

**McLeod Health**

The Choice for Medical Excellence

In affiliation with



**Cleveland Clinic**  
Heart Surgery

2009

Outcomes

Cardiothoracic Surgery

Quality counts when referring patients to hospitals and physicians, so Cleveland Clinic has created a series of outcomes books similar to this one for many of its programs and affiliate programs. Designed for a healthcare provider audience, the outcomes books contain a summary of our surgical and medical trends and approaches, data on patient volume and outcomes, and a review of new technologies and innovations.

Although we are unable to report all outcomes for all treatments provided — omission of outcomes for a particular treatment does not mean we necessarily do not offer that treatment — our goal is to increase outcomes reporting each year. When outcomes for a specific treatment are unavailable, we often report process measures that have documented relationships with improved outcomes. When process measures are unavailable, we report volume measures; a volume/outcome relationship has been demonstrated for many treatments, particularly those involving surgical technique.

Cleveland Clinic also supports transparent public reporting of healthcare quality data and participates in the following public reporting initiatives:

- Joint Commission Performance Measurement Initiative ([www.qualitycheck.org](http://www.qualitycheck.org))
- Centers for Medicare and Medicaid (CMS) Hospital Compare ([www.hospitalcompare.hhs.gov](http://www.hospitalcompare.hhs.gov))
- Leapfrog Group ([www.leapfroggroup.org](http://www.leapfroggroup.org))
- Ohio Department of Health Service Reporting ([www.odh.state.oh.us](http://www.odh.state.oh.us))

Our commitment to providing accurate, timely information about patient care is designed to help patients and referring physicians make informed healthcare decisions. We hope you find these data valuable. To view all our outcomes books, visit Cleveland Clinic's Quality and Patient Safety website at [clevelandclinic.org/quality/outcomes](http://clevelandclinic.org/quality/outcomes).

The Department of Thoracic and Cardiovascular Surgery is pleased to share with you our 2009 *Outcomes* for the Cleveland Clinic/McLeod Regional Medical Center cardiothoracic surgical program.

Together, our cardiothoracic surgeons, cardiologists, cardiac anesthesiologists, cardiovascular radiologists collaborate to provide the highest quality care and service for our patients.

Highlighted in this issue are data detailing the outcomes of this affiliate program and, to the extent that it is possible, how they compare to national benchmarks from The Society of Thoracic Surgeons.

On behalf of both of our institutions, I hope you find this edition of *Outcomes* useful as a reference for the quality of our care and our commitment to patients.



Bruce W. Lytle, MD  
Chairman, Miller Family  
Heart & Vascular Institute



With a focus on meeting the special needs of patients with heart and vascular disease, updates and enhancements to the McLeod Heart and Vascular Institute are currently under way. As part of the McLeod Health vision for growth, cardiovascular services are being brought together on the first floor of McLeod Regional Medical Center. The new center will allow patients and family members to come to an easily recognized area where they can receive diagnostic testing, treatment, and surgery.

The ultimate goal is for a central location, where patients and staff will be able to receive and give care in a streamlined and efficient manner.

Construction will facilitate relocation of the cardiac day hospital, currently on the third floor of the McLeod Tower, into the main section of the Heart and Vascular Institute, which will have 20 pre-operative rooms, five post-op rooms, five rooms that can be used for patients before or after surgery, two isolation rooms, 13 procedure rooms, two ultrasound rooms, and a work area for electrocardiogram.

Relocation of the cardiac day hospital will bring this function adjacent to the cardiac surgery suites, cardiac catheterization labs, CVICU, and other cardiac services, for more efficient operations and improved patient care.



McLeod Health is honored to be among health care leaders and learners who are committed to improving care for patients. Our remarkable accomplishments in quality at McLeod can directly be credited to the exceptional skill and leadership of our medical staff and health care teams.

This work, driven by our mission, is founded on three principles -- the Quality of Safety, the Quality of Science and the Quality of Service. The results have been meaningful and have demonstrated outstanding achievements in raising the bar for patient care at McLeod.

For more than a decade, the efforts have been formalized, using physician-led teams with staff from every level of the organization all striving to continually improve Clinical Effectiveness, a physician-led, evidence-based, data-driven process that takes the best information and practices that the medical literature has to offer and applies that information to the local health care setting.

Each day, patients are trusting us with their lives, trusting us to do the right thing at the right time. We've put a lot of time and effort into looking at the way in which we do our work to be sure that we're delivering a quality product. We have accomplished this with the clinical effectiveness focus in diagnosis, treatment or surgery and recovery. Using the data, we continue to identify where our opportunities for improvement exist and focus on refining our care to be the best that it can possibly be for the patients we serve.

