

Scripps Cardiovascular Care

ANNUAL REPORT 2014 OUTCOMES





Scripps Cardiovascular Steering Committee

From left to right, Jerrold Glassman, MD; Debra McQuillen; Jeffrey Cavendish, MD; Paul Teirstein, MD; Barbara Price; Richard Fortuna, MD; Martin Charlat, MD

Dear Colleague:

Scripps Health is the largest provider of cardiovascular care in San Diego, treating more than 76,000 patients each year. The cardiac specialists at Scripps perform more cardiovascular procedures than any other heart care program in California. We are proudly recognized as a heart leader for our innovative care, expansive scope of services and unparalleled commitment to quality. In fact, we were again named as one of America's Best Hospitals for cardiology and heart surgery by U.S. News & World Report.

At the forefront of cardiovascular care, our innovative and comprehensive treatment options, advanced technology and quality care are just a few reasons why Scripps continues to be recognized for outstanding heart care. Our success is the result of many factors, including talented physician-scientists and a long history of clinical research that has changed the delivery of cardiovascular care. Scripps physicians are conducting research in numerous breakthrough technologies. Recent breakthroughs include:

- Continued advancement of the Transcatheter Aortic Valve Replacement (TAVR) technique and technologies. Scripps is at the forefront of this new minimally invasive procedure investigating four novel TAVR devices and innovating the TAVR procedural technique.
- Investigation of a coronary stent that is biodegradable. After implantation, this novel stent remodels the coronary artery and then two to three years later, dissolves leaving a more normally functioning artery without a foreign body.
- Research using wireless sensors to anticipate worsening heart failure and prescribe treatment early, before a patient requires hospitalization.
- Continued study and validation of the heart attack gene blood test that predicts heart attacks by picking up the cells shed from the culprit artery to determine its use in emergency departments.
- Becoming one of the leading centers evaluating new therapies to avoid blood thinners in patients with atrial fibrillation.
- Evaluation of new catheter-based, minimally invasive approaches for the treatment of mitral regurgitation.
- Continued research with stem cells and angiogenesis to improve heart function and treat patients with incessant chest pain.

Additionally, through trailblazing wireless health care, we continue to transform medicine in unprecedented ways. These technologically sophisticated procedures—many of which are available nowhere else—are frequently performed by Scripps physicians who have earned international acclaim for cardiac care.

The health of our community is paramount to our mission. We are proud of our distinguished history and our trailblazing contributions to the field. As always, we continue to raise the bar of excellence for the benefit of our patients and future generations. With the recent opening of the Prebys Cardiovascular Institute, patients from the global community now have access to one of the most advanced heart centers in the nation.

With sincere thanks,

Paul S. Teirstein, MD
Medical Director, Prebys Cardiovascular Institute, Scripps Health

Cardiovascular firsts

1985

- Scripps enters into an ongoing partnership with Kaiser Permanente as the exclusive provider of cardiac surgery for its local members

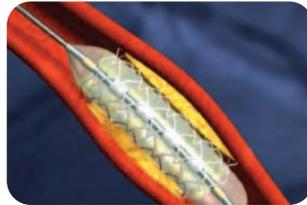
1988

- First rotoblator procedure in the United States to break up plaque in the arteries



- First in San Diego to use catheter ablation to cure arrhythmias

1990



- One of the first stents (Palmaz-Schatz) co-invented by a Scripps cardiologist
- First in Southern California to surgically correct Wolff-Parkinson-White syndrome
- First in Southern California to perform open heart surgery to cure arrhythmias

1995

- World's first vascular radiation therapy procedures invented by a Scripps physician
- First in the U.S. to implant a dual-chamber defibrillator

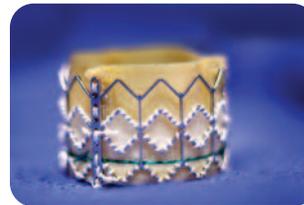
2005

- First heartpod—a sensor that transmits information to a wireless, handheld computer—in the Western United States



2008

- First percutaneous cardiac valve replacement in San Diego



2009



- One of the first hospitals in country to utilize Hansen Sensei X robot for catheter ablation



- First in California to utilize Carrot EP lab-integrated monitor system
- First in Southern California to utilize CARTO sound mapping technology in atrial fibrillation ablation

Accolades and Recognition



U.S. News & World Report's 2014-2015 Best Hospitals national rankings named the combined heart programs of Scripps Memorial Hospital La

Jolla and Scripps Green Hospital #18 in the nation for cardiology and heart surgery.



U.S. News & World Report's 2013-2014 Best Hospitals regional rankings named Scripps Mercy Hospital among the best in the region for cardiology and heart surgery.

Becker's Hospital Review/Becker's ASC Review
100 Best Places to Work in Healthcare

Becker's Hospital Review named Scripps Health to its annual "100 Hospitals and Health Systems with Great Heart Programs."

2010

- First in the United States to apply genotyping to improve heart care



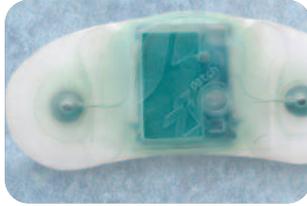
- First use of genetic testing to determine treatment efficacy
- First in the world to test a MEM sensor to evaluate cardiac dyssynchrony and biventricular pacing

2011



- First Vscan technology allowing for wireless monitoring and diagnosis

2012



- One of three cardiovascular sites to participate in Zio Patch study
- First in San Diego to use approved cryoablation (cold) technology to cure atrial fibrillation



- First in California to Study Watchman Device
- First in San Diego to use Lariat® Suture Delivery Device

2013

- First in San Diego to successfully use the AngioVac venous drainage system



- First in San Diego to use a percutaneous MitraClip for high risk patients
- Only West Coast site for nationwide stem cell clinical trial, ATHENA



- First in the country to use Capitivia thoracic stent graft after FDA approval
- First in California to insert an Endologix AFX stent graft after FDA approval

- First in San Diego to study Absorb dissolvable stent implant for heart disease treatment in clinical trial
- “First in humans” ALLSTAR study to evaluate infused allogeneic cardiosphere-derived stem cells (CAP-1002) in patients having had a recent MI

2014



- First in the United States to implant the Reveal LINQ™ Insertable Cardiac Monitor (ICM)
- First in Southern California to implant the Nanostim™ leadless pacemaker and one of the leading national enrolling centers
- First in San Diego and one of the first in the nation to implant the wireless implanted pulmonary artery heart pressure monitor, CardioMEMS

Accolades and Recognition



Scripps Health is the only California health system

named among the **Top 15 Health Systems** in the Nation by Truven Health Analytics, formerly Thomson Reuters.



Scripps Green Hospital was named one of the 50 top

cardiovascular hospitals in the United States by Truven Health Analytics for the sixth time.



For the fourth consecutive year and the sixth time

overall, **Scripps Green Hospital** has been named among the **100 Top Hospitals** in the Nation by Truven Health Analytics.

Innovation in Heart Care

Scripps Cardiologist Authors Book on Patient Empowerment

A trip to the doctor is almost always a guarantee of misery. You'll make an appointment months in advance. You'll probably wait for several hours until you hear "the doctor will see you now"—but only for 15 minutes! Then you'll wait even longer for lab tests, the results of which you'll likely never see, unless they indicate further (and more invasive) tests, most of which will probably prove unnecessary (much like physicals themselves). And your bill will be astronomical.

In *"The Patient Will See You Now,"* Eric Topol, MD, one of the nation's top physicians, shows why medicine does not have to be that way. Instead, you could use your smartphone to get rapid test results from one drop of blood, monitor your vital signs both day and night, and use an artificially intelligent algorithm to receive a diagnosis without having to see a doctor, all at a small fraction of the cost imposed by our modern health care system.

The change is powered by what Topol calls medicine's "Gutenberg moment." Much as the printing press took learning out of the hands of a priestly class, the mobile internet is doing the same for medicine, giving us unprecedented control over our health care. With smartphones in hand, we are no longer beholden to an



impersonal and paternalistic system in which "doctor knows best." Medicine has been digitized, Topol argues; now it will be democratized. Computers will replace physicians for many diagnostic tasks, citizen science will give rise to citizen medicine, and enormous data sets will give us new means to attack conditions that have long been incurable. Massive, open, online medicine, where diagnostics are done by Facebook-like comparisons of medical profiles, will enable real-time, real-world research on massive populations. There's no doubt the path forward will be complicated: the medical establishment will resist these changes, and digitized medicine inevitably raises serious issues surrounding privacy. Nevertheless, the result—better, cheaper, and more human health care—will be worth it.

Provocative and engrossing, *"The Patient Will See You Now"* is essential reading for anyone who thinks they deserve better health care. That is, for all of us.

Eric J. Topol, MD

Eric J. Topol, MD, is a practicing cardiologist, professor of genomics and director of the Scripps Translational Science Institute in La Jolla, California. He started a medical school, is one of the top 10 most-cited researchers in medicine, and was elected in a Modern Healthcare national poll to be the No.1 most influential physician executive in the United States. The author of *"The Creative Destruction of Medicine,"* recognized by Thomson Reuters as a Doctor of the Decade, and in GQ as a "rock star of science," he works on digital innovative technologies to reshape the future of medicine.

Genomics Clinical Trials

PI, Eric Topol, MD

- Comprehensive Molecular and Morphologic Characterization of Circulating Endothelial Cells
- Elucidating Cardiovascular Phenotypes Employing Genome Editing of iPS Cells
- Molecular Autopsy for Sudden Cardiovascular Death



Scripps cardiologist Sanjeev Bhavnani, MD, is advancing health care through digital medicine. Working with area tech companies, he's designed trials to study the advances of wireless applications on health care, especially in resource-limited areas.

Common among the world's diverse socio-economic populations is smartphone access. Through mHealth clinics in Africa and India, Dr. Bhavnani is assessing the benefit and outcomes of smartphone-based technologies, including handheld ultrasound, iECG and point-of-care lab testing. His focus is on creating a new point of care delivery model by tapping local resources and innovation in each community. "When patients leave a hospital, we arm them with basic smartphones apps to track their follow-up care, connecting them to their community of caregivers," says Dr. Bhavnani. "The information is provided in a way that is interpretable, audited and easy to act on."

Publications (October 2013–September 2014)

Scripps cardiac specialists are actively involved in clinical trials in all aspects of cardiovascular care and regularly contribute to industry publications. Below is a listing of some of the articles written by renowned Scripps physicians and published in 2014.

Walsh JA 3rd, **Topol EJ, Steinhubl SR**. Novel wireless devices for cardiac monitoring. *Circulation*. 2014 Aug 12;130(7):573-81.

