

CARDIAC SURGERY CLINICAL ACTIVITY REPORT

LANKENAU HEART INSTITUTE



Lankenau Heart Institute
Main Line Health®

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THE LIFE YOU
LIVE FOR OTHERS
IS A LIFE
NOT LIVED IN VAIN.

— JOHN D. LANKENAU



DEAR COLLEAGUES:

I am pleased to present the first clinical activity report from Lankenau Heart Institute's division of cardiac surgery. This report highlights the depth and breadth of surgical services available through Lankenau Heart Institute—Main Line Health's comprehensive cardiovascular medicine and surgery program.

Lankenau Heart Institute was established in the Fall of 2013 with the goal of offering a unified system of cardiovascular care to better serve communities in the Philadelphia area. The Institute combines the cardiovascular expertise at Main Line Health's acute care hospitals—Lankenau Medical Center, Bryn Mawr Hospital, Paoli Hospital, and Riddle Hospital—with that of a dedicated team of community-based cardiovascular specialists to ensure seamless patient care and a level of quality and service that is unprecedented in the region.

In the realm of cardiac surgery, Lankenau Heart Institute is proud to uphold the reputation for excellence, innovation, and research in cardiac surgical care earned over the past 50 years by Lankenau Medical Center—its namesake. Lankenau Medical Center is ranked fifth in Pennsylvania and second in the region for overall heart surgery volume and remains one of the most active medical centers performing coronary artery bypass graft (CABG) procedures.*

Lankenau Medical Center serves as the main hub for complex, minimally invasive, and robotic surgical procedures offered through Lankenau Heart Institute. The combined experience of its physicians

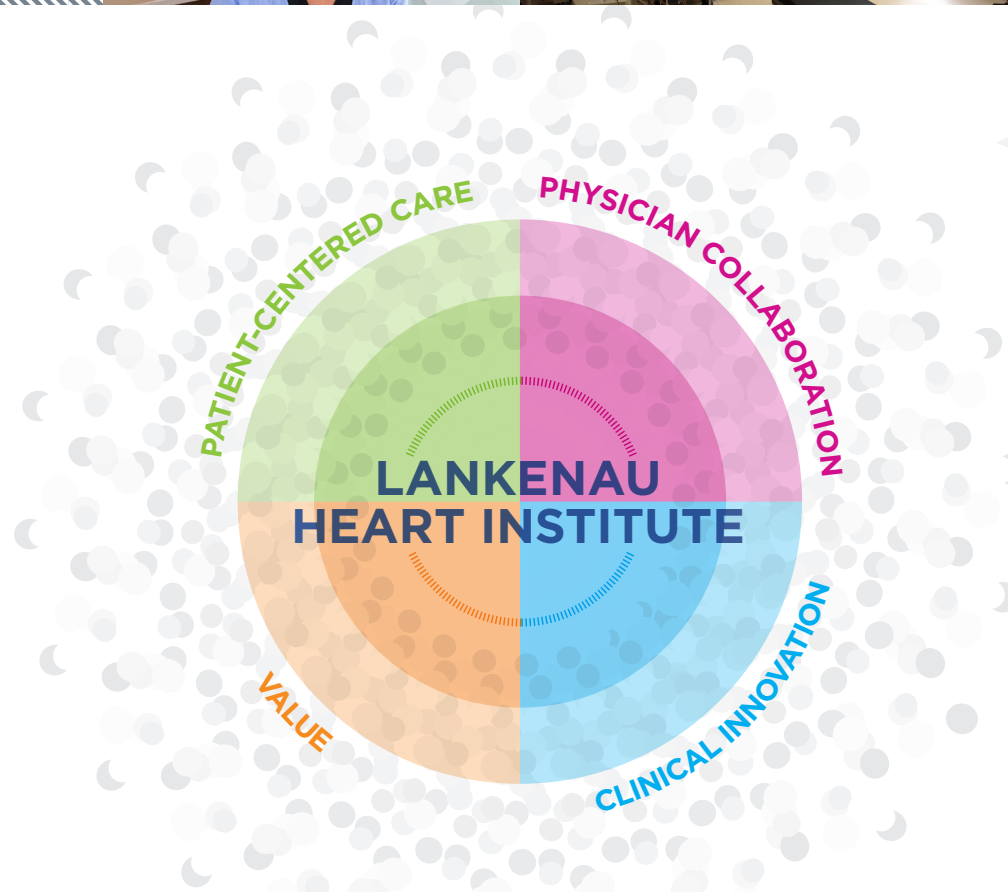
and its commitment to providing the highest quality personalized heart care make Lankenau Medical Center a primary point of referral for patients seeking treatment for coronary artery disease and structural heart disorders, particularly minimally invasive approaches to coronary revascularization and valve repair or replacement and transcatheter therapies.

In 2014, a comprehensive Aortic Wellness Program was established at Lankenau Medical Center, expanding Lankenau Heart Institute's advanced cardiovascular care offerings to surgical and endovascular procedures for the treatment of complex aortic disease. This year, leading-edge treatment options for heart failure will be offered as part of a new Destination Therapy Program at Lankenau Medical Center.

On behalf of my dedicated colleagues at Lankenau Heart Institute, I hope that you find this report an informative and useful overview of our capabilities in cardiac surgery. It is an honor to serve you and your patients, and we look forward to continuing to earn your trust.