McLeod compares the outcomes of care for the patients we serve to national and international best practices and is committed to identifying any and all opportunities for improvement. We then establish a physician-led team to lead the clinical improvement work, because the expertise of our physicians and their specialties are the primary drivers of the health care that is being provided. They review the evidence of best practices and create a method to make the improvements at McLeod.

This journey to medical excellence reflects a dedication to improvements in efficiencies and outcomes in all major services, including the McLeod Heart and Vascular Institute. Advancements in heart care have also been strengthened with a world class affiliation between McLeod Health and the Cleveland Clinic in 2008.

We are extremely grateful for our physician and staff leadership, and their focus on innovation in quality and safety in patient care which underscores tireless efforts to advance medical services provided to our community.



Quality is one of our McLeod Core Values and we strive daily to pursue excellence in care and service for our patients.

Donna Isgett, Senior Vice President  
Quality and Safety  
McLeod Health

# McLeod Heart and Vascular Institute

## Excellence in Cardiac Care

The McLeod Heart and Vascular Institute Cardiothoracic Surgical Program is the leader in heart valve surgery, redo surgery, and the surgical treatment for lung cancer; setting the standard of care for the region. The Heart and Vascular Team reflects a multi-specialty collaboration and a strong nursing commitment in cardiac care.

- Dedicated open heart and vascular surgical suites for both elective and emergent care, cardiac catheterization rooms equipped with state-of-the-art digital cardiovascular imaging system and one dedicated lab for electrophysiology studies
- Seventeen Cardiologists, an Electrophysiologist and a Pediatric Cardiologist Subspecialist
- Cardiovascular Intensive Care Unit for open heart and vascular surgical patients
- Coronary Care Unit comprised of 65 nurses and technicians with extensive training and expertise in cardiac care
- Dedicated Cardiovascular Day Hospital and Recovery Unit for pre and post operative cardiac surgical patients
- Highly specialized diagnostic tools that include echocardiography, nuclear cardiology, MRI, PET, and CT scans
- Only area hospital to use hypothermia therapy, a procedure that lowers the body's temperature to prevent brain damage after cardiac arrest
- Chest Pain Center staffed 24 hours a day, seven days a week by experienced healthcare professionals trained in recognizing and treating a heart attack
- Seventy-three minute average "Door to Balloon Time" for emergent cardiac catheterization patients, seventeen minutes below standard of care
- Four-phase cardiac rehabilitation program, which begins when the patient is still in the hospital, that helps patients resume active, productive lifestyles
- HeartReach Mobile Cardiac Unit, a coronary care unit on wheels providing cardiac intensive care during emergency hospital to hospital patient transfers
- Growth and expansion plans for the Heart & Vascular Institute are part of the McLeod Vision 2012 project
- Accommodations for family members of patients from outside the area at the McLeod Guest House
- Ease of access for transfers, admissions and physician to physician referrals through the Physician Access Center
- A 100,000-square-foot, medically supervised Health and Fitness Center providing the highest quality and professionally managed programs in fitness and health education in the area

## what's inside

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# Overview



2009

Total Volume 503  
Total Cardiac Cases 316

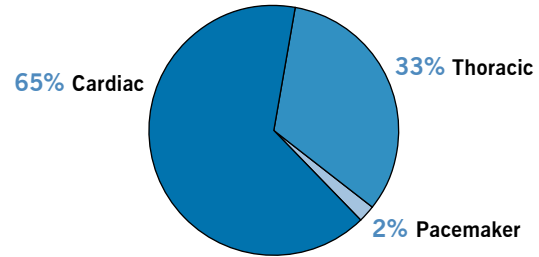
McLeod Health, a regional presence and predominant healthcare organization, is dedicated to patients and their families. Founded in 1906, McLeod is a locally owned, not-for-profit institution which features the strength of more than 350 physicians on the medical staff and more than 1,400 nurses, in addition to modern facilities; premier technology; and a dedication to improving the health of the communities it serves. McLeod Health is one of the largest employers in the region, composed of more than 4,600 employees and approximately 30 medical practices. The McLeod respected acute-care facilities, McLeod Medical Center Darlington and McLeod Medical Center Dillon, gives McLeod greater flexibility in providing care to the nearly half a million patients who come from outside of Florence.