Shen GQ, Girelli D, Li L, Ra S, **Topol EJ**, et al. A novel molecular diagnostic marker for familial and early-onset coronary artery disease and myocardial infarction in the LRP8 gene. *Circ Cardiovasc Genet*. 2014 Aug;7(4):514-20.

Khan HA, Wineinger NE, **Uddin PQ, Mehta HS, Rubenson DS, Topol EJ**. Can hospital rounds with pocket ultrasound by cardiologists reduce standard echocardiography? *Am J Med*. 2014 Jul;127(7):669.e1-7.

Bethel K, Lutten MS, **Damani S, Topol S, Topol EJ**, et al. Fluid phase biopsy for detection and characterization of circulating endothelial cells in myocardial infarction. *Phys Biol*. 2014 Feb;11(1):016002.

Barrett PM, Komatireddy R, **Topol S, Sheard J, Topol EJ**, et al. Comparison of 24-hour Holter monitoring with 14-day novel adhesive patch electrocardiographic monitoring. *Am J Med*. 2014 Jan;127(1):95.e11-7.

Ziaeian B, Zhang Y, Albert NM, **Heywood JT**, et al. Clinical effectiveness of CRT and ICD therapy in heart failure patients by racial/ethnic classification: insights from the IMPROVE HF registry. *J Am Coll Cardiol*. 2014 Aug 26;64(8):797-807.

Ousdigian KT, Borek PP, Koehler JL, Heywood JT, et al. The epidemic of inadequate biventricular pacing in patients with persistent or permanent atrial fibrillation and its association with mortality. *Circ Arrhythm Electrophysiol*. 2014 Jun;7(3):370-6.

Wilcox JE, Fonarow GC, Zhang Y, **Heywood JT**, et al. Clinical effectiveness of cardiac resynchronization and implantable cardioverter-defibrillator therapy in men and women with heart failure: findings from IMPROVE HF. *Circ Heart Fail*. 2014 Jan;7(1):146-53.

Price MJ, Gibson DN, Natale A, Burkhardt JD, et al. Early safety and efficacy of percutaneous left atrial appendage suture ligation: results from the U.S. transcatheter LAA ligation consortium. *J Am Coll Cardiol*. 2014 Aug 12;64(6):565-72.

Di Biase L, **Burkhardt JD, Santangeli P, Natale A**, et al. Periprocedural stroke and bleeding complications in patients undergoing catheter ablation of atrial fibrillation with different anticoagulation management: results from the Role of Coumadin in Preventing Thromboembolism in Atrial Fibrillation (AF) Patients Undergoing Catheter Ablation (COMPARE) randomized trial. *Circulation*. 2014 Jun 24;129(25):2638-44.

Lakkireddy D, Reddy YM, Di Biase L, **Burkhardt JD, Natale A**, et al. Feasibility and safety of uninterrupted rivaroxaban for periprocedural anticoagulation in patients undergoing radiofrequency ablation for atrial fibrillation: results from a multicenter prospective registry. *J Am Coll Cardiol*. 2014 Mar 18;63(10):982-8.

Di Biase L, Santangeli P, **Burkhardt JD, Natale A**. The "battle" against paroxysmal atrial fibrillation: is there a role for left atrial mechanical dyssynchrony evaluated by speckle tracking? *J Interv Card Electrophysiol*. 2014 Jan;39(1):17-8.

Di Biase L, **Burkhardt JD, Gibson DN, Natale A**. 2D and 3D TEE evaluation of an early reopening of the LARIAT epicardial left atrial appendage closure device. *Heart Rhythm*. 2014 Jun;11(6):1087-8.

Price MJ, Gibson DN, Yakubov SJ, Schultz JC, Di Biase L, Natale A, Burkhardt JD, et al. Early safety and efficacy of percutaneous left atrial appendage suture ligation: results from the U.S. transcatheter LAA ligation consortium. *J Am Coll Cardiol*. 2014 Aug 12;64(6):565-72.

Price MJ. Diabetes mellitus and clopidogrel response variability. *J Am Coll Cardiol*. 2014 Sep 9;64(10):1015-8.

Price MJ, Holmes DR. Mechanical closure devices for atrial fibrillation. *Trends Cardiovasc Med*. 2014 Aug;24(6):225-31.

Price MJ, Gibson D. Left atrial appendage occlusion with the WATCHMAN™ for stroke prevention in atrial fibrillation. *Rev Cardiovasc Med*. 2014;15(2):142-51. Review.

Price MJ, Valderrábano M. Left atrial appendage closure to prevent stroke in patients with atrial fibrillation. *Circulation*. 2014 Jul 8;130(2):202-12.

Holmes DR Jr, Kar S, **Price MJ**, et al. Prospective randomized evaluation of the Watchman Left Atrial Appendage Closure device in patients with atrial fibrillation versus long-term warfarin therapy: the PREVAIL trial. *J Am Coll Cardiol*. 2014 Jul 8;64(1):1-12.

Kern MJ, Applegate RJ, Bell M, **Price MJ**, et al. Conversations in cardiology: bridging antiplatelet therapy before surgery. *Catheter Cardiovasc Interv*. 2014 Apr 1;83(5):748-52.

Généreux P, Stone GW, **Harrington RA, Price MJ**, et al. Impact of intraprocedural stent thrombosis during percutaneous coronary intervention: insights from the CHAMPION PHOENIX Trial (Clinical Trial Comparing Cangrelor to Clopidogrel Standard of Care Therapy in Subjects Who Require Percutaneous Coronary Intervention). *J Am Coll Cardiol*. 2014 Feb 25;63(7):619-29.

Montalescot G, Harris NS, **Price MJ**, et al. Novel uses for platelet function testing in the clinical laboratory: where are we now? *Clin Chem*. 2014 Mar;60(3):441-5.

Vijayakrishnan R, **Steinhubl SR**, et al. Prevalence of heart failure signs and symptoms in a large primary care population identified through the use of text and data mining of the electronic health record. *J Card Fail*. 2014 Jul;20(7):459-64.

Steinhubl SR, et al. Antiplatelet therapy in prevention of cardio- and venous thromboembolic events. *J Thromb Thrombolysis*. 2014 Apr;37(3):362-71.

Marston NA, Auger WR, Madani MM, **Kimura BJ**, et al. Assessment of left atrial volume before and after pulmonary thromboendarterectomy in chronic thromboembolic pulmonary hypertension. *Cardiovasc Ultrasound*. 2014 Aug 11;12:32.

Via G, Hussain A, Wells M, Reardon R, **Kimura B**, et al. International evidence-based recommendations for focused cardiac ultrasound. *J Am Soc Echocardiogr*. 2014 Jul;27(7):683.e1-683.e33.

Srivastava AV, Hasan R. Assessing Thromboembolic Risk on Anti-Coagulation Reversal in Patients with Left Ventricular Assist Devices: A Call to Action for the Mechanical Circulatory Support Community. *ASAIO J*. 2014 May 9.

Teirstein PS, Topol EJ. The role of maintenance of certification programs in governance and professionalism. *JAMA*. 2015 May 12;313(18):1809-10.

Teirstein PS. Boarded to death--why maintenance of certification is bad for doctors and patients. *N Engl J Med*. 2015 Jan 8;372(2):106-8.

Teirstein PS, Meredith IT, Feldman RL, Rabinowitz AC, Cannon LA, Lee TC, Dens J, Dubois CL, Mooney MR, Pompili VJ, Saito S, Allocco DJ, Dawkins KD, Stone GW. Two-year safety and effectiveness of the platinum chromium everolimus-eluting stent for the treatment of small vessels and longer lesions. *Catheter Cardiovasc Interv*. 2015 Feb 1;85(2):207-15.

Makkar RR, Jilalawi H, Mack M, **Teirstein PS**, et al. Stratification of outcomes after transcatheter aortic valve replacement according to surgical inoperability for technical versus clinical reasons. *J Am Coll Cardiol*. 2014 Mar 11;63(9):901-11.

Research listing of selected 2014 clinical trials

SCRIPPS cardiovascular specialists are currently involved in more than 60 clinical trials, including the following:

Atrial Fibrillation

PI, Matthew Price, MD

- Prospective Randomized EVALuation of the WATCHMAN LAA Closure Device In Patients with Atrial Fibrillation Versus Long Term Warfarin Therapy (PREVAIL)
- Continued Access to PREVAIL (CAP2)

PI, Eric Topol, MD—The GIRAFFE Study: Genomic Risk Markers for Atrial Fibrillation Following Extended Cardiac Rhythm Monitoring

Drug Therapy

PI, Paul Teirstein, MD

- A Prospective, Randomized, Multi-Center, Double-Blind Trial To Assess The Effectiveness And Safety Of Different Durations Of Dual Anti-Platelet Therapy (DAPT) In Subjects Undergoing Percutaneous Coronary Intervention With The CYPHER® Sirolimus-Eluting Coronary Stent (CYPHER® Stent)
- A Randomized, Multi-center, Placebo-controlled, Parallel-group Study to Determine the Effects of AMG 145 Treatment on Atherosclerotic Disease Burden as Measured by Intravascular Ultrasound in Subjects Undergoing Coronary Catheterization

Diagnostic Imaging

PI, David Rubenson, MD—

Characterization of intraventricular flow pattern in patients with heart failure and preserved ejection fraction
Retrospective

PI, Eric Topol, MD—Cost effectiveness of using the Vscan pocket mobile echocardiography device as an initial screening modality before transthoracic echocardiography in an ambulatory care population.