Sincerely,

Konstadinos A. Plestis, MD
System Chief, Cardiothoracic and Vascular Surgery
Lankenau Heart Institute
Main Line Health



At Lankenau Heart Institute, every day we dedicate ourselves to four core principles — patient-centered care, physician collaboration, unyielding commitment to value, and leadership in clinical innovation.

Lankenau Heart Institute is one of the top-performing cardiovascular medical and surgical programs in the country.

The physicians and clinical staff of Lankenau Heart Institute provide the spectrum of cardiovascular care—from prevention through diagnosis, treatment, and long-term management of cardiovascular disease. Physicians pair time-honored clinical approaches with the latest preventive, diagnostic, medical, and surgical interventions.

*Pennsylvania Health Care Cost Containment Council (PHC4) November 2013, coronary artery bypass graft (CABG) surgery and/or heart valve surgery between July 1, 2011, and December 31, 2012.

THE HEART PAVILION

at Lankenau Medical Center

The Heart Pavilion represents the culmination of more than 150 years of superior patient care.

In August 2013, Lankenau Medical Center opened the state-of-the-art, five-story Heart Pavilion—the largest expansion project in Lankenau's history. Construction of this advanced concept facility solidified Main Line Health's commitment to meeting the region's diverse cardiovascular needs.

Everything about the Heart Pavilion—from the patient rooms to the public spaces—is designed to maximize healing.

- Each patient room features a generous space to welcome the supportive presence of family and other loved ones.
- Inpatient floors are designed for visual and acoustic comfort, from dimmed evening hallway lighting to quiet rubber flooring.
- Consultative, diagnostic, and subspecialty cardiovascular services are centrally located, making it significantly easier for patients to receive the full continuum of cardiovascular care.



Every aspect of the Heart Pavilion was designed with the patient in mind.

All patient rooms are private to minimize infection and maximize safety and comfort.



Patients have access to a multidisciplinary team of cardiologists, cardiac surgeons, vascular specialists, and specially trained nurses and technologists who work collaboratively to deliver superior patient-centered care in one central location.

To refer a patient for evaluation or a second opinion or for a cardiac surgery consultation, please call 484.476.1000.

CARDIAC SURGERY PROGRAM

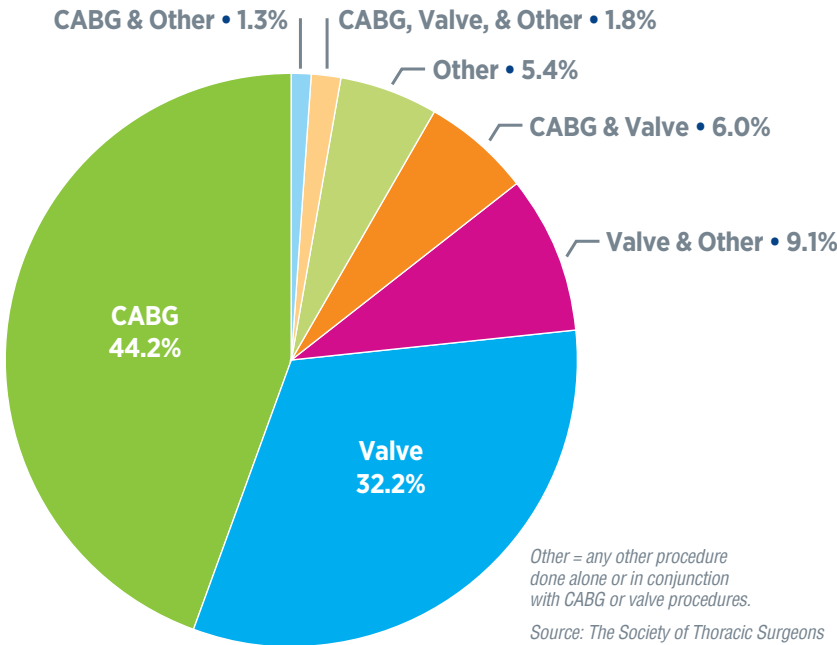
Lankenau Heart Institute’s Cardiac Surgery Program is defined by its commitment to the four core principles of patient-centered care, physician collaboration, value, and clinical innovation. Here, patients benefit from the care of surgical teams experienced in performing complex operations on the heart and great vessels, often with a minimally invasive approach.



Front row: Francis Sutter, DO, Konstadinos Plestis, MD, and Scott Goldman, MD.
Back row: Roberto Rodriguez, MD, and Louis Samuels, MD.

Lankenau Heart Institute has become a primary point of referral for patients requiring surgical treatment of critical and complex disorders of the heart and great vessels. In 2014, Lankenau Heart Institute cardiac surgeons performed 794 operations spanning nearly every aspect of cardiac surgery, including beating-heart and robotic-assisted coronary artery revascularization, minimally invasive valve repair and replacement, transcatheter aortic valve replacement and mitral valve repair, complex aortic repair, and minimally invasive surgical treatment of arrhythmia.

