

**SUMMER 2015**

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## Dr. Leonard N. Girardi Appointed Cardiothoracic Surgeon-in-Chief at NewYork-Presbyterian/Weill Cornell

Leonard N. Girardi, MD, an internationally renowned expert in complex aortic procedures, has been appointed Cardiothoracic Surgeon-in-Chief at NewYork-Presbyterian/Weill Cornell Medical Center, and Chairman of the Department of Cardiothoracic Surgery at Weill Cornell Medical College. Dr. Girardi succeeds O. Wayne Isom, MD, who in his 30 years as head of the Department developed it into one of the highest ranked cardiothoracic surgery centers in the country.

“Dr. Girardi brings a unique blend of world class clinical expertise, commitment to excellence in medical education and research, and outstanding leadership skill that will build on and further strengthen Weill Cornell’s Department of Cardiothoracic Surgery in the coming years,” says Steven J. Corwin, MD, CEO of NewYork-Presbyterian Hospital.

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Dr. Leonard N. Girardi

## Hybrid Cardiac Surgery: A Viable Strategy for Select Cardiac Patients

In an era of aging patients with increasingly complex cardiac conditions, it has become imperative to provide innovative surgical approaches for patients with advanced coronary disease, says Isaac George, MD, Surgical Director of Transcatheter Cardiovascular Therapies and Director of Hybrid Coronary Interventions at NewYork-Presbyterian/Columbia University Medical Center. “As technology improves, important questions regarding optimal treatment must now be asked,” says Dr. George. “For example, are patients with advanced coronary disease better served by coronary artery bypass grafting or by percutaneous coronary intervention or both? Should older patients with aortic stenosis undergo surgical aortic valve replacement or transcatheter aortic valve replacement? Can we combine surgical and interventional approaches to treat valvular disease, heart failure, or aortic aneurysms?”

Having completed 10 years of fellowship training at NewYork-Presbyterian/Columbia in cardiothoracic surgery, ventricular assist device/cardiac transplant, minimally invasive cardiac surgery, and interventional cardiology/hybrid cardiac surgery, and performed more than 1,500 valve procedures, including TAVR, Dr. George is ideally qualified to address these often complex questions. Board certified in thoracic surgery and general surgery, he is one of just four physicians in the country dually trained in both cardiac surgery and interventional cardiology.

Dr. George integrates new technology and innovation into his clinical practice that enable him to combine strategies to create a personalized surgical plan for each patient that, he says, “draws on the best of cardiac surgery and the best of cardiology, and most importantly, without compromising quality or outcomes.”

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Weill Cornell Medical College

## Dr. Leonard N. Girardi Appointed Cardiothoracic Surgeon-in-Chief at Weill Cornell (continued from page 1)

After obtaining a degree with honors in biochemistry at Harvard University in 1985, Dr. Girardi earned his medical degree at Weill Cornell Medical College, where he was named the Spingold Scholar and the Skudder Scholar, and was also awarded the Coryell Prize in both Medicine and Surgery. After pursuing an NIH research fellowship, Dr. Girardi returned to Weill Cornell for residency training under Dr. G. Thomas Shires, being honored with membership in the Alpha Omega Alpha Honors Medical Society for his outstanding achievements.

Dr. Girardi then joined the Department of Cardiothoracic Surgery for fellowship training under the tutelage of Dr. Isom. His final year of training was spent at the Baylor College of Medicine in Houston, Texas, under Dr. Michael E. DeBakey. While there, he obtained specialty training in surgery of the aorta and great vessels. In 1997, he joined the faculty in the Department of Cardiothoracic Surgery at NewYork-Presbyterian/Weill Cornell.

"Here at NewYork-Presbyterian/Weill Cornell we take some of the sickest people in the world and do everything possible, every single day, to make them better," says Dr. Girardi. "I believe NewYork-Presbyterian allows you to do that by whatever means necessary. I take great pride in being a member of a team that can handle the most complex patient situation, regardless of the time, whether day or night, the circumstances, or the nature of the problem."

**"I take great pride in being a member of a team that can handle the most complex patient situation, regardless of the time, whether day or night, the circumstances, or the nature of the problem."**

— Dr. Leonard N. Girardi

Dr. Girardi emphasizes the importance of a shared commitment to excellence, not only by cardiac surgeons, but also by anesthesiology, nursing, and critical care, which helps to ensure a cardiac patient's positive outcome. "Half the battle is in the operating room and half the battle is in the postoperative period, so cardiac surgery is very much a team effort," he says.

Dr. Girardi's primary research interests lie in the field of thoracic aortic aneurysms. Due in large part to his extensive experience in aneurysm surgery, the Department of Cardiothoracic Surgery at Weill Cornell was one of 17 international surgery centers chosen to study outcomes for aortic valve-sparing surgery in patients with ascending aortic aneurysms due to Marfan's syndrome. Traditionally, these patients would have their valve removed and replaced.



