Mitral Valve Repair & Replacement

At Washington University School of Medicine, interventional cardiologists are seeing a double-digit growth in the number of patient referrals for evaluation and treatment of complex mitral valve regurgitation (MR). The growth comes as results of the latest participation in clinical trials evaluating both mitral valve repair and replacement devices are expected to be presented at national cardiology symposiums later this year.

“Mitrail valve disease is 2-3 times more prevalent than aortic disease,” says John Lasala, MD, PhD, Director of the Structural Heart Disease program in WU’s Cardiovascular Division. “The questions we are trying to answer are who are the ideal candidates for percutaneous mitral valve repair or replacement and when is the ideal time to implant these devices?”

For more than a decade, WU researchers have been part of clinical trials focused on the use of a mitral valve clip for percutaneous treatment of MR. Early results from the EVEREST I and II trials in patients with severe MR due to ‘structural’ MR were very promising and led to FDA approval. The next generation study, COAPT, evaluated the clip specifically in functional MR-symptomatic patients with enlarged hearts producing congestive heart failure. Preliminary results from that study should be announced this fall. In the meantime, WU cardiologists and cardiac surgeons have participated in early feasibility studies involving a subvalvular annuloplasty device (ANCORA), which is designed to “cinch” the valve closed to stop leaks.

“All of these investigations focus on the repair of the mitral valve,” says Alan Zajarias, MD, co-director of the Center for Valvular Heart Disease. “In the past year, however, we’ve seen rapid advancements in efforts to replace rather than repair the valve.”

In November, WU became one of the first 12 centers in the United States to participate in the INTREPID early...
Management of valvular heart disease has been undergoing a revolution over the past decade. From traditional open-heart surgical procedures, we have advanced to minimally invasive surgical techniques to repair aortic and now mitral valves. On the horizon we see similar research under way for tricuspid valves. That’s good news, because more than five million Americans have moderate to severe valve disease. As the population ages, we anticipate that the number will rise significantly. In the Cardiovascular Division, we have the region’s largest structural heart disease program, with international leaders in valve repair and replacement. Our growing expertise has led to participation in some of the most innovative clinical trials in the country, and we’re pleased to see patient outcomes improving as new technologies and procedures for valve disease are identified.

Because this is a rapidly evolving subspecialty with many clinical trials available, I hope you join us in St. Louis for our annual Valve Symposium on October 20, 2018 to learn more about the latest advances in the management of valvular heart disease. We have a great program prepared for you, led by interventional cardiologist Alan Zajarias, MD and his colleague, cardiothoracic surgeon Ralph Damiano, Jr., MD.

It will also be a great time to catch up with other alumni and faculty. As always, I appreciate knowing where your career paths have taken you and look forward to seeing you, either at our symposium or at a national conference.

Douglas L. Mann, MD
Lewin Professor and Chief, Cardiovascular Division

Mitral Valve
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feasibility trial evaluating a trans-mitral valve replacement (TMVR) device. Its success led to the launch of the national pivotal randomized trial, APOLLO, which includes patients of intermediate risk or greater with severe mitral regurgitation. “We’ve implanted about half a dozen of this first generation device to date,” says Zajarias. “So far, we’ve had good results in very sick patients.”

The current device is too large for percutaneous placement. Instead, the valve is implanted using a transapical approach. In the future, cardiologists anticipate the devices will get smaller and be implanted via a transfemoral approach.

The team of valve specialists at Washington University includes interventional cardiologists and cardiac surgeons. They collaboratively see patients in clinics and work side-by-side during procedures.

In addition to Lasala and Zajarias, Marc Sintec, MD, a former fellow in the WU Cardiovascular training program, has joined the team. Surgeons include Hersh Maniar, MD, Puja Kachroo, MD, and Spencer Melby, MD. All have extensive expertise in valve repair and replacement, and were among the first in the country to evaluate and then offer routine transcatheter aortic valve replacement (TAVR).