CARDIAC SURGERY PROCEDURE BREAKDOWN
CY 2014

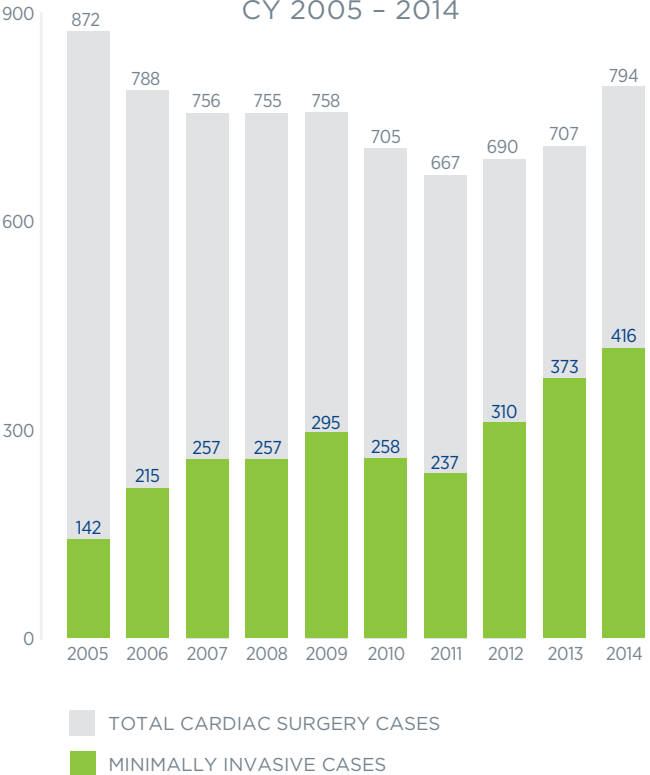


Other = any other procedure done alone or in conjunction with CABG or valve procedures.

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

In 2014, more than 52% of cardiac surgical procedures were performed using a minimally invasive approach.

CARDIAC SURGERY CASES USING A MINIMALLY INVASIVE APPROACH
CY 2005 – 2014



For more than 50 years, Lankenau Medical Center has garnered a reputation for clinical excellence, innovation, and research in cardiac surgery.

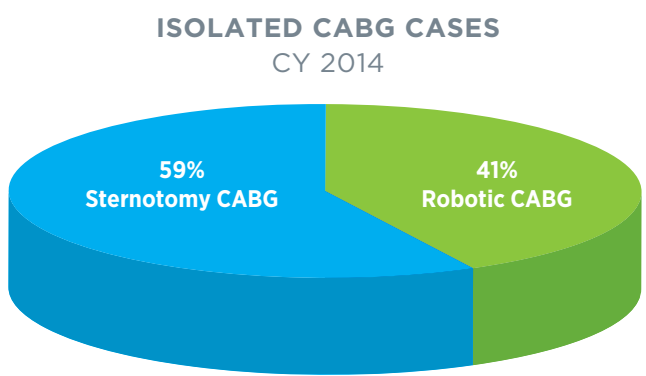
At the core of Lankenau Heart Institute’s cardiac surgery program are internationally renowned specialists who are leaders in the field. The expertise of these physicians spans the full spectrum of cardiac surgery and includes groundbreaking applications of minimally invasive and robotic-assisted techniques.

Minimally invasive cardiac surgery is associated with decreased mortality as well as less postoperative pain, reduced risk of stroke, avoidance of blood products, quicker return to daily activities, and improved quality of life.

To refer a patient for evaluation or a second opinion or for a cardiac surgery consultation, please call 484.476.1000.

CORONARY ARTERY DISEASE

Lankenau Heart Institute is proud to continue the tradition of excellence and innovation in surgical treatment of coronary artery disease established at Lankenau Medical Center. For the past 9 consecutive years, Lankenau Medical Center has received the top quality rating (three stars) from The Society of Thoracic Surgeons (STS) for CABG surgery. Only 15% of hospitals nationwide achieve the distinction of a three-star STS rating, which reflects the highest level of quality in the performance of isolated CABG procedures.



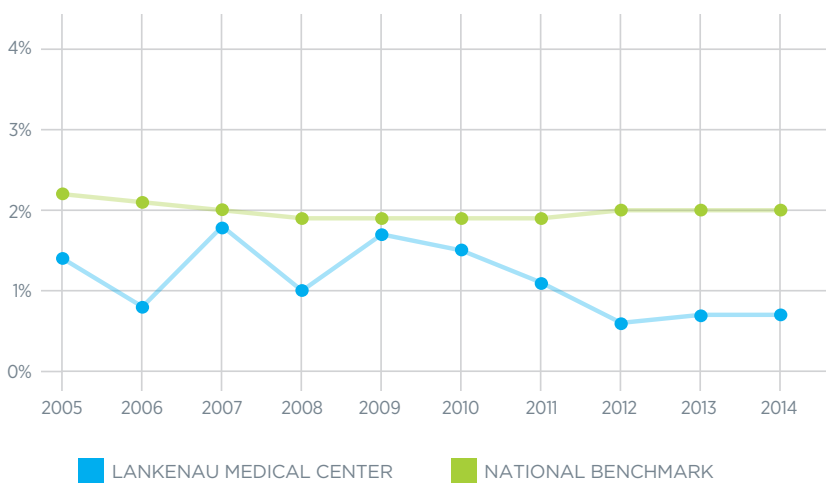
Source: The Society of Thoracic Surgeons Adult Cardiac Surgery Database.

ROBOTIC-ASSISTED SURGERY

Lankenau Medical Center is a leader in coronary artery bypass graft (CABG) surgery, with one of the most experienced robotic heart surgeons in the country. **Francis Sutter, DO**, has performed more than 1,200 robotic-assisted CABG procedures. Dr. Sutter and his dedicated team have more than 10 years' experience working together to provide optimal care to patients needing surgical treatment of coronary artery disease, with operative mortality rates consistently lower than national averages.

In 2014, 41% of all CABG procedures were performed robotically using a single, 1-inch incision to avoid sternotomy.

