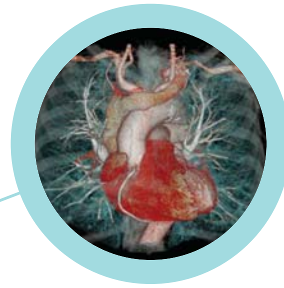


Linking Best Practices to Quality Care

Stony Brook Heart Institute

> Patients
> Referring Physicians
> Our Heart Team

A most valued link.

Top photo: **Thomas Ribaudo, MD,** Managing Partner, North Suffolk Cardiology Associates
Bottom photo: **Apostolos K. Tassiopoulos, MD,** Chief, Division of Vascular Surgery, Stony Brook Medicine, and **Olympia Christoforatos, RN,** with patient

CONTENTS

A COLLABORATIVE APPROACH 2

> Noninvasive Diagnostics and Imaging 4
> Catheterization and Intervention 6
> Electrophysiology 8
> Cardiac Assist Program and Heart Failure Program 10
> Cardiac Surgery: Program and Quality Metrics 12
> Minimally Invasive and Robot-Assisted Surgery 14
> Vascular Disease: Diagnosis and Interventions 16
> Clinical Trials 18
> Publications 22
> Achievements 24

Welcome

Stony Brook Heart Institute—Long Island's only university-based cardiovascular program—is the region's leading referral center for clinically complex cardiac care. Through our groundbreaking research and innovative care that improve patient outcomes, we are home to the best ideas in cardiovascular medicine. Our cardiologists, cardiac surgeons and other specialists take a collaborative approach with patients and their referring physicians to provide comprehensive and advanced cardiac care.

Stony Brook Heart Institute offers a full spectrum of cardiac services, including Suffolk County's only university-based open-heart surgery program and 24/7 interventional services. Despite caring for many high-risk patients, our patient outcomes remain outstanding, with current outcomes among the best in New York State and well above the national averages. In fact, we are a University HealthSystem Consortium "Top 10" hospital for CABG outcomes, ranking eighth out of more than 100 academic medical centers in the past year.

As a testament to our ability to provide outstanding, state-of-the-art cardiac care, in 2011 our Left Ventricular Assist Device (LVAD) Program became the only on Long Island to receive accreditation from The Joint Commission. This lifesaving technology allows us to help more patients with end-stage heart disease by extending and improving their quality of life. We are now one of only three national reference centers to help new programs successfully launch their VAD initiatives.

Certain marks of distinction indicate quality and signal to patients that they are in a top program and in capable hands. Here at the Stony Brook Heart Institute, the distinctions we have achieved help to demonstrate our exceptional, high-quality care. We encourage you to read about these accomplishments and others in this report, and we welcome the opportunity to work with you to ensure the best care for your patients.

- **Advanced cardiovascular imaging using the 320-slice CT scanner**
- **Triple-accredited echocardiography lab, including routine availability of 3D echo imaging**
- **A Valve Center where patients are seen by multiple heart specialists during the same visit**
- **Only hospital on Long Island with established programs for minimally invasive heart valve surgery and robotic MIDCAB procedures**
- **Sensei® robotic catheter system for radiofrequency ablation procedures**
- **First hospital in Suffolk County to provide radiofrequency ablation for atrial fibrillation and ventricular tachycardia**
- **Endovascular Rapid Response Team available 24/7 to treat aortic dissections/ruptures**
- **Routine use of minimally invasive valve, coronary and thoracic aortic stenting procedures**

Todd K. Rosengart, MD
Professor and Chairman, Department of Surgery
Chief, Division of Cardiothoracic Surgery
Co-Director, Stony Brook Heart Institute

Luis Gruberg, MD
Professor of Medicine
Interim Chief, Division of Cardiovascular Medicine
Director, Cardiovascular Catheterization Laboratories
Co-Director, Stony Brook Heart Institute

A Collaborative Approach

To provide our patients with the very best care, we take a collaborative approach that spans many specialties through our comprehensive, multidisciplinary programs. Our team of 50 physician-scientists, recruited from prestigious programs across the country, brings a high level of expertise and experience in all areas of cardiac care. They work across disciplines to ensure coordination of services with 350 other highly trained anesthesiologists, nurses, physician assistants, nurse practitioners and other support staff.

Part of Long Island's premier academic medical center, Stony Brook Heart Institute participates in the ground-breaking research necessary to create innovative approaches to diagnostics and treatment. These efforts provide our patients with access to leading-edge treatments for heart disease.

In addition, all physicians of the Heart Institute serve as faculty at Stony Brook School of Medicine, teaching residents and mentoring fellows on a daily basis. These roles demand that they maintain a depth of expertise that keep them at the forefront of medical discoveries and leading-edge care—all with the single goal of enhancing care for the benefit of patients.

We look forward to working with you to deliver quality, coordinated cardiac care to your patients.

Team

At Stony Brook Heart Institute, we've developed an innovative team approach that is woven into every aspect of our services. Demonstrating this team approach is our Valve Center, offering patients access to advanced care and technology for the diagnosis and treatment of valvular heart disease. Patients at the Valve Center are seen by multiple heart specialists during the same visit and receive a personalized, comprehensive diagnosis and treatment plan at the completion of their evaluation.

At the core of the Valve Center is its multispecialty team. During visits to the Valve Center, patients meet with an experienced team of valve disease specialists—all within one appointment. A cardiologist and a cardiothoracic surgeon work together to provide patients with the most comprehensive diagnostic assessment that leads to the best therapeutic option tailored to treat their specific valve disease. Additionally, a nurse practitioner meets with each patient to coordinate evaluation and treatment. By the end of their visit, patients are able to thoroughly understand their condition, and have a detailed plan of their treatment.

Smadar Kort, MD, Director, Valve Center and Director, Noninvasive Cardiology; and **Sandeep Gupta, MD,** Co-Director, Valve Center and Cardiothoracic Surgeon

STONY BROOK HEART INSTITUTE LEADERSHIP TEAM

Luis Gruberg, MD, Co-Director, Heart Institute; **Michael Poon, MD,** Director, Advanced Cardiac Imaging; **Apostolos K. Tassiopoulos, MD,** Chief, Division of Vascular Surgery; **Margaret Duffy, RN,** Associate Director of Nursing, Cardiac Services; and **Todd Rosengart, MD,** Co-Director, Heart Institute

NONINVASIVE DIAGNOSTICS AND IMAGING

Stony Brook's renowned cardiovascular imaging program is considered among the best in the nation, with expertise and experience in a full range of diagnostic modalities.

> **Advanced cardiac imaging** offered with our 320-slice CT scanner. The first on Long Island to have this capability, and the second hospital in the nation to install a 320-slice CT in an Emergency Department to provide quicker diagnoses for heart patients.

> **A Chest Pain Center that received accreditation by the Society of Chest Pain Centers** in 2008, one of only 12 hospitals in New York State to achieve this designation.

The 320-slice CT scanner provides precise images of the heart with a single rotation of the gantry and minimal exposure to radiation. Michael Poon, MD, Director, Advanced Cardiac Imaging, developed the advanced technique that exposes patients to the equivalent of just two chest x-rays, much less than the typical CT scan, which exposes patients to the radiation equivalent of 200 x-rays.

Under the leadership of Dr. Smadar Kort, nearly 13,000 cardiovascular imaging studies are performed annually, including transthoracic, transesophageal and stress echocardiography; 3D transthoracic and transesophageal echocardiography; nuclear stress testing; tissue doppler; strain and strain-rate imaging; and perfusion MR and MR-PET fusion imaging. Transthoracic echocardiography and nuclear stress testing are also provided at our two outpatient facilities in Islandia and East Setauket.

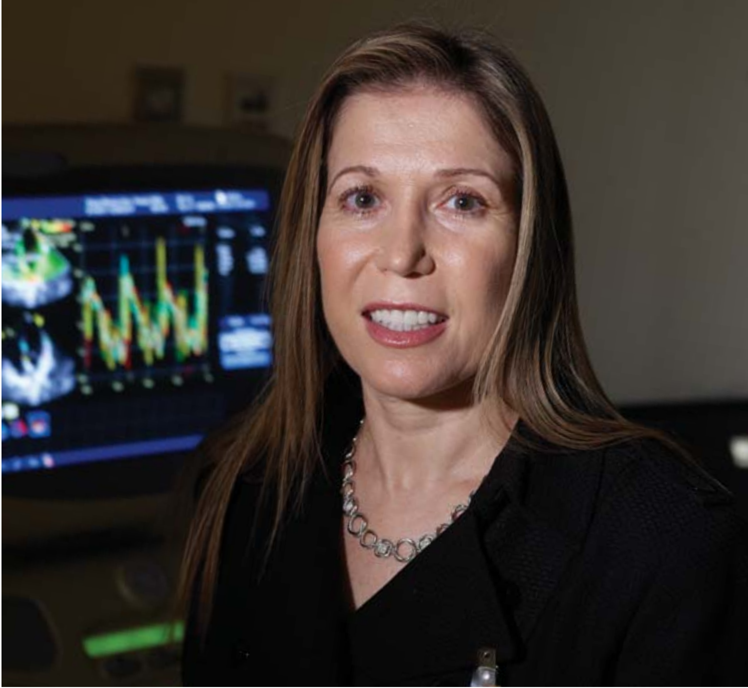
> **The first to offer 3D transesophageal echocardiography** on Long Island, and among the few centers in the country to offer this advanced technology.

