



## DIVISION OF CARDIOLOGY

“Mount Sinai Heart is the model for preventing, treating, and eradicating heart disease.”

Dr. Valentin Fuster

DR. VALENTIN FUSTER  
is President of the  
World Heart Federation.

Mount  
Sinai

## In April of 2006, Mount Sinai Heart was created under the leadership of Valentin Fuster, MD, PhD, Richard Gorlin, MD/Heart Research Foundation Professor, Director of the Zena and Michael A. Wiener Cardiovascular Institute and the Marie-Josée and Henry R. Kravis Center for Cardiovascular Health, and Chief of the Division of Cardiology.

Mount Sinai Heart is a multidisciplinary effort that brings together expertise in cardiology, cardiovascular surgery, vascular medicine, pediatric cardiology, cardiac anesthesiology, medical education, research, and community service. It features state-of-the-art facilities for patient care, advanced laboratories for scientific research, and leading-edge programs for postgraduate education of clinician-scientists.

According to Dr. Fuster, who is currently President of the World Heart Federation, "Mount Sinai Heart is the model setting for preventing, treating, and eradicating heart disease."

### **By All Measures, Superior Patient Care**

Nearly all patient care services provided by the Division of Cardiology have experienced growth over the past several years, including a 30 percent increase in cardiac catheterizations, a 25 percent upswing in echocardiography procedures, 17.5 percent increase in electrophysiology cases, and a 20 percent increase in referrals to the vascular laboratory.

### **Cardiac Catheterization—Safety in Numbers**

According to the New York State Department of Health, Samin K. Sharma, MD, Zena and Michael A. Wiener Professor of Medicine and Director of the Cardiac Catheterization Laboratories, has maintained the highest angioplasty success rate for an interventional cardiologist in the state every year since 1994.

In May 2005 Mount Sinai renovated and expanded its cardiac catheterization and electrophysiology laboratories, including patient preparation and recovery areas. In a first-of-its-kind arrangement for the New York metropolitan area, the facility provides a single location that encompasses five rooms for cardiac catheterization and

angiographic intervention, two rooms for electrophysiology procedures, eight patient-intake beds, and a 20-bed patient recovery area.

The volume of procedures performed in the cardiac catheterization laboratory is growing at an astonishing rate, while complication rates remain extremely low. Over 5,000 cardiovascular interventions were performed in 2006, the highest in the Northeast region, making it one of the top-six performing laboratories in the nation.

To increase opportunities for residents of East and Central Harlem to access this high level of care, a cardiac catheterization laboratory was opened in 2005 at North General Hospital, an affiliate of Mount Sinai located in the heart of East Harlem. Services at Mount Sinai-affiliate Elmhurst Hospital Center, located in Queens, have also been expanded. The catheterization laboratory there is now performing percutaneous coronary intervention.

### **Taking Research to the Bedside...and Beyond**

Several years ago, Division faculty followed heart attack survivors in the longest-ever clinical trial designed to determine the best approach to preventing a second heart attack or stroke by administering anti-clotting agents.

The results of this research are now a standard part of care for heart attack victims. Division faculty continue to develop and redefine state-of-the-art care through cutting-edge research.

### **Cardiovascular Research Center**

The Cardiovascular Research Center at Mount Sinai was created in 2006 to bridge basic and translational research, applying the results to advance cardiac care.

Leading the Cardiovascular Research Center's efforts is new faculty recruit Roger J. Hajjar, MD,

DR. ROGER HAJJAR, Director of the Cardiovascular Research Center, is currently the primary investigator for a multicenter, phase I clinical trial examining the safety and efficacy of gene therapy developed specifically for patients with heart failure.



Professor of Medicine. Dr. Hajjar's groundbreaking research uses cellular gene therapy to deliver therapeutic genes directly into the heart. He is currently the primary investigator for a multi-center, phase I clinical trial examining the safety and efficacy of gene therapy developed specifically for patients with heart failure. "This technique could completely change the whole approach to treating heart failure," Dr. Hajjar explains.

#### Pinpointing Plaque to Save Lives

In a clinical study published in *Nature Medicine* in early 2007<sup>1</sup>, principal investigator Zahi A. Fayad, PhD, Professor of Radiology and Medicine, and his team used contrast-enhanced CT imaging to pinpoint dangerous arterial plaque before a heart attack or stroke occurred.