ISOLATED CABG OBSERVED OPERATIVE MORTALITY
CY 2005 - 2014



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

In 2014, more than 42% of patients undergoing robotic CABG had a hybrid coronary revascularization procedure combining robotic CABG and PCI as their treatment plan.

COMPLEX AND HYBRID CORONARY REVASCULARIZATION PROCEDURES



Lankenau Medical Center is a referral center for patients requiring coronary revascularization and offers off-pump ("beating-heart"), robotic-assisted minimally invasive, as well as traditional on-pump techniques for select CABG cases.

At Lankenau Medical Center, hybrid revascularization is often an option for patients with multivessel coronary artery disease. This collaborative effort between cardiac surgery and interventional cardiology capitalizes on the survival benefits of a robotic-assisted approach to harvesting the left internal mammary artery (LIMA) and grafting the LIMA to the left anterior descending artery. This approach decreases the trauma and comorbidity frequently associated with sternotomy. In addition, state-of-the-art percutaneous coronary intervention is performed as necessary to the right and circumflex coronary arteries. These procedures can be performed during a single stay or in two stages within days or weeks of each procedure.

Source: Isolated CABG Procedures, The Society of Thoracic Surgeons Adult Cardiac Surgery Database.

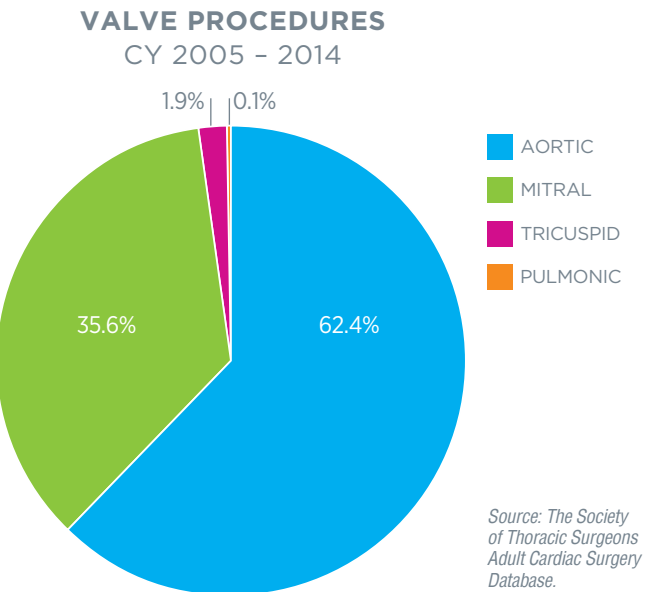


Dr. Sutter's team at Lankenau Medical Center performed its first robotic-assisted CABG procedure in 2005 and has unrivaled regional and national experience in robotic CABG surgery.

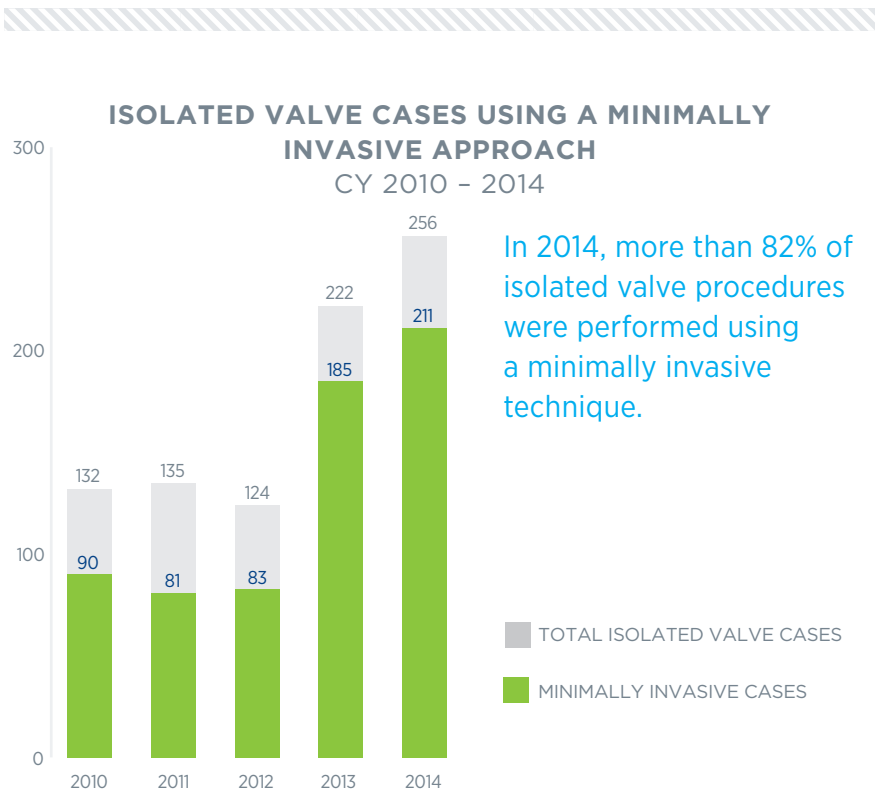
To refer a patient for evaluation or a second opinion or for a cardiac surgery consultation, please call 484.476.1000.

VALVE DISEASE

Lankenau Heart Institute’s heart valve program is a direct outgrowth of Lankenau Medical Center’s experience treating valvular heart disease. For more than 25 years, Lankenau has offered regional patients surgical expertise in performing complex and reoperative valve procedures as well as innovative approaches to minimally invasive valve repair and replacement.



Cardiac surgeons at Lankenau Medical Center are highly skilled in minimally invasive valve surgery and in most cases can offer patients a less-invasive approach to treatment.