PI, Robert Russo, MD; Steven Higgins, MD—Chart Review to Determine the Safety of MRI in the Presence of Pacemakers and Implantable Cardioverter Defibrillators and to Validate a Device Interrogation Protocol

PI, Robert Russo, MD

- MagnaSafe Registry: Determining the Risk of Magnetic Resonance Imaging in the Presence of Pacemakers and Implantable Cardioverter Defibrillators
- Variation in Cardiac Device Parameter Measurements Part II
- Left Main Intravascular Ultrasound Registry
- ERADICATE: Estimating RADiation accumulation In Coronary Artery disease Treatment Exposure

Interventional Cardiology

PI, Matthew Price, MD—Observational Study of Optical Coherence Tomography (OCT) in Patients Undergoing Fractional Flow Reserve (FFR) and Percutaneous Coronary Intervention Stage I (ILUMIEN I)

PI, Paul Teirstein, MD

- A Clinical Evaluation of the Medtronic Endeavor® Resolute Zotarolimus-Eluting Coronary Stent System in the Treatment of De Novo Lesions in Native Coronary Arteries with a Reference Vessel Diameter of 2.25 mm to 4.2 mm

- A Prospective, Randomized, Multicenter Trial to Assess an Everolimus-Eluting Coronary Stent System (PROMUS Element™) for the Treatment of up to two De Novo Coronary Artery Lesions [PLATINUM]
- Intracoronary Brachytherapy for Recurrent Restenosis after Multiple Drug-Eluting Stents (SCRIPPS V)

PI, Richard Fortuna, MD; Paul Teirstein, MD—ABSORB RANDOMIZED CONTROLLED TRIAL: A Clinical Evaluation of Absorb™ BVS, the Everolimus Eluting Bioresorbable Vascular Scaffold in the Treatment of Subjects with de novo Native Coronary Artery Lesions

Research listing of selected 2014 clinical trials

Electrophysiology

PI, John Rogers, MD –

- New normal limits for electrocardiograms in adolescents and youth
- Integrated Diagnostic Evaluation in Non-Therapy Devices For the Study of Heart Failure
- St. Jude Medical Cardiac Lead Assessment Study

PI, Steven Higgins, MD

- St Monitoring To Detect ACS Events In ICD Patients Study (Analyze St)
- The LEADLESS II Study—A safety and effectiveness trial for a leadless pacemaker system

PI, Thomas Ahern, MD

- SJM Confirm Implantable Cardiac Monitor Study
- SJ4 Post Approval Study
- Quadripolar Pacing Post Approval Study
- MultiPoint Pacing IDE Study
- Accent MRI Pacemaker and Tendril MRI Lead IDE Study
- Identifying characteristics of POTS patients

Stem Cell

PI, Richard Schatz, MD

- A Prospective, Randomized, Double-Blinded, Active-Control And Unblinded Standard Of Care (Soc) Controlled Study To Determine The Efficacy And Safety Of Targeted Intramyocardial Delivery Of G-Csf Mobilized Autologous Cd34+ Cells For The Improvement In Total Exercise Time During Standardized Exercise Testing In Subjects With Refractory Angina Pectoris And Chronic Myocardial Ischemia(Cmi)
- A Prospective Randomized Double Blinded Placebo Controlled Phase II Trial of Intra-coronary Infusion of AMR-001, a Bone Marrow Derived Autologous CD34+ Selected Cell Product, in Patients with Acute Myocardial Infarction

Structural Heart Disease

PI, Matthew Price, MD—Clinical Outcomes Assessment of the MitraClip Percutaneous Therapy for High Surgical Risk Patients (The COAPT Trial)

PI, Paul Teirstein, MD; Richard Fortuna, MD

- The PARTNER Trial: Placement of AoRTic TraNscathetER Valves Trial with Continued Access and with Post-Approval Study
- Placement of AoRTic TraNscathetER Valves Trial (The PARTNER II Trial)—The Safety and Effectiveness of the SAPIEN XT™ Transcatheter Heart Valve with NovaFlex and Ascendra/Ascendra 2 delivery systems(transfemoral and transapical)in Intermediate and High Risk for Aortic Valve Surgery and Patients Who Cannot Undergo Surgery [2010-12-US]

PI, Paul Teirstein, MD

- Surgical Replacement and Transcatheter Aortic Valve Implantation (SURTAVI)
- Portico™ Re-sheathable Transcatheter Aortic Valve System US IDE Trial (PORTICO)

- Randomized, Double-Blind, Placebo-Controlled Phase I/II Study of the Safety and Efficacy of Intracoronary Delivery of Allogeneic Cardiosphere-Derived Cells in Patients With an Anterior Myocardial Infarction and Ischemic Left Ventricular Dysfunction (ALLogeneic Heart STem Cells to Achieve Myocardial Regeneration, ALLSTAR)
- AXERA Access Safety and Efficacy Post Endovascular INtervention (ASPEN)

- A multicenter, randomized, double-blind, placebo-controlled, parallel group study to evaluate the efficacy, safety, and tolerability of transendocardial injection of ixmyelocel-T in subjects with heart failure due to ischemic dilated cardiomyopathy (ICDM)
- Adipose-derived regenerative cells in the Treatment of patients with chronic ischemic HEart disease Not Amenable to surgical or interventional revascularization-The ATHENA Clinical Trial
- Characterization of Adipose Derived Regenerative Cells (ADRCs) from excess tissue and cells designated for discard from patients with chronic heart disease

An Incredible Cardiac Care Collaboration

Now in its 32nd year, Scripps' visionary cardiac care partnership with Kaiser Permanente is built around quality patient care, collaborative medical management and patient satisfaction to deliver premier heart services.

"Last year's introduction of LVAD destination therapy to the partnership has been incredibly successful, and this year's opening of three state-of-the-art EP labs promises equally exciting opportunities for collaboration between our doctors," said Jeffrey Cavendish, MD, director of interventional cardiology and co-director of the cardiac cath lab, who also just completed his first year as partnership liaison for Scripps and Kaiser Permanente.



The cardiac care team also has a cardiopulmonary support system in place to deal with complex patients who lack an LVAD. Kaiser patients in heart failure outside the hospital can be connected to an Impella cardiac pump and transferred to Scripps for immediate care.

The heart surgery program is another excellent outcome of the Scripps/Kaiser collaboration. It is not only important to the continuum of care for Kaiser patients, but enables Scripps to operate one of the highest volume centers on the West Coast—an outcome synonymous with quality patient care that attracts ongoing referrals.

"High volume is the key to the overall quality of a cardiac program," said Cavendish. "The symbiotic relationship between Scripps and Kaiser not only drives volume but also attracts the best of the best among physicians, surgeons, nurses and other specialists across the spectrum of care, from pre-procedure to post-op."



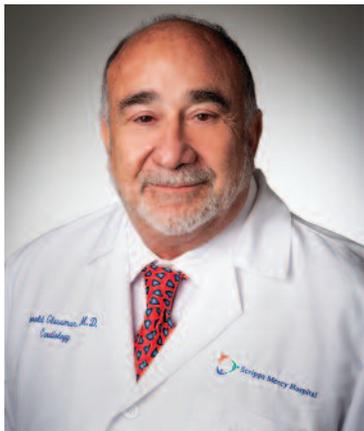
First in San Diego to Lasso the Heart

There are many exciting aspects of the Scripps/Kaiser partnership, one of the most current success stories being the collaboration between Steven Higgins, MD, Bahram Khadivi, MD, and Joseph Blatt, MD, Scripps Memorial Hospital La Jolla, and Douglas Gibson, MD, Scripps Green Hospital, to introduce the "Lariat" to San Diego to provide effective long-term protection against stroke in patients with atrial fibrillation (AF) who are unable to tolerate blood thinners. This innovative nonsurgical procedure uses sutures to tie off the left



atrial appendage (LAA) to preclude blood clots in patients with AF. Inserted via two catheters under general anesthesia, the FDA-approved Lariat® Suture Delivery Device in effect "lassos" the LAA and occludes the appendage, which eventually shrivels into scar tissue. The team is also exploring the recently FDA-approved WATCHMAN LAA Closure Technology.

Scripps Clinical Excellence



In 2014, Jerrold Glassman, MD, Scripps Mercy Hospital, led a performance improvement initiative across the Scripps cardiovascular care line to reduce variation in the health system's care delivery protocol while maintaining excellent patient outcomes. With the industry being increasingly driven by

economics, Scripps' goal is to be a leader in best cardiology outcomes in every way measurable. The success of this initiative within the high cost/high volume program will set the precedent across all specialty care lines at Scripps about how medical teams can work together to establish best practices.

"Collectively, Scripps has one of the top cardiovascular care lines on the West Coast, but across our five cardiology centers we each do things a little differently," said Dr. Glassman. "Using this diversity as our strength, cardiology department heads compared protocols and researched best practices to reduce costs by eliminating practices that did not improve patient outcomes."

The team sought to measure protocols against evidence-based practices, from pharmacology to therapeutics, weighing expense against clinical effectiveness. A parallel goal was to establish a community of standards that invited physicians to be more comfortable in changing their techniques as they worked together as a team.

Success stories included:

- Reducing associated pre- and post-op costs by thousands of dollars per case for coronary bypass surgery care by standardizing delivery of insulin drips on the floor versus in the ICU and eliminating use of albumin.
- Saving \$800,000 annually by establishing the efficacy of a generic versus brand name contrast agent in percutaneous coronary intervention.
- Using fractional flow reserve (FFR) and intravascular ultrasound (IVUS) to determine the significance of a blockage and subsequent choice of a stent.

"Now with the opening of the Prebys Cardiovascular Institute, it's a mistake to think it's just a new building—it's the continuum of a care line that will affect the delivery of cardiology services for years to come," said Dr. Glassman. "The very special work we do requires a high level of competency and resources that would be irresponsible to continue to duplicate across all our hospitals—a practice that inspires low volume and high risk, which is does not meet Scripps' high standards."



Darla's Story

At age 39, Darla was working as a learning strategist with the military, had a family, a full-time job, and was working on her PhD. When she woke one day to find her ankles were the size of grapefruits, she was diagnosed with stress cardiomyopathy, likely caused by a cold virus that jumped from her lungs to her heart. Her condition was controlled for six years through medication until she received an implantable cardiac defibrillator in 2006. Eventually frequent shocks kept landing her in the ER, so in 2014 she received an LVAD and was in a drug-induced coma for 60 days before being released to await a heart transplant. Now 51, Darla's writing a book about her experience, "Tales from the Heartland," to fill the gap of literature available about women and heart disease.

Scripps STEMI Receiving Centers

Scripps has four certified STEMI receiving centers in San Diego. Each of our hospital emergency departments have been recognized by the American Heart Association for following national best practices for heart attack care to improve chances of survival and recovery. Our protocols exceed national standards in rapid response time. Activation of the cath lab team based on the paramedic evaluation of the patient in the field ensures an average door-to-device time of 66.1 minutes.

Scripps Memorial Hospital Encinitas
354 Santa Fe Dr, Encinitas, CA 92024

Acute-care hospital serving the communities of San Diego’s coastal North County since 1978.

Scripps Memorial Hospital La Jolla
9888 Genesee Ave., La Jolla, CA 92037

Acute care, Level II trauma hospital serving San Diego’s central coast since 1924.

Scripps Mercy Hospital, San Diego
4077 Fifth Ave., San Diego, CA 92103

Teaching hospital, providing acute care and Level I trauma services to San Diego residents since 1891.

Scripps Mercy Hospital, Chula Vista
435 H St., Chula Vista, CA 91910

Acute care community hospital serving San Diego’s South Bay community since 1986.