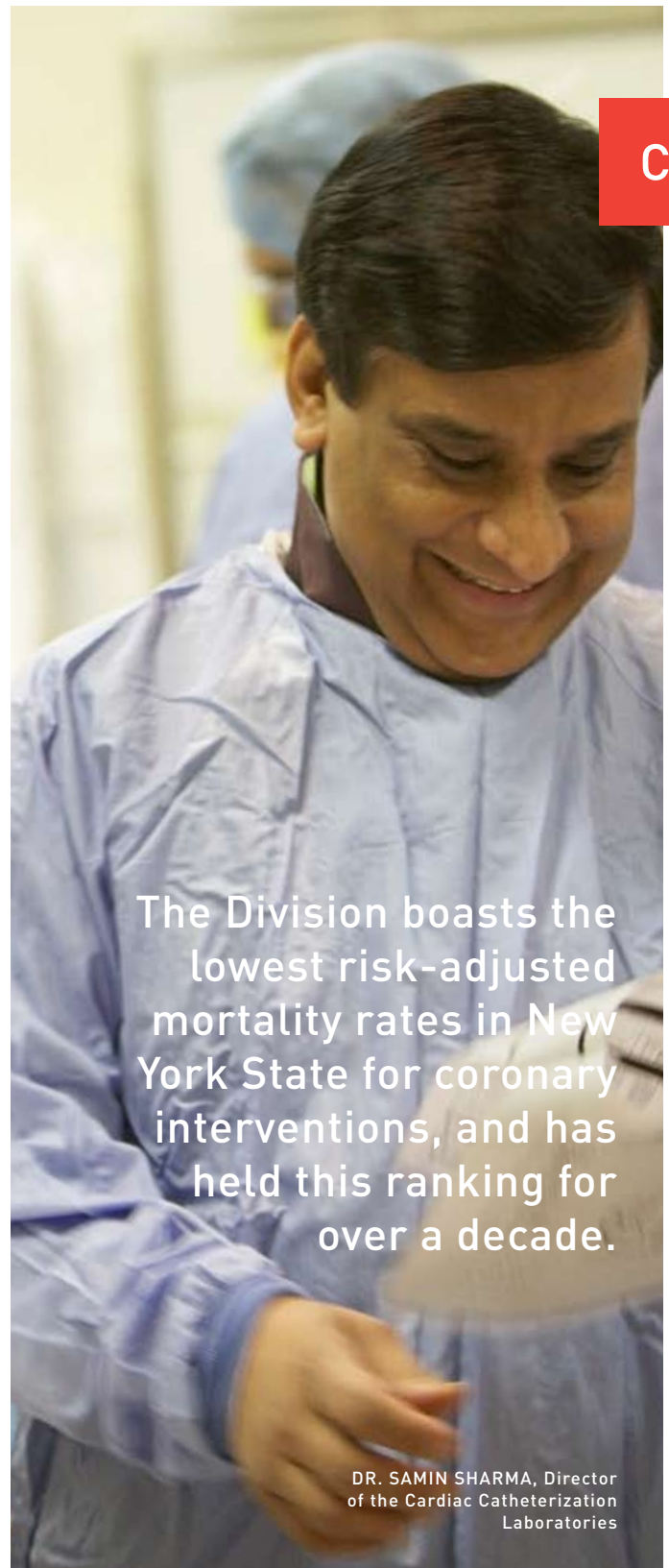
"For the first time, we may be able to predict and prevent adverse events using a non-invasive technique," reports Dr. Fayad.

Several years ago Dr. Fayad worked with Dr. Fuster and colleagues at Mount Sinai to develop "black-blood" MRI, a technique that provides the most detailed images yet recorded of the walls and main channels of human coronary arteries in living subjects. Ultimately, this form of imaging could be used to evaluate vessels throughout the body<sup>2,3</sup>.

Building on Mount Sinai's achievements in cardiac imaging, Mario Garcia, MD, Professor of Medicine, was recruited in 2006 to serve as Director of Non-Invasive Cardiology. Previously of the Cleveland Clinic Foundation, Dr. Garcia is leading the coordination and development of multiple imaging technologies at Mount Sinai and creating a new fellowship program in cardiovascular imaging.