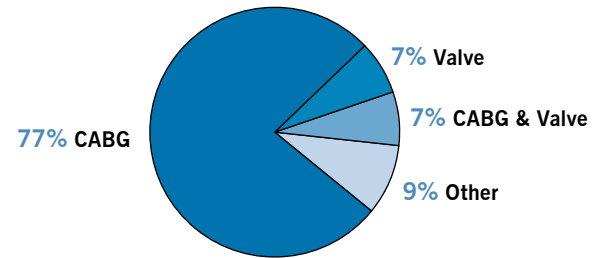
Dr. Jamie Holland

Outcomes 2009

## 2009 Case Distribution



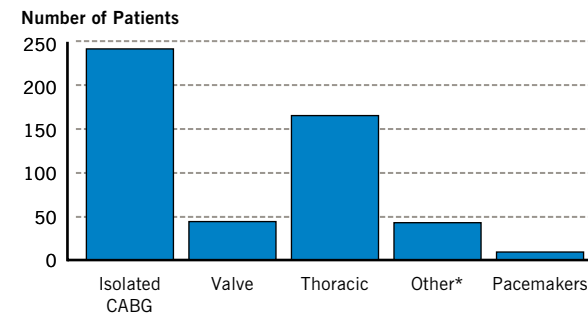
## Cardiac Case Distribution



Isolated coronary artery bypass grafting (CABG) operations accounted for 77 percent of cardiac procedures in 2009. Valve and other procedures represented the remaining 23 percent.

## Surgical Experience

In 2009, Cleveland Clinic cardiothoracic surgeons at McLeod Regional Medical Center performed a total of 503 procedures.



Data represents the work of the cardiothoracic surgeons

\*Other includes: Vascular, and any procedures with Maze and/or multiple valves

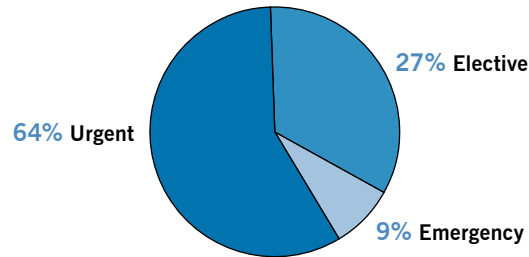
Thoracic and Cardiovascular Surgery



Dr. Gregory Jones

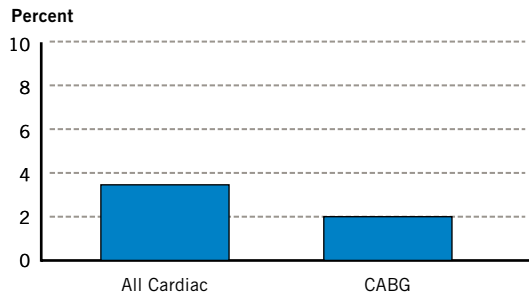
## Status of Cardiac Cases

In 2009, 9 percent of cardiac procedures were emergencies.



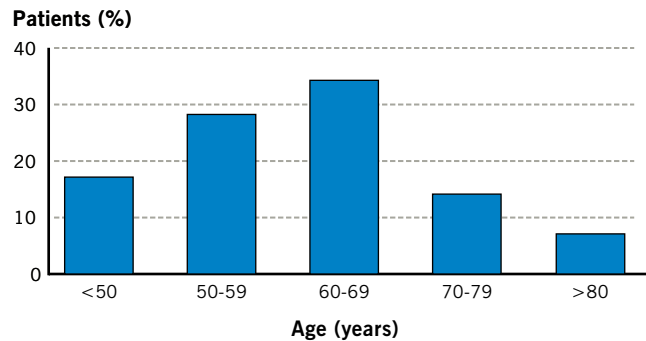
## Mortality

In 2009, operative mortality for isolated revascularization procedures was 2.0 percent.



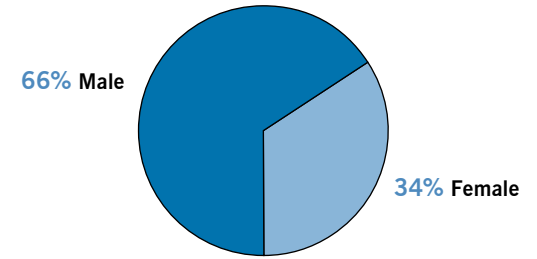
## Age Distribution

McLeod Regional Medical Center treats a large number of patients over the age of sixty. Advanced age and associated medical conditions are known risk factors that can adversely affect cardiac surgical outcomes.