STEMI Patients Receiving PCI

Site	2012	2013	2014
Encinitas	42	51	55
La Jolla (Including Kaiser Permanente)	139	152	144
Mercy San Diego	49	58	68
Mercy Chula Vista	60	43	47
TOTAL	399	405	429



Scripps Marks 30 Years of Saving Lives Through San Diego Trauma System

San Diego’s collaborative system that has become a model for trauma care nationwide celebrated its 30th anniversary.

Since 1984, collaboration among the region’s hospitals is the key innovation that has enabled the system to save the lives of more than 230,000 severely injured people in the county, and cut mortality rates for trauma patients from 21 to 10 percent.

Each equipped with an elite team of trauma specialists, Scripps Mercy Hospital, San Diego, Scripps Memorial Hospital La Jolla, Sharp Memorial Hospital, UC San Diego Medical Center, Rady Children’s Hospital and Palomar Medical Center, along with San Diego Fire Department and Mercy Air Transport provide care for the most critically injured patients.

“Since the development of the trauma system in San Diego, a trauma patient will have a better chance of surviving an injury here in San Diego County than anywhere in the United States,” said Melanie Gawlik, director of trauma services at Scripps Memorial Hospital La Jolla.

Scripps Cardiovascular Programs

Noninvasive Diagnostic/Cardiac Imaging

Advanced Imaging	2012	2013	2014
Cardiac MRI	444	459	351
Cardiac CT/ CT Angio	365	509	636
Nuclear Medicine	3,447	3,118	3,043
Total	4,256	4,086	4,030

Noninvasive Imaging	2012	2013	2014
12 Lead Ekg	120,423	120,960	119,703
Echo Studies	29,163	29,902	30,267
Ekg Stress Test	3,002	2,533	2,325
Stress Echo Studies	3,825	3,473	3,483
Tee	2,446	2,675	2,638
Total	158,859	159,543	158,416

First to Implant Miniature Cardiac Monitor

Scripps Green Hospital was the first hospital in the U.S. to implant the world's smallest implantable cardiac monitoring device. Scripps Clinic cardiologist John Rogers, MD, successfully completed the first implant of Medtronic's Reveal LINQ™ Insertable Cardiac Monitor (ICM), which is about one-third the size of an AAA battery, making it more than 80 percent smaller than other ICMs currently available. The Reveal LINQ ICM is a diagnostic tool for doctors with patients who experience symptoms such as dizziness, palpitation, syncope and chest pain that may suggest a cardiac arrhythmia, and for patients at increased risk for cardiac arrhythmias. LINQ enables the doctor to remotely assess the arrhythmia as it happens.

"If they've had a heart rhythm problem, I'm going to know about it that day," Rogers explained. "And that allows me to deliver the appropriate care in a timely fashion, so I can treat them faster and hopefully safer."

In 10 minutes with a local anesthetic, the device is inserted under the skin of the chest wall and is nearly invisible. In addition to its continuous and wireless monitoring capabilities, the system provides remote monitoring through the Carelink® Network. Through the Carelink Network, physicians can request notifications to alert them if their patients have had cardiac events. The Reveal LINQ ICM is also MR-Conditional, allowing patients to undergo magnetic resonance imaging (MRI) if needed.



Chuck's Story

Chuck Beal became the first patient in the United States to receive the world's smallest heart monitor in February 2014, after various medications failed to treat his irregular heartbeats. Scripps Clinic cardiologist John Rogers, MD, successfully completed the first implant of the Reveal LINQ™ Insertable Cardiac Monitor (ICM) in the 71-year-old race car fanatic. Cleared by the Food and Drug Administration (FDA) on Feb. 19, 2014, the LINQ™ ICM from Medtronic is approximately one-third the size of an AAA battery, making it more than 80 percent smaller than other ICMs currently available. Beal, the owner of San Diego-based Beal Racing, has a lengthy history of heart palpitations, and was at an elevated risk for stroke following a previous heart valve replacement, which made him a prime candidate for the LINQ ICM.

Scripps Cardiovascular Programs

Interventional Cardiology

All Scripps hospitals are exceptional centers for interventional cardiology, with 13 cath labs and four EP labs throughout the system. Scripps employs state-of-the-art cardiac imaging, cardiac mapping and robotic navigation systems, as well as engaging in leading edge technology development and deployment.

While not new, the transradial approach for coronary angiography and angioplasty is gaining momentum as a viable alternative to the transfemoral approach. There

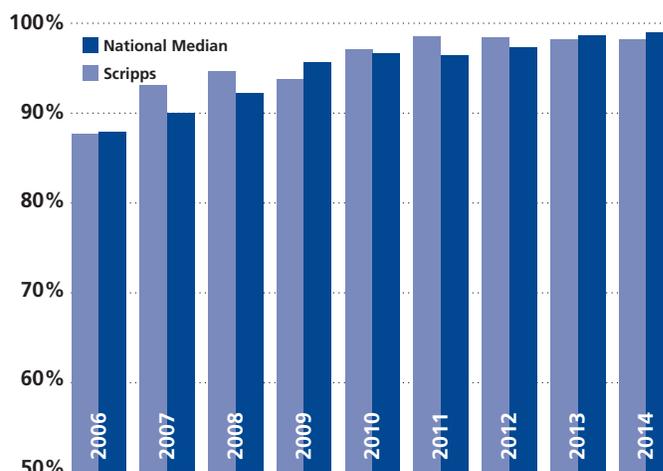
are significant benefits to the patient, including reduced discomfort, improved recovery time, and reduction in potentially life-threatening complications. As more studies are investigating radial technology mortality benefits, Scripps and Kaiser are taking the lead in encouraging radial intervention as a philosophy through cath conference presentations to foster confidence among the cardiology community.

Transcatheter Aortic Valve Replacement (TAVR)

Procedure	2012	2013	2014
Transfemoral	101	83	151
Transapical	29	70	44
TOTAL	130	153	195

Radial Procedures	2012	2013	2014
Radial	806	1,594	2,553

Heart Attack Bundle Scores



Cardiac Cath Lab Procedures

Procedure	2012	2013	2014
Cardiac Catheterizations	7,218	7,126	7,128
Percutaneous Coronary Intervention	3,229	3,018	3,140
Adult Structural Heart (excluding TAVR)	128	182	179
Transcatheter Aortic Valve Replacement (TAVR)	143	148	192
TOTAL	10,718	10,474	10,639

30-Day All-Cause Risk-Standardized AMI Readmission

Facility	Adjusted Actual Readmission	Expected Readmission	National Crude Readmission
Encinitas	13.7%	16.1%	17.4%
Green	16.5%	17.5%	
La Jolla	14.3%	15.9%	
Mercy	15.1%	16.7%	

(based on discharges from July 2010–June 2013)

Scripps Offers Latest in TAVR Technology and Trials

Scripps continues its revolutionary work in Transcatheter Aortic Valve Replacement (TAVR). Created in 2008 through the PARTNER (Placement of Aortic Transcatheter Valves) Trial, Scripps' leadership role in the proliferation of TAVR has dramatically changed outcomes for more than 1,000 patients suffering from aortic stenosis. Thanks to new commercially available valves and trials Scripps is participating in, the volume of implants surged from the teens in 2008 to the hundreds in 2014 and has expanded across the Scripps system to benefit Scripps Green Hospital, Scripps Clinic, Scripps Memorial Hospital La Jolla and Kaiser patients.

- PARTNER II—Edwards Sapien S3 valve for intermediate-risk patients (finished enrollment and awaiting data analysis)
- SURTAVI—Medtronic Evolute R valve for intermediate-risk patients (enrolling)
- PORTICO—St. Jude-sponsored for high-risk and inoperable patients (enrolling)
- REPRISÉ III—Boston Scientific-sponsored for high-risk and inoperable patients (enrolling)

"With TAVR a superior option for so many patients, Scripps' goal is to offer the very best technology and protocol available, especially considering TAVR's very desirable benefits of being minimally invasive with moderate sedation," said Sarah Clarke, nurse practitioner at Scripps Green Hospital, who anticipates adding two more valves to the program that are now being used in Europe after FDA approval.

In the early stages of TAVR, the delivery catheter was larger and patients often did not have large enough vessels to accommodate the sheath. At that time, Scripps performed 50 percent of implants via the transfemoral route and 50 percent via the transapical route. As the delivery technology has advanced, the ratio is about 90 percent transfemoral and 10 percent alternate access (encompassing both the transapical and direct aortic routes).

Scripps has also increased its screening to implant ratio from 30% in 2008 to more than half in 2014. This exponential success is attributed to the development of a systematic patient evaluation, selection criteria and outcome analysis that expedites patient treatment:

- Database access that centralizes valve provider/trial information to juxtapose diagnostic findings and patient history.
- Weekly TAVR team conference to discuss every referred aortic stenosis patient.
- Evidenced-based mandate to report outcomes.

The Center for Medicare Services (CMS), which oversees Medicare reimbursement for TAVR, has released a National Coverage Determination (NCD) that specifies institutional standards for coverage or reimbursement. The majority of patients who are candidates for TAVR are covered under Medicare. All U.S. sites approved for commercial TAVR are required to participate in TVT Registry, a benchmarking tool designed to monitor the ongoing safety and efficacy of TAVR's transformational technology.



Harry Kaplan's Story

Harry Kaplan, 89, suffered from severe aortic stenosis that seriously affected his quality of life. Though otherwise in good health, he was eligible for the TAVR procedure in a special research trial for moderate-risk patients. As Harry didn't want to lose any more time to his limiting condition, the prospect of a short hospital stay and an overall quicker recovery were his main motivators. TAVR has enabled him to recover and he is now able to walk up inclines without losing his breath, which definitely keeps him moving in the right direction.

Scripps Cardiovascular Programs



Scripps Cardiovascular and Thoracic Surgery Group, left to right: William Wang, MD; Richard Stahl, MD; Jeffery Tyner, MD; Douglas Mellinger, MD; Scot Brewster, MD; Sam Baradaran, MD; Dan Meyer, MD; James Hemp, MD

Cardiovascular and Thoracic Surgery

Our surgeons offer some of the most innovative treatment options and research available in cardiovascular surgery, including cardiovascular and thoracic robotic surgery. For all patients, minimally invasive surgical approaches are considered to avoid sternal incisions or rib spreading whenever possible. As leaders in cardiac surgery for the Southern California region, Scripps cardiovascular and thoracic surgeons perform more than 1,000 surgeries each year with a market share of close to 40 percent.

