

# CARDIOLOGY

## The Advanced Heart Failure Program Expands

In five years, the number of left ventricular assist devices (LVADs) implanted at Washington University School of Medicine/Barnes-Jewish Hospital has more than doubled, from 52 in 2009 to 122 devices in 2013.

Add to that the debut last year of a dedicated six-bed ICU step-down unit for VAD patients and a second slot added to the advanced heart failure fellowship, and the Division's advanced heart failure program is increasingly in demand.

"I don't think there's an experience like this anywhere," says **Shane LaRue, MD, MPH**, a former WU Hawes Fellow in Heart Failure and Cardiac Transplantation (2012-2013) who joined the faculty in 2013. "With the leadership of Doug Mann (Division Chief) and Greg Ewald (Director, Section of Heart Failure & Cardiac Transplantation), there is a much stronger emphasis on research. The faculty soon will increase from four to six, too, which allows more time to pursue research interests while handling the patient volume."

Much of the increase in patient volume is related to research within the past decade that indicates a broader use of LVADs beyond end-stage heart failure. While still used primarily as a bridge to transplant, LVADs are increasingly implanted in less critical patients.

"Research is showing that survival and quality of life are markedly increased with LVADs in these patients," says current advanced heart failure fellow **Justin Vader, MD, MPH**, who joins the faculty this summer. "The goal now is to learn how to better manage post-device complications, identify patient characteristics associated with complications,

and better communicate the risks and benefits to prospective LVAD recipients even as larger trials are seeking to expand the population that may benefit from this advancing technology."

Fellow **Kory Lavine, MD, PhD**, also joins the faculty. The recipient of a 5-year NIH Career Development (K) Award, Lavine studies resident cardiac macrophages, a type of immune cell that may be responsible for the growth of coronary vasculature that develops in some patients with coronary artery disease. "Understanding how the vasculature grows is an essential first step toward the development of therapies aimed at restoring blood flow and improving function of a failing heart," Lavine says.

"We have a wide array of research under way, either as individual projects or as part of multicenter studies, says LaRue. "We're



From left: Greg Ewald, MD, Justin Vader, MD, Kory Lavine, MD, and Shane LaRue, MD

a member of the NHLBI's Heart Failure Clinical Research Network and have created our own internal research group of those interested in the care of LVAD patients. We also have a comprehensive heart failure management program that offers the latest treatments, investigational drugs and heart assist devices, some of which are only available through our current clinical research trials."

Adds Vader, "I believe that with the opportunities for research, coupled with our clinical volume, we have one of the most impressive service lines in cardiology now."

## Heart & Vascular Center



NATIONAL LEADERS IN MEDICINE

The mission of the Washington University and Barnes-Jewish Heart & Vascular Center is to achieve excellence in patient care, research and education through seamless integration of heart and vascular care. The Heart and Vascular Center is committed to promoting heart and vascular health through education, prevention and treatment of heart and vascular disease.

# MESSAGE FROM THE CHIEF



This summer our heart failure and VAD team increases by two. Former fellows Justin Vader and Kory Lavine are two physicians with the unique background of also having their master's degrees in population health sciences. Our ability to bring them on as faculty is indicative of the rapid growth of the heart failure program and reflects our strong emphasis on clinical and basic cardiovascular research as well as on premier patient care.

Two other esteemed faculty also are on board this summer. David Brown has had a distinguished career specializing in general and preventive care cardiology and comes to us from Stony Brook University School of Medicine. Bill Balke, who will be the new chief of cardiology at the John Cochran VA Medical Center in St. Louis, is known nationally and internationally for cardiovascular research related to calcium handling and heart failure. He previously was at the University of California in San Francisco.

The new faculty additions come at a time when cardiovascular training programs are undergoing a major shift in how trainees are evaluated. In accordance with ACGME guidelines, this year marks the first time fellows will be evaluated progressively throughout their training with objective benchmarks. The move is expected to identify any deficiencies

early in the training program so that support can be provided. It also enables trainees to better navigate the complexities of cardiovascular care and independent practice or research.

