at St. Joseph's Hospital



Mitral Valve Regurgitation



MitraClip deployment



MitraClip – Post procedure

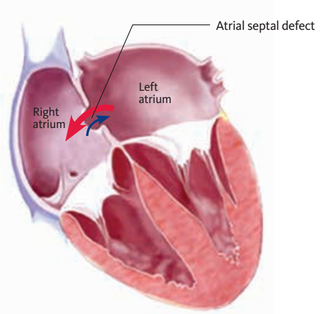
Mitral regurgitation or insufficiency: Mitral regurgitation is a condition in which the heart's mitral valve leaflets do not close tightly. When this happens, blood flows backward from the heart's left ventricle into the left atrium. This reduces the effectiveness of the heart to pump blood to the body, which can cause fatigue.

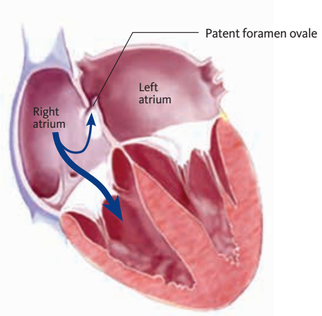
Mitral stenosis: Mitral stenosis is a result of having rheumatic fever as a child, and leads to calcium deposits on the mitral valve leaflets, preventing them from opening or closing properly. This condition can lead to increased pressure in the lungs, possibly causing permanent damage.

Percutaneous MitraClip placement for mitral regurgitation: During the mitral valve clip placement procedure, a catheter is used to deliver a small clip into the heart via the femoral vein. Once in place, the clip is attached to the leaflets of the mitral valve to improve their function, and the catheter is removed. Because the procedure is minimally invasive, the recovery time is substantially shorter than with open-heart surgery, the traditional method for treating mitral valve leaks.

Transcatheter aortic valve replacement (TAVR): Transcatheter aortic valve replacement is a minimally invasive procedure for people with severe aortic stenosis who may be unable to undergo traditional open-heart surgery. BayCare physicians offer minimally invasive treatment options for patients with severe aortic stenosis, a narrowing of the aortic valve opening that affects tens of thousands of people each year. The FDA has approved this treatment for high-risk and inoperable patients. Recently, physicians at Morton Plant Hospital received approval to perform TAVR procedures for intermediate-risk patients who want to participate in a research protocol. During TAVR, cardiovascular surgeons and interventional cardiologists place a new valve inside the heart without stopping the heart or opening the chest. Patients often recover more quickly from this minimally invasive approach.

Atrial septal defect (ASD)/patent foramen ovale (PFO): An ASD is a hole in the wall (septum) that separates the two upper (atrial) chambers of the heart. A PFO is a condition in which a small opening in the atrial septum fails to seal after birth. Some patients with a PFO can develop stroke when small blood clots cross from the right-sided collecting chamber to the left-sided collecting chamber (atrium), ultimately flowing into the brain.





In the past, people with holes in their hearts could face a lifetime of anticoagulant therapy or even open-heart surgery in order to reduce their high risk of stroke. Some BayCare facilities now offer a minimally invasive option to close a variety of cardiac holes, including atrial and ventricular septal defects and patent foramen ovales. During these procedures, a hollow catheter is threaded through a blood vessel and guided to the site of the defect. Once in place, it is used to deliver a collapsed mesh closure device and place it inside the defect. The device is then activated, expanding to block the opening and hold the device in place, and the catheter is removed. Recovery time following placement is considerably shorter compared with traditional surgery.

Transcatheter paravalvular leak closure: Paravalvular leaks can occur when a suture holding an artificial valve to the heart tissue breaks, or when the heart tissues around the artificial valve weaken. This defect causes a leak around the valve. Re-operation to repair a paravalvular leak may be a very risky procedure for some patients. This minimally invasive technique uses a catheter to deliver and deploy a closure device at the site of the leak.

Arrhythmia Terminology and Procedures

Common disorders and procedures to manage them are listed below.