Scripps Minimally Invasive Robotic Surgery program is the fastest-growing, most comprehensive robotics program in San Diego. James Hemp, MD, listed as a top-performing physician in thoracic and heart surgery by U.S. News & World Report, is the leader in the San Diego region in robot-assisted cardiothoracic surgery. As an alternative to traditional open heart surgery, Dr. Hemp uses the da Vinci Surgical System to provide patients with a highly effective, less invasive treatment for even the most complex cardiothoracic procedures, such as mitral valve repair and coronary revascularization.

Cardiovascular/Thoracic Surgery

Procedure	2012	2013	2014
Coronary Artery Bypass Grafting (CABG)	360	389	390
Mitral Valve Replacement/Repair (MVR)	85	81	82
Surgical Aortic Valve Replacement (SAVR)	152	177	130
Transcatheter Aortic Valve Replacement (TAVR)	143	148	192
CABG + MVR	22	24	29
CABG + AVR	90	81	87
AVR + MVR	11	10	17
Other	212	201	239
TOTAL	1,075	1,111	1,166

STS NQF Quality Metrics Isolated CABG

July 2013–June 2014	Participant Score (98% CL)	STS Mean Participant Score	Participant Rating
Overall	96.9%	96.7%	★★
	(95.9, 97.7)		
Absence of Mortality	97.9%	97.9%	★★
	(97.1, 98.5)		
Absence of Morbidity	86.6%	87.9%	★★
	(82.3, 90.1)		

Minimally Invasive

With demand for minimally invasive procedures on the rise, Scripps' volume of cases utilizing port access and robotic assisted procedures is the most aggressive in San Diego and rivals the most successful West Coast practice, with best outcomes to report.

The port access approach to aortic valve replacement to avoid sternotomy has become standard practice for James Hemp, MD, one of the founding partners of Scripps Cardiovascular and Thoracic Surgery Group. The centerpiece of his practice is minimally invasive procedures, which also includes robotic-assisted surgeries. This technology can drive endovascular stent grafts, atrial septal defects, aortic aneurysm, pericardial effusion and mitral valve, tricuspid valve and thoracoscopic, procedures—even certain types of coronary artery bypass.

“For each patient I like to design the least invasive but equivalent approach to cardiovascular thoracic surgery—and there’s a whole array of alternatives,” said Dr. Hemp. “The leading-edge technology now available to us represents progress that affords patients less pain, disability and complications, with faster return to normal activity.”

“I’m proud of what we’ve done here and know that utilizing technology to offer less invasive procedures with the same quality outcomes is the right direction to take cardiovascular care,” said Dr. Hemp.



Walter's Story

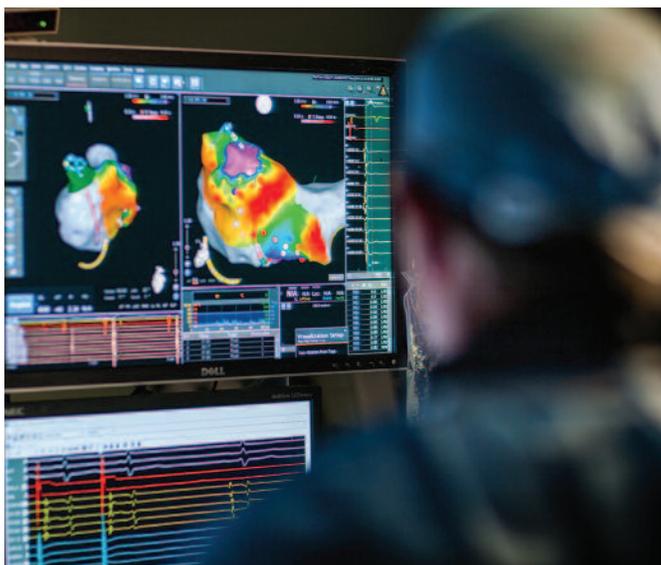
Walter Kennedy, a 73-year-old avid golfer, was in great shape thanks to a lifetime of good diet and exercise. But when an aggressive mitral valve leak present since childhood was threatening to shut down a heart valve, just carrying a bucket of balls got him winded.

Walter was a perfect candidate for a seven-hour robotic assisted procedure to replace his aortic valve and shore up his mitral valve, and he was thrilled with the outcome of this innovation. “I expected a four-month recovery but I barely had pain once I left the hospital, and there was minimal scarring—I was even out to dinner with friends within two weeks—it was marvelous! I am fully appreciating the improved quality of life.”

Scripps Cardiovascular Programs

Electrophysiology

Scripps is the leader in San Diego for electrophysiology research as well as the market leader for treatment of cardiac arrhythmia, with a market share of 45 percent. With the opening of Prebys Cardiovascular Institute, the EP lab has now expanded to four state-of-the-art imaging, mapping and ablation technology labs, with plans for a fifth lab to open in 2015. This represents more EP labs than any hospital in California and one of the largest programs in the country. The exciting expansion was in response to the growing



demand for innovative applications for pacemaker and ICD management, including radial frequency ablation, cryoblation and robotic assisted procedures. With volumes continuing to climb, Scripps is positioned to offer San Diegans the most comprehensive care available.

Centralizing Scripps' EP practice in a new, cutting-edge space provides a collaborative environment where major technology and leading physicians can inform idea exchange, advance research and heighten the quality of care provided to patients. The building is designed to foster a high level of interaction between techs, nurses and doctors to facilitate a total care package for patients.

The collaboration continues through clinical trials and technology adoption as Scripps continues to train doctors in new protocols and contribute to the advancement of the EP practice, including:

- New tools and robotic technology to navigate catheter ablation.
- Implantation of new wireless pacemakers, defibrillators and biventricular devices.

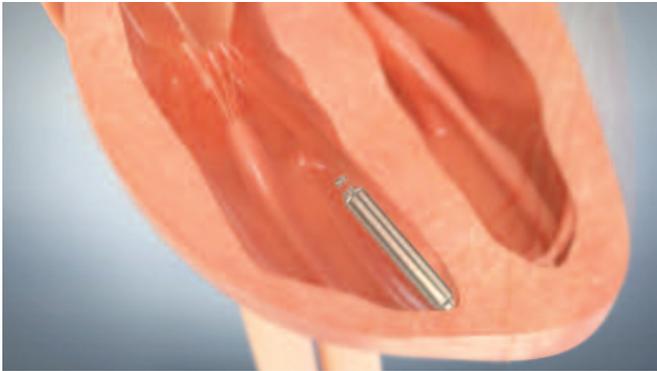
EP is one of the fastest growing segments of cardiology, with catheter ablation being one of highest volume procedures. The growth trend is in direct response to the procedure's safety and success rates, as well as a growing U.S. population of 5 million people with atrial fibrillation—the underlying cause of 25 percent of strokes.

Electrophysiology Procedures

Procedure	2012	2013	2014
Pacemaker Implantation	1,121	1,231	1,187
Implantable Defibrillators/ Resynchronization	658	704	652
Electrophysiology Studies	869	868	837
Ablations (SVT, AfLutter, AVN, Afib)	811	879	950
TOTAL	3,459	3,682	3,626

Scripps First in Region to Implant Wireless Cardiac Pacemaker

Scripps Health became the first health care provider in Southern California to implant the investigational Nanostim™ leadless pacemaker, the world's first wireless pacemaker totally implanted in the heart, as part of the Leadless II Clinical Trial. Developed for patients with bradycardia—a heart rate



that is too slow—the Nanostim™ is placed directly in a patient's heart without the visible lump, scar and insulated wires ("leads") required for conventional pacemakers.

"An Achilles' heel of traditional pacemakers is that they have leads or wires that go from the battery to the heart, and sometimes these can break due to excessive strain and additional hospital visits," said Steven Higgins, MD, director of cardiac electrophysiology, Scripps Memorial Hospital La Jolla. "With the Nanostim™, there are no wires involved, so we are hoping that this device will last longer with fewer complications."

About one-tenth the size of a traditional pacemaker, the device is catheter inserted via a groin-area vein and is screwed into the inside of the heart's right ventricle. The entire procedure takes less than one hour. The goal of the new device is to allow patients to regulate their heart rates without dealing with the chest pocket and other complications that have historically arisen, as well as enjoy living active, uninhibited lifestyles due to less activity restriction than conventional pacemakers require.

The national Leadless II study is expected to enroll approximately 670 patients at 50 centers. Higgins and Scripps Clinic cardiologist John Rogers, MD, are co-investigators at Scripps, the only San Diego location to participate in the trial.



Betty's Story

What could be better than the gift of life on your 80th birthday? A proud owner of a new Nanostim, Betty Hartung quips, "It's the most expensive birthday present my husband ever got me!" For several years, Betty used medication to control her low blood pressure but chronic fainting forced frequent ER visits. She knew she was a candidate for a pacemaker, but because of malignant stomach tumors that need regular MRIs, traditional pacemakers leads made that an unsympathetic option. When Scripps entered the Leadless II trial, Nanostim wireless pacemaker technology fit perfectly with Betty's needs. Given Scripps' reputation for excellence in patient care, deciding to participate in the trial was a "no brainer." Monthly performance monitoring gives her confidence, coupled with the fact that she feels strong and is staying active.

Scripps Cardiovascular Programs

Comprehensive vascular program

The Scripps team of board-certified vascular surgeons and cardiovascular interventionalists, along with our experienced clinical staff, provide outstanding care to patients with all forms of vascular disease. Our physicians are highly skilled in vascular medicine, traditional open surgical procedures and minimally invasive endovascular procedures to treat and prevent circulation disorders.

Performing more than 33,000 diagnostic tests annually, Scripps provides diagnostic testing and screening across the Scripps Health system for a full range of vascular diseases, including:

- Carotid artery disease
- Peripheral arterial disease (PAD)
- Venous disease
- Abdominal aortic aneurysm (AAA)
- Reynaud’s Disease
- Mesenteric vascular disease
- Renovascular disease
- Thoracic outlet syndrome



Noninvasive Vascular Diagnostics

Procedure	2012	2013	2014
Vascular Ultrasound	29,881	26,626	23,937
Carotid Ultrasound	9,411	8,926	8,606
Transcranial Ultrasound	107	579	960
TOTAL	39,399	36,131	33,503

Scripps is at the national forefront of minimally invasive procedures for treatment of peripheral vascular disease. New approaches available at Scripps are giving patients hope and relief in the most difficult cases previously thought impossible to treat with standard treatment methods.

Patients from all over the United States travel to Scripps for groundbreaking catheter-based treatment of peripheral vascular disease aimed at eliminating pain, healing wounds, and avoiding amputation.