> **The only Echocardiography Laboratory** in Suffolk County to achieve accreditation for all three types of adult echocardiography: transthoracic, transesophageal and stress testing. Only 28 centers in New York State have attained this triple accreditation from the Intersocietal Commission for the Accreditation of Echocardiography Laboratories (ICAEL).

> **A Nuclear Cardiology Service**, performing more than 2,500 nuclear cardiology studies annually, also accredited by the ICAEL.

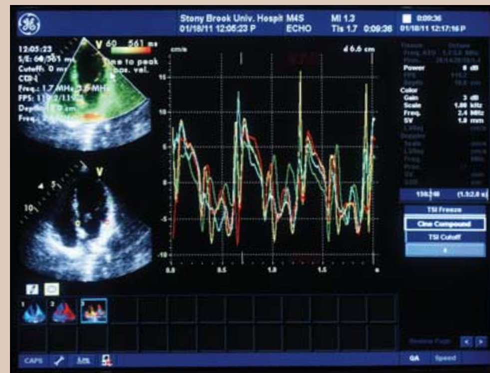
Michael Poon, MD, Director, Advanced Cardiac Imaging

Innovation



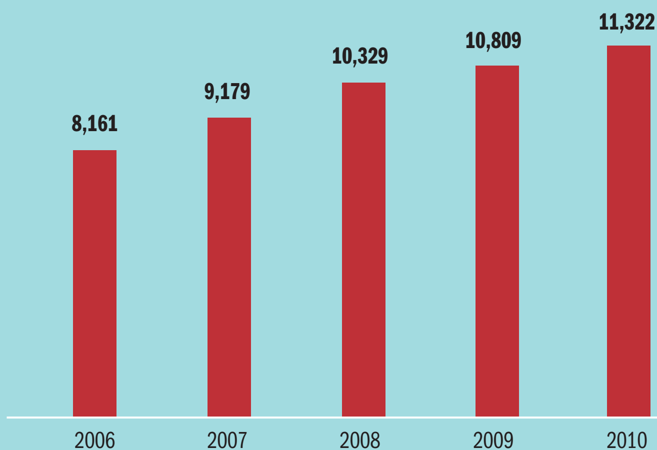
Smadar Kort, MD
Director, Noninvasive Cardiovascular Imaging

> Smadar Kort, MD, is leading several studies, including research on the use of 3D echocardiography for diastolic function assessment; the identification of patients who would benefit from biventricular devices; assessment of atrial function in patients with atrial fibrillation; and examination of left ventricular function in patients with cardiomyopathies using speckle tracking.



> Stony Brook is one of only five hospitals in New York State and 250 hospitals in the nation participating in the PROMISE (PROspective Multicenter Imaging Study for Evaluation of Chest Pain) trial. Michael Poon, MD, is the principal investigator of this randomized trial to determine the clinical effectiveness of anatomic testing with coronary CT angiography (CTA) compared to function testing (usual care), such as EKG, nuclear stress testing and echocardiography.

ECHOCARDIOGRAPHY VOLUMES



> Most advanced echocardiographic technology in the region

> Triple accreditation for all three types of adult echocardiography

> Fully accredited Nuclear Cardiology Service

CATHETERIZATION AND INTERVENTION

As the only tertiary care center in Suffolk County, Stony Brook offers access to three dedicated state-of-the-art cardiac catheterization laboratories and two additional electrophysiology labs. To meet the region's needs, our expert team of interventional cardiologists, nurses and technologists provides 24/7 cardiac catheterization service with interventional services and on-site cardio-thoracic surgical capability.

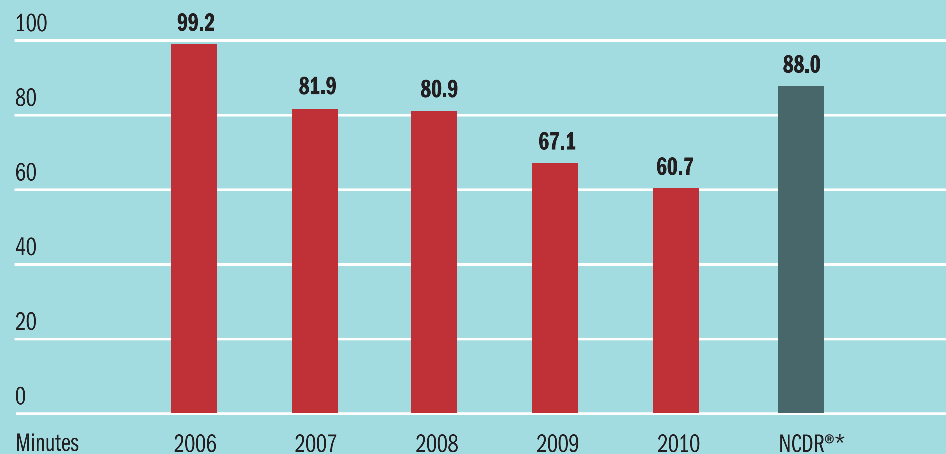
- **The first Chest Pain Center** on Long Island to earn accreditation by the Society of Chest Pain Centers.
- **A multidisciplinary Code H Team** that provides outstanding door-to-balloon times for acute myocardial infarction (AMI) patients entering our Emergency Department (see below). Rapid transfer of AMI patients to Stony Brook for emergency treatment from other Suffolk County hospitals is available.
- **An average door-to-balloon time of 61 minutes**, well below the 90-minute or less timeframe recommended by the American College of Cardiology and the American Heart Association.
- **A Transradial Cardiac Catheterization Program**, offering patients significant benefits over femoral access, including a lower risk of complications, faster recovery and increased comfort.

Our cardiologists perform a full spectrum of interventional therapies in catheterization laboratories designed for patient comfort and updated technology. More than 4,000 cardiovascular catheterization procedures are performed each year for the treatment of patients with coronary, peripheral artery and carotid artery diseases. We also treat more than 400 patients each year who arrive at our Emergency Department and to other regional hospitals with an AMI.

In addition, we have a structural and valvular heart disease program for the treatment of patients with valvular heart disease, atrial septal defect (ASD) and patent foramen ovale (PFO).

DOOR-TO-BALLOON TIMES

- An expert Code H team coordinates and facilitates response and transport of patients with acute myocardial infarction
- A steadily decreased door-to-balloon time, well below the National Cardiovascular Data Registry® (NCDR) average



*American College of Cardiology's National Cardiovascular Data Registry

STONY BROOK HEART INSTITUTE "CODE H" PHYSICIAN TEAM

From left to right: **Anil Mani, MD,** Associate Director, Cardiovascular Catheterization Laboratory; **William E. Lawson, MD,** Director, Heart Institute Outcomes Research; Director, Preventive Cardiology; and Director, Interventional Cardiology Fellowship Program; **Joseph Chernilas, MD; Luis Gruberg, MD,** Interim Chief, Division of Cardiovascular Medicine; Director, Cardiovascular Catheterization Laboratories; and Co-Director, Heart Institute; **Allen Jeremias, MD,** Director, Cardiac Intensive Care and Director, Vascular Medicine and Peripheral Intervention

ELECTROPHYSIOLOGY

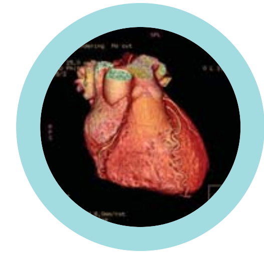
The procedural volume of the Cardiac Electrophysiology Service has tripled since 2006 under the leadership of Eric J. Rashba, MD, Director, Electrophysiology Laboratories. With the recruitment of four additional electrophysiologists from the nation's top centers, Dr. Rashba has assembled a highly skilled team of physician assistants, nurse practitioners and electrophysiology laboratory nurses with specialized training.

The Cardiac Electrophysiology Service offers comprehensive services for all types of cardiac arrhythmias and related diagnoses. By precisely defining the patient's arrhythmia, we can match the most appropriate therapeutic approach to achieve optimal outcomes. Our expertise and sophisticated technology places us at the forefront of care.

The Cardiac Electrophysiology Service is the only center in Suffolk County offering a comprehensive approach to the management of patients with ventricular arrhythmias, including implanting defibrillators and cardiac resynchronization therapy devices for extremely ill patients with advanced heart failure.

We also perform a high volume of ablation procedures for premature ventricular contraction/ventricular tachycardia (PVC/VT) in the absence of structural heart disease (idiopathic VT). Our success rate is 95% for ablation of idiopathic VT, with a 1 to 2% incidence of complications. For some patients, ablation is also indicated for VT for advanced structural heart disease. While complete elimination of VT is not expected in these patients, 70% experience a dramatic reduction in the frequency of implantable cardioverter-defibrillator (ICD) shocks, and major complications are infrequent (1 to 2%).