MITRAL VALVE SURGERY

The cardiac surgeons at Lankenau Medical Center are leaders in the treatment of mitral valve disease and have been at the forefront of developing the latest minimally invasive surgical approaches to mitral valve repair.

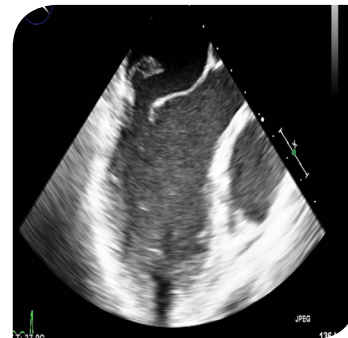


The valve team, led by **Scott Goldman, MD**, and **Roberto Rodriguez, MD**, has refined the endoscopic approach to repairing regurgitant mitral valves using a technique that requires only a 1.75-inch incision and two < 0.25-inch port sites.

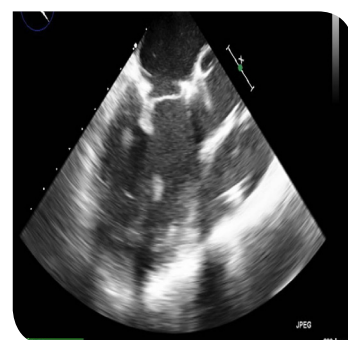
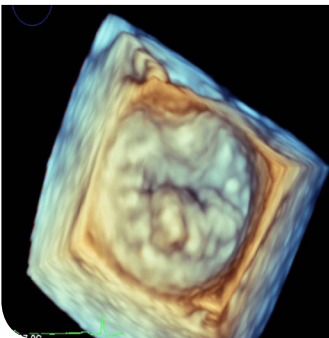
Over the past five years, 91% of isolated mitral valve procedures were performed using a minimally invasive technique.

Lankenau Medical Center is one of the most experienced mitral valve repair centers in the country.

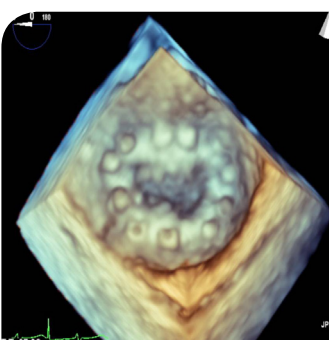
Over the past five years, 91% of mitral valve cases were valve repairs versus valve replacements.



Preoperative flail mitral leaflet.



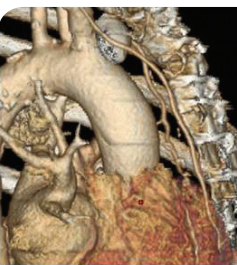
Post-repair with normal mitral valve function.



AORTIC VALVE SURGERY

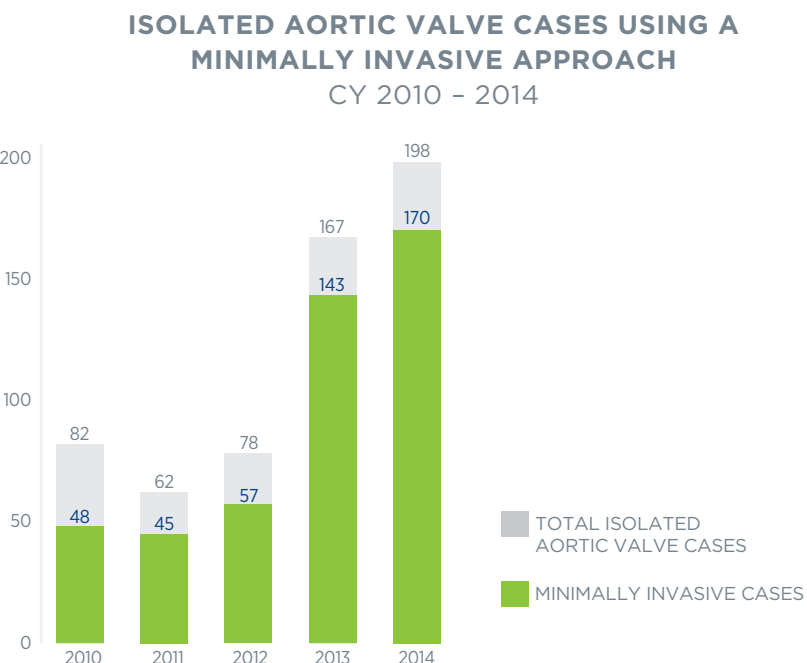
At Lankenau Medical Center, aortic valve replacement is typically performed via a partial sternotomy. In a majority of cases, the aortic valve is replaced with a bioprosthetic valve, thereby eliminating the long-term need for anticoagulants.

The use of advanced imaging with CT angiography (CTA) and 3D reconstruction facilitates a minimally invasive strategy for reoperative native valve replacement. This approach to care management has resulted in excellent outcomes in this patient population.



3D CTA reconstruction showing the internal mammary artery and its relation to the sternum.

In 2014, 86% of all isolated aortic valve procedures were performed using a minimally invasive approach. In 27% of the isolated aortic valve cases, the patient had undergone a previous cardiac surgical procedure.



TRANSCATHETER THERAPIES

Transcatheter therapies for valvular heart disease are fast evolving, offering greater opportunity and options for treatment in patients who do not qualify for surgery or for whom surgery is considered too risky. The Transcatheter Valve Program at Lankenau Medical Center is led by **Scott Goldman, MD**, and **Roberto Rodriguez, MD**, in collaboration with a dedicated team of interventional cardiologists, advanced cardiac imaging specialists, and clinical navigators.