Vascular/Surgery/Intervention*

Procedure	2012	2013	2014
Peripheral Vascular Intervention Including renal artery stents	1,378	1,454	1,378
Infra or Supra Extremity Bypass	106	90	92
Abdominal Aorta Aneurysm Repair—Open	12	7	11
Abdominal Aorta Aneurysm Repair—Endo	51	57	63
Carotid Endarterectomy	134	148	132
Carotid Artery Stent	30	19	19
Thoracic Endovascular Aortic Repair (TEVAR)	13	32	27
Hemodialysis	287	327	323
SYSTEM TOTAL	2,011	2,134	2,045

*Categorized utilizing the Vascular Quality Initiative (VQI) ICD-9 procedure definitions



Applying Cardiac Expertise to Peripheral Arteries

Scripps has long been a national leader in the minimally invasive treatment of coronary artery disease and pioneering in the use of stents to treat heart disease. Expanding upon these successful techniques, Curtiss Stinis, MD, a Scripps interventional cardiologist, has developed and perfected minimally invasive methods tailored for the treatment of complex PAD. Through two small needle puncture sites—one in the groin and one in the foot—completely blocked arteries of the legs can be effectively treated in an outpatient setting at Scripps. The image-guided “retrograde” procedure is performed by a multidisciplinary team of highly skilled physicians and requires no general anesthesia or overnight hospital stay for patients. There is also minimal pain and recovery time, and no scars from a surgical incision.

Peripheral Vascular Research PI, Curtiss Stinis, MD

- The Medtronic Zotarolimus-Eluting Peripheral Stent System for the Treatment of Erectile Dysfunction in Males with Sub-Optimal Response to PDE5 Inhibitors
- Carotid Artery Stenting Outcomes in the Standard Risk Population for Carotid Endarterectomy
- Randomized Trial of IN.PACT (Paclitaxel) Admiral Drug-Eluting Balloon (DEB) vs Standard PTA for the Treatment of Atherosclerotic Lesions in the Superficial Femoral Artery (SFA) and/or Proximal Popliteal Artery (PPA)
- Clinical Investigation Plan Of The Cook Formula™ 535 Iliac Balloon-Expandable Stent (FORMAT Clinical Study)



Barbara’s Story

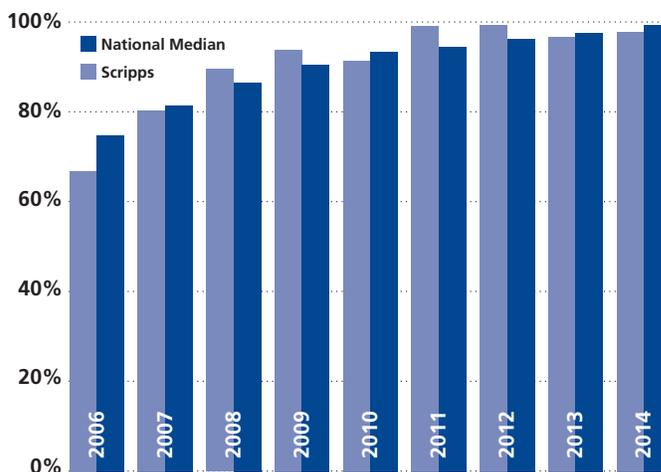
Barbara Murray was at her wit’s end. Suffering greatly from right critical limb ischemia despite an arduous history of five peripheral bypass surgeries, she feared she was losing her foot and was powerless to do anything to stop it. When she finally was referred to Scripps, Curtiss Stinis, MD, was confronted with a largely discolored, icy cold foot and a very scared patient. Eight stents and eight hours later, Dr. Stinis was happy to report to Barbara’s husband, “That was a challenge but I gave her back the artery she was born with.” Barbara considers the restoration of her native arteries a miracle that kept her from being confined to a wheelchair for the rest of her life. “There simply are no words to express my gratitude.”

Scripps Cardiovascular Programs

Heart failure

Our team of dedicated personnel at Scripps Heart Failure Recovery and Research Program utilizes the major advances in diagnosis and treatment of heart failure to provide increasingly better prognoses for our patients with outstanding patient and outpatient care. The program, led by James Heywood, MD, board-certified specialist in advanced heart failure, diagnoses and treats patients with systolic, diastolic, ischemic and nonischemic heart failure, pulmonary arterial hypertension and various cardiomyopathies.

Heart Failure Bundle Scores



30-Day All-Cause Risk-Standardized HF Readmission Results

Facility	Adjusted Actual Readmission	Expected Readmission	National Crude Readmission
Scripps Memorial Hospital Encinitas	17.8%	21.1%	22.6%
Scripps Green Hospital	18.6%	21.3%	
Scripps Memorial Hospital La Jolla	20.3%	21.1%	
Scripps Mercy Hospital	25.7%	22.9%	

(based on discharges from July 2010–June 2013)

Heart Failure Research

PI, Thomas Heywood, MD

- Left Atrial Pressure Monitoring to Optimize Heart Failure Therapy Study (Protocol 60023344/H) - LAPTOP-HF
- Stiff Left Atrium - Patient Characteristics and Outcomes (SLAPCO Study)
- Interagency Registry for Mechanically Assisted Circulatory Support
- MEtoLazone as early add on Therapy for acute decompensated Heart Failure (MELT-HF) A multicenter, randomized controlled trial
- LV Outflow Tract velocity time integral correlated with Stroke Volume
- A Double-blind, Randomized, Sham-procedure-controlled, Parallel-group Efficacy and Safety Study of Allogeneic Mesenchymal Precursor Cells (CEP-41750) in Patients with Chronic Heart Failure Due to Left Ventricular Systolic Dysfunction of Either Ischemic or Nonischemic Etiology Phase 3 Study



Life-saving devices for heart patients

Scripps Health offers advanced ventricular assist devices (VADs) and the region's top heart doctors who care for patients with end-stage heart failure. Recognized by the Joint Commission as an Advanced Certification Program, the Scripps VAD Program is led by a nationally recognized surgeon whose research and clinical trials work has helped launch some of the world's most advanced VADs, including left ventricle assist devices (LVADs).

For patients with failing hearts, these implanted compact pumps serve as a:

- Bridge to heart transplant surgery.
- Destination therapy (permanent treatment).
- Bridge to decision (transplant or permanent treatment).
- Bridge to recovery (removal if a heart has regained full strength).

From stem cell injection to tissue grafts to improve the left ventricle functionality, Scripps is currently participating in trials to advance the efficacy of mechanical assistance devices. On the horizon are trials that seek to monitor LVAD patients wirelessly. Scripps is also looking at different nanotechnologies and relationships with local biotechs. New to the field is minimally invasive LVAD placement, which will eventually become part of Scripps' practice.

While LVAD is a long-term solution for failing hearts, also on the rise is the consideration of extracorporeal membrane oxygenation (ECMO) machines as a short-term solution.

"Cardio Help is a more portable device for very sick patients that need an ECMO to keep them alive until we can stabilize them," said Dan Meyer, MD, Scripps cardiovascular surgeon. "It's part of Scripps' commitment to have a full portfolio of mechanical support for acute and chronic care, and the 24-hour, multidisciplinary team of heart specialists to direct that process, from infectious disease to palliative care."

Heart Failure Research

- Non-Invasive Estimation of Pulmonary Capillary Wedge Pressure via the Modified Bernoulli Equation in Patients with Pulmonary Venous Hypertension

PI, Dan Meyer, MD

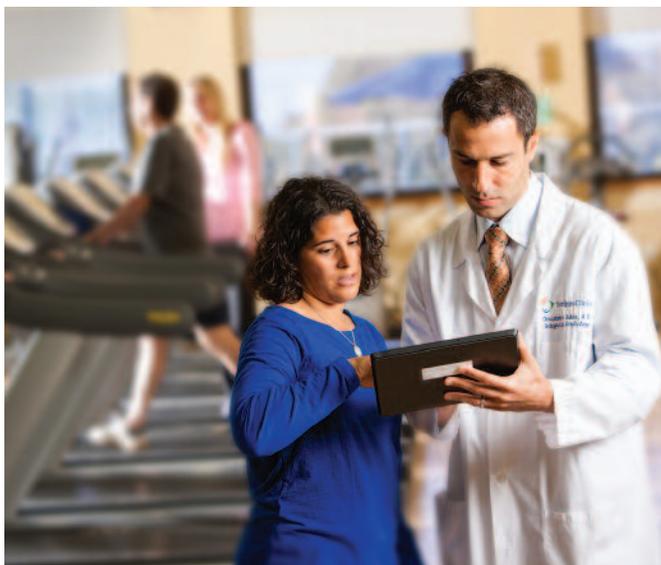
- ReViveIT Trial for earlier stage CHF patients
- Sunshine Heart C-Pulse System Trial for moderate/severe CHF

- Coapt clinical trial to study the safety and effectiveness of the MitraClip® device in heart failure patients who have functional mitral regurgitation (MR) and are considered extremely high-risk for surgery

Scripps Cardiovascular Programs

Advanced Technology Engages Rehab Patients

Founded in 1999, Scripps Center for Integrative Medicine (SCIM) uses pioneering, state-of-the-art technology, clinical research, education and lifestyle programs to prevent and treat cardiovascular disease, as well as other chronic conditions. To manage patient rehab from heart attacks and other heart-related issues, Scripps is one of a handful of sites conducting Jansen Healthcare Innovation's Care4Today™ Heart Health Solutions. The software-based program makes it easier for patients and caregivers to do the sometimes tedious follow-up work that includes monitoring and tracking blood pressure, pulse, blood sugars and telemetry. The increasing incidence of cardiovascular disease necessitates innovative solutions to reduce both the toll of cardiac recovery and associated costs.



The program features a technology platform that integrates engaging tools and incentives to motivate patient behavioral change while creating a systematic approach for the cardiac team to remotely manage the rehab process.

“The ultimate goal is a state-of-the-art software program that will digitize cardiac rehab,” says Christopher Suhr, MD, director of Scripps Center for Integrative Medicine. “It provides more efficient tracking and recruitment of patients and, ultimately, more efficient feedback to providers on how their patients are doing.”



Your Heart, Your Life: Keeping Hearts Healthy

The Well-Being Center at Scripps Mercy Hospital, Chula Vista has instituted an intervention program to decrease readmission rates of heart failure patients, thereby reducing medical costs and improving quality of life for patients. One of the core elements is to educate patients on behavioral and social risk factors contributing to heart failure. Specifically targeted to special populations, such as older, non-English-speaking residents who generally do not benefit from mainstream health promotion efforts, Your Heart, Your Life utilizes a Promotora model—a lay health professional from the Latino community who receives specialized training in heart disease and wellness. Promotoras have the capacity to influence and inspire change as part of the patient's accepted social network. The Promotora provides a conduit for diffusion of culturally appropriate information and a channel for empowerment through informal health promotion efforts. The program tracks a patient's heart-related hospital admissions and sets goals to significantly reduce follow-up biometric measures from baseline to follow up. Patients in the intervention group participate in six weekly education sessions, followed by weekly motivation and support phone calls for eight consecutive weeks.

