

# Cardiovascular and Surgical Outcomes | 2017



[BayCareHeart.org](http://BayCareHeart.org)

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**Table of Contents**

Why Choose Us?..... 3

Cardiovascular Surgery..... 5

Advanced Structural Heart and Valve..... 13

Arrhythmia ..... 17

Percutaneous Coronary Intervention..... 21

Heart Failure ..... 25

Pediatric and Adult Congenital Heart ..... 29

Cardiac Rehabilitation ..... 33

Research and Clinical Trials:  
    Currently Enrolling ..... 35

Our Facilities ..... 41

Cardiovascular Surgery Data  
    Addendum by Facility ..... 48

Medical Terminology  
    and Procedure Review ..... 51

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Dear Colleague,

Physicians and staff of the BayCare Cardiovascular Service Line are once again pleased to present the annual clinical outcomes for 2017. The outstanding clinical results for the patients within BayCare is a direct result of dedicated teams of caregivers who use the latest technology to address very complex cases. There is a culture of continuous quality improvement with the use of clinical data to hardwire processes to maintain and surpass previous levels of success.

The Cardiovascular Service Line has been structured to allow multi-disciplinary teams to manage coronary artery disease, heart failure, structural heart and valve disease, peripheral vascular disease,

arrhythmia, pediatric and congenital heart disease and diseases of the aorta. This delivers optimal care that is patient-centered. The following pages will highlight volume and select clinical outcomes within BayCare.

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.



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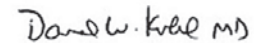
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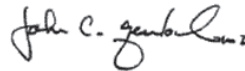
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# Why Choose Us?

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. To implement our quality philosophy and process, BayCare has established a culture where quality behaviors and expectations are communicated, encouraged and rewarded.

Our quality philosophy efforts are aimed at the customer experience and improving customer satisfaction with the services we deliver. The customer experience is not only enhanced by improving processes and reducing process variations, but also through the way we deliver care. It's our goal to inject health care with a much-needed dose of humanity, ensuring that competence doesn't come at the expense of compassion.

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

physicians and patients have access to experts across the cardiovascular spectrum. BayCare even provides an additional layer of expertise for our critically ill cardiovascular patients through our virtual intensive care unit (vICU), a program that provides continuous around-the-clock, real-time audio and visual monitoring of patients by experienced board-certified critical care specialists.

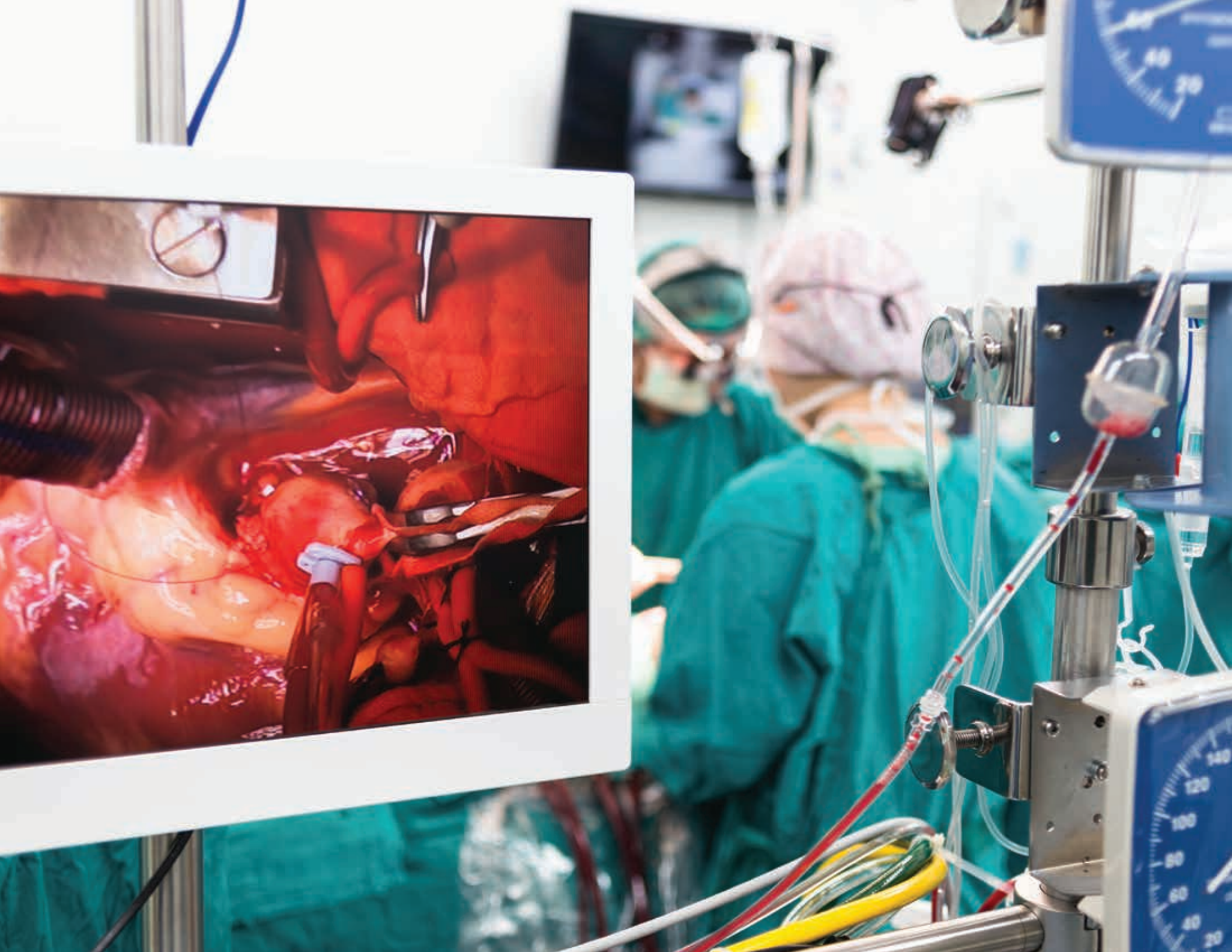
In addition, through our expansive network, patients are able to move within the health care system to get the care and clinical expertise they need, regardless of their location. To further enhance our network, BayCare is also investing in the community and future of cardiovascular medicine through participation in national and international clinical trials and research.

Our commitment to high-quality health care, an expansive network of physicians and facilities, and innovative specialty programs, makes BayCare an excellent health care partner for patients in need of cardiovascular care.

**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 utmost 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. Cardiothoracic surgeons Dr. David Evans, Dr. John Ofenloch and Dr. Andrew Sherman acknowledge that "Cardiac surgery is one of the most scrutinized and data-driven specialties. In addition to our participation with STS, our cardiovascular and thoracic surgeons frequently collaborate throughout the year in our never-ending pursuit to provide the highest quality cardiovascular care to the communities of West Central Florida. This consistent collaboration allows us to share best practices across the spectrum of surgical care provided within our health system." For information on BayCare's management and

treatment of pediatric and adult congenital heart disease, see the Pediatric and Adult Congenital Heart section of this book on page 29.

## BayCare's cardiovascular surgical procedures include:

- Aortic aneurysm repair
- Aortic valve repair and replacement
- Carotid endarterectomy and stenting
- Coronary artery bypass
- 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)
- Transcatheter mitral valve replacement (TMVR)
- Surgical treatment for atrial fibrillation (Maze, Convergent, AtriClip)

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*"In addition to our participation with STS, our cardiovascular and thoracic surgeons frequently collaborate throughout the year in our never-ending pursuit to provide the highest quality cardiovascular care to the communities of West Central Florida. This consistent collaboration allows us to share best practices across the spectrum of surgical care provided within our health system."*

~ Dr. David Evans  
*Director, Cardiac Surgery  
at the Bostick Heart Center  
at Winter Haven Hospital*

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

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

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## A Look at Volume

2017 Open-Heart Surgery Breakdown	
	BayCare
Surgical Valve	551
Isolated CABG	692
Other	211

**Surgical valve** = Represents total number of valves, not patients; **Other** = Includes all procedures that fall outside any STS procedure identification category

2017 Surgical and Transcatheter Valve Volume	
	BayCare
Aortic Valve	282
Mitral Valve	214
Tricuspid valve	55
Transcatheter Valve ( <i>aortic and mitral</i> )	393

Represents total number of valves, not patients

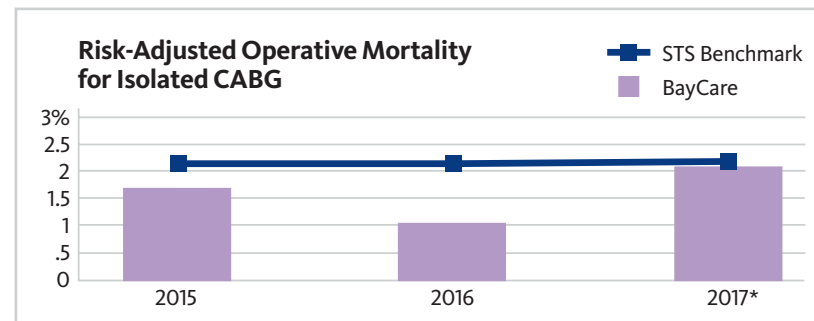
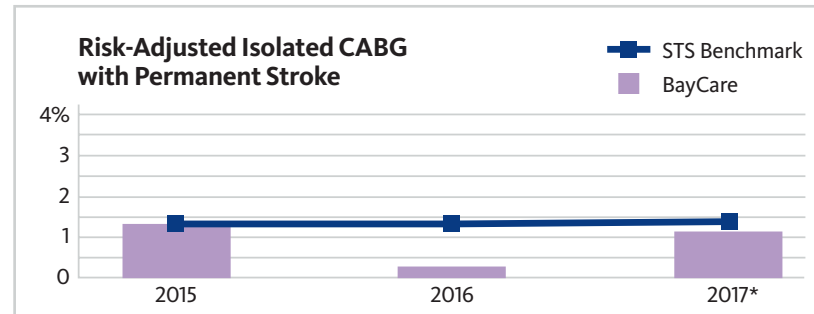
*“Cardiac surgery is rapidly evolving to include more treatments for valvular heart disease. Many of these procedures can be performed with minimally invasive surgical and transcatheter techniques.”*

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



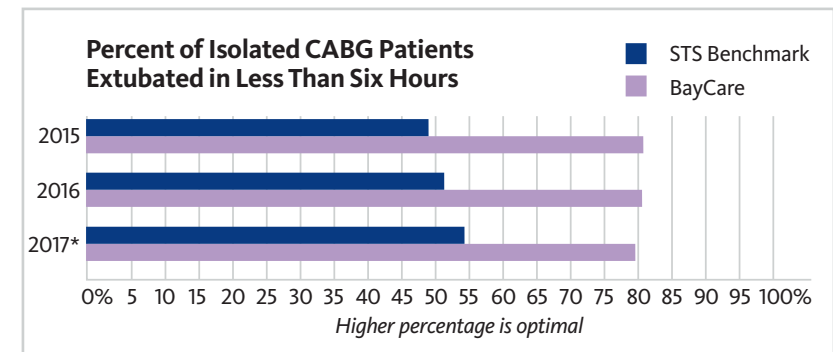
## A Look at Quality

At the time of production, the risk-adjusted composite scores for BayCare as a health system were unavailable. To review risk-adjusted cardiovascular surgery data by facility, see the Cardiovascular Surgery Data Addendum by Facility section of this book on page 48.