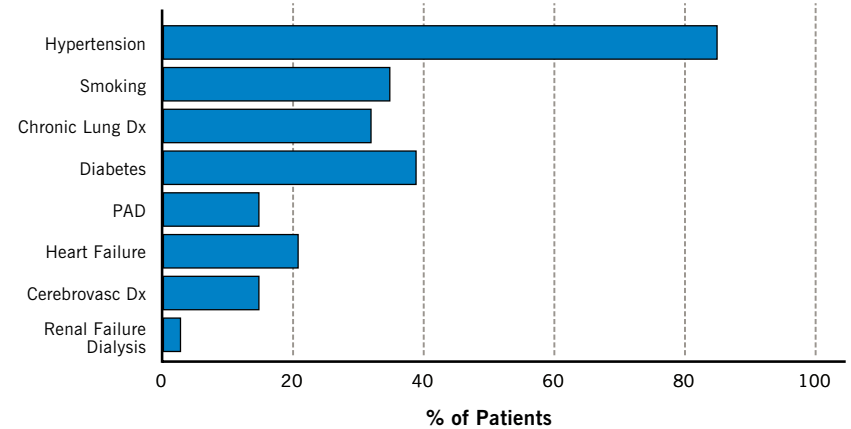
## Gender

In 2009, 66 percent of our patients were male and 34 percent were female.



## Risk Factors

Although advanced age and female gender are known risk factors affecting outcomes, other factors may also have an adverse effect. Our patients' risk factors are shown below.

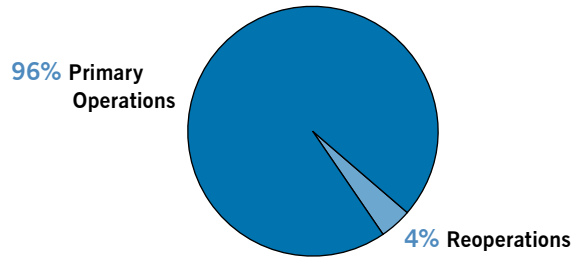


Thoracic and Cardiovascular Surgery

Dr. Gregory Jones

# Coronary Bypass Surgery

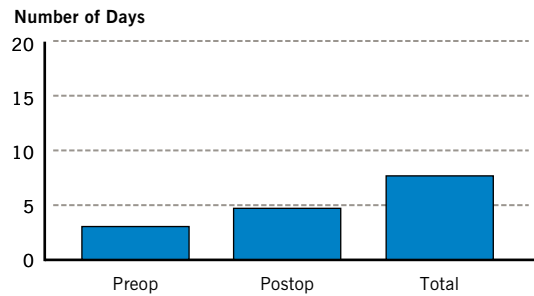
## Incidence



In 2009, 96 percent of isolated revascularization procedures were primary or first-time operations.

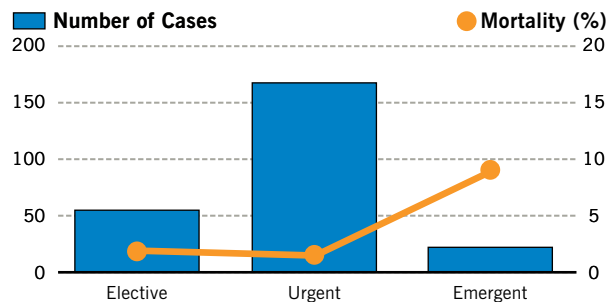
## Length of Stay

In 2009, the average post-operative length of stay following isolated CABG was 4.7 days.



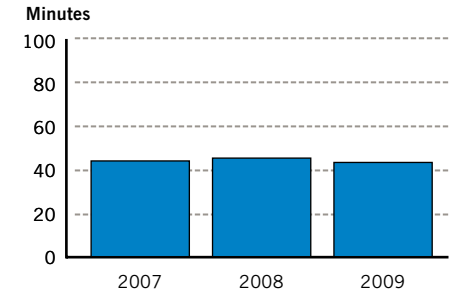
## Mortality Distribution by Operative Status

In 2009, operative mortality for urgent isolated revascularization procedures was 1.2 percent.



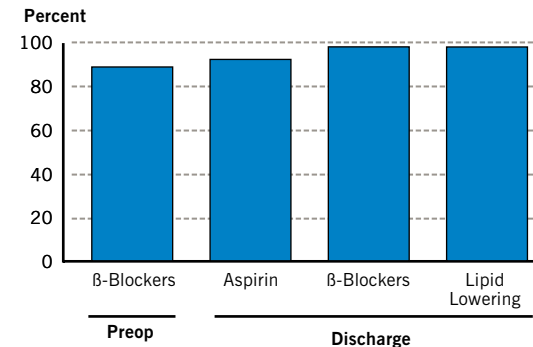
## Aortic Clamp Time (minutes)

During on-pump coronary bypass surgery, aortic clamp time is the amount of time the heart is stopped. Aortic clamp times at McLeod Regional Medical Center are well below the Society of Thoracic Surgeons' (STS) benchmark.