Scripps Cardiology Physician Leaders



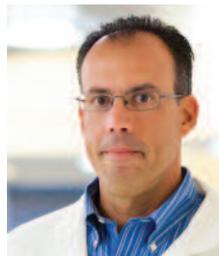
Martin Charlat, MD
Chief of Cardiology
Scripps Memorial
Hospital Encinitas



Paul Teirstein, MD
Chief of Cardiology
Scripps Clinic
Medical Director,
Prebys Cardiovascular
Institute



Steven Higgins, MD
Chairman, Department
of Cardiology
Scripps Memorial
Hospital La Jolla



Jeffrey Cavendish, MD
Lead Interventional
Cardiologist for Kaiser
Permanente,
Vice Chairman,
Department of
Cardiology
Scripps Memorial
Hospital La Jolla



Kiyon Chung, MD
Chief of Cardiology,
Scripps Mercy Hospital
San Diego



Roman Szkopiec, MD
Chief of Cardiology
Scripps Mercy Hospital
Chula Vista

Dr. Carson's Story

It's the end of an era for Scripps as we bid farewell to John Carson, MD, who retired from Scripps cardiology program on his 87th birthday after 53 years of service. An iconic figure whose counsel is still sought, Dr. Carson is a one-of-a-kind physician who followed the latest medical developments, devoured 18th century literature, stockpiled collectibles, treated tens of thousands of patients...and still made time to make house calls, citing it as a useful tool to observe a patient in their own environment.

Born in Kansas, Dr. Carson served a short stint with the U.S. Army in 1945 at the end of World War II. He entered Yale in 1946 and subsequently studied at University of Pennsylvania School of Medicine. His first job took him back home to the University of Kansas Medical Center, where he brought along a new bride, Elizabeth "Libby" Carter, who recalls Dr. Carson as "a character" back then.

The pair recently celebrated their 60th anniversary in the same home they purchased and raised five children in 53 years ago when Scripps wooed Dr. Carson to La Jolla. While they were worried about adapting their Midwest mentality to the "rootless society" of Southern California, Dr. Carson professes the move to be the best investment they ever made.

Dr. Carson actually joined Scripps when it was known as the Scripps Clinical and Research Foundation. He was a part of Scripps' early Institute of Cardiopulmonary Diseases, and when the hospital opened, was chief of staff for a year.



Libby sums up Dr. Carson the best. "His patients were his best friends...in today's world, when a doctor is seeing 40 patients a day, you can't do that anymore."

Graduate Medical Education

Scripps Health offers several graduate medical education programs in San Diego, California, in a variety of medical specialties and care environments. These residency programs emphasize:

- Collaborative relationships with faculty
- Diverse learning opportunities, including partnerships and affiliations
- Service to the local and international communities
- Clinical research opportunities

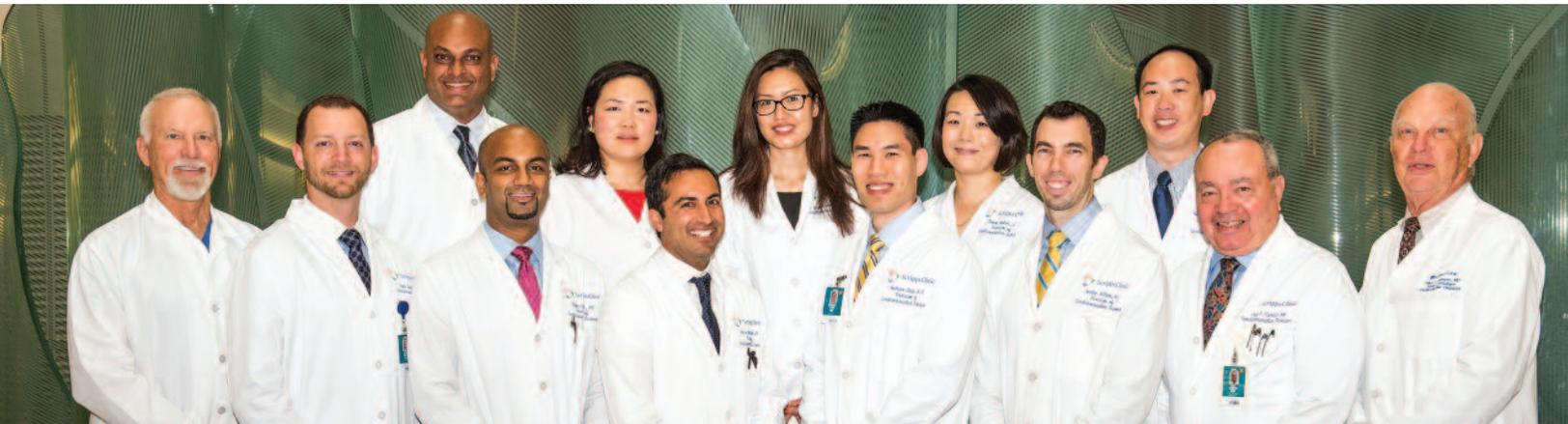
Scripps Clinic Division of Cardiovascular Disease Fellowship

The Scripps Clinic Division of Cardiovascular Disease Fellowship develops clinical and research leaders who have mastered all components of general cardiology and provides them with the opportunity to develop a personal emphasis. It is the priority of our cardiology staff to teach and mentor. Scripps Clinic and Scripps Green Hospital take great pride in the close relationship between attending physicians and

fellows, a partnership that fosters collegial and collaborative interactions between fellows and clinical faculty.

The comprehensive three-year fellowship includes these rotations:

- Inpatient Cardiology/CCU
- Heart Failure/LVAD Program
- Cath Lab
- Echocardiography/TEE
- EKG/Stress Lab
- Electrophysiology
- Adult Congenital Heart Disease
- Integrative Medicine/Preventative Cardiology/Advanced Lipid Clinic
- Continuity Clinic
- Research
- Pacer/ICD Clinic
- Interventional and Peripheral Cardiology
- Scripps Translational Science Institute
- Cardiac MRI



Front row: Richard Schatz, MD; Ryan Smith, DO; Rajeev Mohan, MD; Arvin Narula, MD; Andrew Chen, MD; Jordan Allem; Guy P. Curtis, MD, PhD; Allen D. Johnson, MD
Second row: Malhar Patel, MD; Namee Kim, MD; Christina Tan, MD; Kanae Mukai, MD; Richard Shu, MD

Faculty

Guy P. Curtis, MD, PhD

Director, Cardiovascular Fellowship Program
Director, Cardiac Electrophysiology

David Rubenson, MD

Director, Non-Invasive Laboratory/ Echocardiography

Allen Johnson, MD

Senior Consultant, Cardiovascular Disease
Director, Adult Congenital Disease Chairman Emeritus,
Division of Cardiovascular Diseases

J. Thomas Heywood, MD

Director, Heart Failure Research and Recovery

Michael Smith, MD

Division of Cardiovascular Diseases,
Heart Failure Research and Recovery

Eric Topol, MD

Senior Consultant, Division of Cardiovascular Diseases
Chief Academic Officer, Scripps Health
Director, Scripps Translational Science Institute

Malhar Patel, MD

Immediate Director, Cardiovascular Fellowship Program

Christopher Suhar, MD

Director, Scripps Center for Integrative Medicine

Interventional Cardiology Fellowship

The interventional cardiology fellowship is a two-year program offering trainees broad experience in all aspects of interventional cardiology, including:

- Percutaneous coronary interventional (PCI) procedures
- Peripheral intervention
- Transcatheter Aortic Valve Replacement (TAVR)
- Brachytherapy
- Clinical management of patients undergoing PCI
- Outpatient management of ambulatory patients following PCI
- Clinical research opportunities
- Emerging technologies, including left atrial appendage occlusion, mitral clip and the genomics of vascular disease

Scripps Clinic is a leader in interventional cardiology, performing more than 2,000 procedures each year and specializing in high-risk PCI and peripheral vascular procedures, congenital heart defect correction and transcatheter aortic valve replacement.

Medical Residency Program

Offers Abundant Learning Opportunities

The Scripps Clinic and Scripps Green Hospital Internal Medicine Residency Program combines the rigor, research opportunities and academic success of a large university medical center with the collegiality of a smaller medical center. The faculty is drawn from 500 clinicians in the Scripps Clinical Medical Health Group. Our locations, close relationship with the Naval Medical Center and a wide range of services provide abundant learning opportunities.

The Scripps Mercy Hospital Internal Medicine Residency Programs provide a friendly, close-knit environment that balances service and education. The programs' small size provides greater opportunities for residents to interact with faculty and conduct clinical research. The programs offer a socio-economically, ethnically and clinically diverse patient population. Subspecialty rotations include working directly with the subspecialty attending, performing procedures and consultations. Scripps Mercy Hospital faculty and residents develop and implement resident-driven clinical guidelines and clinical performance improvement projects.

National Conferences

Scripps Health offers nationally recognized annual conferences and is accredited by the Accreditation Council for Continuing Medical Education (ACCME) to provide AMA PRA Category 1 Credit(s) for physicians. Credits for other health care professionals (nurses, psychologists, pharmacists, etc.) are also available. A complete listing of 2015–2016 Scripps CME courses can be found at Scripps.org. Upcoming conferences include:

26th Annual Cardiovascular Interventions

This course is designed to provide the practicing cardiologist a concentrated exposure to new developments in interventional cardiology through a dynamic program of lectures from world experts, live case procedures, and extensive participant-faculty interactions.

*October 27–30, 2015
Hilton La Jolla Torrey Pines
Course Director:
Paul Teirstein, MD*

Fifth Annual Structural Heart Disease Intervention and Imaging: A Practical Approach

This annual conference is designed to provide a practical, cutting-edge, and case-based assessment of the emerging area of structural heart disease intervention and interventional cardiovascular imaging, with an emphasis on the collaborative nature of these procedures across many disciplines within cardiology.

*February 3–5, 2016
Hilton La Jolla Torrey Pines
Course Directors:
Matthew J. Price, MD, and David S. Rubenson, MD*

Third Annual Clinical Advances in Arrhythmias and Cardiovascular Disease

This conference is designed to educate clinicians on the latest advances in the diagnosis and treatment of various cardiovascular conditions such as heart failure, cardiac arrhythmias, hypertension and sudden cardiac death.