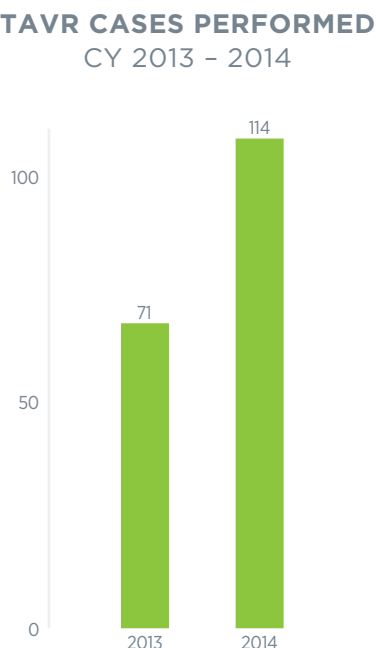
The team is skilled in using all current FDA-approved devices for transcatheter treatment of aortic stenosis and mitral regurgitation, including:

- The latest generation balloon-expanding SAPIEN XT® valve for transcatheter aortic valve replacement (TAVR)
- The self-expanding CoreValve® system for TAVR
- The MitraClip® percutaneous mitral valve repair system for treatment of mitral regurgitation

Today, Lankenau Medical Center is among the 20% of highest-performing TAVR centers in the nation.*

*Centers performing 100-200 TAVR procedures/year.

The transcatheter valve team has performed more than 250 catheter-based procedures since the program began in September 2012.



COMPLEX AORTIC DISEASE

Aortic disease management has recently emerged as a distinct cardiovascular subspecialty. In 2014, Lankenau Heart Institute introduced an Aortic Wellness Program to address the complex needs of patients with aortic disease. The program brings together a dedicated team of cardiothoracic and vascular surgeons, cardiologists, cardiac imaging specialists, radiologists, and anesthesiologists who ensure optimal evaluation and management of patients at risk for aortic disease complications as well as rapid, coordinated treatment of acute aortic emergencies.

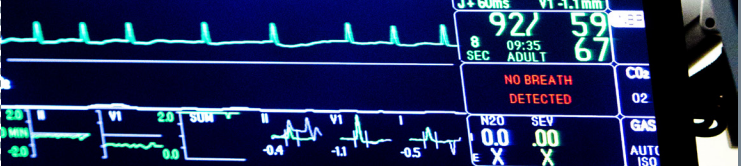
The Aortic Wellness Program is under the leadership of cardiothoracic and vascular surgeon **Konstadinos Plestis, MD**. Dr. Plestis has more than 20 years of experience in the surgical treatment of complex aortic disease.

From 1998 through 2014, Dr. Plestis performed 1,225 complex aortic surgical procedures spanning every segment of the aorta.

The aortic disease management team has expertise in the use of the most advanced cardiagnostic technology for evaluating aortic disease and for preoperative assessment, as well as all available medical, surgical, and endovascular interventions for management of aortic disease. To ensure quality of care, the team maintains an internal database for long-term patient follow-up and participates in a national patient registry for ongoing assessment of clinical performance related to aortic surgery.

SERVICES

- Multidisciplinary evaluation of patients with clinically suspected aortic disease
- Comprehensive imaging of the aorta and any coexisting structural heart disease
- Medical and risk factor management
- Elective and emergent treatment
- Aortic disease surveillance and long-term patient monitoring
- Aortic disease screening and genetic evaluation of high-risk individuals



CONDITIONS TREATED

Lankenau Medical Center offers treatment for the full range of aortic disease, including:

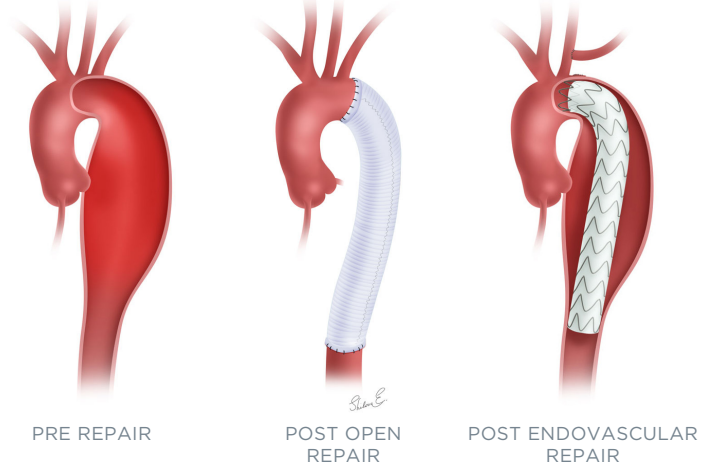
- Aneurysms of the aortic root, ascending aorta, aortic arch, descending aorta, thoracoabdominal aorta, and abdominal aorta
- Aortic valve regurgitation
- Acute and chronic Type A and Type B aortic dissections
- Aortic rupture
- Bicuspid aortic valve disease
- Genetic, familial, and inflammatory or infectious aortic disease