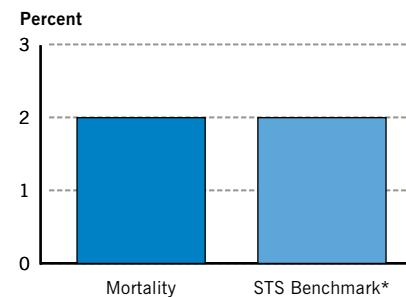
## Perioperative Medications

The National Quality Forum has developed a set of standardized cardiac surgery performance indicators to measure quality of care. At McLeod Regional Medical Center, compliance with discharge medication recommendations is above 92 percent in eligible cases.



\*Source: STS period July 2008 - June 2009

## CABG Mortality



McLeod Regional Medical Center had a 2.0 percent operative mortality for isolated revascularization procedures in 2009. The Society of Thoracic Surgeons' (STS) benchmark is 2.0 percent.

\*Source: STS period ending 6/30/09

98 percent of all cardiac surgical patients rated their level of safety while in the hospital as excellent, very good or good\*.

\*based on Professional Research Consultants patient satisfaction surveys conducted 11/08-10/09



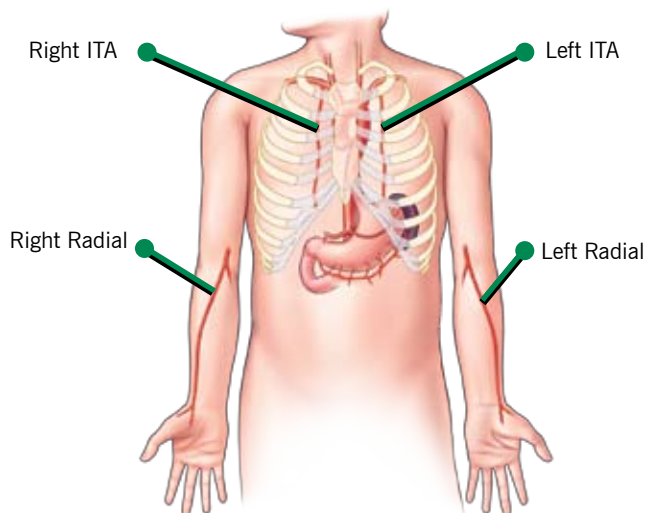
# Coronary Bypass Surgery

97.1 percent of all cardiac surgical patients rated their quality of care while in the hospital as excellent, very good or good\*.

\*based on Professional Research Consultants patient satisfaction surveys conducted 11/08-10/09

## Arterial Grafts

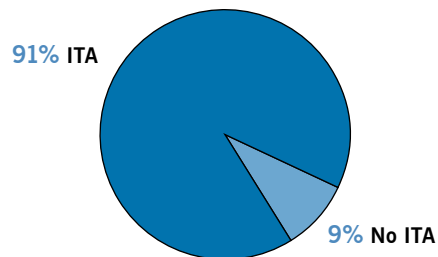
Arterial grafts are known for their excellent long-term patency and are the conduits of choice for coronary revascularization.



Key: ITA = Internal Thoracic Artery

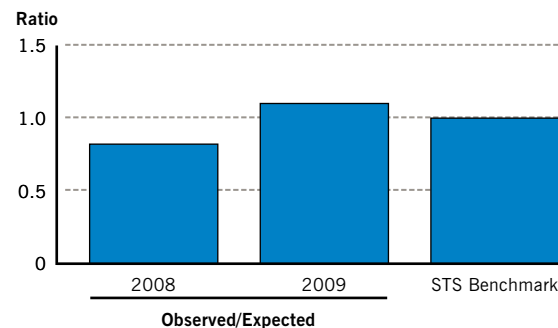
## Arterial Graft Usage

In 2009, 91 percent of primary isolated revascularization patients received at least one internal thoracic artery graft.