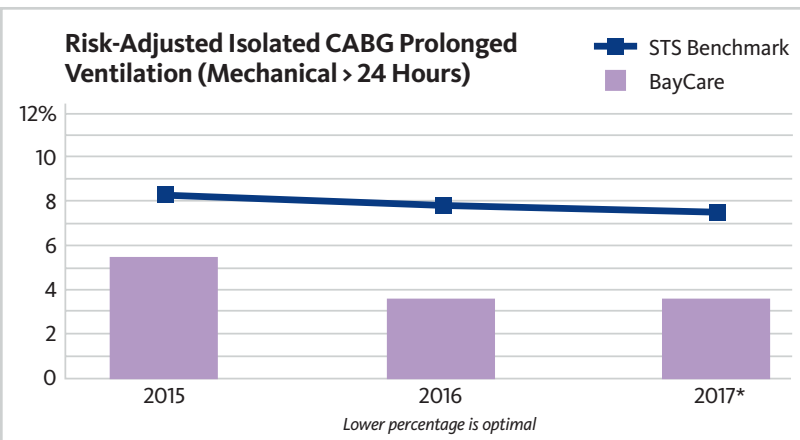


STS Major Cardiac Procedures Mortality				
	Number of Procedures	Operative Mortality	O:E	STS O:E
2015	923	1.7%	0.8	1.0
2016	988	1.7%	0.88	1.0
2017	1,053*	2.28%	N/A	1.0

For 2015–16, 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.



\*Indicates non risk-adjusted data. Composite risk stratification not available. For risk-adjusted data by facility, see the Cardiovascular Surgery Data Addendum by Facility on page 48.



Deep Sternal Wound Infection for Isolated CABG		
	STS Benchmark	BayCare
2015	0.3%	0.28%
2016	0.3%	0.0%
2017	0.3%	0.0%

### 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. David Evans, director of cardiac surgery at the Bostick Heart Center at Winter Haven Hospital acknowledges, “Being able to repair a mitral valve versus replacing it gives our patients a great quality of life advantage for years to come. Most mitral valves can be repaired in the hands of the BayCare heart surgeons who have demonstrated a superior track record over many years of experience with these techniques.”

\*Indicates non risk-adjusted data. Composite risk stratification not available. For risk-adjusted data by facility, see the Cardiovascular Surgery Data Addendum by Facility on page 48.





### Case Study

A 64-year-old female who had mitral valve prolapse (MVP) diagnosed in 1975 experienced MVP progression to cause moderate mitral regurgitation (MR) in 2014. The patient was followed closely by her cardiologist over the years and remained relatively asymptomatic until recently. She began experiencing increasing swelling of her lower extremities, shortness of breath and fatigue associated with diminished activity tolerance. Her mitral valve regurgitation had progressed to severe. Patient underwent a diagnostic cardiac catheterization, which revealed no significant coronary disease and a transesophageal echocardiogram that revealed preserved left ventricular function. She underwent leaflet repair and annuloplasty of her mitral valve with excellent results. The patient had an uneventful recovery and is enjoying time with her grandchildren.

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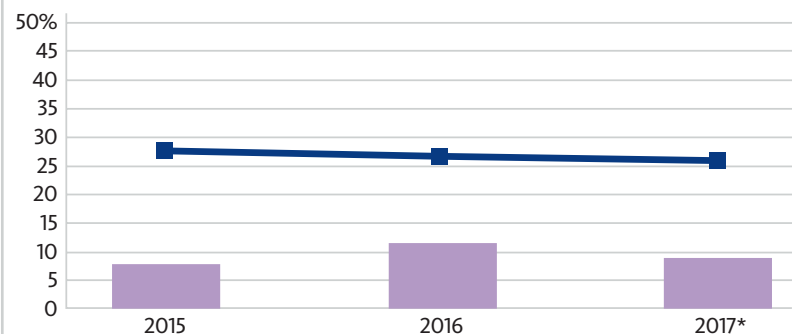


### Importance of Blood Conservation

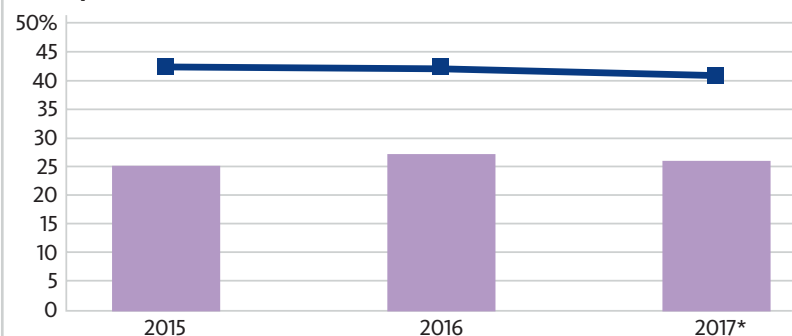
Multiple strategies are utilized within BayCare cardiovascular surgical programs to limit operative blood loss and patient exposure to blood products. Techniques to limit bleeding and return shed blood to the patient include:

- 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

**Blood Utilization for CABG Surgeries:** ■ STS Benchmark ■ BayCare  
Represents Intraoperative Blood Use



**Blood Utilization for CABG Surgeries:** ■ STS Benchmark ■ BayCare  
Represents Intraoperative and Postoperative Blood Use



### 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, including radial artery and bilateral internal mammary artery grafts, is significantly higher than regional and national averages,” according to chief of cardiothoracic surgery and medical director of the Morgan CVICU/OR at Morton Plant Hospital, Dr. John Ofenloch.

\*Indicates non risk-adjusted data. Composite risk stratification not available. For risk-adjusted data by facility, see the Cardiovascular Surgery Data Addendum by Facility on page 48.

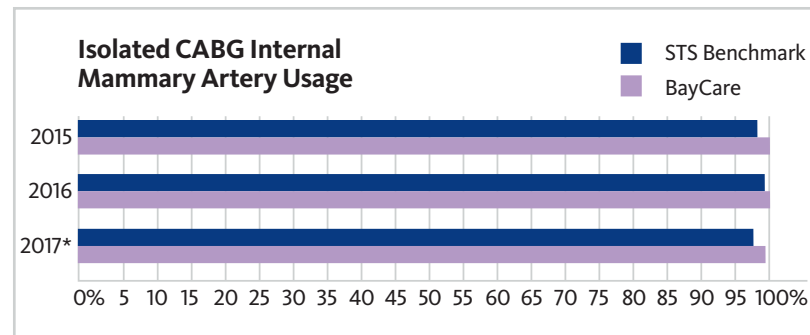
“BayCare cardiovascular surgeons are committed to providing the highest quality surgical care. Not only are in-hospital and 30-day mortality rates important, but also long-term freedom from further cardiovascular events.”

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 for the treatment of atrial fibrillation. According to Dr. Andrew Sherman, chief of the department of cardiothoracic surgery at St. Joseph's Hospital, “This collaborative approach to patients with atrial fibrillation (AFib) not only significantly improves the care of these patients, but has been highlighted by our major societies as an area of focus. In 2017, the STS published guidelines for the surgical treatment of AFib. These guidelines stressed the importance of addressing AFib at the time of other cardiac procedures and the standard of care being the use of a multidisciplinary team approach, both of which occur at a high rate across BayCare.”



2017 Surgical Treatment of Arrhythmias	
	BayCare
Maze	101
PVI	39
Convergent	43
<b>Total</b>	<b>183</b>

Radial Artery Usage		
	STS Benchmark	BayCare
2015	4.5%	17%
2016	5.1%	20.9%
2017*	5.0%	20.2%

Bilateral Internal Mammary Artery Usage		
	STS Benchmark	BayCare
2015	4.8%	12%
2016	5.5%	7.3%
2017*	5.1%	5.2%

\*Indicates non risk-adjusted data. Composite risk stratification not available. For risk-adjusted data by facility, see the Cardiovascular Surgery Data Addendum by Facility on page 48.







# 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. We're able to personalize each patient's care, allowing for the best possible outcomes. Together, our team reviews the patient's diagnostic studies and recommends an individualized treatment plan for each patient. This programmatic approach has allowed us to participate in multiple national research trials," 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. They 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 51.

For information on BayCare's management and treatment of pediatric and adult congenital heart disease, see the Pediatric and Adult Congenital Heart section of this book on page 29.

### BayCare's advanced structural heart and valve procedures include:

- |   |   |
|---|---|
| ■ Balloon valvuloplasty                         | ■ Transcatheter mitral valve repair (MitraClip) |
| ■ Left atrial appendage closure                 | ■ Transcatheter mitral valve replacement (TMVR) |
| ■ Transcatheter atrial septal defect closure    | ■ Transcatheter paravalvular leak closure       |
| ■ Transcatheter aortic valve replacement (TAVR) |   |

**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 six 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.

- Greater than fifty percent of all BayCare cardiovascular surgical and transcatheter cases involve valve surgery.
- One quarter of all BayCare cardiovascular cases are transcatheter-based.
- Nearly half of all BayCare valve procedures are currently performed by transcatheter approach.

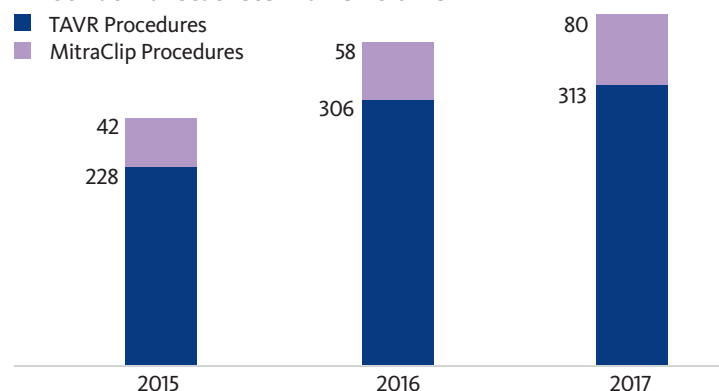


## 2017 TAVR 30-Day Outcomes (In hospital)

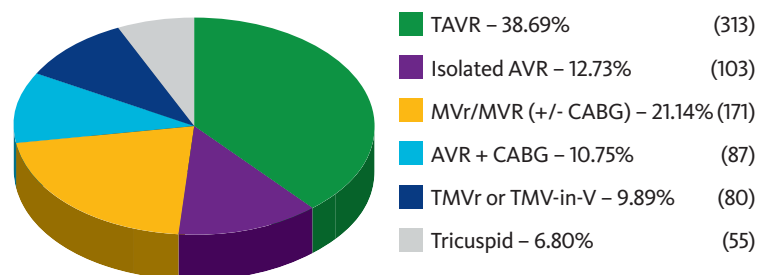
	BayCare
	*N=313 (%)
All-cause mortality	1.9%
Major disabling stroke	0.32%
Access site vascular complications	2.24%