Syncope: Syncope is the sudden and transient loss of consciousness associated with the loss of postural tone. Syncope can occur as a result of low heart rate, fast heart rate or dysfunction of the autonomic nervous system.

Supraventricular tachycardia (SVT): SVT, or narrow complex tachycardia, represents a group of rhythm disorders that predominantly occur in the atria. Fortunately these arrhythmias are easily treatable. They commonly manifest with palpitations, dizziness and, at times, loss of consciousness.

Ventricular tachycardia/fibrillation (VT/VF): VT/VF is an arrhythmia involving the ventricles and are most commonly life threatening. Patients with compromised left ventricular function are at risk for developing ventricular arrhythmias and represent the mechanism of sudden cardiac death in these patients and patients who've had myocardial infarctions. These disorders have been historically managed with defibrillator therapy; however, with advancements in technique and equipment, ablation is now considered an acceptable method of managing this rhythm disorder.

Atrial fibrillation (AF): Atrial fibrillation is an electrical disorder involving the atria and represents a chaotic electrical process that renders the atria nonfunctional. The end result is stasis of blood in the atria and appendage which can lead to stroke, loss of atrial contractility leading to decreased cardiac output, and in an uncorrected AF, myopathy as a result of chronic uncontrolled ventricular rate. AF is categorized as either paroxysmal, persistent or chronic.

Channelopathies: The myocardium relies on appropriate functioning of the ion channels. In some patients, genetic abnormalities of these ion channels can result in arrhythmia; at times life threatening. Appropriate management relies on genetic testing and counseling and, in some cases, protection against ventricular arrhythmia with defibrillator therapy.

Bradyarrhythmias: Premature conduction disease may result in low heart rates insufficient to maintain activities of daily living and in severe cases loss of consciousness. Management includes removing offending agents or conditions which may cause bradycardia and in irreversible cases, placement of a pacemaker.

Implantable cardioverter defibrillator (ICD): ICDs represent cardiac devices which protect against sudden cardiac death by effective treatment of ventricular arrhythmias. Traditional devices relied on endovenous wires connected to the heart. Novel devices can be placed under the skin without requiring venous punctures and may be ideal in selected patients.

Permanent pacemaker: Traditional pacemakers rely on pacing wires connected to the heart. New generation devices are now completely implantable in the right ventricle and do not require any surgery, as the device is delivered through the femoral veins.

Hybrid AF ablation: Patients with advanced AF benefit from both epicardial and endocardial ablation. BayCare is a center of excellence in managing advanced AF using novel techniques.

SVT ablation: Ablation of SVTs can be safely performed using minimally invasive, catheter-based ablation. With the assistance of state-of-the-art 3-D mapping software, eradication of SVTs can be accomplished with unprecedented accuracy and efficacy.