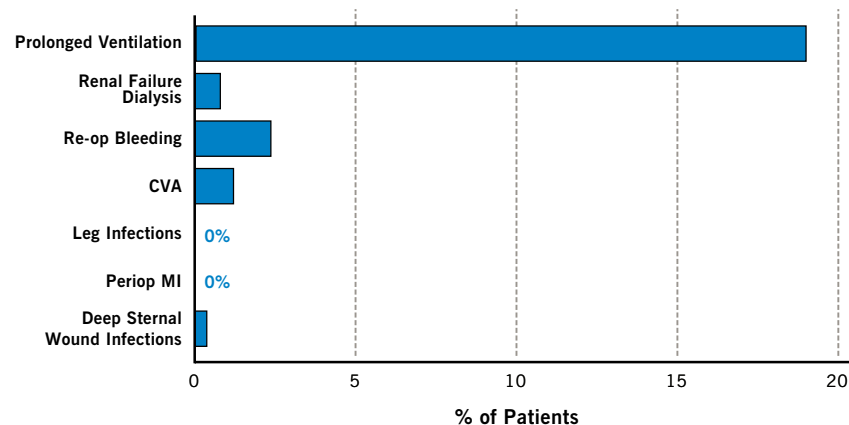
## Observed to Expected Mortality Ratio

The STS algorithm for predicted risk of mortality counts hospital deaths and deaths occurring after discharge but within 30 days. Our program's observed to expected mortality ratio is 1.1.



## Postoperative Complications

In 2009, there were no infections or perioperative myocardial infarctions after isolated revascularization procedures. Over 80 percent of our patients were on a ventilator for less than 24 hours.



# Valve Surgery

## Expertise in Mitral Valve Repair at McLeod

A young 26-year-old is not the typical candidate for heart disease. For Crystal Wilson of Florence, her congenital heart disease was discovered at age thirteen.

Her condition, a defective mitral valve, was monitored by McLeod Pediatric Cardiologist Dr. Charles Trant throughout her teenage years.

As a young adult, her care was then transferred to Cardiologist Dr. Evans Holland, Pee Dee Cardiology Associates, who determined that the damage to Crystal's valve had reached a point that surgical intervention was necessary. Dr. Holland referred Crystal to Dr. Jamie Holland, a cardiothoracic surgeon with McLeod Cardiothoracic Surgical Associates.

"A review of Crystal's echocardiogram demonstrated to me that she had severe mitral regurgitation," said Dr. Holland. "Surgery was necessary. When a valve leaks, blood can flow back into the lungs. This condition leaves you fatigued or short of breath.

"In most cases, the mitral valve becomes abnormal with age and will no longer properly close. Occasionally, as in Crystal's case, the mitral valve is abnormal from birth," explained Dr. Holland.

"Dr. Holland informed me that he wouldn't know until surgery whether he would be able to repair my valve or find it was so damaged it would need to be replaced," said Crystal.

"Crystal is so young," said Dr. Holland. "My hope was that I would be able to repair her valve. A man-made valve for Crystal would require her to take blood thinning medication and more than likely necessitate another replacement surgery in the next ten years.

**"When possible, our focus at McLeod is most often on repairing rather than replacing a patient's mitral valve. For those patients whose valve is not suitable for repair, surgical replacement with a man-made valve is an option. My experience in valve repair gives me a unique perspective on replacement. When valve replacement is necessary, I incorporate valve repair techniques in the replacement procedure to ensure the preservation of heart function,"** added Dr. Holland.

Crystal underwent a successful valve repair surgery performed by Dr. Jamie Holland. Two days later, Crystal was discharged.

"Dr. Holland explained that recovery would be more rapid since I was so young," said Crystal.

"He was right. The nurses from McLeod Home Health, who came in weekly to change my dressings, were amazed at how quickly I was up and walking around."

"I now have a two-inch scar on my chest from the open heart surgery, but it is worth it. When Dr. Holland originally said the word 'surgery' to me, it scared me as it would anyone. But, my family and I prayed about it and knew it was the right decision. The love of my family helped me get through this experience," said Crystal.

"Ultimately, my mom was the one that really surprised me. She was the strongest person through this whole ordeal. Dr. Holland won her over from the start. She had all the confidence in his capabilities to take care of me.

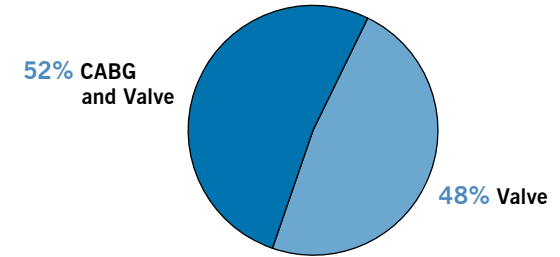
"Dr. Holland's nurse, Emily Blackburn told me that once I had this surgery I would feel like a brand new person. What Emily said was true. I have more energy now than I can ever remember having," added Crystal.