\*Includes research cases

## A Look at Transcatheter Valve Volume



## 2017 Valve Surgery and Transcatheter Therapy Breakdown



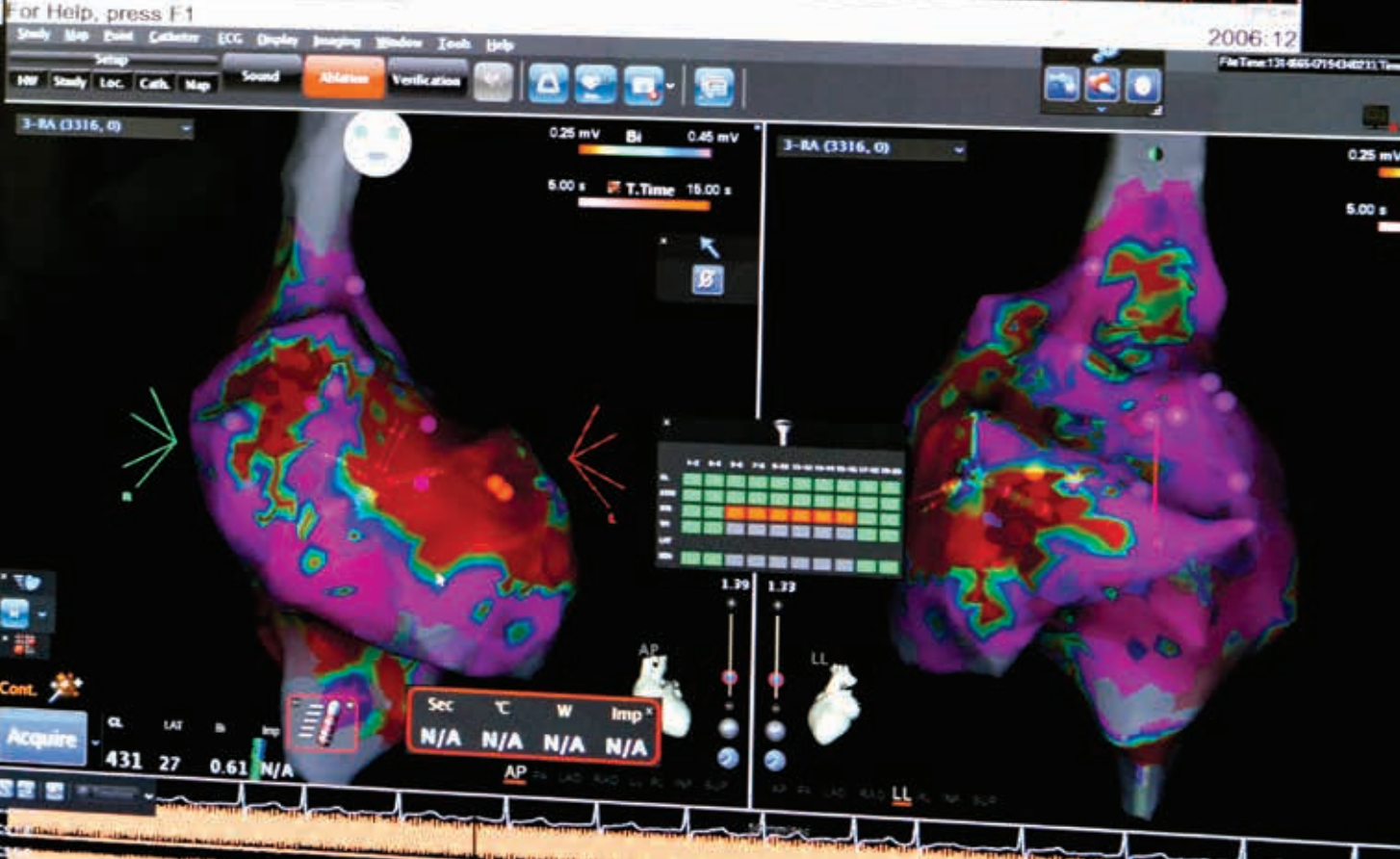
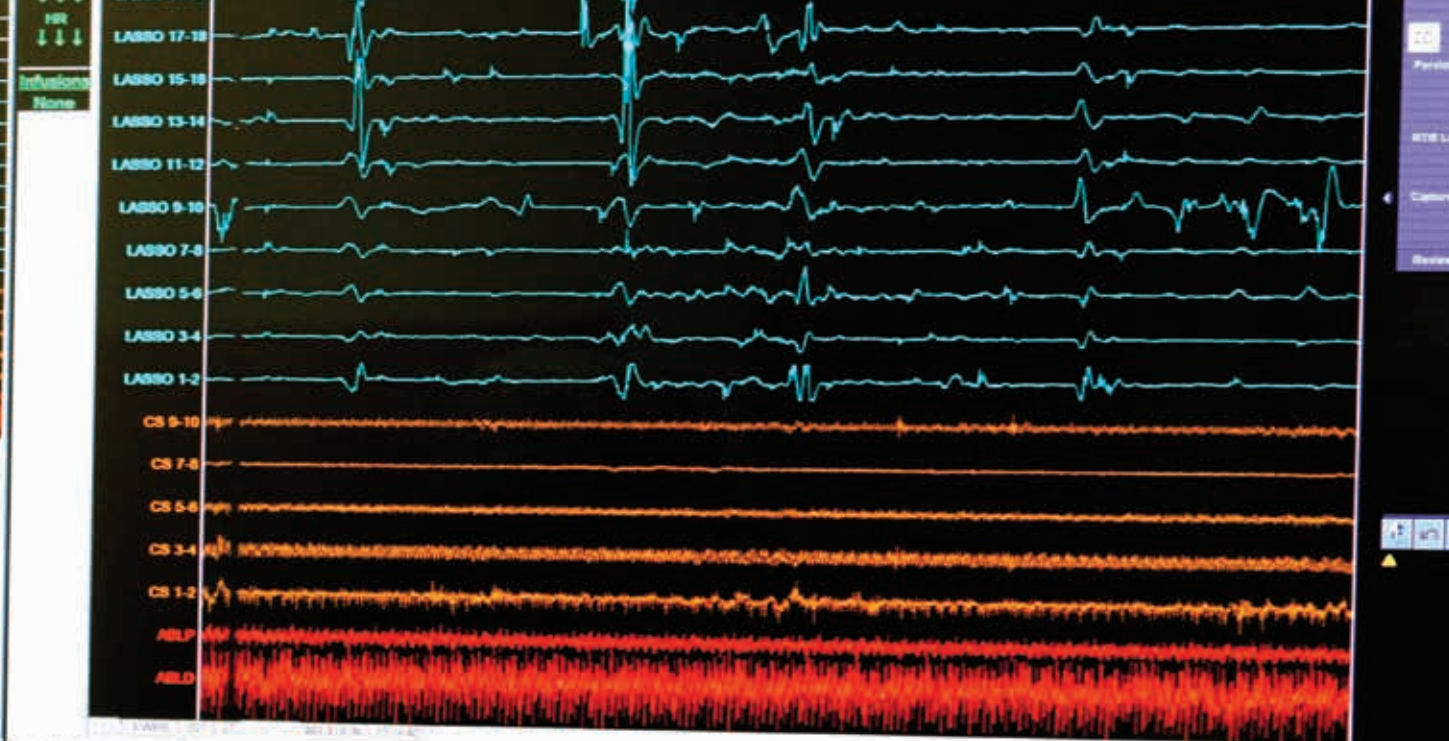
TAVR = Transcatheter aortic valve replacement; AVR = Aortic valve replacement; MVr = Mitral valve repair; MVR = Mitral valve replacement; CABG = Coronary artery bypass graft; TMVr = Transcatheter mitral valve repair; TMV-in-V = Transcatheter mitral valve in valve



### Case Study

A 68-year-old male, who previously had a mitral valve repair with a ring, developed severe congestive heart failure, was on dialysis for kidney failure and approaching death due to his severe mitral regurgitation from failure of the ring. Due to the patient's severe condition, he was not a candidate for another open-heart procedure, therefore his only hope was a transcatheter mitral valve replacement (TMVR) into the ring. Although the patient had a difficult postoperative course, he is now feeling great, has transitioned to home dialysis on a less frequent basis and has returned to work. The patient is sincerely grateful to the team for this life-saving procedure.





# 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.

“The treatment of cardiac arrhythmias is continuously evolving. At BayCare, our Rhythm specialists collaborate on a scale not often seen in today’s health care environment. Through sharing of ideas, techniques and the latest research, BayCare physicians provide cutting-edge treatments and evidence-based care for patients,” according to Dr. Rodrigo Bolaños, medical director of electrophysiology at Winter Haven Hospital. “The collective procedural experience of our physicians combined with a collaborative ‘team approach’ allows the BayCare Rhythm team to deliver unmatched patient care across our communities and beyond.”

Common arrhythmia disorders and the procedures that manage them are listed in the Medical Terminology and Procedure Review section of this book on page 51. For volume related to surgical management of arrhythmias, see the Cardiovascular Surgery section of this book on page 5.

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*“The collective procedural experience of our physicians combined with a collaborative ‘team approach’ allows the BayCare Rhythm team to deliver unmatched patient care across our communities and beyond.”*

*~ Dr. Rodrigo Bolaños  
Medical Director,  
Electrophysiology at  
Winter Haven Hospital*

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## **A Closer Look: Comprehensive Treatment of AFib**

At BayCare, for each atrial fibrillation (AFib) patient, we undertake a comprehensive treatment approach. Successful AFib treatment is grounded in our interdisciplinary approach that includes integration of various other specialties such as cardiothoracic surgery, general cardiology, radiology, neurology, anesthesiology and pulmonary medicine. We hold monthly meetings with physicians and supporting staff to discuss complex cases and ensure appropriate and individualized management for each patient.

The treatment of AFib has three specific goals: 1) control of symptoms, 2) stroke prevention, and 3) treatment of the underlying risk factors. Symptom control of AFib can be achieved through rate control (slowing of AFib) with medications and, when necessary, via pacemaker therapy. BayCare offers the newest pacemaker therapy including the leadless pacemaker and His bundle pacing where appropriate. However, despite slowing of AFib, some patients may still have symptoms. For symptomatic patients, a “rhythm control” strategy using medication and/or ablation may be employed. Ablation is utilized where patients’ symptoms can’t be controlled with medication and

for improvement in quality of life. At BayCare, we utilize a variety of ablation techniques including cryoballoon ablation, radiofrequency ablation and a combined hybrid ablation that includes both a surgical and catheter-based approach that are performed on the same day.

In addition to controlling symptoms, stroke prevention is an important part of AFib treatment. Anticoagulation is the cornerstone of stroke prevention in AFib management regardless of the strategy elected, and is based on the individual’s risk. However, a large proportion of patients at high risk for stroke aren’t anticoagulated due to bleeding complications. For those patients, we offer left atrial appendage (LAA) closure devices such as WATCHMAN, which occludes the LAA, the source of 90 percent of thrombi from AFib.

The third and final cornerstone is the management of AFib risk factors including issues such as sleep apnea, obesity, diabetes and tobacco use. BayCare is piloting the concept of an AFib clinic that specializes in bringing together appropriate specialists to address risk factors to improve outcomes in patients with AFib.