I hope you have the opportunity to see or purchase two of our latest publications. John Lasala has co-authored an insightful and comprehensive text with former fellow Jason Rogers titled *Interventional Procedures for Adult Structural Heart Disease*. It's already a best-seller. Our *Washington University Manual – Cardiology Subspecialty Consult* also has been newly updated.

We are pleased that a number of alumni are recognizing the value of their education and time at Washington University and are sending donations to our Division. They are much appreciated and we will honor your contributions in this and subsequent issues.

As always, thank you for sending updates as your careers progress. We look forward to seeing you at our next AHA satellite symposium later this fall.

**Douglas L. Mann, MD**

*Lewin Professor and  
Chief, Cardiovascular Division*

## THANK YOU to Our 2013 Donors

Beginning with this edition of our newsletter, we gratefully acknowledge donations to our Division. Contributions can help fund new programs & technologies, research or lectureships. The following made contributions to the Smith-Oliver Society, the Dr. Burton Sobel Lecture, or the Dr. John P. Boineau Lecture in 2013:

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## Fellowship Program Update

**Andrew Kates, MD**

Evaluating fellows is essential in any training program. The way we do that has just changed dramatically.

The Next Accreditation System or NAS was introduced by the ACGME last summer in seven specialties, (e.g. internal medicine, pediatrics, emergency medicine, and others) as an integral part of resident training evaluations. This summer, we begin evaluating cardiovascular fellows the same way.

The ACGME has identified six “core” competencies: patient care; medical knowledge; practice-based learning and improvement; interpersonal and communication skills; professionalism; and systems-based practice, all of which must be mastered in each medical specialty. Each of these core competencies is further subdivided into 23 subcompetencies and further still into “milestones”—knowledge, skills, attitudes or other attributes—that describe the development of competence from that of an “Early Learner” to “Improving” to “Ready for Unsupervised Practice” to “Aspirational.” These levels roughly track from first year fellow to attending level.

We believe there are several potential benefits to the new system. Early assessment allows for the identification of “Critical Deficiencies” that can be addressed aggressively. The fellow deemed “Ready for Unsupervised Practice” may now focus on other areas of training.

We all remember as fellows the evaluations which give trainees a 1 to 9. Everyone received at least a seven or higher with limited opportunity for feedback. The NAS, once implemented, should help our trainees and us by providing more objective measures of competence as well enabling us to track progress throughout a fellow’s time in training.

## Alumni Update

**Jose Banchs, MD, FACC, FASE**

*Clinical Cardiology Fellow, 2000–2004*

*Currently: Director of Echocardiography and Assistant Professor, Department of Cardiology at The University of Texas, MD Anderson Cancer Center*

Dr. Banchs has been a member of MD Anderson’s Cardiology Department since 2009. As medical director for the Echo lab, a significant portion of his daily activities is focused on imaging reviews and quality enhancement initiatives. He is overseeing what he calls “an exciting growth period,” which is leading to the lab becoming recognized as a premier imaging center in Houston. He and his team have been particularly successful at securing significant funding for innovative research, with several large cardiovascular studies beginning soon.

**Favorite Leisure Activities:** With three boys, my family keeps me busy! I play videogames with my oldest boys, Evan, 9, and Emil, 7. I play with cars and am trying to teach my youngest son, Ellis, 4, Spanish. Some of the best fun has been taking Evan and Emil to Astros baseball games. Both now understand basic defensive strategies of the game and regularly talk about batting averages and on-base percentages of their favorite players. It’s been priceless! Only now after five years of living in Houston, and only because the Astros moved out of the National League Central Division, have we allowed ourselves to root for the home team. I still make my boys root for the Cardinals.

**Favorite Fellowship Memories:** It was hard work, but I had a wonderful time during my four years of training. My favorite memories, by far, were the times in the Echo lab because of both



Jose Banchs, MD, with his three sons

the spectacular imaging and the noninvasive faculty we had. Most unforgettable were the reading and teaching lessons with the “master” of ultrasound imaging, and the person I want to be when I grow up — Dr. Julio Perez!