*April 15-17, 2016
Loews Coronado Bay Resort
Course Directors:
Douglas N. Gibson, MD;
J. Thomas Heywood, MD;
John D. Rogers, MD*

Prebys Cardiovascular Institute

With more than 2,200 doors, enough concrete to fill nine Olympic-sized pools, and almost 118,000 bricks, Prebys Cardiovascular Institute is San Diego's largest and most advanced hospital dedicated to heart care. Scripps officially took possession of the building in late 2014 after a three-year construction phase and the facility opened up for patient care in March 2015.

"This is a very exciting milestone for us—after years of planning, design, and construction, Scripps now offers the most comprehensive cardiovascular program that has ever been available in the region," said Scripps President and CEO Chris Van Gorder.

The 383,000-square-foot building is located on the campus of Scripps Memorial Hospital La Jolla. Rising seven stories, the exterior of the Prebys Cardiovascular Institute is a landmark model of 21st century heart care. More than 200 individuals, from clinicians, leadership and architects to support staff, provided guidance on creating an environment that comprehensively embodies best practices for cardiac patients. Based on this feedback, evidence-based design and notable construction features are incorporated throughout, including:

- A curved building shape to reduce the distance that staff needs to travel to care for patients. Care providers have a less than 60-foot travel path from their work stations to the patient rooms.
- Floor-to-ceiling windows that incorporate natural light and views of nature. Studies show that patients' need for pain medicine was reduced by 22 percent when they are exposed to light and a view.
- A three-tiered wireless infrastructure dedicated to enterprise, medical and consumer use that maintains maximum capabilities for clinicians.
- All single-patient rooms designed with three distinct zones: the nursing zone with a sink, supply area and charting space; the patient's bed area; and the family zone.

- Patient rooms that offer a variety of amenities, including wireless Internet access, LCD screen televisions and pullout couches so family members can stay comfortably overnight.
- Located 1,600 feet away is a new central energy plant that provides air conditioning, heating, medical gas, steam, fuel storage, waste storage, and emergency generators for the new hospital tower.

Cardiovascular care at Scripps

The Prebys Cardiovascular Institute is the cornerstone of a 25-year master plan that will transform the Scripps Memorial Hospital La Jolla campus. Scripps Health is replacing the existing hospital with new facilities to meet state earthquake safety mandates. The new facility features 108 inpatient beds in private rooms, 59 intensive care beds, six state-of-the-art operating rooms, and as many as 14 cardiac catheterization labs with the most advanced medical technology. It also integrates the highly respected cardiovascular programs throughout the Scripps Health system and Kaiser Permanente.

"The Prebys Cardiovascular Institute is more than a building; it represents Scripps' commitment to providing our patients with the highest quality of cardiovascular care," Van Gorder said.

Every year, more than 76,000 patients receive their heart care from Scripps, making it the largest heart care provider in the region. And Scripps is the only cardiovascular program in the region ranked by U.S. News & World Report as one of top 20 in the country.



The Premier Destination for Heart Care in the West

Building on a legacy of innovation, leadership and quality care, Scripps Health introduces the Prebys Cardiovascular Institute—a world-class, uniquely designed facility, which serves as the premier destination for heart care on the West Coast. Prebys Cardiovascular Institute is one of the most advanced heart care centers in the nation, bringing together the renowned heart and vascular programs of Scripps La Jolla, Scripps Green and Kaiser Permanente, and ushering in a new era of medicine for San Diego—and beyond.

Complex Facade

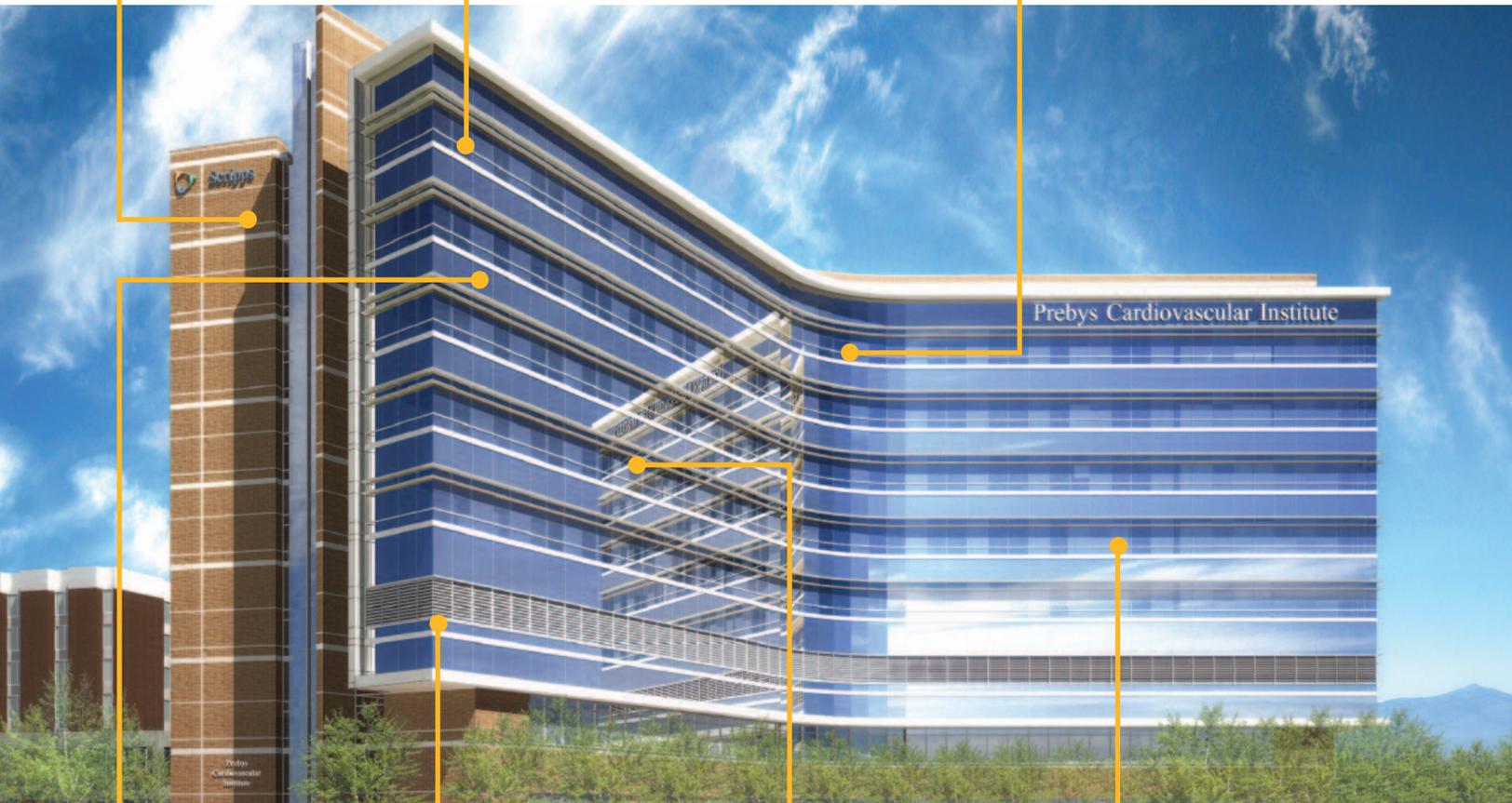
Almost 118,000 bricks were used, making the hospital tower one of the biggest brick buildings constructed in San Diego over the past 15 years.

Exterior

The 383,000-square-foot building is located at Scripps La Jolla. The building's exterior is a combination of glass windows, bricks and steel, designed to complement and blend with the architecture of the existing Scripps La Jolla campus.

Curved Design

The building is curved to reduce the distance that staff needs to travel to care for patients. The travel path between care providers' work stations and patient rooms is less than 60 feet.



Patient Rooms

Floors 5, 6 and 7 feature 108 single-patient rooms (36 per floor). Included in this design are two, two-room suites on each floor for patients who require increased security and privacy.

Operating & Procedure Rooms

Floor 2 features four state-of-the-art operating rooms, two hybrid operating rooms, and four cardiac catheterization labs with the most advanced medical technology.

ICU Rooms

Floors 3 and 4 house 59 intensive care (ICU) rooms. Three of these rooms will be negative pressure isolation rooms, increasing safety and infection control for patients and staff.

Earthquake Ready

The institute has the largest installation to date of side plate steel connections, exceeding seismic safety standards. The connections are designed to mitigate movement in the event of an earthquake.

In the Community



Protecting Young Hearts From Sudden Cardiac Death

Scripps' sponsorship of the Eric Paredes Save A Life Foundation has helped provide free heart screenings to nearly 14,000 teens, finding 1 in 100 with an undetected heart abnormality or factor that puts them at risk for sudden cardiac arrest—the number two killer of youth under 25. Scripps volunteers, from doctors to nurses to EKG and echo techs, help staff screenings, led by Scripps cardiologist John Rogers, MD. Screenings are a vitally important initiative as they are not a regular part of youth health care though heart conditions often have unrecognized warning signs. The first symptom could be death, as was the case with Eric Paredes. Rhina Paredes, a Scripps RN, created the foundation with Eric's dad, Hector, when their son died in 2009. Nearly 40 percent of youth screened are from moderate to extremely low-income households, hundreds without primary care physicians and dozens without medical insurance.



Teaching Garden Plants Seeds to Combat Early Childhood Obesity

Parents, students and faculty from Rohr Elementary in Chula Vista, along with physicians and staff from Scripps Clinic, broke ground on an American Heart Association Teaching Garden. The event was part of an innovative education initiative aimed at improving student nutrition and health education, and at fighting childhood obesity—which the Centers for Disease Control cites as an issue for nearly one in three kids, with one in 10 consuming the recommended daily serving of fruits and vegetables. The teaching garden offers students the opportunity to plant, grow, harvest and prepare their own fresh produce. There are more than 230 American Heart Association teaching gardens nationwide.



Free Blood Pressure Screenings

Scripps Health, in partnership with the County of San Diego, provides free blood pressure screenings to help San Diegans take charge of their own heart health. During the Love Your Heart Valentine's Day event, Scripps provided 2,271 free screenings to its employees and the public at 12 sites across its system and via a mobile medical unit at the local YMCA. Last year, the county and all program partners performed blood pressure checks on more than 2,000 San Diegans at more than 60 sites.

*“The most important gift one human being can give to another is,
in some way, to make life a little better to live.”*

—Ellen Browning Scripps