### **BayCare’s arrhythmia programs include:**

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

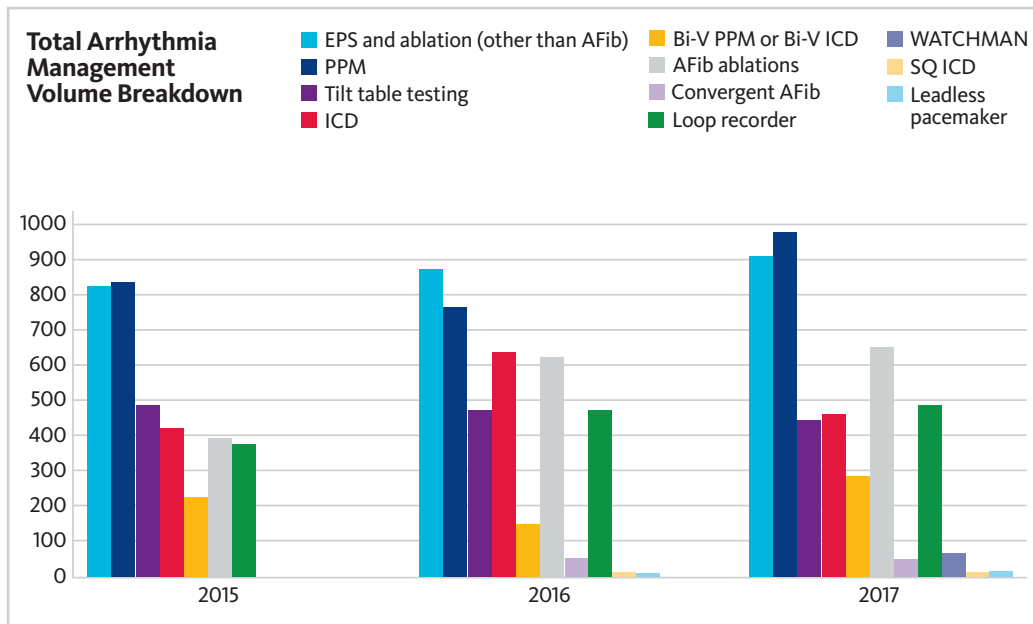
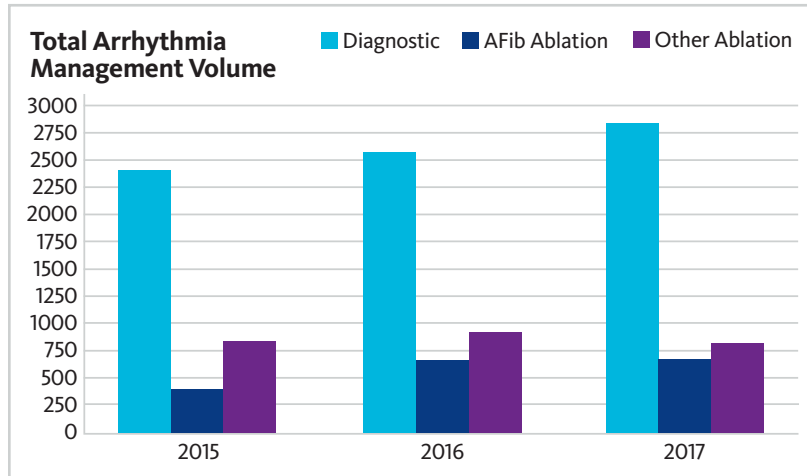
### **Cardiac rhythm management (CRM) device implants include:**

- Diagnostic EP studies as part of implantation
- 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 adult congenital heart disease can be found in the Pediatric and Adult Congenital Heart section of this book on page 29.



## A Look at Volume



## Case Study

A 65-year-old male with a history of ischemic heart disease and previous coronary artery bypass grafting (CABG) presented with sustained ventricular tachycardia (VT). A stress test showed no ischemia, so the patient received an implantable cardioverter defibrillator (ICD) and was started on Sotalol. Over the next couple of months, the patient had increasing episodes of VT. Over a two-month period, the patient experienced 85 episodes of VT that were pace terminated. He later presented with shock and was admitted to the hospital, and scheduled for VT ablation. While the patient had easily induced VT, he was not hemodynamically stable enough to map while in VT. Utilizing the RHYTHMIA HDx™ Mapping System, substrate mapping was performed, and seven channels were identified and ablated during the procedure. Post ablation, the patient had only nonsustained ventricular tachycardia (NSVT). The patient is currently VT free and off medications.



# Percutaneous Coronary Intervention

The landscape of coronary disease treatment is changing and evolving rapidly with more complex diseases 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 and the ability to support the failing heart muscle with different percutaneous devices (i.e. Impella). “The BayCare cardiology team is committed to doing the right thing for the right patient at the right time so as to maximize chances for a long and healthy life,” said Dr. David Kohl, clinical leader for percutaneous coronary intervention at BayCare and interventional cardiologist at St. Anthony’s 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, St. Joseph’s Hospital-South, South Florida Baptist Hospital and Winter Haven Hospital. In addition, Mease Countryside Hospital,

Morton Plant Hospital, Morton Plant North Bay Hospital, South Florida Baptist Hospital, St. Anthony’s Hospital, St. Joseph’s Hospital, St. Joseph’s Hospital-North, St. Joseph’s Hospital-South 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 a decrease in length-of-stay and bleeding risks, and a shorter duration of bedrest after a catheterization procedure. Many of the physicians within these hospitals are able to perform radial procedures when appropriate.

## BayCare’s PCI procedures include:

- Diagnostic coronary angioplasty
- Diagnostic peripheral angioplasty
- Mechanical support in cardiogenic shock
- Percutaneous coronary intervention (PCI)
- Peripheral vascular intervention (PVI)

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*“The BayCare cardiology team is committed to doing the right thing for the right patient at the right time so as to maximize chances for a long and healthy life.”*

*~ Dr. David Kohl  
Clinical Leader for  
Percutaneous Coronary  
Intervention at BayCare  
and Interventional  
Cardiologist at  
St. Anthony’s Hospital*

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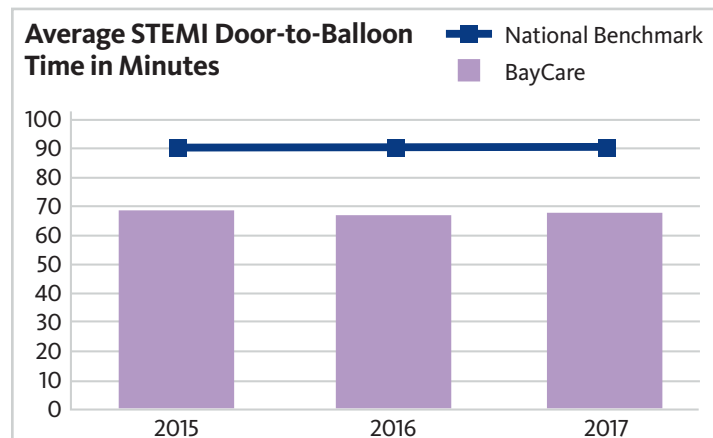
## A Look at Volume

PCI Volume			
	2015	2016	2017
PCI volume	5,060	5,187	5,262
Total peripheral vascular intervention volume	1,793	2,511	1,797
Diagnostic cath lab volume	11,808	12,254	11,936

The cardiac catheterization, percutaneous coronary intervention (PCI) and peripheral intervention volumes included in this year's outcomes book reflect cases performed in the cardiac catheterization labs throughout BayCare. These volumes include a variety of procedures that address a multitude of diseases both chronic and acute in nature.

The PCI procedures include the treatment of coronary artery disease by angioplasty, stenting and atherectomy. Many of the peripheral intervention procedures include the treatment of peripheral vascular disease by thrombectomy, angioplasty, stenting and/or catheter-directed thrombolysis to improve quality of life, relieve pain, and in more advanced cases, for limb salvage. These procedures can be performed using a variety of access points including femoral, popliteal and pedal vessels, depending on the lesion being addressed.

## A Look at Quality

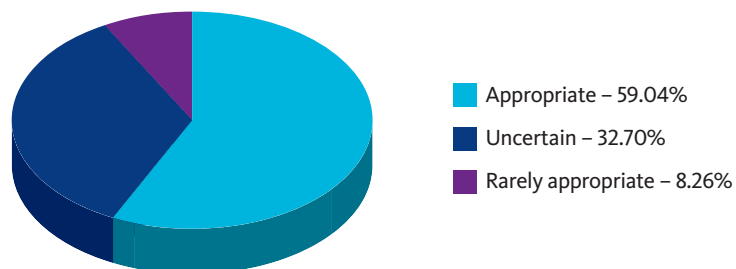


Dr. Lang Lin, co-director, STEMI Program at Morton Plant Hospital, notes “In STEMI care, ‘time is heart muscle.’ Timely intervention in opening a clotted or closed artery is essential for short- and long-term outcomes and decreased mortality and morbidity. At BayCare, we continue to strive for shorter door-to-balloon times. In order to improve our quality of care, each BayCare hospital’s STEMI committee routinely reviews every STEMI case—from our emergency rooms to cardiac catheterization labs, and our post-procedure care—for opportunities to improve. We still face challenges: a significant amount of patients delay medical contact for a variety of reasons including (1) atypical symptoms that delay presentation and evaluation,

(2) an increasing amount of patients are older and have more medical problems that make initial diagnosis more difficult and acute invasive treatment is delayed or complicated, (3) an increasing amount of younger patients go to the Internet first when symptoms develop before they call EMS or go to an emergency room. Therefore, ample opportunities exist for medical providers—cardiologists, emergency physicians, EMS—and patients, to further shorten the amount of time to medical contact and door-to-balloon time to preserve more heart muscle.”

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

**2017 Proportion of Evaluated PCI Procedures Without Acute Coronary Syndrome**

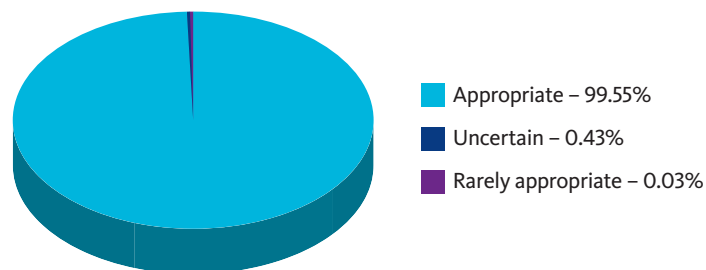


**Appropriate:** Meets ACC/NCDR guidelines for performing PCI

**Uncertain:** Currently insufficient evidence

**Rarely Appropriate:** Not generally acceptable

**2017 Proportion of Evaluated PCI Procedures With Acute Coronary Syndrome**



### **A Closer Look: Impella for High-Risk PCI Cases**

BayCare hospitals were some of the first in the west central Florida region to offer a protected heart procedure to patients with coronary artery disease (CAD). Known as a protected percutaneous coronary intervention (PCI) with Impella, the world's smallest heart pump, this treatment option is now available for patients who otherwise were determined to be inoperable or not candidates for stents or angioplasty as a result of the high degree of risk involved.