*Dr. Leonard Girardi (right) is one of the highest volume cardiac surgeons in the state of New York and has been recognized for consistently producing some of the best results according to the New York State Department of Health Cardiac Surgery Database.*

"There wasn't a great alternative to treat this condition from the 1960s to early 2000," says Dr. Girardi. Over the last 15 years, the Aortic Surgery Program at Weill Cornell has been aggressively pursuing the development of a procedure that would enable surgeons to spare the patient's native valve. Today, valve-sparing ascending aortic aneurysm repair is a viable option for an increasing number of patients.

"In the past, surgery for patients involved either a biological valve replacement, which, potentially, would fail in 10 to 15 years, or they would have to have a valve replaced with a metal valve that required them to be on anticoagulants for the rest of their lives," explains Dr. Girardi. "We can now repair the aneurysm and save and reconstruct the patient's own native aortic valve in such a way that it works fine, is quite durable, and the patient doesn't need to be on blood thinners. Also, the risk of needing to reoperate on that valve is very, very low."

In collaboration with the Division of Molecular Cardiology, Dr. Girardi is investigating the genetics and natural history of thoracic aneurysms and aortic dissections, examining the genetic makeup of patients with aneurysms, and seeking to develop a screening test that will allow for the early detection of aneurysms before they become symptomatic or require surgery. He also has ongoing projects examining the effects of antifibrinolytic drugs in reducing blood loss and the need for blood transfusions in patients undergoing high-risk surgery of the aortic root and aortic arch.

Dr. Girardi has published and lectured extensively in multiple areas of cardiac and thoracic surgery and has made important contributions to advancing the field. His most recent journal publications include articles on mitral valve surgery, mitral regurgitation, pericardiectomy, paradoxical embolus, and percutaneous coronary intervention prior to open thoracoabdominal and descending thoracic aneurysm repair. He serves on the editorial boards of the *Journal of Thoracic and Cardiovascular Surgery*, *Journal of Cardiac Surgery*, and *Aorta*, and is a member of the American Association for Thoracic Surgery, the Society of Thoracic Surgeons, the American Heart Association, the American College of Surgeons, the American College of Cardiology, and the DeBakey International Surgical Society.

Strongly committed to training the next generation of cardiothoracic surgeons, Dr. Girardi, who is also the O. Wayne Isom, MD, Professor of Cardiothoracic Surgery at Weill Cornell, teaches medical students and residents on all levels. He is currently the Chair of the Evarts A. Graham Memorial Traveling Fellowship sponsored by the American Association for Thoracic Surgery.

### For More Information

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## Hybrid Cardiac Surgery: A Viable Strategy for Select Cardiac Patients (continued from page 1)

According to Dr. George, there are numerous advantages to hybrid cardiac surgery, which is performed in the same operative setting as percutaneous coronary interventions (PCI). “We can avoid a sternotomy in favor of minimally invasive approaches,” he says. “In high-risk patients and reoperative patients, risky surgical procedures can be converted to complex surgeries combined with an interventional procedure, resulting in small incisions, less pain, quicker recovery times, and a high level of patient satisfaction.”

The hybrid strategy of combining cardiac surgery and PCI also has been proposed for non-left anterior descending coronary artery (LAD) lesions but with limited acceptance. “Many centers are reluctant to perform PCI on the same day as surgery owing to the fear of increased bleeding from dual antiplatelet therapy and the theoretical risk of acute stent thrombosis after surgery,” says Dr. George. “Therefore, hybrid procedures have predominantly been staged with varying intervals between PCI and then surgery or between surgery and then PCI. Nevertheless, single-stage hybrid surgery offers a number of potential advantages over staged strategies or traditional cardiac surgery. These may include partial or complete revascularization before surgery, elimination of the need for multiple procedures to achieve definitive treatment, and a reduction in calculated operative risk by eliminating or reducing bypass grafting. Here at Columbia, we are one of only two or three centers in the country that performs the surgical portion and the coronary stenting portion at the same time.”

### Applications of Hybrid Cardiac Surgery

- Coronary artery bypass grafting and in placing coronary stents
- Heart valve repairs or replacements
- Aortic arch surgeries

### Benefits of Hybrid Cardiac Surgery

- Better option for reoperative patients in light of risk of having two open bypass operations, avoiding further injury to the heart and existing valves
- Allows for a minimally invasive operation that does not require a sternotomy
- Can replace vein grafts with coronary stents, which may be a better option long term

The hybrid approach also extends to valve disease. “You can perform minimally invasive valve surgery using a stent rather than a vein graft,” notes Dr. George. “A bypass can be more risky in certain situations and may not give the same benefit. This is particularly so in individuals who are undergoing reoperations. So rather than doing reoperative bypass surgery, you can stent the lesion and do the valve procedure from the surgery side. We can also perform the valve procedure using a transcatheter approach and combine that with a left internal mammary artery or LAD graft. Other advantages to the hybrid approach are that it is all done at once, you don’t have to rely on the veins, and you have equal or maybe even better patency of these procedures. Recovery in general is faster, and usually with less time on the ventilator and in the ICU. Also, the cost is likely reduced since you are only doing one procedure.”