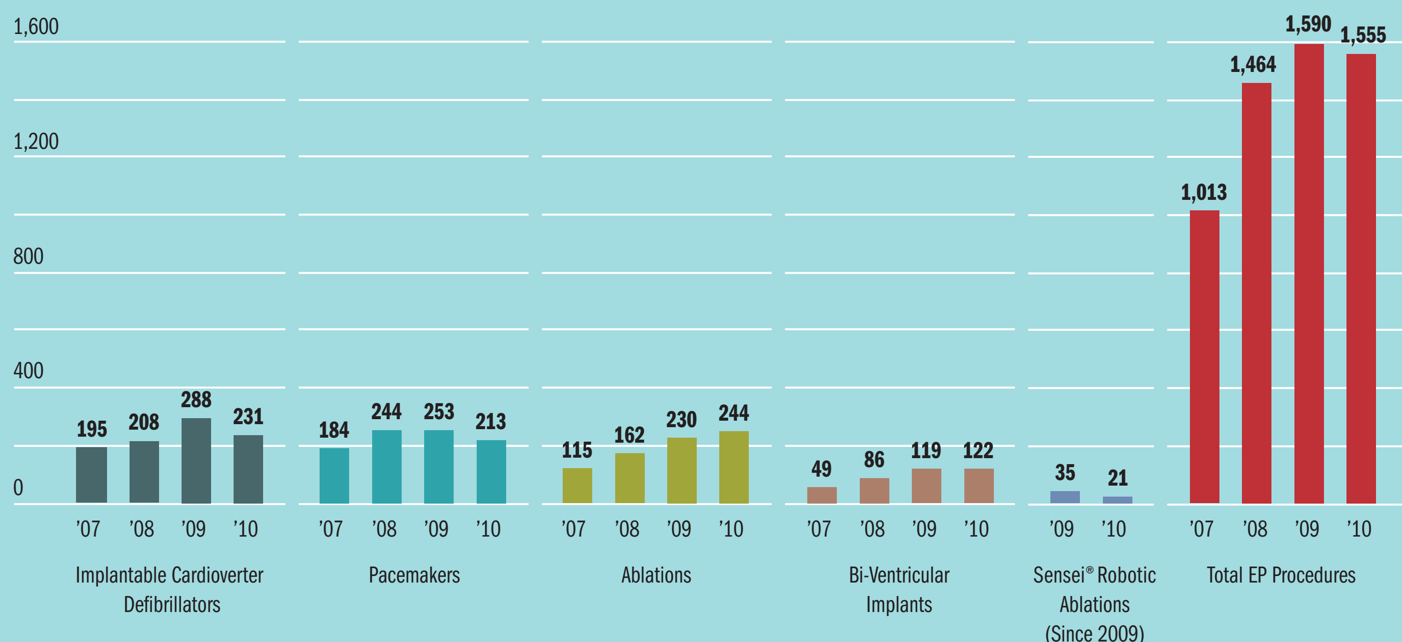
Eric J. Rashba, MD, Director, Electrophysiology Laboratories, with the Sensei® robotic ablation system



Additional highlights of Stony Brook's Cardiac Electrophysiology Service include:

- **The only center on Long Island that has the Sensei® robotic ablation system for atrial fibrillation.** This system employs a robotically guided sheath to facilitate manipulation of the ablation catheter to precise locations within the heart so that ablation lesions are more effectively performed.
- **Only center in Suffolk County that performs ablation for the most complex arrhythmias,** such as atrial fibrillation and ventricular tachycardia.
- **Cardiac resynchronization therapy (CRT) implant success rates** that have enabled improved survival and improved quality of life, which has been demonstrated in clinical trials. The program is led by Saverio (Sam) Barbera, MD, who has performed more than 1,000 CRT implants.
- **A unique lead management program** for the removal of chronically implanted pacemakers and defibrillator leads.
- **A new Clinical Cardiac Electrophysiology Fellowship training program**—the first on Long Island—that received approval from the Accreditation Council for Graduate Medical Education.
- **A peer-reviewed grant** awarded to Dr. Rashba to fund a full-time electrophysiology research fellow for the 2010–2011 academic year.

Innovation



CARDIAC ASSIST PROGRAM AND HEART FAILURE PROGRAM

The first implantation on Long Island of a permanent left ventricular assist device (LVAD)—the HeartMate® II—took place at Stony Brook in 2010, only three months after approval from the U.S. Food and Drug Administration. Nearly two dozen patients have received a permanent LVAD, performed by Program Director Allison J. McLarty, MD, either at our partner site at Montefiore Medical Center or here at Stony Brook—firmly establishing our VAD Program to improve quality of life for patients with late-stage heart failure.

- **The only VAD program on Long Island** to receive accreditation from The Joint Commission and Centers for Medicare and Medicaid Service (CMS) in 2011.
- **The first center on Long Island** to implant the advanced HeartMate II LVAD.

In patients who are ineligible for a heart transplant, the HeartMate II LVAD can serve as a "destination therapy"—available for permanent use instead of a heart transplant. The device is so well accepted that many patients are now electing to remain with their implants even though they may be transplant-eligible.

It is estimated that as many as 100,000 patients with heart failure per year in the United States could be helped by this advance in technology.

Allison J. McLarty, MD, Director, Cardiac Assist Program

Under the direction of Hal A. Skopicki, MD, PhD, our Heart Failure Program treats annually more than 700 patients with advanced heart failure. Our team of highly trained nurses works together with faculty physicians and community-based physicians to manage these patients. Our nurses have been trained in protocols for Sustaining Excellence and Results in the Care of Heart Failure (SEARCH). Our accomplishments include:

- **The highest heart failure survival rate on Long Island**, according to the 2010 Annual Report of the Niagara Health Quality Coalition.
- **The third highest survival rate in New York State**, based on the 2010 Niagara Health Quality Coalition's survey of 210 hospitals.

Our outpatient services include comprehensive, individualized patient evaluations using the latest technology and diagnostic tools; medical regimens; lifestyle education; referrals to nutritionists and cardiac rehabilitation programs; evaluations for specialized pacemakers and defibrillators; and evaluation and implantation of mechanical assist devices, such as LVADs.

Our physicians provide a consultation service for other physicians of all specialties to optimize patient care, assist in diagnosing complex cardiovascular disease, and offer state-of-the-art therapies and clinical research alternatives. As a renowned academic research center, we are able to offer newer treatments and promising experimental medications.

Our annual seminar on caring for patients with heart failure, hosted in conjunction with the American Association of Critical Care Nurses, provides a forum to share and exchange expertise in heart failure management with other heart failure specialists. Stony Brook also helps to prepare the next generation of heart failure specialists through our heart failure fellowship.

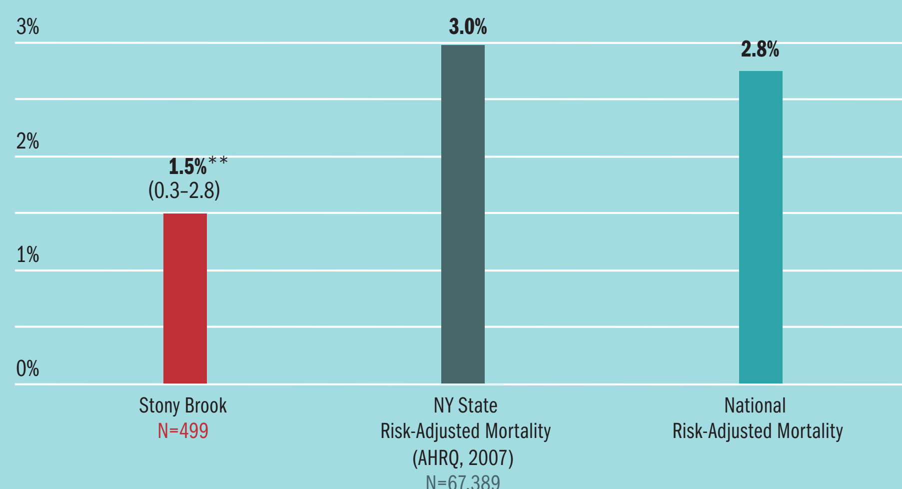
Expertise

- The highest survival rate on Long Island, per the 2010 Niagara Health Quality Coalition report
- Third highest survival rate in New York State out of 210 hospitals, per the 2010 Niagara Health Quality Coalition Report

Source: myhealthfinder.com/newyork10/full.php?table=16REG
* Risk adjusted
** Statistically better than multicenter standard

HEART FAILURE: MORTALITY RISK COMPARISON

Risk of Dying, % (Confidence Interval)*



CARDIAC SURGERY: PROGRAM AND QUALITY METRICS

Stony Brook Heart Institute—which provides Suffolk County's only university-based open-heart surgery program—has brought numerous advanced techniques and technologies to Long Island. These include:

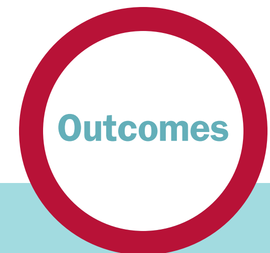
> **Left ventricular assist device (LVAD) implantation**
> **Endovascular thoracic aortic aneurysm repair**
> **Maze surgery for arrhythmia**
> **Minimally invasive valve surgery**
> **Minimally invasive robot-assisted bypass graft**
> **Off-pump coronary artery bypass**

Stony Brook performs more than 500 cardiothoracic surgeries each year. Five expert cardiothoracic surgeons, trained at the nation's leading medical institutions, perform pioneering procedures, including minimally invasive and robot-assisted procedures.