A protected PCI procedure uses the Impella heart pump to help maintain stable heart function during procedures by pumping blood for the heart. Benefits may include a reduction in adverse events, improvement in patients' quality of life, less time spent in the hospital and a reduced need for repeat procedures and related readmissions.





# 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.

In 2017, BayCare began an effort to standardize treatment protocols for heart failure patients seen within our heart function clinics across the system. 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:

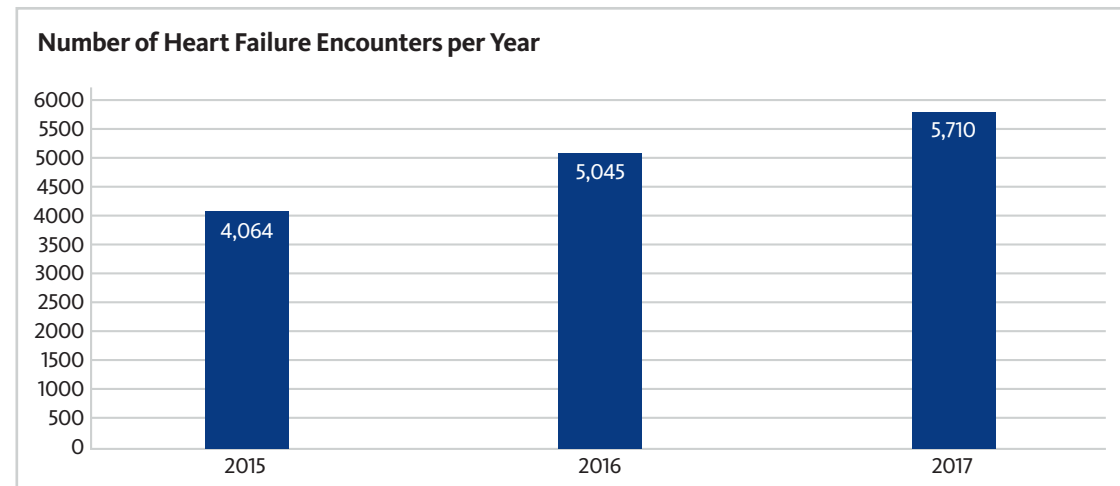
- Emergency room follow-up
- Clinical care and research on athletic heart disease
- Comprehensive evaluation of cardiomyopathy
- Coordination of home heart monitoring
- Home infusion therapy
- Hospital readmission risk management
- Inpatient continuity of care
- Opportunity to participate in clinical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

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

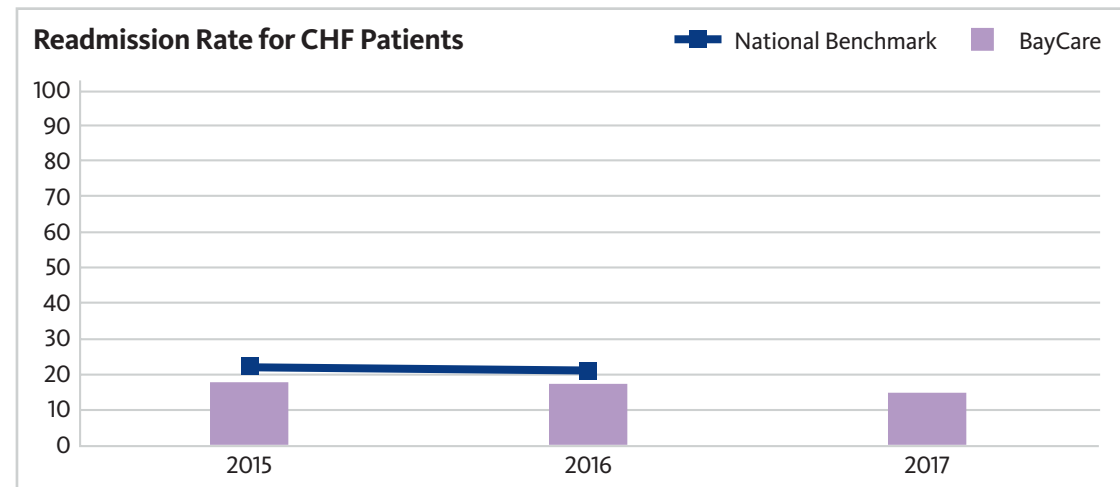
*“Heart failure is the most common reason for hospitalization in people over age 65 and effective treatment often requires the collaboration of a health care team that includes primary care physicians, cardiologists and the specialized doctors and nurses of BayCare’s Heart Function Programs.”*

*~ Dr. Augustine Agocha  
Medical Director of the  
Heart Function Clinic  
at St. Joseph’s Hospital*

### A Look at Volume



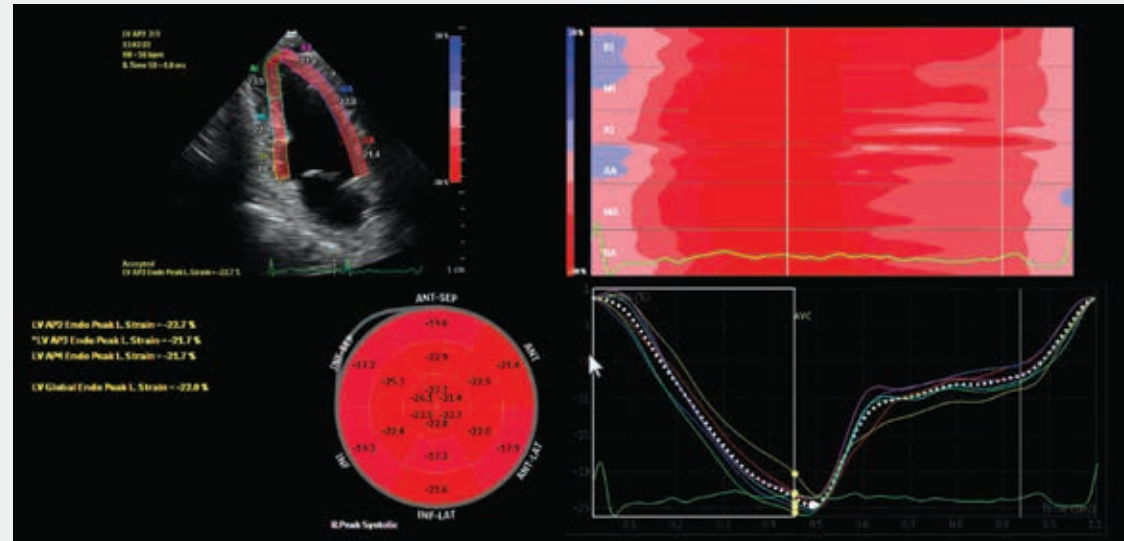
### A Look at Quality



## A Closer Look: BayCare's Cardio-Oncology Program

Over the past few years, tremendous progress has been made in the treatment of cancer, and millions of survivors are now living happy and healthy lives. For some people, however, the benefits of effective cancer treatment can be lessened by development of new or worsening heart conditions related to chemotherapy or radiation. Cardio-oncology is the medical discipline committed to the diagnosis, monitoring and management of heart problems in patients undergoing cancer treatment. BayCare's Cardio-Oncology Program was developed in collaboration with cardiologists, oncologists, cancer surgeons and primary care physicians. The primary goal of the program is to monitor and protect the heart while giving patients the best chance at curing their cancer.

More than 30 different drugs used for cancer treatment have been associated with some degree of heart problems, ranging from palpitations to elevated blood pressure, arrhythmia and even heart failure. Fortunately, not everyone exposed to these life-saving agents develops a heart problem. Certain risk factors are associated with increased likelihood of a cardio-oncology problem including older age at the time of treatment, prior exposure to chemotherapy



or radiation, and the presence of heart conditions such as coronary disease and hypertension. Patients with any of these risk factors are monitored closely because early detection of heart problems is very important to prevent permanent heart damage.

With clinics at St. Joseph's Hospital and St. Joseph's Hospital-North, the BayCare Cardio-Oncology Program features a highly individualized care plan of surveillance, prevention and treatment. Key program elements include:

- Multidisciplinary team-based care
- Comprehensive initial evaluation and risk-based follow up

- Tracking of key clinical, laboratory and imaging parameters
- Advanced quantitative echocardiography serial monitoring (as shown in the image above)
- High resolution CT and/or cardiac MRI, as needed
- Evidence-guided drug therapy
- Alternative medicine therapy
- Exercise therapy and cardiac rehabilitation
- Opportunity for participation in clinical trials
- Access to support groups







# Pediatric and Adult Congenital Heart

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

Developed in collaboration with the Children's Hospital of Pittsburgh, the center's congenital surgical program is a leader in patient volume, surgical outcomes, early extubation and short length of stay. Surgical planning often begins at fetal diagnosis, allaying family anxiety and ensuring that 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), 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
- Tetralogy of Fallot
- 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. The

catheterization laboratory is one of the busiest congenital laboratories in Florida, performing over 500 procedures annually, most of which are interventions. Some procedures include:

- Angioplasty
- Atrial septal defect (ASD) device closure
- Atrial septostomy
- Balloon valvotomy
- Coil embolization
- Patent ductus arteriosus (PDA) device closure, including newborns weighing less than 2kg
- Pulmonary valve insertion (Melody® valve, Sapien valve)
- Stent implantation
- Ventricular septal defect (VSD) device closure
- Electrophysiology studies with/without ablation
- Implantable cardioverter defibrillators (ICD) and pacemakers
- Radiofrequency and cryoablation (often without fluoroscopy)

■ Pediatric cardiac imaging including:

- Echocardiology laboratory:  
The first accredited center for transthoracic, transesophageal and fetal echocardiography in West Central Florida by the Intersocietal Accreditation Commission (IAC)
- Fetal echocardiology
- 3-D echo

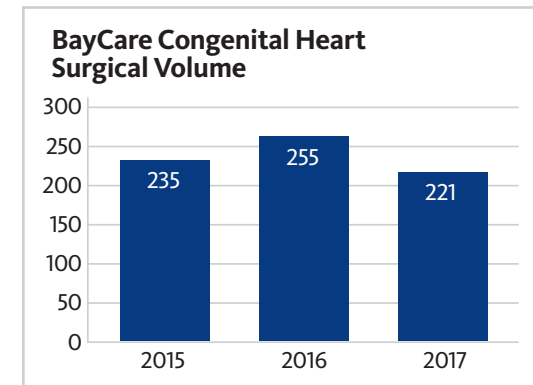
■ Pediatric and adult congenital cardiovascular surgery serving children and adult congenital heart patients. Some offered procedures include:

- 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 including early extubation and pain management that may include more favorable cardiac performance, reduced length of ICU and hospital stay, and a lower rate of ventilator associated respiratory infections. Greater than 60 percent of our congenital heart patients leave the operating room without a breathing tube.

### A Look at Volume

At BayCare, we constantly evaluate our internal data collection processes. Upon review of and improvement to our practices to aggregate data for pediatric and adult congenital heart, we identified additional volume for the previously reported years of 2015 and 2016 and have included that volume below.