#### Translational Research in Cardiovascular Thrombosis

In a study led by Juan Jose Badimon, PhD, Professor of Medicine, published in the *Journal of the American College of Cardiology* in 2005<sup>4</sup>,



The Division boasts the lowest risk-adjusted mortality rates in New York State for coronary interventions, and has held this ranking for over a decade.

DR. SAMIN SHARMA, Director  
of the Cardiac Catheterization  
Laboratories

<sup>1</sup>Nat Med. 2007;130: 636-641.

<sup>2</sup>J Am Coll Cardio. 2005; 45:846-54.

<sup>3</sup>Int J Cardiovasc Imaging. 2001; 17:195-201.

<sup>4</sup>J Am Coll Cardio. 2005;46:106-12.

## **“FREEDOM” TRIAL: TARGETING OPTIMAL TREATMENT FOR DIABETES & HEART DISEASE**

Patients with diabetes are known to be at high risk for developing cardiovascular disease. But what are the best ways to manage and treat these patients? That question is at the heart of the Future Revascularization Evaluation in Patients with Diabetes Mellitus: Optimal Management of Multivessel Disease (FREEDOM) trial.

Dr. Fuster is the principal investigator for this \$25 million, five-year award, one of the largest single grants ever awarded by the National Heart, Lung, and Blood Institute of the NIH. To manage this study, Dr. Fuster recruited Michael E. Farkouh, MD, Associate Professor of Medicine, in 2006. Dr. Farkouh has extensive experience leading large, multi-center clinical trials.

The multicenter study, which focuses on patients with diabetes and multivessel coronary disease, has several components. The investigators will recruit 2,400 patients to participate in a clinical trial comparing the effectiveness of percutaneous coronary intervention (PCI; also known as angioplasty) with drug-eluting stents versus the current standard of care, coronary artery bypass graft (CABG) surgery.

The five-year trial is expected to be the definitive study to determine the best clinical practice for these patients.

In addition, the study will recruit 2,000 additional patients with diabetes and cardiovascular disease into a registry that will broaden the clinical implications of the results of the trial.

“This new program will reach far beyond the confines of any single institution or study,” Dr. Fuster says. “Our findings, the consortium we are building, and the registry we are creating will serve as a foundation upon which numerous NIH-funded studies will be based in the coming years.”

high-resolution magnetic resonance imaging was used to measure changes in lesion size after simvastatin therapy. Results of this and similar studies may suggest alterations in therapy for patients with atherosclerosis.

The research group led by Pedro R. Moreno, MD, Associate Professor of Medicine, demonstrated that advanced, complex plaques create their own blood supply by forming tiny capillaries<sup>5</sup>. Halting or reversing their development constitutes a novel target in the fight against heart disease.

Another important perspective on the causes of atherosclerosis involves a group of proteins called chemokines that are secreted by inflammatory cells. In 2006, a team led by Alison D. Schechter, MD, Assistant Professor of Medicine, identified several potential therapeutic targets involving interactions between the immune and cardiovascular systems<sup>6</sup>.

### **Education and Training**

The teaching focus within the Division of Cardiology ranges from the acclimation of first-year medical students to providing accredited continuing medical education to experienced physicians practicing in the community.

The Division offers two accredited cardiology fellowship programs specifically designed to train cardiologists who will become leaders in cardiology research and in patient care, particularly within an urban community. More than a thousand applicants apply annually to fill ten open positions.

The Division also offers specialized courses, mini-residencies, conferences, and seminars that attract trainees and practicing cardiologists from around the world. Cardiology faculty participate in three continuing medical education symposia conducted by Mount Sinai each year—one on interventional cardiology, a second on acute coronary events, and a third on general cardiovascular medicine.

<sup>5</sup>Circulation. 2004;110:2032-8.

<sup>6</sup>Cardiovasc Res. 2006;69: 706-15.

In January of 2007, DR. IRA NASH was appointed Vice Chair for Veterans Affairs for the Department of Medicine and Chief of Internal Medicine at the James J. Peters VA Medical Center in the Bronx.

The Bronx VA, the first VAMC in New York City, has been affiliated with Mount Sinai School of Medicine for decades. In his new role, Dr. Nash is strengthening the ties between the two institutions, enhancing the quality of care, and strengthening the educational experience for residents and fellows.