Working in close collaboration with colleagues in the Division of Cardiovascular Medicine, Stony Brook surgeons convene weekly meetings with their counterparts in Cardiology to discuss patient management, therapeutic options, and results and outcome trends in order to provide optimal care for their patients. This integrated program offers a wide range of options for patients treated at the Heart Institute, delivered with outcomes that well exceed national standards.

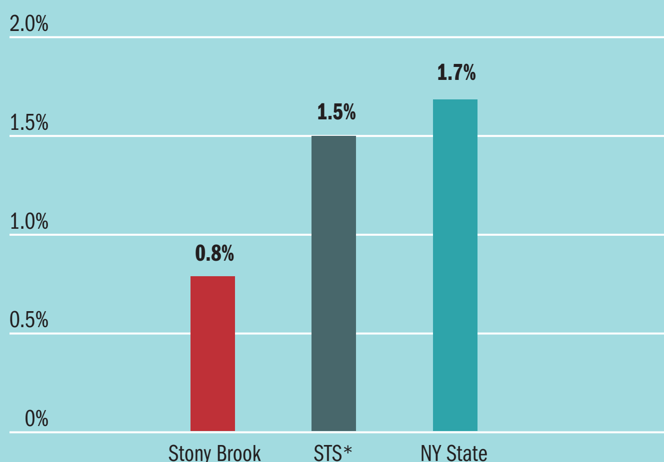
Our multispecialty Valve Center and our Thoracic Aneurysm Center are two examples of coordinated, multispecialty approaches for patients with complex cardiovascular disease.

Collaboration

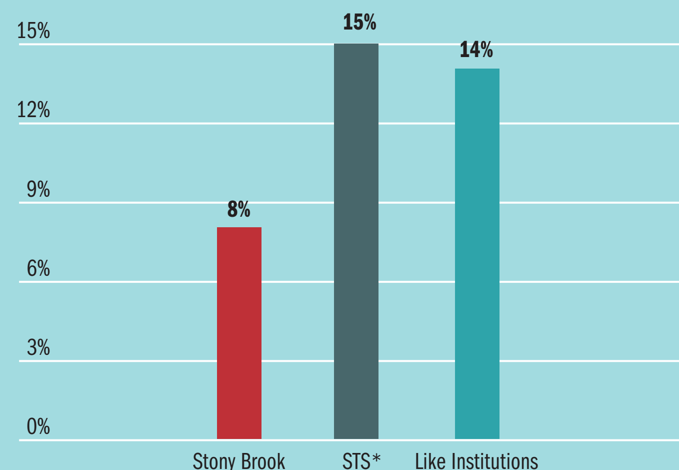


CORONARY ARTERY BYPASS GRAFT (CABG) SURGERY

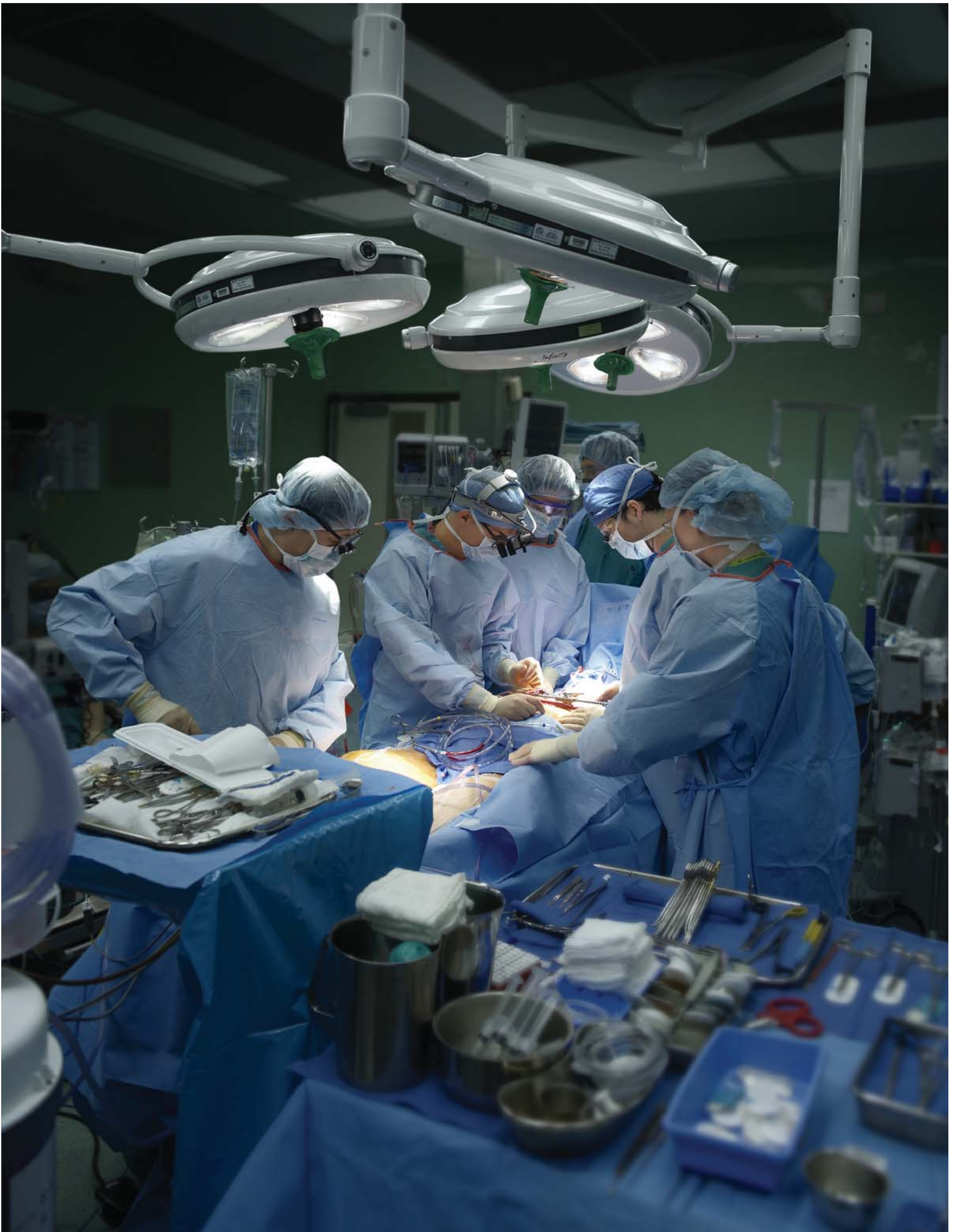
Inpatient CABG Mortality (2010)



CABG Mortality or Major Complications (2010/STS)



*Society of Thoracic Surgeons Registry



Todd K. Rosengart, MD, and surgical team, including physician assistant **Wei He** (foreground)

MINIMALLY INVASIVE AND ROBOT-ASSISTED SURGERY

Stony Brook Heart Institute offers our patients a variety of minimally invasive heart and vascular procedures that provide the advantages of less pain, faster healing, shorter hospital stays and smaller scars.

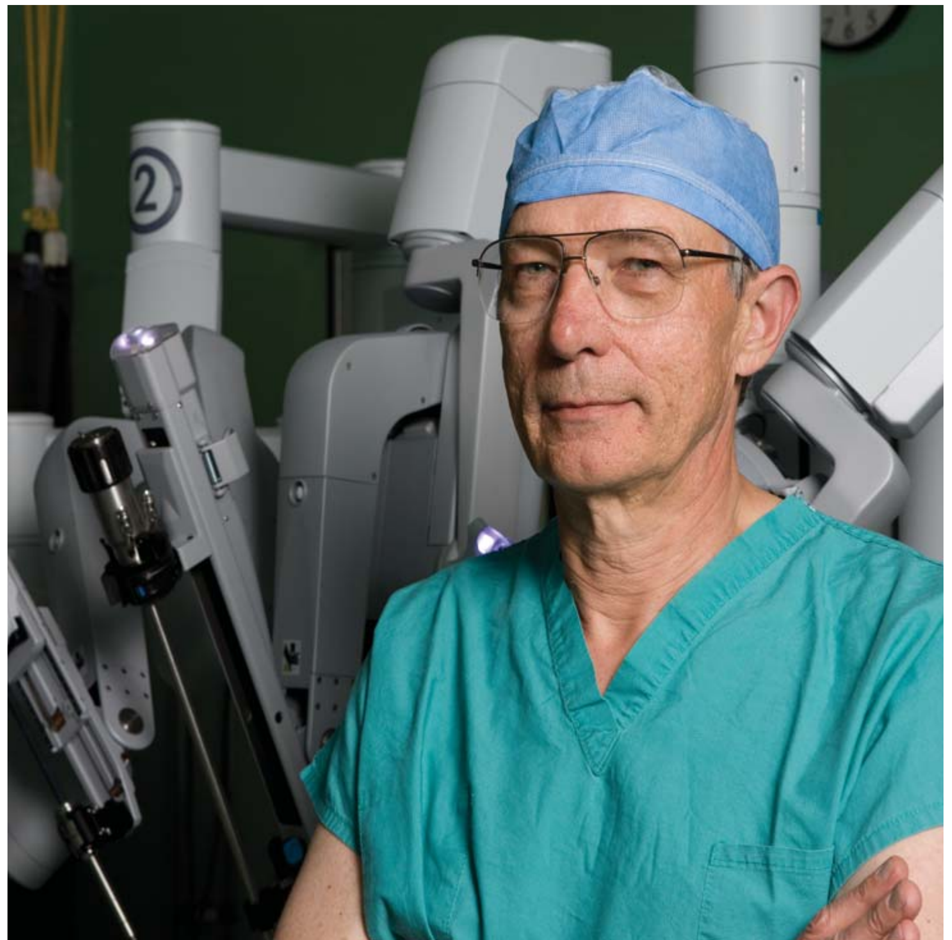
Thomas V. Bilfinger, MD, Chief, Thoracic Surgery, and Allison J. McLarty, MD, Director, Thoracic Aortic Surgery Program, lead our team in providing these lifesaving thoracic endovascular aortic repair (TEVAR) procedures in collaboration with our vascular surgeons to treat thoracic aortic aneurysms. The entire operation is done within the aorta itself.