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*“Our passion for excellence drives us to provide the best possible care for every child and adult with congenital heart disease.”*

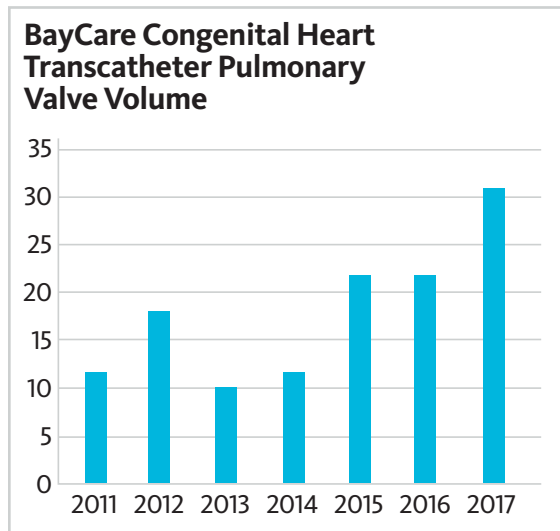
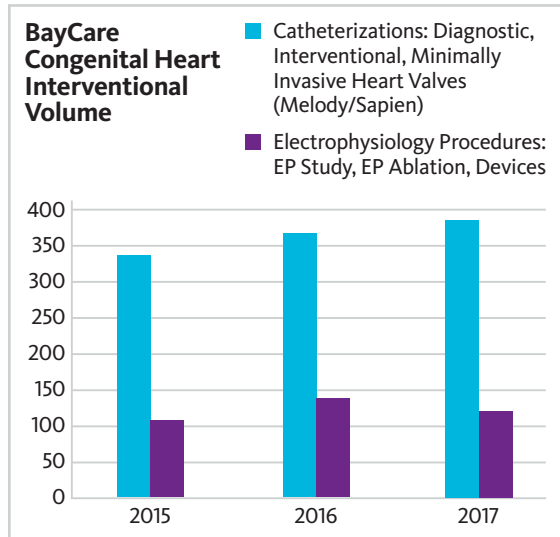
~ Dr. Stephen M. Langley  
*Director, Pediatric and Congenital Heart Surgery  
at St. Joseph's Children's Hospital*

~ Dr. Jeremy M. Ringewald  
*Director, Pediatric Cardiac Catheterization  
Labs at St. Joseph's Children's Hospital*

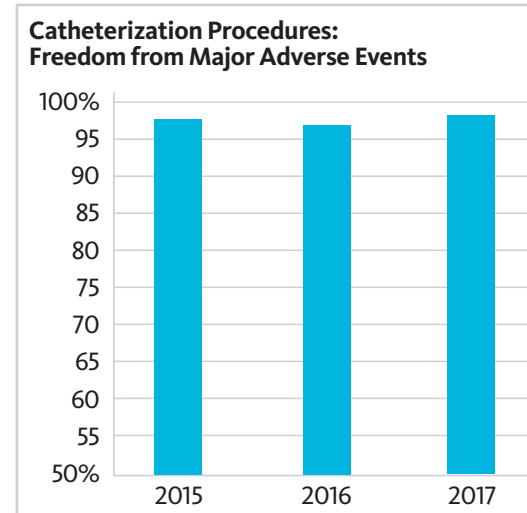
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## A Look at Volume



## A Look at Quality for 2015–17



Major adverse events as defined by IMPACT.

Percent of Operative Mortality by Patient Group		
Patient Group	BayCare	STS Benchmark
STAT 1	0%	0.4%
STAT 2	1.1%	1.6%
STAT 3	2.0%	2.3%
STAT 4	7.6%	6.4%
STAT 5	7.7%	14.6%

Lower percentage is optimal

**What is a STAT group?** 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.

Length of Stay (LOS) by Patient Group		
Patient Group	BayCare	STS Benchmark
STAT 1	3	7
STAT 2	4	21
STAT 3	5	16
STAT 4	10	27
STAT 5	27	45

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

Operative Mortality	
BayCare	STS Benchmark
2.2%	3.0%

Lower percentage is optimal

Percent of Patients Extubated in Operating Room		
Extubated in the OR	BayCare	STS Benchmark
All Patients	64%	24%
Neonates	15%	3%
Infants	53%	16%

Higher percentage is optimal



# 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 who have experienced a

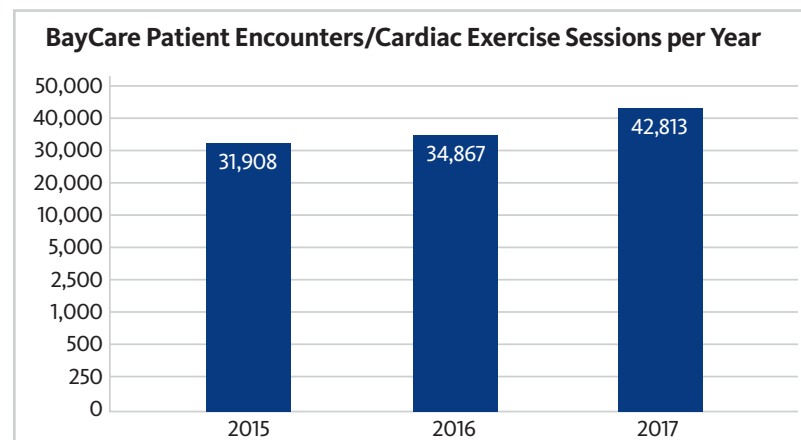
cardiac event. It's recognized as an integral component of the continuum of care for patients with cardiovascular disease.

## 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. Many of our programs are nationally certified by the American Association of Cardiovascular Pulmonary Rehab (AACVPR) and the staff are certified cardiac rehab professionals (CCRP). They 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

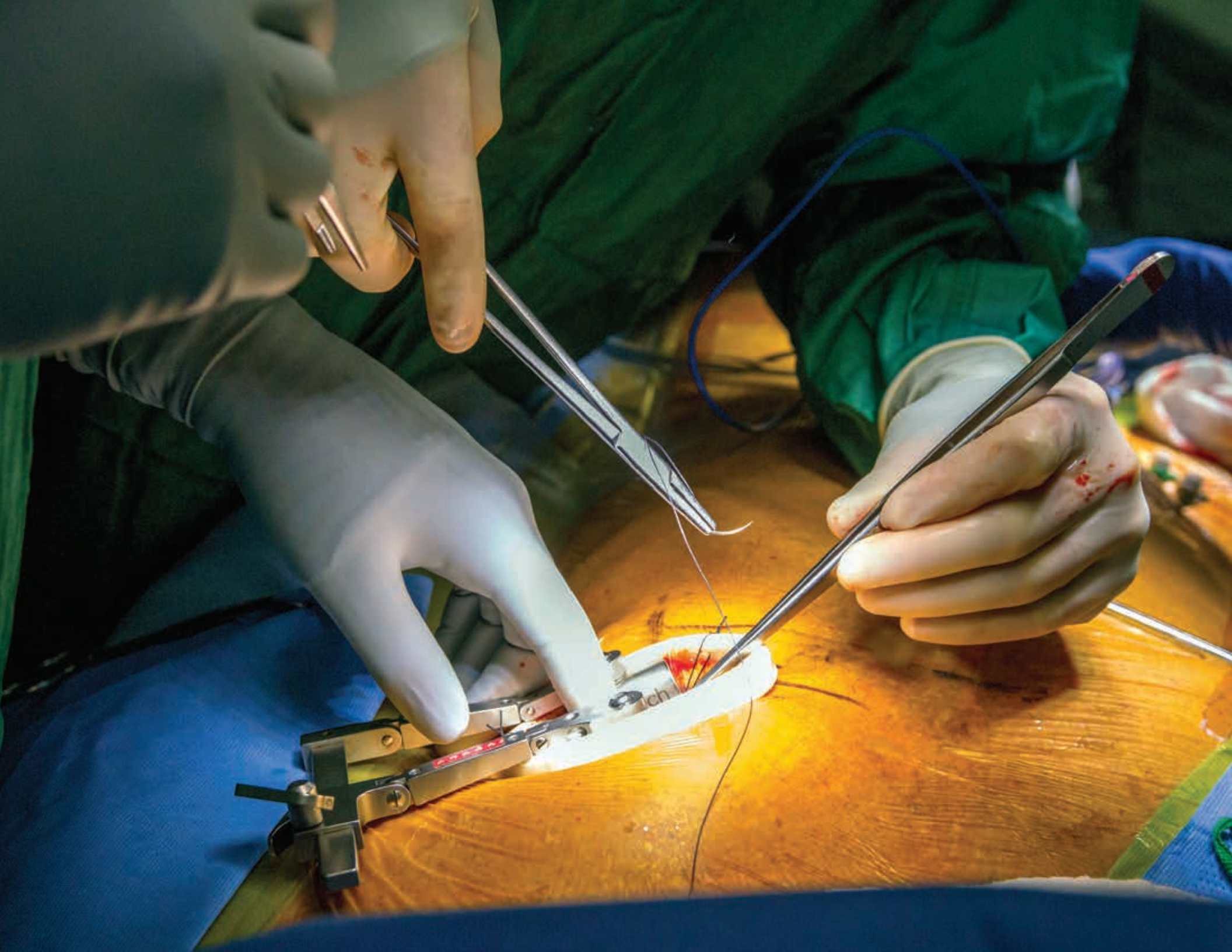


Includes some volumes from programs currently working toward certification

*“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. Kimberly Guy, senior vice president, market leader for Hillsborough and southeast Pasco counties and leader of the cardiovascular service line across BayCare, acknowledges “research is a critical component of improving our community’s cardiovascular health. BayCare’s commitment to advancing new treatments encourages collaboration across clinical care teams and assures our patients have access to the most current treatments.”

“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. The following 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.

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*“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.”*

*~ Dr. Leslie Miller  
Medical Director,  
Heart Function Clinic at  
Morton Plant Hospital*

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





## Transcatheter Mitral Valve Replacement with the Medtronic Intrepid™ TMVR System in Patients with Severe Symptomatic Mitral Regurgitation – APOLLO Trial

*Participating facility: Morton Plant Hospital*

Multicenter, global, prospective, randomized, interventional, pre-market trial. Subjects will be randomized on 1:1 basis to either TMVR with the Medtronic Intrepid™ TMVR System or to conventional mitral valve surgery. Subjects ineligible for randomization may be enrolled through a single-arm trial. Subjects enrolled in the single-arm cohort will be assigned to TMVR with the Medtronic Intrepid™ TMVR System.

## A Randomized Evaluation of the TriGuard HDH Cerebral Embolic Protection Device and the TriGUARD 3 Cerebral Embolic Protection Device to Reduce the Impact of Cerebral Embolic Lesions after Transcatheter Aortic Valve Implantation – The REFLECT Trial

*Participating facility: Morton Plant Hospital*

Prospective, single-blind, three-arm, randomized, (2 device: 1 control), multicenter safety and efficacy trial designed to enroll up to 533 total subjects in two consecutive phases: Phase I enrolled 258 subjects (including 54 roll ins) and utilized TriGuard HDH and Phase II will enroll up to 275 subjects (including 40-50 roll ins) and will utilize the TriGUARD 3.

## Arrhythmia

### AdaptResponse

*Participating facilities: Mease Countryside Hospital and Morton Plant Hospital*

This study is a prospective, randomized, controlled, interventional, single-blinded, multicenter, 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).

### Product Surveillance Registry

*Participating facilities: Mease Countryside Hospital and Morton Plant 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.