Dr. Isaac George

### Personalized Medicine Applied to Heart Disease

Dr. George points out that the range of procedures allows the surgeon to personalize treatment for coronary and valve disease. “We can customize a plan for patients based on their anatomy, their disease, risks, and benefits, as well as their preference,” he says. “There are unlimited options in hybrid surgery for treating a patient who has valve disease, coronary disease, or combined valve and coronary disease.”

Dr. George’s work is bolstered greatly by his bench and clinical research. He and his Columbia colleagues recently published results of a study of the feasibility and early safety of single-stage hybrid coronary intervention and valvular surgery in *The Annals of Thoracic Surgery*. In an operating room specifically designed for hybrid surgery, 26 patients underwent surgery consisting of femoral arterial access for coronary stenting followed by valve surgery. The mean follow-up was 680 days, plus or minus 277 days. The planned coronary stenting and surgery procedure was successful in all cases. Major adverse events occurred in one patient, with no in-hospital deaths. No vascular complications or stent thrombosis was observed with the antiplatelet regimen, and the outcomes were comparable to those of standard bypass valve replacement surgery. The researchers concluded that hybrid procedures may lower the operative risk by eliminating or reducing the need for bypass grafting.

Going forward, Dr. George believes that the field of hybrid cardiac surgery will continue to expand and explode. “You’re going to see more and more of these hybrid procedures performed,” he says. “The stents are getting better and the transcatheter valve technology is also much better. We’re also using robotics more frequently, and we expect to gather data that show that hybrid procedures offer long-lasting outcomes.”

#### Reference Article

George I, Nazif TM, Kalesan B, Kriegel J, Yerebakan H, Kirtane A, Kodali SK, Williams MR. Feasibility and early safety of single-stage hybrid coronary intervention and valvular cardiac surgery. *The Annals of Thoracic Surgery*. 2015 Jun;99(6):2032-37.

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## Advances in Cardiology, Interventional Cardiology, and Cardiothoracic Surgery

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## NewYork-Presbyterian Studies Device to Prevent Stroke During TAVR

Roughly 3 percent of TAVR patients undergoing transcatheter aortic valve replacement experience stroke caused by embolic debris that becomes dislodged when the valve is replaced. More recently, over 90 percent of TAVR patients have been shown to have ischemic brain lesions, or “silent” infarcts associated with adverse neurologic and cognitive consequences and dementia.

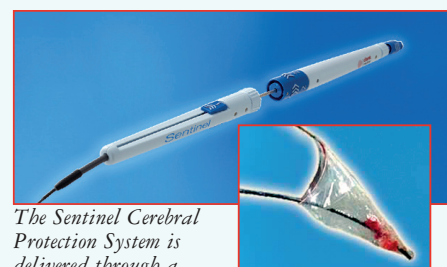
In October 2014, **Susheel K. Kodali, MD**, Director of the Heart Valve Center at NewYork-Presbyterian/Columbia University Medical Center, successfully treated the first patient in a trial evaluating the role of cerebral protection during transcatheter aortic valve replacement. The SENTINEL Trial – of which Dr. Kodali is a national co-principal investigator – is a multicenter pivotal trial of the Sentinel™ Cerebral Protection System developed by Claret Medical.

The trial will evaluate up to 284 patients at up to 15 centers nationwide, including both NewYork-Presbyterian/Columbia and NewYork-Presbyterian/Weill Cornell Medical Center. NewYork-Presbyterian has been a pioneer in TAVR procedures since 2009. Since then, more than 1,500 TAVR procedures have been performed at the Hospital.

“Embolic debris dislodged during TAVR poses a threat to the brain,” says Dr. Kodali. “The SENTINEL device shows promise as an effective way to filter out harmful material and increase the safety of TAVR for our patients.”

The percutaneous device is implanted in tandem with the replacement heart valve during TAVR and can be adjusted to the precise size of a patient’s arteries. It employs a proximal embolic filter delivered to the brachiocephalic artery, and a distal embolic filter delivered to the left common carotid artery. The filters collect debris released during the procedure – valve tissue, calcification,

thrombus, or other material – and prevent it from traveling to the brain. At the completion of the procedure, the filters and collected debris are recaptured into the catheter and removed from the patient.



*The Sentinel Cerebral Protection System is delivered through a conventional radial artery approach in the right arm. (Inset) The filter collects debris released during the TAVR procedure.*

The primary endpoints for the SENTINEL Trial are the reduction in total new lesion volume as determined by diffusion-weighted magnetic resonance imaging and major adverse cardiac and cerebrovascular events. A number of secondary endpoints, such as neurocognitive and histopathological outcomes during TAVR, will be compared in the study arms with and without cerebral protection.

“We are excited to be participating in the SENTINEL Trial at NewYork-Presbyterian,” adds **Shing-Chiu Wong, MD**, Director of Cardiac Catheterization Laboratories at NewYork-Presbyterian/Weill Cornell and principal investigator of the trial there. “The novel cerebral protection system will potentially reduce the risk of stroke for our patients undergoing TAVR procedures.”

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