## Departing Fellows

Congratulations to our fellows who are moving to new positions:

**Derrick Fansler, MD**

*Electrophysiologist, Colorado Springs Cardiologists*

**Corey Foster, MD**

*Imperial Health, Lake Charles, LA*

**Iliia Halatchev, MD, PhD**

*Assistant Professor of Medicine, Washington University School of Medicine, St. Louis Veterans Affairs Medical Center*

**Carl Kapadia, MD**

*Interventional Fellow, Mayo Clinic in Rochester, MN*

**M.C. Jeffrey Lau, MD, PhD**

*National Heart Center of Singapore*

**Kory Lavine, MD, PhD**

*Instructor of Medicine, Cardiovascular Division, Washington University School of Medicine*

**Kathryn Lindley, MD**

*Assistant Professor of Medicine, Cardiovascular Division, Washington University School of Medicine*

**Sujata Ramamurthy, MD**

*General Cardiology and Imaging, Pioneer Valley Cardiology, Springfield, MA*

**Justin Sadhu, MD**

*Instructor of Medicine, Cardiovascular Division, Washington University School of Medicine*

**Deepak Thomas, MD**

*Interventional Fellow, University of Virginia in Charlottesville*

**Justin Vader, MD**

*Assistant Professor of Medicine, Cardiovascular Division, Washington University School of Medicine*

In addition, the following fellows move to advanced clinical tracks:

**Alejandro Aquino, MD**

*Interventional*

**Robert Shapiro, MD**

*Interventional*

**Sarah Sandberg, MD**

*Electrophysiology (2nd year)*

**Jonathan Davis, MD**

*Heart Failure*

## New Division Faculty

We are delighted to welcome two new faculty to the Cardiovascular Division:



David L. Brown, MD, FACC

**David L. Brown, MD, FACC**, joined the faculty on May 28, 2014. He is internationally recognized for his outcomes and comparative-effectiveness research on coronary artery disease, with more than 100 publications in leading

cardiology and internal medicine journals. An accomplished clinician, Dr. Brown specializes in general, preventive and critical care cardiology. Following internal medicine training and a chief medical residency at Baylor College of Medicine in 1986, Dr. Brown completed fellowships in cardiology, hematology and vascular biology at the University of California-San Francisco and advanced

fellowship training in interventional cardiology at the Cleveland Clinic Foundation. He is a co-editor of two textbooks, *Cardiac Intensive Care* and *Evidence-Based Cardiology Consult*, and serves on several editorial boards, including the *American Journal of Cardiology*, the *Journal of Cardiovascular Translational Research* and the *Journal of Geriatric Cardiology*. Prior to joining our faculty, he served as Chief of Cardiology and Professor of Medicine at Stony Brook University School of Medicine in New York. Dr. Brown currently sees patients in the Heart & Vascular Center at Barnes-Jewish West County Hospital.



C. William Balke, MD, FACP, FAHA

**C. William Balke, MD, FACP, FAHA**, joined the faculty on June 1, 2014. He serves as the new chief of cardiology at the John Cochran VA Medical Center. Like Dr. Brown, Dr. Balke is internationally recognized

for his cardiovascular research, specifically on calcium handling in hypertrophy and heart failure. He most recently served as a Professor in the Department of Medicine at the University of California-San Francisco School of Medicine. He also was a member of the university's Board of Directors for the Clinical and Translational Science Institute (CTSI). Dr. Balke completed his internship and residency training at Johns Hopkins Hospital in Baltimore and was both a clinical and research cardiovascular fellow at Brigham and Women's Hospital in Boston. He also completed additional training as a clinical and research electrophysiology fellow at the University of Pennsylvania. Since 1998, he has served as the Associate Editor of the *Journal of Investigative Medicine* and sits on multiple editorial boards. As head of cardiology at the VA, Dr. Balke will assist with both the training and research missions of our Division.



Helen Hobbs, MD

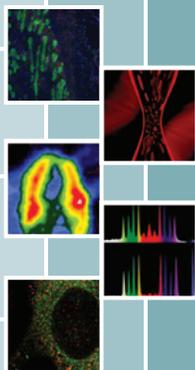
## Keynote Speaker — Helen Hobbs, MD 3rd Annual Cardiovascular Research Day November 7, 2014

**Helen Hobbs, MD**, Professor of Internal Medicine and Molecular Genetics at the University of Texas Southwestern Medical Center, will be the guest speaker for the 2nd Annual Burton E. Sobel Lecture at Cardiovascular Research Day on November 7, 2014.