Crystal Wilson

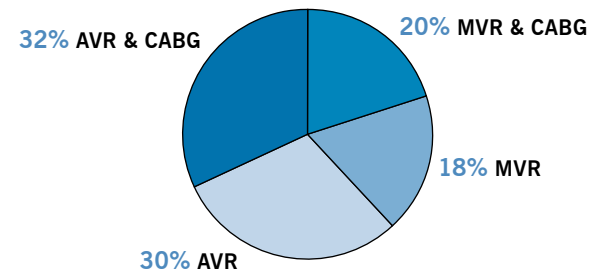


## Valve Volume

In 2009, 52 percent of the valve procedures were in combination with coronary surgery at McLeod Regional Medical Center.



## Distribution of Valve Procedures

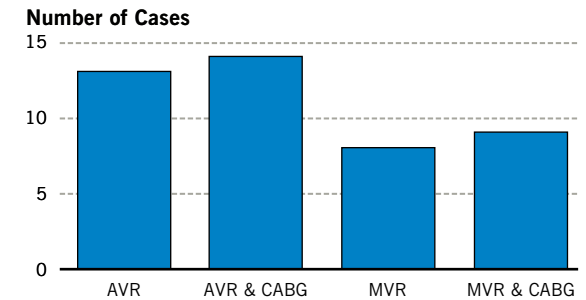


In 2009, 62 percent of valve procedures were AVR and AVR & CABG.

Key: MVR = Mitral Valve Repair/Replacement  
AVR = Aortic Valve Replacement  
CABG = Coronary Artery Bypass Grafting

## Valve Surgery

There were 44 valve procedures in 2009 at McLeod Regional Medical Center.



## Mitral Valve Repair with Annuloplasty Ring

Cleveland Clinic research has shown that mitral valve repair is durable and has a long-term survival advantage compared with valve replacement.

The affiliation between the Cleveland Clinic Department of Thoracic and Cardiovascular Surgery and McLeod Heart and Vascular Institute enhance opportunities to provide **new treatments and therapies** to patients as well as to accelerate **mutual accomplishments** in cardiac care. The following pages highlight some of the **latest innovations** being investigated at the **Miller Family Heart and Vascular Institute** at Cleveland Clinic's main campus.



## Heart Assist Devices

Cleveland Clinic has nearly 20 years of experience with mechanical circulatory support (MCS) devices. In 2009, our surgeons implanted 80 MCS devices, including 67 left ventricular assist devices (LVADs), three total artificial hearts and eight right ventricular assist devices (RVADs) with an LVAD. Temporary RVAD support was used in 4 of the eight RVADs. Access to multiple devices allows us to choose the specific support for each patient's individual needs.

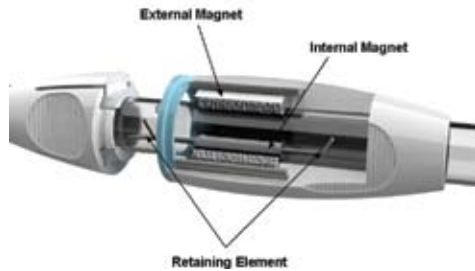
Cleveland Clinic surgeons placed a total of 68 HeartMate IIs in 2009. This device is now approved by the FDA for bridge to transplant (BTT), destination therapy (DT).



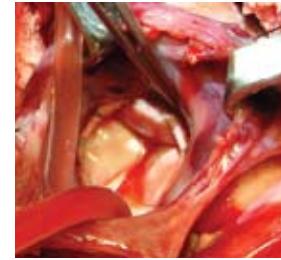
Cleveland Clinic is one of only two health care organizations in Ohio to have Advanced Ventricular Assist Device (VAD) Certification from the Joint Commission, a distinction Cleveland Clinic has maintained since 2008.

## PleuraFlow Active Tube Clearance System

Cleveland Clinic researchers have helped develop the PleuraFlow Active Tube Clearance System — a chest tube drainage system to help improve outcomes and comfort among patients who undergo heart, lung and trauma surgery. These collaborative advancements in technology help improve safety when managing post-surgical bleeding and clogging. In studies at Cleveland Clinic, this new design was associated with statistically significant reductions in retained hemothorax and far superior drainage compared with standard tubes. The studies also demonstrated that the proprietary clearance mechanism in the new small-diameter tube provided improved flow versus the larger-diameter standard tubes. This new chest tube drainage system received the European Association for Cardio-Thoracic Surgery (EACTS) Techno-College Innovation Award. The award was established by EACTS to recognize important technological breakthroughs related to thoracic and cardiovascular surgery.