AORTIC PROCEDURES

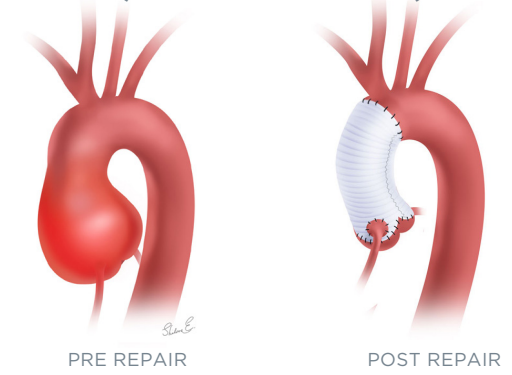
Aortic procedures commonly performed at Lankenau Medical Center include:

- Open surgical repair (all aortic segments) with a synthetic graft that is sewn into place
- Composite aortic root repair (open repair of the aortic root combined with surgical valve placement)
- Valve-sparing aortic root replacement
- Endovascular repair (stent graft placement) of the aortic arch, descending thoracic aorta, and abdominal aorta
- Hybrid procedures (open repairs plus stent grafting) for complex aortic disease
- Aortic valve repair

OPEN AND ENDOVASCULAR REPAIR OF VARIOUS SEGMENTS OF THE DESCENDING THORACIC AORTA



VALVE-SPARING AORTIC ROOT SURGERY (DAVID PROCEDURE)



HEART FAILURE

Lankenau Heart Institute provides access to a broad range of medical and surgical treatment options for advanced heart failure. These options will expand in 2015 with the launch of a Destination Therapy Program offering comprehensive care for patients who are not eligible for cardiac transplantation. The program will be led by **Louis Samuels, MD**.

Lankenau Medical Center has a dedicated ECMO team who mobilize quickly to treat patients in acute cardiopulmonary shock.

ADVANCED TREATMENTS

Extracorporeal Membrane Oxygenation (ECMO) Therapy

This form of therapy completely takes over for the heart and lungs in the most severe circumstances of cardiopulmonary failure. A dedicated service treats patients with isolated pulmonary failure or combined cardiopulmonary failure. Lankenau Heart Institute participates in the Extracorporeal Life Support Organization (ELSO) registry.

Ventricular Assist Device (VAD) Therapy

These partial artificial hearts restore circulation to the body, improving length and quality of life. VADs may be used temporarily, while the heart rests and recovers, or permanently in a patient whose heart is beyond recovery. The newest versions of these permanent devices are implanted under the skin, allowing a patient to resume a near-normal lifestyle outside the hospital.

- **Bridge-to-Transplant Therapy** – The VAD is used to enable a patient to survive until a donor heart becomes available.
- **Destination Therapy** – The VAD offers life-long support for a failing heart in a patient who is ineligible for transplantation.
- **Bridge-to-Recovery** – The VAD is used to “rest” the native heart over a period of weeks to months, and is then removed.

Heart Transplantation Access and Care

Through a formal partnership with Thomas Jefferson University Hospital, Lankenau Heart Institute cardiovascular specialists ensure that patients in need of cardiac transplantation are evaluated and listed if eligible. The surgical and medical teams at both centers discuss cases weekly and work together to offer the most appropriate therapy for each patient with end-stage heart failure.

TEAM

Cardiac Surgeons

- Konstadinos A. Plestis, MD
- Scott M. Goldman, MD
- Roberto Rodriguez, MD
- Louis E. Samuels, MD
- Francis P. Sutter, DO

Clinical Navigators

- Maysoon Dayoub, PA-C, MPAS
- Elena Casanova-Ghosh, CRNP*
- Lisa Igidbashian, CRNP
- Samantha Roesch, CRNP
- Mary Ann Wertan, RN

For a cardiac surgery consultation or second opinion or to refer a patient, please call 484.476.1000.

* Not Pictured



Physicians at Main Line Health are permitted to engage in limited outside activities independent of their clinical practice. Outside work, such as consulting, is required to be disclosed as part of a physician’s employment obligations. Some cardiovascular surgeons perform work on behalf of companies that manufacture cardiovascular devices, which may include participating in the research, design, development, or improvement of these cardiovascular devices and technologies.

PATIENT REFERRAL

To refer a patient for evaluation or a second opinion or for a cardiac surgery consultation, call 484.476.1000. Patient consultation and follow-up visits are scheduled at the Heart Pavilion.

Lankenau Medical Center
Heart Pavilion | Mezzanine Level, Zone E
100 Lancaster Avenue | Wynnewood, PA 19096

PHYSICIAN-TO-PHYSICIAN REFERRAL



Konstadinos Plestis, MD
E: PlestisK@mlhs.org



Louis Samuels, MD
E: SamuelsL@mlhs.org



Scott Goldman, MD
E: GoldmanS@mlhs.org



Francis Sutter, DO
E: SutteF@mlhs.org



Roberto Rodriguez, MD
E: RodriguezR@mlhs.org



Alon Aharon, MD
E: AharonA@mlhs.org

EMERGENCY PATIENT TRANSFER

Main Line Health welcomes the opportunity to partner with you in caring for your patients. Our dedicated Transfer Center is available 24 hours a day, 7 days a week and is committed to serving you and your patients.

The Transfer Center at Main Line Health is staffed by registered nurses who understand the complexities of the acutely ill patient as well as nonemergent transfer for ongoing care. Our nurses communicate with referring physicians and staff to provide a one-call solution for fast, efficient transfer to Main Line Health clinical services.