“Our population in the valve center has changed from being 90-percent aortic valve to a population with more than 50 percent being non-aortic valve patients,” says Zajarias. “Advancements to treat MR have been slower than with aortic disease because the mitral valve is so much more complex, but we are seeing good results with the latest technologies. The key now is to hone in on the patient criteria to ensure excellent outcomes.”

If you are interested in making a donation to the Cardiovascular Division, please contact Rachel A. Hartmann in the Washington University Medical Alumni and Development office at: 314-935-9715 or rachel_hartmann@wustl.edu

Washington University in St. Louis
Office of Medical Alumni and Development
Attn: Rachel A. Hartman
Campus Box 1247
7425 Forsyth Blvd.
St. Louis, MO 63105

Contact Information
Cardiovascular Division
Washington University School of Medicine
Campus Box 8086
660 S. Euclid Ave.
St. Louis, MO 63110

Administration Office
314-747-3031

Fellowship Office
314-362-1297
Laura King, coordinator
lkling@wustl.edu

On the web:
cardiology.wustl.edu

Toll-Free Appointment Line:
888-210-8375

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FELLOWSHIP & ALUMNI NEWS

Fellowship Program Update

Andrew Kates, MD

I have decided to devote this month's column to our Cardiology Fellowship Coordinator Ava Ysaguirre, who retired at the end of June.

As many of you know and have witnessed, Ava has been the heart and soul of our fellowship program for many years. She has been the first point of contact for many applicants, a resource for innumerable fellows, and has been a positive influence on so many aspects of our program. I can honestly say that the success of our program has, in many ways, been due to her.

Ava first joined Washington University in 1978 in Dr. Bob Roberts' lab, where she worked as part of the MILIS trial. She then left briefly for Saint Louis University before returning here to work with Dr. Peter Corr. She became the fellowship program coordinator in 1994, first working with Dr. Ben Barzilai and then me.

Ava is now loving retirement, especially since she has more time with her husband, children, and nine grandchildren. She enjoyed working with many of you, and I am sure you join me in thanking her for her years of tireless dedication to our program.

Ava’s retirement email address is ava.retired@gmail.com

Alumni Update

David E. Lanfear, MD, MS
WU Cardiology (Clinical, Advanced Heart Failure & Transplant) Fellow, 2005

Current: Section Head, Advanced Heart Failure and Transplant Cardiology, Henry Ford Heart and Vascular Institute, Detroit, MI. As a physician-scientist, Lanfear has been recognized for outstanding research efforts, beginning in his fellowship, when his research published in the Journal of the American Medical Association titled "β2-Adrenergic Receptor Genotype and Survival among Patients Receiving β-Blocker Therapy after an Acute Coronary Syndrome" was named one of the top 10 achievements of the year by the American Heart Association. A past recipient of the WU Cardiovascular Division’s Burton Sobel Award for Excellence in Cardiovascular Research, Lanfear studies precision medicine and genomics in heart failure; in particular, he focuses on cardiovascular pharmacogenetics, and has a solid track record of NIH funding. He earned a master's degree in clinical research design and statistical analysis from the University of Michigan's School of Public Health in 2007. He has been on faculty at Henry Ford for the past 13 years and was named head of the Advanced Heart Failure and Transplant Cardiology Section in 2013. In this role, Lanfear oversees all clinical, education, and research activity for heart failure, encompassing the health system's heart transplant and LVAD programs. He also oversees a wide range of clinical trials.

Favorite Fellowship Memories: “There are so many memories from my time as a fellow. A fun one was just a night out with all the other fellows and our SO’s in the Central West End as we started our first year. Another unforgettable moment was when a bunch of us stopped, shocked, watching news updates in the fellows’ room/echo lab when 9-11 occurred. There also were many memorable conference trips — one in particular was the ACC in Atlanta when several fellows in my class and our Program Director Ben Barzilai went. Great times were had that can’t be shared here!”

Favorite Leisure Activities: Spending time with family, going to theme parks, and playing basketball every Tuesday night!