Endovascular stents have long been used by our vascular colleagues for treating abdominal aortic aneurysms in lieu of open repair, and now we are applying the technology in the chest.

The new endovascular approach to treating thoracic aneurysms, which Stony Brook has used since 2006, is a huge benefit for the patient, decreasing morbidity and mortality, shortening hospital stay and improving recovery compared to patients who have open aneurysm repair by thoracotomy. The endovascular technique is particularly valuable in patients who are older and have more advanced disease.

Thomas V. Bilfinger, MD, Chief, Thoracic Surgery, and **Sandeep Gupta, MD,** Cardiothoracic Surgeon

At Stony Brook, we also perform minimally invasive valve surgery. We have seen outcomes and safety results that exceed conventional open surgical approaches to valvular heart disease. Using technologically advanced endosurgical instrumentation, our “mini-valve” program reflects practices employed at only the top 20 percent of leading heart centers nationwide. New minimally invasive procedures that will soon be available at Stony Brook: robotic mitral valve repair and percutaneous aortic valve replacement.



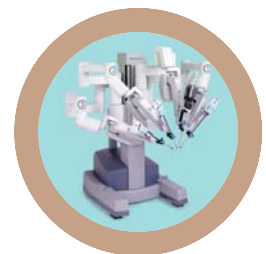
Frank C. Seifert, MD, Director, Minimally Invasive Bypass Surgery Program, with the da Vinci® system

On another front, Frank C. Seifert, MD, leads our minimally invasive bypass surgery program. Off-pump coronary artery bypass (OPCAB) allows multiple bypasses to be performed on the beating heart, without the use of the heart-lung machine, while minimally invasive direct coronary artery bypass (MIDCAB) is performed off-pump through very small incisions between the ribs. Both procedures typically result in less trauma, less pain and faster recovery times than traditional open-heart surgery. During the past decade, nearly half of all coronary bypass procedures at Stony Brook were performed using the OPCAB method, with the number of OPCAB cases exceeding 2,000 and the number of MIDCAB procedures exceeding 400—making Stony Brook among the most experienced in the nation.

Our MIDCAB program coordinates highly customized interventional treatment with our cardiology colleagues, and includes a hybrid procedure, with stenting of other diseased vessels after using the left internal mammary artery (LIMA) artery to bypass the front of the heart.

> **An approved center for the teaching of OPCAB techniques**, demonstrating our role as national leaders in advancing minimally invasive bypass surgery.

We are also one of the few centers nationally that perform robot-assisted MIDCAB procedures using the da Vinci® S HD™ Surgical System. The high-fidelity robotic system seamlessly translates the surgeon’s hand movements into more precise robotic movements. With accompanying high-definition 3D endoscope, surgeons have twice the viewing resolution and a greater viewing area compared to conventional methods, greatly facilitating these complex procedures.



The technical advantages of the robot result in a longer, more versatile LIMA bypass graft, and the possibility of utilizing the right internal mammary artery for multivessel bypass. The robot requires only three small port holes to harvest the vascular grafts, greatly reducing incision size. We continue to increase our experience with this minimally invasive, robotic approach to heart surgery as more and more patients benefit from it.

VASCULAR DISEASE: DIAGNOSIS AND INTERVENTIONS

Comprehensive screening for vascular disease is critical for patients with coronary artery disease because they often have undiagnosed concomitant peripheral arterial disease (PAD). Our Vascular Medicine and Peripheral Vascular Service, introduced by Allen Jeremias, MD, who is among the first physicians in the nation to obtain board certification in vascular medicine, provides expert evaluation and treatment of PAD.

Diagnosis and treatment of vascular disease is provided through the collaboration of our Vascular Medicine and Vascular Surgery physicians who have established screening programs for the diagnosis of PAD, carotid artery disease and abdominal aortic aneurysms (AAAs). Patients diagnosed with any of the above conditions are placed on risk-modification programs that promote smoking cessation, tight control of hypertension, diabetes and hyperlipidemia, and initiation of exercise programs. The goal is to delay or halt progression of vascular disease and decrease the risk of acute cardiac events and stroke. When an intervention is deemed necessary to treat the underlying vascular disease, our physician experts provide all currently available minimally invasive and open surgical interventions with established excellent outcomes.

The Division of Vascular Surgery, under the direction of Apostolos K. Tassiopoulos, MD, provides state-of-the-art evaluation and treatment of vascular disease. More than 2,000 open and endovascular interventions are performed by our vascular intervention team annually. Our four vascular surgeons offer unique expertise in all aspects of diagnosis and treatment of arterial and veneous pathology, and our PhD-trained vascular physiologist is one of the world's experts in noninvasive duplex ultrasound imaging for the diagnosis of vascular disease. Our vascular surgeons work collaboratively with the Divisions of Cardiothoracic Surgery and Cardiovascular Medicine to provide comprehensive patient care and achieve optimal outcomes.

> **A premier training site for vascular surgeons**, as Stony Brook is the only institution on Long Island and one of only five in New York State to offer a five-year track for graduates. It also offers a two-year track for graduates of general surgery residency programs. Both programs are accredited by the Accreditation Council for Graduate Medical Education.

In addition to standard open procedures, our surgeons and interventionalists also have extensive experience with endovascular abdominal aortic aneurysm repair (EVAR) and thoracic endovascular aortic aneurysm repair (TEVAR), as well as reconstructive procedures for occlusive disease of the aorta, iliac arteries and visceral arteries. Based on the National Surgery Quality Improvement Program (NSQIP) reports, we have achieved:

> **0% 30-day mortality rate for EVAR and TEVAR elective procedures** over the past four years, compared to a 3.2% mortality rate observed at like institutions.

> **Significantly lower mean EVAR and TEVAR hospital length of stay** when compared to like institutions for elective procedures at Stony Brook: 2.3 vs. 3.6.

Allen Jeremias, MD, Director, Vascular Medicine and Peripheral Intervention

Apostolos K. Tassiopoulos, MD, Chief, Division of Vascular Surgery, and members of the Vascular Surgery Team

Comprehensive evaluation of patients with atherosclerotic peripheral arterial disease presenting with claudication or limb-threatening symptoms is also offered. In addition to risk factor analysis and duplex ultrasound imaging, our surgeons have extensive experience and expertise in the treatment of PAD, offering all types of open and endovascular revascularization options. In collaboration with our podiatrists and plastic surgeons, we provide exceptional care for patients with limb-threatening arterial problems.

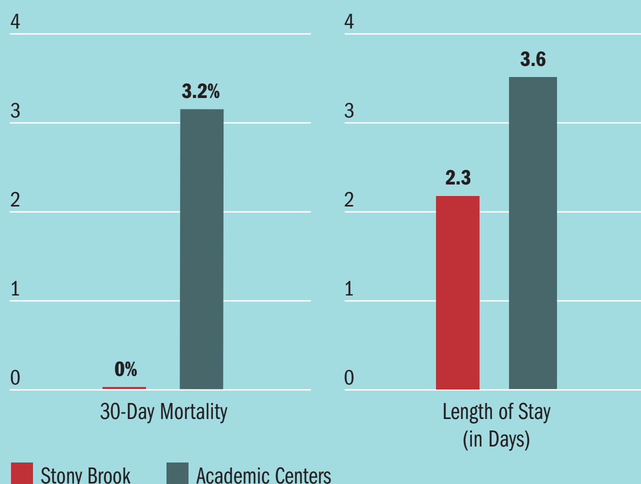
Our vascular surgeons have also gained international reputations for their unique expertise in the diagnosis and management of venous disease.