One call to:

- Get answers to questions about patient transfer
- Coordinate patient transfer
- Make arrangements for patient transport
- Guarantee bed placement within 60 minutes
- Connect with a physician

TO TRANSFER A PATIENT

Call 866.872.6555 and provide the following information:

- Your name and phone number
- Your facility name and phone number
- Patient’s name, age, diagnosis, and services required

PHYSICIAN LIAISON PROGRAM

Questions, concerns, or feedback about referrals or the referral process can be addressed to the physician liaison team at Main Line Health. The physician liaison team offers referring physicians and their office staff:

- Assistance with referrals and consultations to Main Line Health’s cardiovascular programs and physicians
- Detailed information about the Main Line Health Contact Center for referrals and the Transfer Center for inpatient transfers
- Clinical-based educational programs and continuing medical education programs
- Scheduled visits to inform the practice about new programs, physicians, clinical trials, and upcoming events
- Regular communication to ensure a satisfactory referral experience
- Educational materials, including brochures and other handouts for patients

For more information, please contact Main Line Health’s Physician Relations and Recruitment Department, at 484.580.1035.

PHYSICIAN DIRECTORY APP

This mobile app for iPhone and Android devices offers a searchable Main Line Health (MLH) physician directory, select MLH phone numbers, a link to MLH webmail, and physician liaison information.

Download from app stores by searching “MLH Physician.” To obtain the generic password to unlock the app, use the “Forgot Password” feature.





LOCATIONS

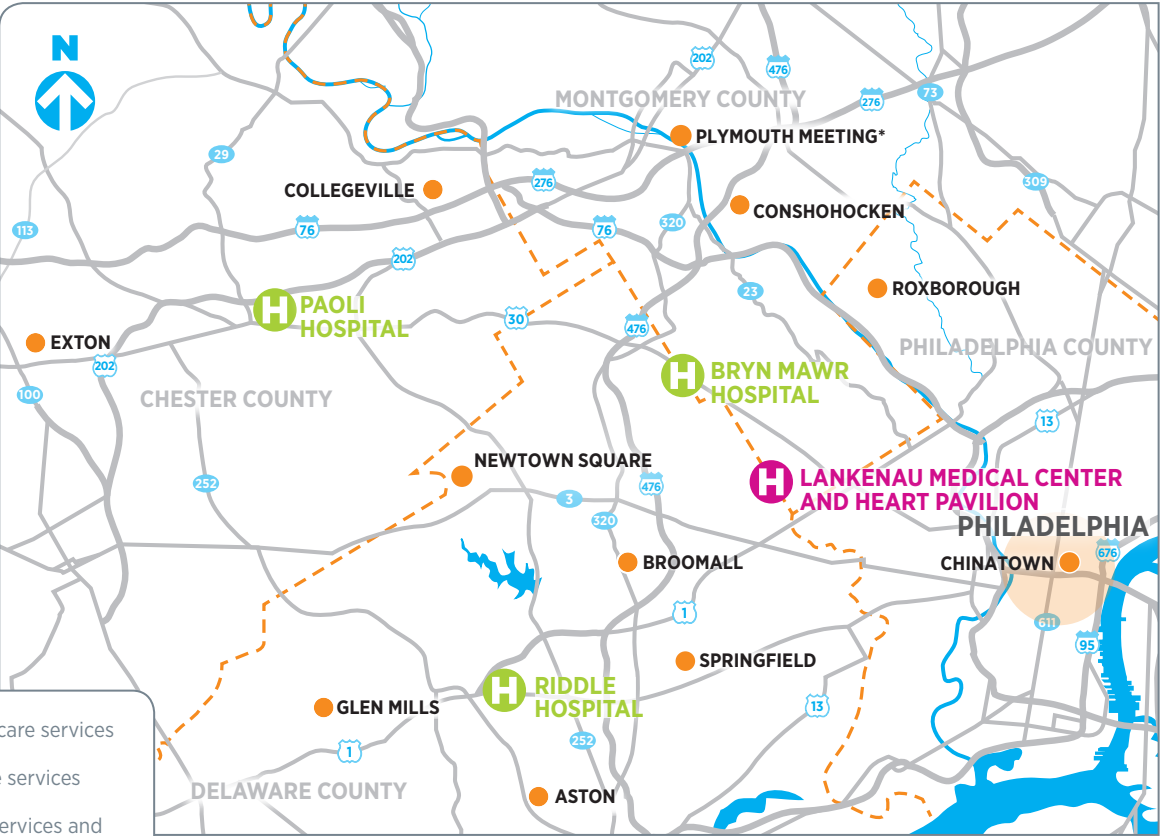
Lankenau Heart Institute is the region’s most comprehensive cardiovascular care resource, with a team of more than 75 cardiologists and cardiovascular surgeons who collaborate to deliver preventive, diagnostic, therapeutic, and rehabilitative cardiovascular services across all of Main Line Health. Lankenau Heart Institute has practice sites at each of Main Line Health’s acute care hospitals—Lankenau Medical Center, Bryn Mawr Hospital, Paoli Hospital, and Riddle Hospital—and at community cardiology practices throughout the region.

Lankenau Medical Center and Heart Pavilion
100 East Lancaster Avenue
Wynnewood, PA 19096
P: 484.476.1000

Bryn Mawr Hospital
130 South Bryn Mawr Avenue
Bryn Mawr, PA 19010
P: 484.337.3000

Paoli Hospital
255 West Lancaster Avenue
Paoli, PA 19301
P: 484.565.1000

Riddle Hospital
1068 West Baltimore Pike
Media, PA 19063
P: 484.227.9400



* Opening Fall 2015

Lankenau Heart Institute provides patients life-saving treatments with life-changing outcomes.



Lankenau Heart Institute

Main Line Health®

LankenauHeart.org