Hobbs, who also serves as UT Southwestern's Director of the McDermott Center for Human Growth and Development, will lecture on "**Lipids, Lipases and Fatty Liver Disease.**" In her research, conducted in partnership with Jonathan Cohen, she has identified genes and sequence variations contributing to metabolic and cardiovascular disorders with a focus on lipids and lipoproteins. Together the two found that rare genetic variations contribute to complex traits in the general population. By concentrating on alleles of low frequency and large phenotypic effect size, they have discovered new therapeutic

targets for the prevention and treatment of heart disease. Most recently, they identified genetic variants that contribute to the full spectrum of fatty liver disease, extending from hepatic steatosis to cirrhosis.

Hobbs has been at UT Southwestern since 1987. In addition to research on lipids and lipoproteins, Hobbs and her colleagues previously identified two gene mutations in the PCSK9 gene that dramatically impact levels of LDL cholesterol. Continued research has found that the LDL receptor can be treated with monoclonal antibodies coupled with high-dose statins. When used in combination, LDL cholesterol levels fell by 73% in study participants, whereas patients taking high-dose statins alone had a 17% decrease. The research shows promise in the development of a new class of drugs to treat high cholesterol.



The Burton E. Sobel, MD, Lecture is named in memory of the former chief of Washington University School of Medicine's Cardiovascular Division, who died in 2013.

## Subcutaneous ICD

Washington University electrophysiologists were the first in Missouri to implant a subcutaneous implantable cardioverter defibrillator (S-ICD) for the treatment of arrhythmias such as tachycardia. The initial procedure took place in late November. The advantage of the subcutaneous device is that there are no wires threaded through a blood vessel into the inside of the heart. Instead, a single wire is placed under the skin on the front of the chest and connected to a subcutaneous ICD placed on the side of the chest.

“There is growing awareness that shocks from wires inside the heart can damage the heart to some degree,” says Mitchell Faddis, MD, Chief of Electrophysiology.

“This does not appear to occur when the shock is delivered outside of the heart with the S-ICD system.”

Dr. Faddis’s group so far has implanted seven S-ICD devices. “I do believe that the enhancement in safety achieved by the S-ICD over a traditional ICD system will



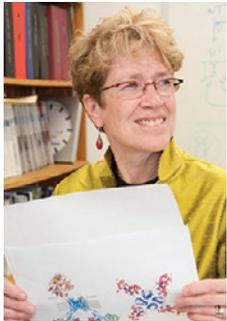
Subcutaneous ICD

quickly drive adoption of this technology in patients who currently don’t also require pacemaker technology,” he says. “For this new generation of wireless devices to become the standard for all ICD

implants, they will need to combine wireless pacing technology with the defibrillator action that typifies current ICD systems implanted with wires in the heart.”

The electrophysiology team implants about 300 ICDs and 250 pacemakers annually at the Barnes-Jewish Heart & Vascular Center.

## Long noncoding RNA linked to Heart Failure



Jeanne Nerbonne, PhD

Large sections of the genome that were once referred to as “junk” DNA have been linked to human heart failure, according to researchers from Washington University School of Medicine. So-called junk DNA was long

thought to have no important role in heredity or disease because it doesn’t code for proteins. Emerging research in recent years, however, reveals that many of these sections of the genome produce noncoding RNA molecules that, despite not being proteins, still have important functions in the body.

In a published article in *Circulation*, Washington University investigators report results from the first comprehensive analysis of all RNA molecules expressed in the human heart. The researchers, who studied nonfailing hearts and failing hearts before and after patients received pump support from left ventricular assist devices (LVADs), found that expression patterns of a specific type of RNA molecule, called a long noncoding RNA, can distinguish between two major types of heart failure and between failing hearts before and after they received LVAD support.

“We don’t know whether these changes in long noncoding RNAs are a cause or an effect of heart failure,” says senior author Jeanne M. Nerbonne, PhD, the Alumni Endowed Professor of Molecular Biology and Pharmacology. “But it seems likely they play some role in coordinating the regulation of multiple genes involved in heart function.”