> **The Stony Brook Vein Center** provides diagnosis and treatment for the entire spectrum of venous disease, including all types of office-based procedures and advanced venous interventions for the treatment of chronic venous insufficiency.

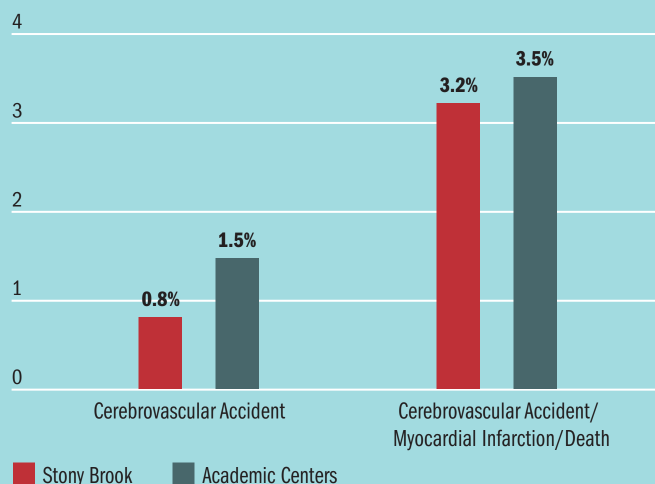
Our interventionalists and surgeons also perform all types of open and percutaneous intervention for stroke prevention. Based on NSQIP reports:

> **Patients who underwent carotid endarterectomy** at Stony Brook had a significantly lower stroke rate (0.8% vs. 1.5%) compared to similar patients at like institutions.

ELECTIVE ENDOVASCULAR AORTIC ANEURYSM REPAIR (2007–2010)



CAROTID ENDARTERECTOMY OUTCOMES (2007–2010)



CLINICAL TRIALS

Stony Brook is committed to transforming the care of patients with cardiac disorders, and research is an integral component of this mission. The Heart Institute offers its patients access to the latest cutting-edge therapies through participation in a variety of clinical trials. Below is a partial listing.

ANEURYSM RISK: Vascular Surgery, in collaboration with Biomedical Engineering, is conducting research through a National Institutes of Health (NIH) grant to more accurately identify aneurysms that carry an increased risk of rupture and, therefore, need a more aggressive treatment approach. The principal investigator is Apostolos Tassiopoulos, MD.

ARTISAN-AF: This randomized study will help determine if robotic ablation using the Sensei® system is superior to manual ablation for atrial fibrillation. The principal investigator is Eric Rashba, MD.

ATRIAL FIBRILLATION: This is a placebo-controlled, double-blind, randomized multicenter study to assess the effects of dronedarone 400 mg, twice a day, on cardiac geometry and function in patients with atrial fibrillation and left atrial enlargement. The principal investigator is Eric Rashba, MD.

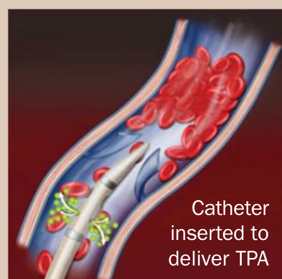
ATTRACT: Vascular Surgery has developed a protocol for the aggressive management of patients with acute deep vein thrombosis (DVT) using pharmacomechanical thrombolysis. Stony Brook is one of the very few sites selected nationwide to participate in the NIH-sponsored ATTRACT (Acute Venous Thrombosis: Thrombus Removal with Adjunctive Catheter-Directed Thrombolysis) trial, which will compare this aggressive approach to the traditional treatment of DVT with anticoagulation only. The principal investigator is Antonios Gasparis, MD.

BOSS: This NIH study is an evaluation of sodium bicarbonate compared with sodium chloride to prevent kidney disease and kidney failure that occurs in some patients with advanced kidney disease who are undergoing angiography after completing the contrast procedure. The principal investigator is Allen Jeremias, MD.

BRIDGE: This study evaluates the maintenance of platelet inhibition with cangrelor after discontinuation of thyropyridines in patients undergoing surgery. This is a collaborative effort between Cardiology and Cardiac Surgery. The principal investigator is Luis Gruberg, MD.

CABANA: This NIH-funded randomized study aims to determine if radiofrequency ablation of AF reduces mortality as compared to standard medical therapy. Currently, AF ablation is reserved for patients who fail initial medical therapy. The CABANA trial will define the management of AF for the next decade, and may establish ablation as first-line therapy for this common cardiac arrhythmia. The principal investigator is Eric Rashba, MD, and the co-investigator is Smadar Kort, MD.

PREVENTING POST-THROMBOTIC SYNDROME



Stony Brook is a collaborating center in the NIH-sponsored study known as the ATTRACT (Acute Venous Thrombosis: Thrombus Removal with Adjunctive Catheter-Directed Thrombolysis) trial. This study aims to determine if new clot-busting treatments can safely prevent post-thrombotic syndrome and improve quality of life in patients with a blood clot in the leg.

ATTRACT is a phase 3, open-label, assessor-blinded, multicenter, randomized clinical trial primarily sponsored by the National Heart, Lung, and Blood Institute.

CLEVER: Vascular Surgery is determining the best treatment approach in patients with claudication. Stony Brook is one of few centers nationally that has been selected to participate in this NIH-sponsored trial. The principal investigator is Apostolos Tassiopoulos, MD.

CREATE-PAS: The use of stents for the treatment of blockages in the carotid arteries is still considered experimental in patients without a previous history of stroke. This NIH study uses the PROTÉGÉ® stent in combination with the SpiderFX™ Embolic Protection Device to treat patients with narrowed carotid arteries, whether they had a stroke in the past or not. The principal investigator is Allen Jeremias, MD.

ECHO-CRT: This randomized study aims to determine if cardiac resynchronization therapy (CRT) will reduce heart failure hospitalization and mortality in patients with left ventricular dysfunction, severe heart failure, narrow QRS complexes and echocardiographic evidence of dyssynchrony. CRT has been proven to reduce heart failure symptoms and mortality in patients with wide QRS complexes on ECG; ECHO-CRT may establish an expanded indication for this lifesaving therapy. The principal investigator is Eric Rashba, MD.

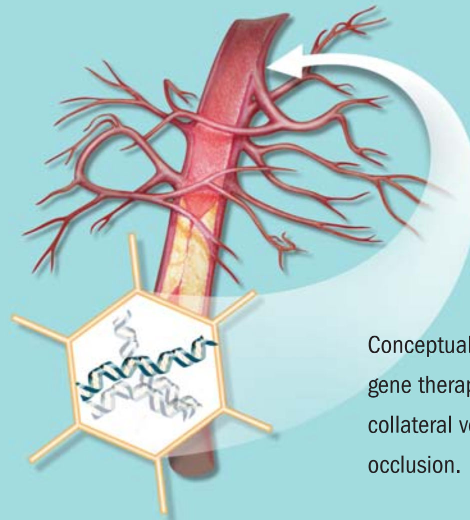
ECRIP: A prospective study to determine the role of median sternotomy versus mini-thoracotomy in systemic inflammatory responses to open-heart surgery. The principal investigator is Todd Rosengart, MD.

EMMI: A prospective, randomized trial assessing whether a web-based audiovisual tool improves patient understanding and expectations of angioplasty procedures. The principal investigator is Todd Rosengart, MD.

EXCEL: This study will evaluate stents versus coronary artery bypass graft (CABG) surgery. This is a collaborative effort between Cardiology and Cardiac Surgery. The principal investigator is Luis Gruberg, MD.

GE CATH: This NIH study compares the effects of an experimental contrast media, called GE-145, to a known contrast media, called iopamidol (Isovue®), on heart and kidney safety in older patients undergoing a coronary catheter angiography, a procedure sometimes called a cardiac CATH. The principal investigator is Allen Jeremias, MD.

EGR-1'S ROLE IN ARTERIOGENESIS



Conceptualization of angiogenic gene therapy, showing growth of collateral vessels around the occlusion.

Arteriogenesis is the development of mature blood vessels supported by smooth muscle. This natural process usually occurs in response to occlusion of blood flow within a vessel, forming collateral vessels that bypass the blockage and allow blood flow to return to the affected area. The process is slow, and catastrophic injury often occurs before a collateral system is developed. Even when a system is formed, only 30 to 40% of the original blood flow capacity is restored.

To shed light on the underlying process of arteriogenesis in order to overcome these limitations, Dr. Rosengart's research team is focusing primarily on the early growth response (Egr-1) gene, which current studies suggest is among the first activated in response to the physical stimuli, such as increased arterial pressure and fluid shear stress that accompany occlusion. Current research in Dr. Rosengart's arteriogenesis laboratory involves cellular analysis as well as a femoral ligation model in the hope of studying Egr-1's role in arteriogenesis by altering its expression level in these systems and comparing the reaction to occlusion in the treatment groups with a normal control group.

GENE THERAPY: Cardiothoracic Surgery is operating an NIH-funded laboratory for arteriogenesis—aiming to develop gene therapy that stimulates the growth of new blood vessels for a "biologic bypass" procedure to treat coronary artery disease. More than $10 million in research grants have been awarded toward this program. Clinical trials involving gene transfer therapy for human subjects are expected in 2012. The principal investigator is Todd Rosengart, MD.