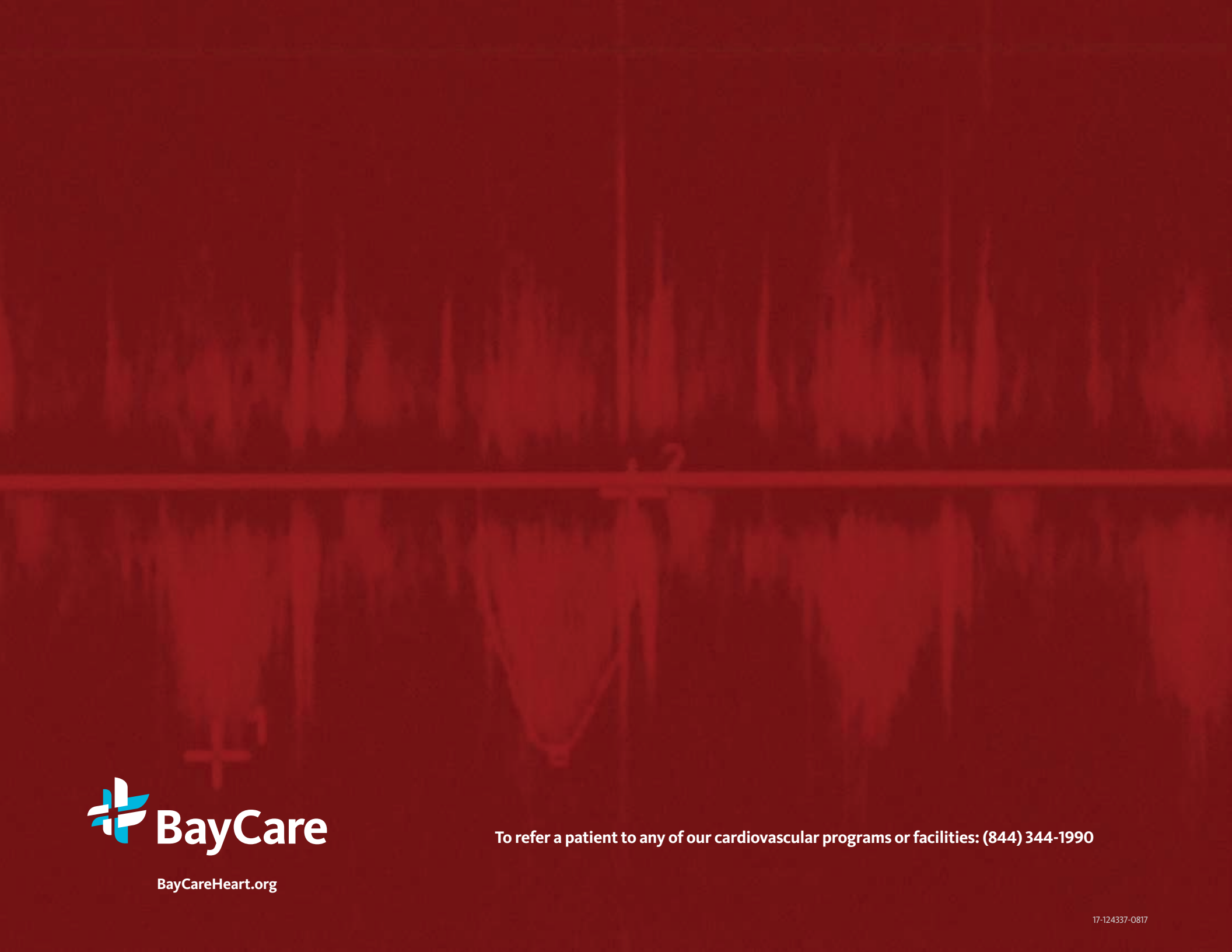
Pulmonary vein isolation for AF: Isolation of the pulmonary veins is the cornerstone of managing paroxysmal AF and can be safely performed using both radiofrequency and cryoballoon ablation techniques.

VT/VF ablation: Ventricular ablations can now be safely performed with the assistance of hemodynamic support devices including Impella and extracorporeal membrane oxygenation. In rare cases, ablation can be performed in the epicardium when endocardial ablation fails.

Lead extraction and venoplasty: Procedural volume is critical as the main determinant of outcome. BayCare's lead extraction programs have over 20 years of experience and has the most cumulative lead extractions in the area. Typical patients who have lead extractions include patients with device-related infections and patients with multiple abandon leads. Lead extractions are performed in some cases with the assistance of advanced laser cutting sheaths. Patients who develop closure of peripheral veins with pacing leads can also be treated with balloon angioplasty.

His bundle/biventricular pacing: Patients who require chronic ventricular pacing or have wide QRS intervals with heart failure could benefit from cardiac resynchronization of the ventricles by pacing both chambers using dedicated right and left ventricular leads. A more contemporary technique utilizes a single lead to directly pace the His Bundle to promote a narrow QRS interval with each paced beat thereby maintaining synchrony between both ventricles and improvement in overall cardiac output.

To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990



BayCare

BayCareHeart.org

To refer a patient to any of our cardiovascular programs or facilities: (844) 344-1990

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