**Strategic Management to Optimize Response to Cardiac Resynchronization Therapy SMART CRT**

*Participating facility: Winter Haven Hospital*

This is a prospective, double-blind, multicenter, international, randomized controlled trial. The primary objective is to show the benefit of SmartDelay in patients with a prolonged RV-LV interval.

**STOP AF First**

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

The purpose of the study is to provide data demonstrating the safety and effectiveness of the Arctic Front Advance™ Cardiac CryoAblation Catheter for the treatment of recurrent symptomatic paroxysmal AF, without the requirement that the subjects be drug refractory.

**Percutaneous Coronary Intervention**

**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).

**Eclipse**

*Participating facility: St. Joseph's Hospital*

Evaluation of Treatment Strategies for Severe Calcified Coronary Arteries: Orbital Atherectomy vs. Conventional Angioplasty Technique Prior to Implantation of Drug-Eluting Stents: The ECLIPSE Trial

This is a prospective, randomized one to one (1:1), multicenter trial designed to evaluate vessel preparation with orbital atherectomy (OA) compared to conventional

balloon angioplasty technique prior to stent implantation for the treatment of severely calcified coronary artery lesions.

**Reveal by Rex Revolution™ Peripheral Atherectomy System for Lower Extremity**

*Participating facility: St. Joseph's Hospital*

Peripheral Arterial Revascularization (REVEAL). To evaluate the safety and effectiveness of the Revolution™ Peripheral Atherectomy System in the treatment of infrainguinal lower extremity peripheral arterial occlusive disease.



## Heart Failure

### **CARDIAMP Heart Failure Trial**

*Participating facility: Morton Plant Hospital*

Randomized Controlled Pivotal Trial of Autologous Bone Marrow Cells Using the CardiAMP System in Patients with Post-Myocardial Infarction Heart Failure

### **CONNECT HF**

*Participating facilities: St. Joseph's Hospital and Winter Haven Hospital*

This trial will be a large-scale, pragmatic, cluster-randomized clinical trial to evaluate the effect of two quality improvement (QI) initiatives compared with usual care on heart failure (HF) outcomes and HF quality of care metrics in the year following discharge for participants hospitalized with acute HF and reduced ejection fraction (EF).

### **DREAM-HF/TEVA C41750/3100 Study**

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

### **EMPEROR**

*Participating facility: Mease Countryside Hospital*

A phase III randomized, double-blind trial to evaluate the efficacy and safety of once daily empagliflozin 10mg compared to placebo, in patients with chronic heart failure with reduced ejection fraction (HFrEF) and in patients with preserved ejection fraction (HFpEF).

### **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) vs. 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)  $\leq$  40%).

### **VICTORIA**

*Participating facilities: Mease Countryside Hospital, Morton Plant Hospital and St. Joseph's Hospital*

A Randomized Parallel-Group, Placebo-Controlled, Double-Blind, Event-Driven, Multi-Center Pivotal Phase III Clinical Outcome Trial of Efficacy and Safety of the Oral sGC Stimulator Vericiguat in Subjects with Heart Failure with Reduced Ejection Fraction (HFrEF)—VerICiguaT Global Study in Subjects With Heart Failure With Reduced Ejection Fraction (VICTORIA)

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



## BayCare's cardiovascular and thoracic programs offer:

245+

Cardiovascular  
specialists

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9

Cardiovascular  
operating suites

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9

Electrophysiology  
labs

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2

Hybrid  
operating suites

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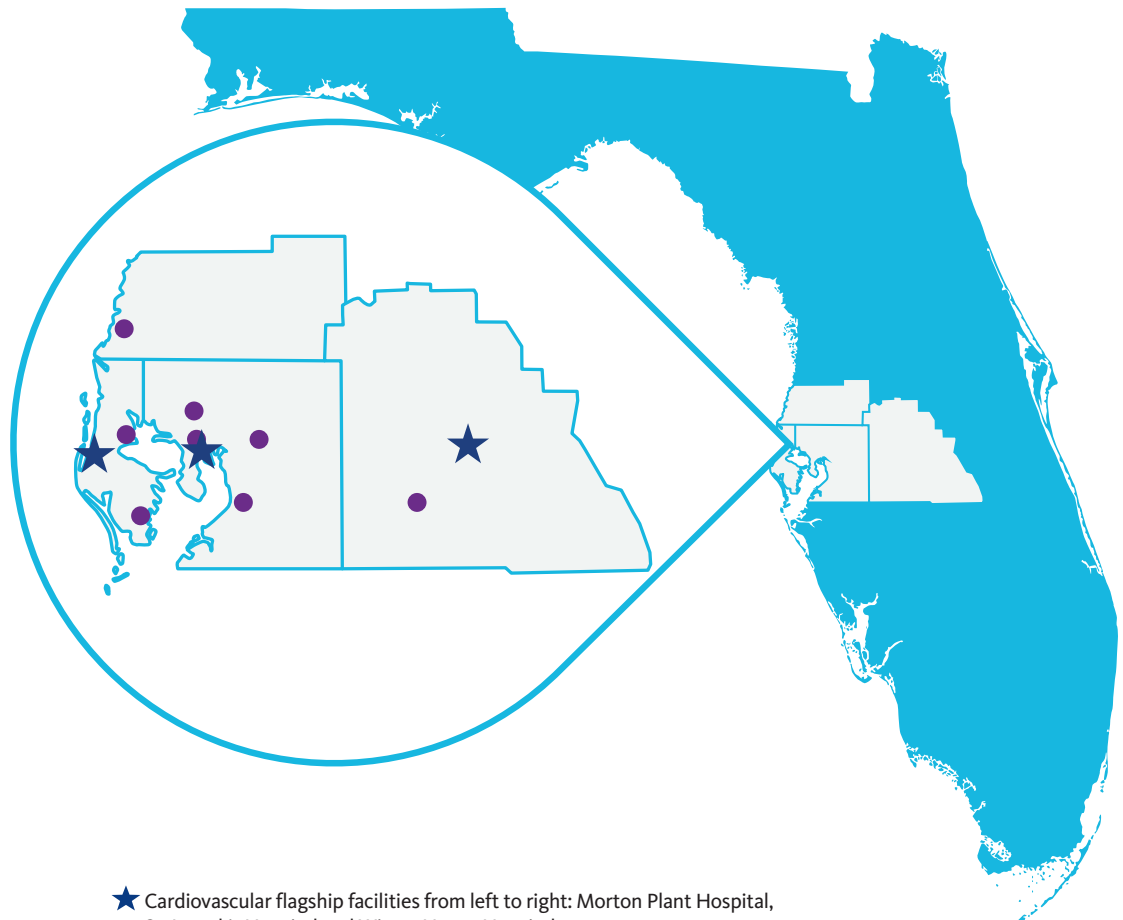


# Our Facilities

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 11 facilities located across Tampa Bay. On the following pages, you'll find a brief description of our different facilities by county.

“As technology advances, physicians have more options available to them to manage patients with complex illnesses. BayCare facilities have embraced the ‘heart team’ concept to provide optimal care to these patients to achieve the best possible outcomes,” according to Dr. Mahesh Amin, medical director, BayCare Cardiovascular Services.

**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. Joseph's Children's Hospital, St. Anthony's Hospital and Mease Countryside 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 the campus of South Florida Baptist Hospital, Plant City and the surrounding communities 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 in both cardiac and interventional radiology in two hybrid cath lab suites. Interventional cardiology services provided

include percutaneous coronary intervention, peripheral angiography and intervention, cardioversions, pacemaker, implantable cardio-defibrillators (ICD) and loop recorder implants. Additionally, South Florida Baptist Hospital is a STEMI receiving facility. Our hybrid approach with a STEMI team and an IR team on call allows us to provide emergent STEMI and pulmonary embolism (PE) responses to give our patients the best possible outcomes. Staffed by expert physicians, the Heart and Vascular Center features a highly trained and experienced team of technologists and nurses dedicated to ensuring the best possible outcomes, top-notch recovery rooms, advanced cardiovascular technology and dedicated waiting areas for the patients' loved ones. The Center also provides an array of diagnostic and interventional services for the treatment of vascular disease, such as peripheral artery and venous disease.

## St. Joseph's Children's Hospital



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

In partnership with the Heart Institute at St. Joseph's Hospital, St. Joseph's Children's Hospital is home to Tampa Bay's only comprehensive congenital heart disease (CHD) center capable of delivering full spectrum care for the CHD patient from conception to late adulthood. St. Joseph's Children's Hospital specializes in diagnosing and treating congenital and acquired heart problems in an innovative and patient-centered environment, and serves as a regional referral center for fetal, pediatric and adult congenital cardiology. The multidisciplinary team of cardiovascular,



intensive care, surgery and anesthesia specialists work in collaboration on all significant patient care decisions for patients of all ages. The CHD center includes one of the busiest congenital cardiac catheterization and electrophysiology labs in the state of Florida that provides a variety of diagnostic and interventional procedures such as angioplasty, pulmonary valve insertion, stent implantations, electrophysiology studies and implantable devices. The CHD center's surgical suites are equipped with the latest technology and staffed with an experienced cardiovascular surgical team for both pediatric and adult patients, and provide surgical intervention for a variety of conditions including arterial switch, complex valve repair and Tetralogy of Fallot.

### **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 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 (AFib) and complex arrhythmia, and a complete suite of offerings to manage implantable cardiac devices. In 2017, the Heart Institute began evaluating patients as part of their advanced heart failure program for VAD destination therapy. In addition to participating in multicenter clinical trials in arrhythmia, the Institute has recently been identified as the leading cryoballoon AFib ablation center in the world and has been designated a leading teaching facility for the convergent hybrid AFib ablation procedure, minimally invasive AFib surgery, as well as advanced 3-D cardiac mapping, hosting visitors internationally. 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 and women's heart disease. Also, understanding the benefits of rehabilitation, St. Joseph's Hospital's cardiopulmonary rehabilitation program is AACVPR accredited. Additional rehab programs are also available for peripheral vascular and ventricular-assist device patients.

### 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 the 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 implants and generator changes, digital loop/event recorder implants, cardioversion and other noninvasive cardiac diagnostic services such as stress testing, echocardiogram and tilt

table studies are also performed on campus. The cardiac catheterization lab at St. Joseph's Hospital-North was one of the first in 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



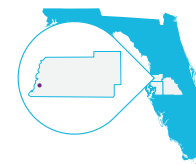
**St. Joseph's Hospital-South**  
6901 Simmons Loop  
Riverview, FL 33578

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

percutaneous coronary intervention (PCI), diagnostic cardiac catheterizations, fractional flow reserve (FFR), intravascular ultrasound (IVUS), defibrillator/pacemaker implants and generator changes, digital loop/event recorder implants, 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**



**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. Mease Countryside Hospital now offers the Philips Azurion therapy platform as part of its cardiac catheterization lab expansion in 2017. This new platform supports the use of facility quality and safety checklists and protocols to enhance patient safety. It also offers high-quality imaging with low-dose radiation and decreased radiation scatter, providing increased safety for patients, treating physicians and staff. Today, the cardiac catheterization laboratory consists of three 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 Tampa Bay, 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 with Impella support for high-risk patients, peripheral angiography, peripheral intervention, carotid angiography and stenting, balloon valvuloplasty, chronic total occlusion and laser therapy.