CLINICAL TRIALS *continued*

HCRI DAPT: Patients treated with stents are currently treated with two blood thinners, usually aspirin and clopidogrel (Plavix®) or prasugrel (Effient®) for at least one year. This is an NIH study that will aim to determine the appropriate length of time patients should receive these two medications after undergoing stenting of the coronary arteries. The principal investigator is Luis Gruberg, MD.

IPAC: The Investigation in Pregnancy-Associated Cardiomyopathy (IPAC) study examines genetic information (DNA) as well as the immune system to find possible causes for the heart muscle damage that occurs in patients with peripartum cardiomyopathy. The principal investigator is Hal Skopicki, MD, PhD, and the co-investigator is Kathleen Stergiopoulos, MD, PhD.

PHOENIX: This study investigates whether the infusion of cangrelor, a new blood thinner, along with Plavix®, is successful in preventing blood clots compared to the safety and effectiveness of Plavix® alone in patients having a percutaneous coronary intervention. The principal investigator is Luis Gruberg, MD.

PROCHYMAL®: Stony Brook is one of two hospitals in New York State selected to participate in a NIH clinical trial that is investigating the use of mesenchymal stem cells (MSCs) to treat patients who have had a first acute myocardial infarction (MI). Pre-clinical studies have indicated that MSCs may limit damage to heart muscle and improve or preserve cardiac function in heart attack patients. This is a phase II, multicenter randomized double-blind, placebo-controlled study to evaluate the safety and efficacy of Prochymal (ex vivo cultured adult human mesenchymal stem cells) intravenous infusion following acute myocardial infarction. The principal investigator is Luis Gruberg, MD, and the co-investigator is Smadar Kort, MD.

PROMISE: Stony Brook is one of only five centers in New York State and 25 hospitals in the nation participating in the PROMISE (PROspective Multicenter Imaging Study for Evaluation of Chest Pain) trial. This randomized trial seeks to determine the clinical effectiveness of anatomic testing with coronary CT angiography compared to function testing such as EKG, nuclear stress testing and echocardiography. Michael Poon, MD, is the principal investigator.

RAID: The purpose of the Ranolozine Implantable Cardioverter-Defibrillator trial (RAID), sponsored by the National Heart, Lung, and Blood Institute, is to see how effective a drug called ranolozine is in reducing the risk of ventricular arrhythmia and death in people with implantable cardioverter-defibrillators (ICDs). The principal investigator is Eric Rashba, MD, and the co-investigator is Smadar Kort, MD.

RED-CABG: The Effect of Acadesine on Reducing Cardiovascular Adverse Events in Coronary Artery Bypass Graft Surgery (RED-CABG) examines the effect of acadesine on clinically significant adverse cardiovascular and cerebrovascular events in high-risk subjects undergoing coronary artery bypass graft (CABG) surgery using cardiopulmonary bypass. The principal investigator is Todd Rosengart, MD.

REVEAL: Reduction of Infarct Expansion and Ventricular Remodeling with Erythropoietin after Large Myocardial Infarction (REVEAL) is a NIH-funded randomized, multicenter, double-blind placebo-controlled trial on the effects of erythropoietin on infarct size and left ventricular remodeling in survivors of large myocardial infarctions. The principal investigator is Luis Gruberg, MD, and the co-investigator is Smadar Kort, MD.

ROBOTIC CATHETER SYSTEM: This is a prospective, randomized study of the Sensei® X Robotic Catheter System for introducing and positioning the ThermoCool® catheter in patients with atrial fibrillation. The principal investigator is Eric Rashba, MD, and the co-investigator is Smadar Kort, MD.

SELECT CABG: This study aims to assess a 20 mg/kg dose of the recombinant human monoclonal antibody against P-selectin in patients undergoing coronary artery bypass graft (CABG) surgery. The principal investigator is Todd Rosengart, MD.

SMARTDELAY: This is a comparison of AV delay methods used in cardiac resynchronization therapy (SMART-AV). The principal investigator is Eric Rashba, MD, and the co-investigator is Smadar Kort, MD.

SOLID TIMI 52: The Stabilization of Plaques Using Darapladib Thrombolysis in Myocardial Infarction 52 (SOLID TIMI 52) is an NIH study investigating how effective darapladib is in treating patients with acute coronary syndrome as compared to a placebo. Darapladib is a novel medication that has the potential of inhibiting inflammation with the cholesterol plaques inside the coronary arteries. The principal investigator is Luis Gruberg, MD.

STATUS-PCI: This study compares two medications, Angiomax® and unfractionated heparin, in patients undergoing coronary artery intervention with stents. The principal investigator is Allen Jeremias, MD.

STRESS ECHO: This NIH-funded study compares the 3D stress echo with standard methods. The principal investigator is Smadar Kort, MD.

SYNCRIA®: A multicenter placebo-controlled study to evaluate the safety of GSK16155 and its effects on myocardial metabolism, myocardial function and exercise capacity in patients with NYHA Class II/III congestive heart failure. The principal investigator is Hal Skopicki, MD, PhD.

SYNTAX: A multicenter, randomized clinical trial comparing Taxus™ PCI to CABG in patients amenable for revascularization treatment of three-vessel disease, left main disease or left main in conjunction with one-, two- or three-vessel disease. The principal investigators are David L. Brown, MD, Todd Rosengart, MD, and Frank C. Seifert, MD.

VEGF: A 10-year follow-up assessment of a phase I trial of angiogenic gene therapy for the treatment of coronary artery disease using direct intramyocardial, an adenovirus vector expressing the VEGF121 cDNA. The principal investigator is Todd Rosengart, MD.

VEST-PREDICTS: NIH-funded randomized study that will determine if the LifeVest® wearable external defibrillator improves survival during the first 60 days after myocardial infarction (MI) in patients with severe left ventricular dysfunction. Detailed noninvasive testing is performed at three months post-MI to determine which patients are most likely to benefit from an implantable cardioverter-defibrillator (ICD). The principal investigator is Eric Rashba, MD.

VIRGO: Variation in Recovery: Role of Gender on Outcomes of Young Acute Myocardial Infarction Patients (VIRGO) investigates whether there are outcome differences between men and women, ages 55 or younger, following a heart attack. The principal investigator is Kathleen Stergiopoulos, MD.

PUBLICATIONS

Below is a sampling of 2010-2011 research published in peer-review journals, as well as books edited and book chapters.

JOURNALS

Bekelis, K., Eskey, C., Erkmen, K., **Labropoulos, N.,** Burdette, T., Stotland, M., & Durham, S. (2011). Scalp arteriovenous malformation associated with a superior sagittal sinus, sinus pericranii. *Int Angiol*, 30(5), 488-492.

Berger, P.B., Kleiman, N.S., Pencina, M.J., Hsieh, W.H., Steinhubl, S.R., **Jeremias, A.,** Sonel, A., Browne, K., Barseness, G., & Cohen, D.J. (2010). Frequency of major non-cardiac surgery and subsequent adverse events in the year after drug-eluting stent placement results from the EVENT registry. *JACC Cardiovascular Interv*., 3(9), 920-927.

Camporese, G., **Labropoulos, N.,** Verlato, F., Bernardi, E., Ragazzi, R., Salmistraro, G., Kontothanassis, D., & Andreozzi, G.M.; Carotid Recanalization Investigators Group (2011). Benign outcome of objectively proven spontaneous recanalization of internal carotid artery occlusion. *J Vasc Surg*, 53(2), 323-329.

Daubert, M.A., & Jeremias, A. (2010). The utility of troponin measurement to detect myocardial infarction: Review of the current findings. *Vascular Health and Risk Management,* 6, 691-699.

Fan, R., Tardos, J.G., Almasry, I., Barbera, S., Rashba, E.J., & Iwai, S. (2011). Novel use of atrial overdrive pacing to rapidly differentiate junctional tachycardia from atrioventricular nodal reentrant tachycardia. *Heart Rhythm,* 8(6), 840-844.

Fox, D., Amador, F., Clarke, D., Velez, M., Cruz, J., **Labropoulos, N.,** Ryan, M., & Gelman, L. (2011, April 29). Duplex-guided dialysis access interventions can be performed safely in the office setting: Techniques and early results. *Eur J Vasc Endovasc Surg*, April 29 [Epub ahead of print].

Fragou, M., Gravvanis, A., Dimitriou, V., Papalois, A., Kouraklis, G., Karabinis, A., Saranteas, T., Poularas, J., Papanikolaou, J., Davlouros, P., **Labropoulos, N.,** & Karakitsos, D. (2011). Real-time ultrasound-guided subclavian vein cannulation versus the landmark method in critical care patients: A prospective randomized study. *Crit Care Med,* 39(7), 1607-1612.

Gruberg, L., Parikh, P., Jeremias, A., Naidu, S.S., Shlofmitz, R.A., Brenner, S.J., Pappas, T., Marzo, K.P., & **Brown, D.L.** (2010). Higher mortality rates after percutaneous coronary intervention in female patients on hemodialysis. *J Am Coll Cardiol,* 55, A210.