Dr. David Lanfear and his family on a recent trip to the Grand Canyon.

Departing Fellows

Adefolakemi Babatunde, MD
Kaiser Permanente Group
Tacoma, WA

Timothy Dunn, MD
General cardiologist,
Mercy Clinic
Chesterfield, MO

Jacob Goldstein, MD
Interventional fellow,
Beaumont Hospital
Royal Oak, Michigan

Joshua Mitchell, MD
Assistant Professor of Medicine
Cardiovascular Division - Cardio-oncology
Washington University School of Medicine

Elizabeth Riddell, MD
Advanced Heart Failure and Transplant Cardiology fellow, St. Vincent Health Lafayette, IN

Nishtha Sodhi, MD

The following fellows continue in our program for subspecialty advanced training:

Advanced Heart Failure
Jonathan Moreno, MD, PhD
Sangita Sudharshan, MD

Electrophysiology
Curtis Steyers III, MD

Interventional
Adam Shpigel, MD

Structural Heart
John (Trevor) Posenau, MD

Advanced Fellowships

Ava Ysaguirre enjoying life with her husband, Lynn.
Amit Noheria, MBBS, SM, is one of three physicians in the nation to be honored with a 2018 Presidential Career Development Award from the American College of Cardiology. The award was announced at the ACC’s Annual Scientific Session earlier this year and provides one year of research funding to junior faculty to support cardiovascular research.

Noheria, who is researching the role of non-invasive electrocardiographic imaging (ECGI) in optimizing cardiac resynchronization therapy (CRT), aims to improve the impact of CRT in patients with heart failure. “My current project is to optimize delivery of CRT using thoughtful, patient-individualized device programming in patients who are already receiving CRT devices, and reduce the number of CRT non-responders,” says Noheria. “Beyond this project, broader goals are to use non-invasive electrical mapping to guide patient selection for CRT so that we can maximize its benefits within the heart failure population.”

Noheria joined the Cardiovascular Division in 2015. As part of the award recognition, he presented his research at the ACC’s Scientific Session. As his research continues, Noheria will investigate whether ECGI also can be used to guide individualized lead placement during CRT implantation.

Kathryn Lindley, MD, director of the Center for Women’s Heart Disease, has been awarded a research grant from the American College of Cardiology-Missouri Chapter to investigate the relationship between cardiac biomarker abnormalities and myocardial dysfunction in women with pre-term pre-eclampsia. She is one of six cardiologists in the state this year to receive a research award from the Missouri ACC.

Lindley specializes in caring for pregnant women with pre-existing cardiovascular conditions such as congenital heart disease, coronary artery disease, cardiomyopathy, valvular heart disease, and arrhythmias. She leads a multidisciplinary clinic that offers comprehensive medical management and counseling on issues such as family planning and hormone replacement therapy for women with heart disease.

Justin C. Hartupee, MD, PhD, joins the Division in the Section of Advanced Heart Failure and Cardiac Transplantation. Hartupee earned his medical degree from Case Western Reserve University in Cleveland, OH, in 2010. Following a residency in internal medicine at Barnes-Jewish Hospital and Washington University School of Medicine, he completed both a clinical cardiology fellowship and an advanced fellowship in advanced heart failure and transplant cardiology in our Division. From 2015 until 2018, he went on to complete a three-year cardiology research fellowship.

Hartupee now oversees the care of patients with advanced heart failure and is continuing his clinical research efforts focused on the transplant donor evaluation and selection process and the relationship between donor characteristics and transplant outcomes.