Morgan Heart Hospital at Morton Plant has three electrophysiology laboratories that offer diagnostic EP studies, ablations and tilt table testing, and Watchman procedures as well as pacemaker, defibrillator and loop recorder implantation. An 18-bed nursing unit provides pre/post-procedural nursing care.

The 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, convergent ablation 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. As of 2017, the physician team had performed nearly 1,000 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



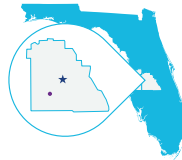
**St. Anthony's Hospital**  
1200 Seventh Ave. N.  
St. Petersburg, FL 33705

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 elective PCI, diagnostic cardiac catheterizations, defibrillator/pacemaker implants and generator changes, 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.



# Cardiovascular Surgery Data Addendum by Facility

BayCare's three flagship facilities have earned distinguished star ratings from the Society of Thoracic Surgeons (STS). St. Joseph's Hospital (SJH) and Winter Haven Hospital (WHH) both earned a three-star rating and Morton Plant Hospital (MPH) earned a two-star rating.

The following is the cardiovascular surgery STS risk-adjusted data by BayCare flagship facility.

Risk-Adjusted Isolated CABG with Permanent Stroke				
	STS Benchmark	MPH	SJH	WHH
2017	1.4%	0.9%	1.5%	0.8%

Risk-Adjusted Operative Mortality for Isolated CABG				
	STS Benchmark	MPH	SJH	WHH
2017	2.3%	3.1%	0.6%	2.6%

Observed Versus Expected Mortality for Isolated CABG				
	STS Benchmark	MPH	SJH	WHH
2017	1.0	1.33	0.25	1.10

*Less than 1.0 is optimal*

Percent of Isolated CABG Patients Extubated in Less Than Six Hours				
	STS Benchmark	MPH	SJH	WHH
2017	54.8%	74.9%	80.0%	83.8%

*Higher percentage is optimal*



Isolated CABG Initial Ventilation Hours (Median)				
	STS Benchmark	MPH	SJH	WHH
2017	5.6	3.6	3.8	3.1

*Fewer hours is optimal*

2017 STS Major Cardiac Procedures Mortality				
	Number of Procedures	Operative Mortality	O:E	STS
Morton Plant Hospital	425	2.4% (NRA) 2.9% (RA)	1.09	1.0
St. Joseph's Hospital	308	1.0% (NRA) 1.3% (RA)	0.49	1.0
Winter Haven Hospital	320	3.4% (NRA) 2.9% (RA)	1.11	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. **NRA** = Non risk-adjusted; **RA** = Risk-adjusted.

Risk-Adjusted Isolated CABG Prolonged Ventilation (Mechanical > 24 Hours)				
	STS Benchmark	MPH	SJH	WHH
2017	7.6%	7.0%	3.9%	2.1%

*Lower percentage is optimal*

Blood Utilization for CABG Surgeries: Represents Intraoperative Blood Use				
	STS Benchmark	MPH	SJH	WHH
2017	26.1%	4.2%	4.9%	19.7%

Blood Utilization for CABG Surgeries: Represents Intraoperative and Postoperative Blood Use				
	STS Benchmark	MPH	SJH	WHH
2017	41.6%	23.8%	25.3%	30.3%

Isolated CABG Internal Mammary Artery Usage				
	STS Benchmark	MPH	SJH	WHH
2017	98.7%	99.6%	100.0%	100.0%

Radial Artery Usage				
	STS Benchmark	MPH	SJH	WHH
2017	5.0%	57.3%	0.4%	0.9%

Bilateral Internal Mammary Artery Usage				
	STS Benchmark	MPH	SJH	WHH
2017	5.1%	14.0%	0.9%	0.4%

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



# 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.

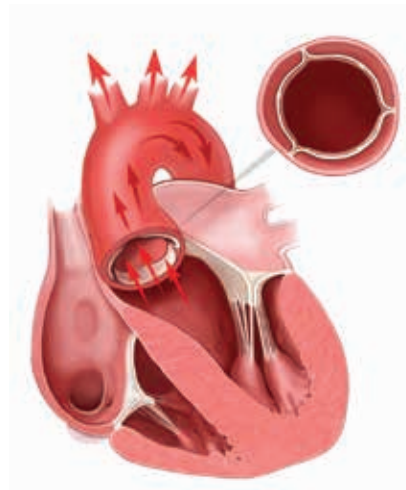
**Congestive heart failure** may be an acute (sudden) or chronic (long-term) problem as a result of a weakened heart muscle. CHF can be a result of multiple causes including but not limited to inadequate blood flow to the heart muscle, valve abnormalities or high blood pressure. Symptoms of CHF include:

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

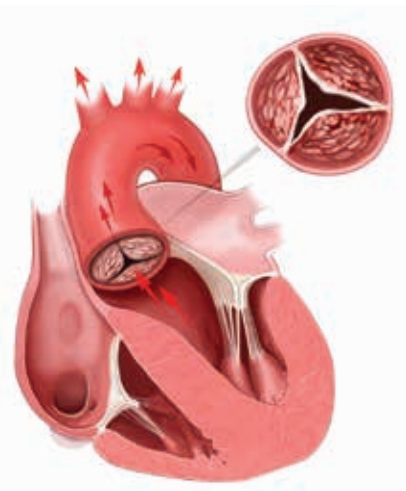
Physicians categorize heart failure into four classes based on a patient's physical symptoms using the New York Heart Association (NYHA) Functional Classification system:

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.

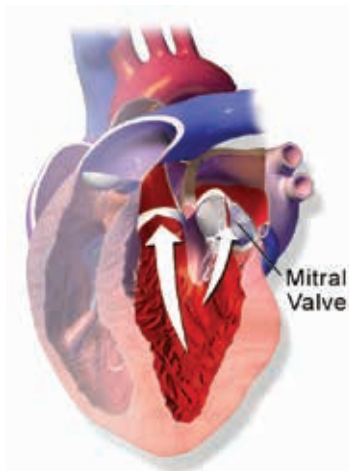
**Aortic stenosis:** Aortic stenosis is a buildup of calcium deposits on the aortic valve.

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's 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.

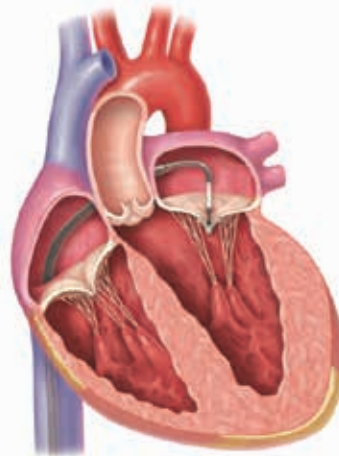
**Balloon valvuloplasty:** Many patients with degenerative valve disease are ineligible for surgery because of their high-risk status (e.g. advanced age, multiple comorbidities or end-stage disease). For these patients with valves that are too tight or restrictive, balloon valvuloplasty may be a viable 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.

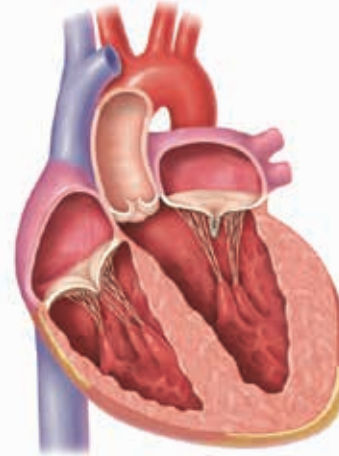
**Left atrial appendage closure:** The left atrial appendage (LAA) is a small pouch in the left atrium. Patients with atrial fibrillation (abnormal heart rhythm) have a high risk of blood clots forming in the LAA. These clots can dislodge and block blood flow to crucial parts of the body, including the brain (stroke). Oral anticoagulation medications may be used to reduce the risk of clots, but these medications aren't 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.



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 don't 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.

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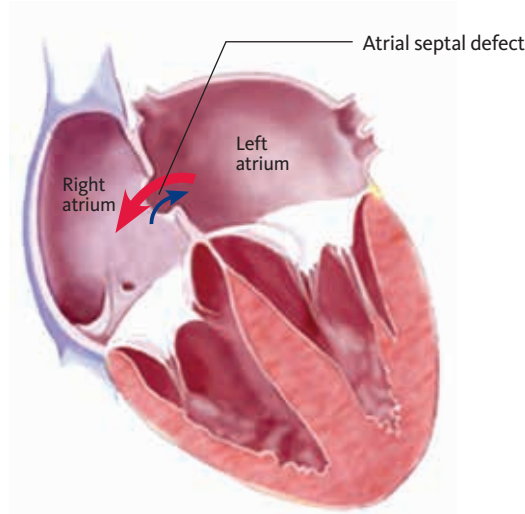
*“Being able to repair a mitral valve versus replacing it gives our patients a great quality of life advantage for years to come. Most mitral valves can be repaired in the hands of the BayCare heart surgeons who have demonstrated a superior track record over many years of experience with these techniques.”*

~ Dr. David Evans  
Director, Cardiac Surgery at  
the Bostick Heart Center  
at Winter Haven Hospital

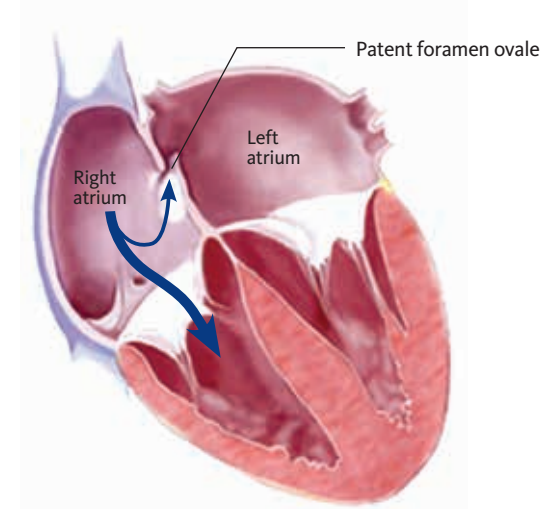
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**Transcatheter aortic valve replacement (TAVR):** Transcatheter aortic valve replacement is a minimally invasive procedure for people with severe aortic stenosis who may be unable to undergo traditional open-heart surgery. BayCare physicians offer 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- and low-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 ovals. During these procedures, a hollow catheter is threaded through a blood vessel and guided to the site of the defect. Once in place, it's 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 (AFib):** 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 AFib myopathy as a result of chronic uncontrolled ventricular rate. AFib 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 select 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 don't require surgery, as the device is delivered through the femoral veins.

**Hybrid AFib ablation:** Patients with advanced AFib benefit from both epicardial and endocardial ablation. BayCare is a center of excellence in managing advanced AFib 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 AFib:** Isolation of the pulmonary veins is the cornerstone of managing paroxysmal AFib 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 have the most cumulative lead extractions in the area. Typical patients who have lead extractions include patients with device-related infections and patients with multiple abandoned 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  
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or facilities: (844) 344-1990**







[BayCareHeart.org](https://www.BayCareHeart.org)

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