Gruberg, L., Parikh, P., Jeremias, A., Naidu, S.S., Shlofmitz, R.A., Brenner, S.J., Pappas, T., Marzo, K.P., & **Brown, D.L.** (2010). The impact of race on in-hospital outcomes in hemodialysis patients undergoing percutaneous coronary intervention. *J Am Coll Cardiol,* 55, A211.

Iwai, S., Badhwar, N., Markowitz, S.M., Stambler, B.S., Keung, E., Lee, R.J., Chung, J.H., Olgin, J.E., Scheinman, M.M., & Lerman, B.B. (2011). Electrophysiologic properties of para-Hisian atrial tachycardia. *Heart Rhythm,* 8(8), 1245-1253.

Jeremias, A., Vasu, S., Gruberg, L., Kastrati, A., Stone, G.W., & **Brown, D.L.** (2010). Impact of abciximab on mortality and reinfarction in patients with acute ST-segment elevation myocardial infarction treated with primary stenting. *Catheter Cardiovasc Interv,* 75(6), 895-902.

Kort, S., Mamidipally, S., Madahar, P., Buzzanca, L., Blizzard, B., Gamboa, J., & Brown, D.L. (2010). Segmental contribution to left ventricular systolic function at rest and stress: A quantitative real-time three-dimensional echocardiographic study. *Echocardiography*, 27(2), 167-173.

Kort, S., Madahar, P., Ajmera, A., & Brown, D.L. (2010). Mitral annular velocities generated by speckle tracking imaging: Reproducibility and correlation with tissue Doppler velocities. *Echocardiography*, 27(6), 637-643.

Labovitz, A.J., Noble, V.E., Bierig, M., Goldstein, S.A., Jones, R., **Kort, S.,** Porter, T.R., Spencer, K.T., Tayal, V.S., & Wei, K. (2010). Focused cardiac ultrasound in the emergent setting: A consensus statement of the American Society of Echocardiography and American College of Emergency Physicians. *J Am Soc Echocardiography,* 23(12), 1225-1230.

Menon, D., & **Gruberg, L.** (2010). Preventing the unpreventable? Rotational angiography for the prevention of contrast-induced nephropathy. *J Invasive Cardiol*, 22(9), 432-433.

Parikh, P., Gruberg, L., Jeremias, A., Naidu, S.S., Shlofmitz, R.A., Brenner, S.J., Pappas, T., Marzo, K.P., & **Brown, D.L.** (2010). Impact of dialysis-dependent end-stage renal disease and advanced chronic kidney disease on in-hospital outcomes in patients undergoing percutaneous coronary intervention. *J Am Coll Cardiol,* 55, A140.

Parikh, P., Gruberg, L., Jeremias, A., Chen, J.J., Naidu, S.S., Shlofmitz, R.A., Brenner, S.J., Pappas, T., Marzo, K.P., & **Brown, D.L.** (2010). Impact of health insurance status on clinical presentation, management and outcomes of patients undergoing percutaneous coronary intervention. *J Am Coll Cardiol,* 55, A222.

Pasklinsky, G., Meisner, R.J., **Labropoulos, N.,** Leon, L., **Gasparis, A.P., Landau, D., Tassiopoulos, A.K.,** & Pappas, P.J. (2011). Management of true aneurysms of hemodialysis access fistulas. *J Vasc Surg,* 53(5), 1291-1297.

Rashba, E.J., Estes III, N.A. (2011, August 1). Is there a mechanistic link between atrial fibrillation and vulnerability to ventricular arrhythmias? *J Cardiovasc Electrophysiol,* August 1 [Epub ahead of print].

Rashba, E.J. (2011, July 12). Dissecting the substrate for sudden cardiac death in the absence of ischemic heart disease. *Heart Rhythm*, July 12 [Epub ahead of print].

Stergiopoulos, K., Bahrainy, S., Buzzanca, L., Blizzard, B., Gamboa J., & Kort S. (2010). Contrast enhanced real-time three-dimensional exercise stress echocardiography: Feasibility and comparison with two-dimensional exercise stress echocardiography. *Heart International*.

Stergiopoulos, K., Vasu, S., Bilfinger, T., & Poon M. (2011). Embolic stroke in a patient with metastatic renal cell cancer. *Hellenic J Cardiol,* 52(3), 256-258.

Tzogias, L., **Labropoulos, N.,** Amaral, S.I., Antoniou, G.A., & Giannoukas, A.D. (2011). Distribution and clinical impact of phlebosclerosis. *Int Angiol*, 30(3), 212-220.

BOOKS EDITED AND BOOK CHAPTERS

Bishawi, M., & **Rosengart, T.K.** (2010). Biologic bypass. In N. Moorjani, N. Viola, & S.K. Ohri (Eds.), *Key questions in cardiac surgery.* Castle Hill Barns, UK: TFM Publishing.

Bishawi, M., & **Rosengart, T.K.** (2011). Regenerating mechanical function in vivo with skeletal myoblasts. In **I.S. Cohen** & G.R. Gaudette (Eds), *Regenerating the heart: Stem cells and the cardiovascular system (pp. 201-218).* New York, NY: Humana Press.

Daubert, M., Jeremias, A., & Brown, D.L. (2010). Diagnosis of acute myocardial infarction. In **A. Jeremias & D.L. Brown** (Eds.), *Cardiac intensive care* (2nd ed., pp. 97-105). Philadelphia, PA: Saunders Elsevier.

Jeremias, A., & Brown, D.L. (Eds.). (2010). *Cardiac intensive care* (2nd ed.). Philadelphia, PA: Saunders Elsevier.

Martin, S., Jeremias, A., & Gruberg, L. (2010). Oral anticoagulation issues in percutaneous coronary intervention. In A. Ajani & R. Waksman (Eds.), *Pharmacology in the catheterization laboratory* (pp. 158-164). Oxford, UK: Wiley-Blackwell.

Parikh, P., & Jeremias, A. (2010). Elevated cardiac troponin in the absence of acute coronary syndromes—mechanism, significance and prognosis. In **A. Jeremias & D.L. Brown** (Eds.), *Cardiac intensive care* (2nd ed., pp. 196-202). Philadelphia, PA: Saunders Elsevier.

Patel, A., & Iwai, S. (2010). Risk stratification of sudden cardiac death. In B.B. Lerman & C.T. Basson (Eds.), *Emerging concepts in cardiology series: Topics in arrhythmias and ischemic heart disease* (pp. 1-20). New York, NY: Demos Medical Publishing.

Stergiopoulos, K., & Kort, S. (2010). Exercise echocardiography in mitral stenosis. In R. Lang, S.A. Goldstein, I. Kronzon, & B.K. Khandheria (Eds.), *Dynamic echocardiography (pp. 46-47).* St. Louis, MO: Saunders Elsevier.

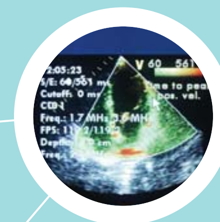
Patel, N., & Gruberg, L. (2010). Intra-aortic counterpulsation. In **A. Jeremias & D.L. Brown** (Eds.), *Cardiac intensive care* (2nd ed.). Philadelphia, PA: Saunders Elsevier.

Stony Brook Heart Institute Achievements

Implanted the region's **first permanent left ventricular assist device** for "destination therapy"

Acquired Suffolk County's **first 320-slice CT** scanner

First hospital on Long Island to achieve **triple accreditation** in all three types of adult echocardiography: transthoracic, transesophageal and stress



Transradial Catheterization offers significant benefits over femoral access

Earned 2010 Silver **Achievement Award** from American Heart Association for heart failure outcomes

Earned 2010 Niagara Health Quality Coalition **top scores among all Long Island hospitals** for heart attack and congestive heart failure rates

Earned 2009 Hospital Association of New York State (HANYS) **Pinnacle Award for Coronary Care Unit** as a high reliability/exemplary clinical unit for patient safety

Earned 2007-2009 UnitedHealth **Cardiac Specialty Center** designation for excellence in cardiac and pulmonary care and cardiac surgery

Ranked #1 in New York State for cardiac services by UnitedHealth for 2009

Earned 2009 Niagara Health Quality Coalition **New York State Honor Roll** for risk-adjusted mortality rates below state average for acute myocardial infarction (AMI), congestive heart failure, percutaneous transluminal coronary angioplasty and AMI

Four physicians named among **New York's Top Doctors** by *New York* Magazine for 2011: David L. Brown, MD, and Michael Poon, MD, Cardiovascular Disease; Thomas M. Biancaniello, MD, Pediatric Cardiology; and Todd K. Rosengart, MD, Thoracic Surgery

Design: Pressley Johnson Design. Photography: Daniel Goodrich, Sam Levitan, Juliana Thomas and Jeff Williams. Illustration (page 19): Kathy Gebhart.

heart.stonybrookmedicine.edu

Stony Brook Heart Institute
Stony Brook, NY 11794

(631) 44-HEART (444-3278)

© 2011 Stony Brook Medicine.
All rights reserved. Stony Brook University/SUNY
is an affirmative action, equal opportunity educator
and employer. 0803053H