Joshua Mitchell, MD, joins the faculty in the Cardio-Oncology Section. After four years as a field artillery officer in the 82nd Airborne Division, Mitchell earned his medical degree from the University of Texas-Southwestern in 2008 and completed an internal medicine residency at the Walter Reed Army Medical Center in 2011. He then served two years as a physician with the US Army’s 75th Ranger Regiment prior to serving as an Assistant Professor of Medicine in Internal Medicine at Walter Reed. During his fellowship in cardiology at Washington University School of Medicine, Mitchell devoted his last year to focusing on cardio-oncology including a four-week externship at the University of Pennsylvania. Mitchell will be splitting time between clinical and research activities in Cardio-Oncology. He has been accepted into the Postdoctoral Mentored Training Program in Clinical Investigation and will be pursuing a Masters of Science in Clinical Investigation. His research interests include preventing and mitigating cardiotoxicities from cancer therapies and improving the diagnosis and management of patients with cardiac amyloid.
Beetroot Juice for Heart Failure Patients?

Researchers at Washington University School of Medicine and Indiana University have found that drinking beetroot juice can improve physical performance in patients with heart failure with reduced ejection fraction (HFrEF).

Beetroot juice is naturally high in inorganic nitrate. Low nitric oxide levels have been identified as a contributing factor for impaired exercise performance in HFrEF patients. In the study, published in the Journal of Heart Failure in February 2018, researchers evaluated beetroot juice’s effect on aerobic exercise capacity and found that oxygen consumption increased by approximately 8% and aerobic exercise capacity improved by 7% after ingesting the juice.

“Although the increase in oxygen consumption in the latest study appears small, it is significant because based upon longitudinal studies of our HFrEF patients, it translates into approximately a 10% decrease in the annual risk of death or transplant,” says Washington University cardiologist Linda Peterson, MD, senior author of the study.

Peterson and University of Indiana researcher Andrew Coggan, PhD, have been researching the effects and potential benefits of beetroot juice on HFrEF patients since 2011, when reports started circulating of athletes (cyclists and others) using the juice to enhance their physical performance. Their previous research focused on quadriceps muscle power. In that study, they found HFrEF patients increased their muscle strength two hours after drinking beetroot juice. The benefits were accompanied by increases in blood nitrate, nitrite, and breath nitric oxide levels.

ACE inhibitors, beta blockers and aldosterone antagonists, all standard medical treatments for HFrEF, have not been shown to improve muscle power. Because heart failure is classified based upon physical activity levels, Peterson believes that consumption of beetroot juice could improve strength and quality of life among HFrEF patients. A larger clinical trial is now under way to expand the research.

Notch Signaling Regulates Ion Channel Gene Expression and Arrhythmogenesis

Washington University investigators report that Notch activation within the adult atrium regulates transcription factor and ion channel gene expression. The finding is significant because Notch reactivation induces electrical changes that can lead to sinus brady-
With a ceremonial canon salute, a gold ring, and the donning of a pleated top hat, Lund University in Sweden bestowed an honorary doctoral degree (in Latin!) upon Sándor J Kovács, PhD, MD, director of Washington University School of Medicine’s Cardiovascular Biophysics Laboratory. The ceremony, a tradition at Lund dating back to 1670, took place at the end of May and honored Kovács for pivotal research in the field of cardiac physiology and for his collaborative research efforts with Lund physician scientists.

“Sándor J. Kovács’s cardiology research is ground-breaking and his commitment to explaining the heart’s unique ability to pump blood is a great source of inspiration to students,” says Håkan Arheden, professor of clinical physiology at Lund University.

Kovács was both a resident and a cardiovascular fellow at Barnes-Jewish Hospital before joining the WU faculty in 1985. He previously earned a doctorate in theoretical physics from Caltech in 1977.

He is known internationally for pioneering research in analyzing and characterizing diastole, including devising a kinematic model to account for suction initiated filling of the heart called the ‘parametrized diastolic filling’ (PDF) formalism, which helped echocardiographic quantification left ventricular diastolic function and expanded our understanding of how the heart works when it fills.

“Lund University is where echocardiography was discovered by Inge Edler in 1953, without which my own research would not have been possible,” says Kovács, who is a professor of medicine, physics, physiology, and biomedical engineering at Washington University. “It was a beautiful ceremony and I was honored to be a part of it and to share the moment with my family.”