Nerbonne pointed out that all types of RNA molecules they examined could distinguish between failing and nonfailing hearts. But only expression of the long noncoding RNAs was measurably different between heart failure associated with a heart attack (ischemic) and heart failure without the obvious trigger of blocked arteries (nonischemic). Similarly, only long noncoding RNAs significantly changed expression patterns after implantation of left ventricular assist devices.

“It’s clear that some patients experience a change in the structure and physiology of the heart tissue following pump support, and in some patients that change results in improved heart function,” Nerbonne said. “One interesting question is whether these long noncoding RNAs could be a measure of whether the failing heart is getting better with an LVAD.”

Nerbonne and her team also want to explore whether measures of long noncoding RNAs could be an early predictor of heart failure, ideally before symptoms develop.

## The following new research awards were made to cardiology faculty during December 2013 – May 2014.

**Sharon Cresci:** ICTS: Validation and Further Characterization of Low Frequency Coding Variants in PGC 1 B

**Brian Lindman:** Doris Duke: Novel Prediction Models for Patient-Centered Clinical Outcomes after Transcatheter Aortic Valve Replacement for Aortic Stenosis

**Daniel Ory:** NIH U01: A Phase 1 Dose Escalation Study Of Vorinostat in Niemann-Pick C1 Disease

**Stacey Rentschler:** SCIMED: Regulation of Cellular Electrophysiological Phenotype by Notch and Wnt Signaling

**Jean Schaffer:** Juvenile Diabetes Award: Non-Canonical SNORAS in the Pathogenesis of Type 1 Diabetes

**Joel Schilling:** DRC Pilot Project: Macrophage PPAR Gamma as a Regulator of Ischemic Cardiac Remodeling

**Alan Zajarias:** Universite Laval: Transcatheter Aortic Valve Implantation in Patients with Low-Flow, Low-Gradient Aortic Stenosis

## New Textbooks by Cardiovascular Faculty



Co-Authors Jason Rogers, MD, and John Lasala, MD hold their first copies of *Interventional Procedures for Structural Heart Disease*.

Just months after leading a highly successful AHA Satellite Symposium on “Advances in Structural Heart Disease,” John Lasala, MD, PhD, Director of Structural Heart Disease, has co-authored a comprehensive medical reference book on the subject. Published this spring, the book, called *Interventional Procedures for Structural Heart Disease*, focuses on the latest technologies and techniques available, including chapters on transcatheter aortic valve replacement and percutaneous approaches for treating mitral regurgitation and pulmonary vein stenosis, as well as full-color images and discussion of advances in cardiovascular imaging for structural heart disease, among other topics.

“This is a burgeoning field that is predominantly procedurally based,” says Lasala. “Because there wasn’t a good reference book for the diversity of procedures that are performed, we decided to write one that was broad both in scope and depth.”

Lasala co-authored the reference manual with Jason Rogers, MD, Director of Interventional Cardiology in the Division of Cardiovascular Medicine at UC-Davis Medical Center. Rogers is a former cardiovascular fellow (1998-2003) from Washington University School of Medicine.

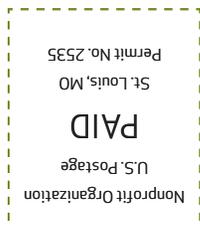
“Our relationship has evolved over more than a decade from a mentoring relationship to that of close collaborators,” says Lasala, who also has conducted numerous courses with Rogers. “This book grew out of our desire to provide a strong foundation and a comprehensive resource for this rapidly growing subspecialty.”

Another text to consider adding to your library is the *Washington University Manual-Cardiology*

*Subspecialty Consult-3rd Edition*, edited by Division faculty members Andrew Kates, MD and Phillip Cuculich, MD. The book, which is growing in popularity, serves as a general reference for the diagnosis and treatment of cardiovascular diseases. Kates notes that the project teamed faculty members with fellows to write every chapter because “This style of collaboration offers incredible opportunities for mentorship and leadership.”

The updated edition includes a more user-friendly design and includes numerous changes related to the new prevention guidelines as well as treatments for atrial fibrillation, valve diseases and disorders, and heart failure, among others. Included with the 3rd edition is a bundled interactive eBook for tablet, smartphone, and online access.

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