## Transcatheter Mitral Valve Delivery System



Cleveland Clinic researchers continue to study a novel valve stent and delivery system for mitral valve replacement that provides a secure attachment to the valve annulus without the use of sutures. The valve stent, which is delivered in a nonsurgical procedure through a cannula-based delivery system, has “wings” that attach firmly to both sides of the valve annulus when the stent is expanded and hold the new valve in place.

## Hybrid Procedures and Interventional Cardiology Aided by Advanced Imaging Technology

Cleveland Clinic recently added the Siemens Healthcare's Artiz zeego® interventional imaging system to several ORs to allow physicians precise positioning, better patient access, and improved visualization during interventional cardiology and hybrid procedures. Cleveland Clinic is one of only 15 hospitals in the United States currently using this system for interventional applications.



## Dr. Gregory H. Jones



**Surgeon,** Thoracic and Cardiovascular Surgery, McLeod Regional Medical Center, a Cleveland Clinic Cardiothoracic Surgery Affiliate Program.

**Specialties:** Cardiovascular procedures, non-invasive and invasive thoracic procedures.

**Medical Degree:** Medical College of Georgia, Augusta, GA

**Board Certifications:** American Board of Thoracic Surgery

**Residency:** University of Texas Southwestern Medical School, Dallas Cardiothoracic Surgery Residency, University of Texas Southwestern Medical School, Dallas

## Dr. Jamie Holland



**Surgeon,** Thoracic and Cardiovascular Surgery, McLeod Regional Medical Center, a Cleveland Clinic Cardiothoracic Surgery Affiliate Program.

**Specialties:** Mitral valve repair and replacement, reconstructive surgery of the aorta, complex heart disease including heart failure and reoperative heart surgery.

**Medical Degree:** Indiana University School of Medicine, Indianapolis, IN

**Special Training:** National Heart, Lung & Blood Institute, National Institute of Health, Bethesda, MD

**Board Certifications:** American Board of Surgery, American Board of Thoracic Surgery

**Residency:** Albany Medical Center, Albany, NY; Cardiothoracic Surgery Residency, University of Miami, Miami, FL

## McLeod Heart & Vascular Institute

[www.McLeodCardiac.org](http://www.McLeodCardiac.org)  
[www.Facebook.com/McLeodCardiac](https://www.facebook.com/McLeodCardiac)

**1-877-777-5330**

**843-777-5330**

## McLeod Cardiothoracic Surgical Associates

305 E Cheves St, Suite 270  
 Florence, SC 29506

**843-664-0220**

This is the cardiothoracic surgeons' office. Office support personnel will help expedite requests for surgical consults.

## Cardiovascular Surgery Nurse Liaison

**Emily Blackburn**

**Cell: 843-601-3007**

**Office: 843-777-2134**

**[eblackburn@mcleodhealth.org](mailto:eblackburn@mcleodhealth.org)**

The Cardiovascular Surgery Nurse Liaison supports and assists physicians, patients and their family in all aspects of cardiac surgical care. Referring physicians may contact the Cardiovascular Surgery Nurse Liaison for assistance in communication with surgeons during OR cases.

## McLeod Physician Access Center

**1-800-877-6762**

Physicians may call this number for the scheduling of hospital transfers, admissions to McLeod Regional Medical Center, physician to physician referrals and assistance in contacting on-call physicians.

## HeartReach

**1-800-877-6762**

The HeartReach Mobile Cardiac Unit is a Coronary Care Unit on wheels that provides cardiac intensive care during emergency transport services, for hospital to hospital transfer, throughout the region.

Arrangements can be made to dispatch HeartReach by calling the McLeod Physician Access Center.

## Cleveland Clinic Main Campus

[www.clevelandclinic.org/heartcenter](http://www.clevelandclinic.org/heartcenter)

Bruce W. Lytle, M.D., Chairman, Heart & Vascular Institute

Joseph F. Sabik III, M.D., Chairman, Thoracic & Cardiovascular Surgery

Eugene H. Blackstone, M.D.

A. Marc Gillinov, M.D.

Gonzalo Gonzalez-Stawinski, M.D.

Douglas Johnston, M.D.

David P. Mason, M.D.

Tomislav Mihaljevic, M.D.

Kenneth McCurry, M.D.

Sudish C. Murthy, M.D., Ph.D.

José L. Navia, M.D.

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Lars G. Svensson, M.D., Ph.D.

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**[www.clevelandclinic.org/heartcenter](http://www.clevelandclinic.org/heartcenter)**

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